The University of Sydney

'09

Science
handbook 2009

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Acknowledgements

The Arms of the University

Sidere mens eadem mutato

Though the constellation may change
the spirit remains the same

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Official course information

Faculty handbooks and their respective online updates along with the *University of Sydney Calendar* form the official legal source of information relating to study at the University of Sydney. Please refer to the following websites:
www.usyd.edu.au/handbooks
www.usyd.edu.au/calendar

Amendments

All authorised amendments to this handbook can be found at www.usyd.edu.au/handbooks/handbooks_admin/updates2009

Disability access

Accessible versions of this document in Microsoft Word are available at www.usyd.edu.au/handbooks/handbooks_disability/index

Resolutions

The Coursework Clause

Resolutions must be read in conjunction with the *University of Sydney (Coursework) Rule 2000 (as amended)*, which sets out the requirements for all undergraduate courses, and the relevant Resolutions of the Senate.

The Research Clause

All postgraduate research courses must be read in conjunction with the relevant rules and Resolutions of the Senate and Academic Board, including but not limited to:

1. The *University of Sydney (Amendment Act) Rule 1999 (as amended)*.
2. The *University of Sydney (Doctor of Philosophy (PhD)) Rule 2004*.
3. The Resolutions of the Academic Board relating to the Examination Procedure for the Degree of Doctor of Philosophy.
4. The relevant Faculty Resolutions.

Disclaimers

1. The material in this handbook may contain references to persons who are deceased.
2. The information in this handbook was as accurate as possible at the time of printing. The University reserves the right to make changes to the information in this handbook, including prerequisites for units of study, as appropriate. Students should check with faculties for current, detailed information regarding units of study.

Price

The price of this handbook can be found on the back cover and is in Australian dollars. The price includes GST.

Handbook purchases

You can purchase handbooks at the Student Centre, or online at www.usyd.edu.au/handbooks

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Handbook enquiries

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Important dates

University semester and vacation dates for 2009

Summer/Winter School lectures	**Dates**
Summer School – December program	Begins: Monday 8 December
Summer School – main program	Begins: Monday 5 January
Summer School – late January program	Begins: Monday 19 January
Winter School – main program	Monday 29 June to Saturday 25 July
Semester One	**Dates**
International student orientation (Semester 1) – STABEX	Monday 16 February and Tuesday 17 February
International student orientation (Semester 1) – full degree	Wednesday 18 February and Thursday 19 February
Lectures begin	Monday 2 March
AVCC Common Week/non-teaching Easter period	Friday 10 April to Friday 17 April
International application deadline (Semester 2) *	Thursday 30 April *
Last day of lectures	Friday 5 June
Study vacation	Monday 8 June to Friday 12 June
Examination period	Monday 15 June to Saturday 27 June
Semester ends	Saturday 27 June
AVCC Common Week/non-teaching period	Monday 6 July to Friday 10 July
Semester Two	**Dates**
International student orientation (Semester Two) – STABEX	Monday 20 July and Tuesday 21 July
International student orientation (Semester Two) – full degree	Wednesday 22 July and Thursday 23 July
Lectures begin	Monday 27 July
AVCC Common Week/non-teaching period	Monday 28 September to Friday 2 October
Last day of lectures	Friday 30 October
International application deadline (for Semester 1, 2010) *	Saturday 31 October *
Study vacation	Monday 2 November to Friday 6 November
Examination period	Monday 9 November to Saturday 21 November
Semester ends	Saturday 21 November

* Except for the faculties of Dentistry, Medicine and the Master of Pharmacy course. See www.acer.edu.au for details.

Last dates for withdrawal or discontinuation for 2009

Semester 1 – units of study	**Dates**
Last day to add a unit	Friday 13 March
Last day for withdrawal	Tuesday 31 March
Last day to discontinue without failure (DNF)	Friday 24 April
Last to discontinue (Discontinued – Fail)	Friday 5 June
Semester 2 – units of study	**Dates**
Last day to add a unit	Friday 7 August
Last day for withdrawal	Monday 31 August
Last day to discontinue without a failure (DNF)	Friday 11 September
Last day to discontinue (Discontinued – Fail)	Friday 30 October
Last day to withdraw from a non-standard unit of study	Census date of the unit, which cannot be earlier than 20 per cent of the way through the period of time during which the unit is undertaken.
Public holidays	**Dates**
Australia Day	Monday 26 January
Good Friday	Friday 10 April
Easter Monday	Monday 13 April
Anzac Day	Monday 27 April
Queen's Birthday	Monday 8 June
Labour Day	Monday 5 October

How to use this handbook

What is a handbook?

The handbook is an official publication and an essential guide for every student who studies at the University of Sydney. It is an important source of enrolment information. It can also help you with more than just planning your course of study.

As a student at the University of Sydney you need to be aware of course structures and content, who your lecturers are, as well as examination procedures.

You should also become familiar with University policies and faculty rules and regulations. The handbook will supply a lot of this information.

It will also point you to places and people around the University who can help with enquiries about library loans, child care, fees, casual employment, places to eat and stay, support groups and much more.

What new students need to know

- terminology used for courses and programs of study
- semester dates and examination periods
- important contact details
- how to plan your study program
- rules and policies on assessment, satisfactory progression, honours, and so on
- what University services are available and where to find them
- how to get around campus.

At the beginning of many of these chapters there will be explanations to help you proceed further.

Where to find information

Course terminology

University terminology, such as 'credit point', 'unit of study', and 'WAM', can be found in the **Abbreviations** and **Glossary** chapters, at the back of this handbook.

Dates

The start and finish dates of semester can be found in the front section of the handbook. Summer and Winter School dates are in the General University section at the back of the handbook.

Contents and index

The comprehensive **Contents** section at the front of the handbook explains the details you'll find within each chapter.

You'll find information like:

- how and where to contact faculty staff
- how to select your units of study and programs
- a list of degrees
- detailed information on all units of study, classified by unit identifiers (a four-alpha, four-digit code and a title)
- electives and streams
- scholarships and prizes
- information specific to faculties.

The **Index** lists units of study only. It allows you to check every reference which refers to your unit of study within the handbook. It is divided into two parts, and lists units of study alphabetically (by course name) and again by course code (alphanumeric).

Colour-coded sections

- Ivory – for undergraduate courses
- Blue – for postgraduate courses

Faculty rules and regulations

Faculty resolutions are the rules and regulations pertaining to a specific faculty. They can generally be found in their own chapter, or next to the relevant units of study.

These should be read along with the University's own *Coursework Rule 2000 (as amended)* which can be found in the **Essential information for students** chapter near the end of this book. Together they outline the agreement between student and faculty, and student and University.

General University information

This is information about the University in general, rather than information specific to the faculty. This information is at the back of the book and includes, among other things:

- University terminology and abbreviations
- campus maps to help you find your way around
- Summer and Winter School information
- international student information
- student services.

Course planner

You might like to plot the course of your degree as you read about your units of study. Use the planner at the back of this handbook.

Timetables

For information about personal timetables, centrally timetabled units of study, and venue bookings, see:
www.usyd.edu.au/studentcentre/timetabling.shtml

For the session calendar, see:
http://web.timetable.usyd.edu.au/calendar.jsp

Students with a disability

For accessible (word, pdf and html) versions of this document, see:
www.usyd.edu.au/handbooks/handbooks_disability

You can find information on Disability Services in the General University information section of the handbook. The service can provide information regarding assistance with enrolment and course requirement modifications where appropriate.

For details on registering with the service and online resources, see the Disability Services website: www.usyd.edu.au/disability

Handbook updates

The information in this handbook is current at the time of publication. Further information on University policies, such as plagiarism and special consideration, can be found on the University's website, along with official handbook amendments.

www.usyd.edu.au/handbooks/handbooks_admin/updates2009

Feedback regarding this handbook is welcome.
info@publications.usyd.edu.au

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Welcome from the Dean

This is a fascinating time to study science. Major technological advances are opening up many new areas, from ecosystems to nano-technology. At the same time, boundaries between traditional areas of science are blurring, as inter-disciplinary research leads to rapid progress on a wide range of issues in environmental, technology and medical/health related industries that underpin the future prosperity and quality of life in Australia.

These issues include protection of biodiversity, environmental remediation, control of industrial pollution, energy production, new manufacturing technologies, genetically modified organisms, stem cells and other new genetic advances in health and medicine, data management and new computing developments, and understanding human behaviour.

The comprehensive scope of the Faculty of Science at the University of Sydney allows us to offer courses in all of these areas and the many joint degree options provide the opportunity to study social, moral and commercial consequences of science.

A degree in science is a first step towards an exciting career, one that stimulates, challenges and rewards you. It can take you from the microscopic to the cosmic level, into physical and biological processes and from order to chaos.

A science degree develops your investigative skills and teaches you the tools of critical analysis and communication skills for lifelong learning. Employers in government, industry and education need graduates who are trained to think, analyse and communicate.

Science graduates have a unique blend of generic and discipline related skills that give them the capacity to tackle problems with initiative and resourcefulness, to plan and execute projects and to work as part of a team.

Studying science gives you the innovative skills for an ever-changing workforce environment and makes you a valuable and sought-after resource for employers. And if you become really excited by a particular area, our honours and postgraduate courses provide you with the training to become a practicing scientist in that field.

The degree programs at the University of Sydney are of exceptional quality. Many of our academic staff have won teaching awards and our research programs are world class.

Our degree programs are designed to offer challenges and excitement at a range of different levels, including the Talented Students Program, Advanced Science degree and specialist streams within the BSc that provide more directed science training, and in some cases, opportunities for industry placements.

The Faculty of Science has close links with industry and a wide range of employers, and will provide opportunities throughout your degree to explore career options.

The degree programs have been designed so that you can specialise if you wish, but you don't have to make that decision until you have completed a general first year.

The first-year experience is designed to help you settle into University, to meet other students, and to decide on or confirm your interest in a specialised area of study.

We use a variety of teaching methods to help you develop sound generic computing skills, interpersonal and communication skills, and an ability to work in teams and groups.

Most importantly, you will learn how to analyse problems, work out solutions, and communicate these clearly to others. We will help to discover how things function, develop lifelong strategies for learning new approaches, and gain skills to explore and use information in different contexts.

David Day
Dean

Introduction to the faculty

In this handbook you will find a wealth of information about the Faculty of Science and the University. In particular, it will help you find out who the people are in your faculty, the requirements for degrees and the ways these can be satisfied.

Chapter 1 is the 'who and where' of the faculty, listing names and locations of people and offices you are likely to need to contact during the year. It also contains information on some important University policies. It is essential that students become familiar with these policies.

Chapter 2 has all the fine print of the undergraduate degree resolutions (rules) covering your degree. The information here takes precedence over all other information in later chapters. You should definitely read the relevant parts of this chapter, and refer to them from time to time during your studies to make sure you are on track to satisfy the requirements of your degree.

Chapters 3 to 8 contain information on undergraduate degrees offered by the Faculty of Science. These chapters contain enrolment advice for undergraduates as well as frequently asked questions and important policy affecting students in the faculty. You will find enrolment guides and a degree planner to assist you to plan your degree. You should read the particular chapter devoted to your degree in conjunction with the resolutions in chapter 2.

Chapter 9 has degree tables and unit of study descriptions for undergraduates. If you want to know what a unit of study is and how it fits into your degree plan, this is the best place to look. You should read this chapter in conjunction with chapters 2 and your degree chapter.

Chapter 10 provides information for honours students.

Chapter 11 introduces the faculty's Talented Student Program and gives contact details for coordinators in participating departments and schools.

Chapter 12 is for all science students considering taking up the opportunity to study on exchange overseas at a partner institution.

Chapters 13 to 28 are for postgraduate students. Each chapter contains enrolment advice, unit of study descriptions and resolutions for specific postgraduate degrees offered by the Faculty.

Chapter 29 lists the staff of the faculty, organised by their school or department.

Chapter 30 contains a summary of scholarships and information about prizes for both undergraduate and postgraduate students.

General University information is a handy reference section describing all sorts of services on campus,

The Glossary and Abbreviations explain terms and abbreviations used throughout this handbook.

The index is a useful reference tool for students who want to locate information on a particular unit of study.

Campus maps are included to help you locate lecture theatres, offices, libraries, cafes, and other student facilities.

1. Contact information and policies

This chapter gives contact details for staff of schools and departments of the Faculty of Science, and some key policies. Students enrolled in units of study offered by the faculty must familiarise themselves with these policies. Towards the end of the chapter, you find information on faculty life and representation, and employment for graduates in science. Information is accurate at 2 September 2008.

The Faculty of Science

Faculty and Student Information Office
Level 2, Carslaw Building, F07
University of Sydney NSW 2006

Counter hours
Monday to Thursday 10am to 4pm, Friday 10am to 1pm
Phone: +61 2 9351 3021
Fax: +61 2 9351 4846
Email: info@science.usyd.edu.au
Website: www.science.usyd.edu.au

Undergraduate degree advisers	
BSc (Advanced Maths)	Associate Professor Don Taylor
BSc (Bioinformatics)	Associate Professor Lars Jermiin
BSc (Environmental)	Associate Professor Gavin Birch
BSc (Marine Science)	Dr Peter Cowell
BSc (Molecular Biology & Genetics)	Professor Iain Campbell
BSc (Molecular Biotechnology)	Associate Professor Kevin Downard
BSc (Nutrition)	Associate Professor Margaret Allman-Farinelli
B Medical Science	Associate Professor Ian Spence
B Computer Science & Technology	Dr Josiah Poon
B Information Technology	Dr Josiah Poon
B Psychology	Associate Professor Iain McGregor
B Liberal Studies	Dr Margaret Charles
B Science Media & Communications	Contact Faculty of Science Office

Schools, departments, centres

Agriculture, Food and Natural Resources

Room 304, McMillan Building, A05
Phone: +61 2 9351 6926
Fax: +61 2 9351 2945
Email: dean@agric.usyd.edu.au
Website: www.agric.usyd.edu.au/su/agric

Academic advisers	
Agricultural Chemistry	
Undergraduate	Dr Robert Caldwell
Honours	Professor Ivan Kennedy
Graduate	Dr Robert Caldwell
Soil Science	
Intermediate year	Dr Stephen Cattle
Senior	Associate Professor Balwant Singh
Honours	Professor Alex McBratney
Graduate	Associate Professor Balwant Singh

Discipline of Anatomy and Histology

Room S463, Anderson Stuart Building, F13
Phone: +61 2 9351 2497
Fax: +61 2 9351 2813
Email: enquiries@anatomy.usyd.edu.au
Website: www.anatomy.usyd.edu.au
Head of Department: Professor Bill Webster

Academic advisers	
Anatomy	
Undergraduate	Dr Denise Donlon
Honours	Dr Frank Lovicu
Graduate	Dr Frank Lovicu
Histology	
All years	Professor Christopher R Murphy Associate Professor Maria Byrne
Neuroscience	Dr Karen Cullen

Biochemistry

See 'Molecular and Microbial Biosciences'.

Bosch Institute

Medical Foundation Building, K25
92-94 Parramatta Road
Camperdown NSW 2050
Phone: +61 2 9351 2841
Fax: +61 2 9351 4195
Email: bosch@bosch.org.au
Website: www.bosch.org.au
Director: Professor Nick Hunt

School of Biological Sciences

Science Road Cottage, A10
Phone: +61 2 9351 2848
Fax: +61 2 9351 2558
Email: office@bio.usyd.edu.au
Website: www.bio.usyd.edu.au
Head of School: Professor Michael B Thompson

Academic advisers	
Junior year	Dr Elizabeth May
Intermediate year	Professor Ben Oldroyd
Senior year	Professor Ben Oldroyd
Honours year	Dr Adele Pile
Graduate adviser	Professor Chris Dickman

Cell Pathology

See 'Pathology'.

Central Clinical School

Immunology Discipline

Room 648, Blackburn Building, D06
Phone: +61 2 9351 7308
Fax: +61 2 9351 3969
Email: a.abendroth@usyd.edu.au
Website: www.infectiousdiseasesandimmunology.med.usyd.edu.au
Head of Discipline: Professor Warwick Britton

Academic adviser	
All years	Dr Allison Abendroth

Infectious Diseases Discipline

Room 676, Blackburn Building, D06
Phone: +61 2 9351 2412 Fax: +61 2 9351 4731
Email: charbour@infdis.usyd.edu.au
Website: www.infectiousdiseasesandimmunology.med.usyd.edu.au
Head of Discipline: Associate Professor Colin Harbour

Academic adviser	
All years	Associate Professor Colin Harbour
Honours	Dr Allison Abendroth

School of Chemistry

School of Chemistry, F11
Phone: +61 2 9351 4504
Fax: +61 2 9351 3329
Email: enquiries@chem.usyd.edu.au
Website: www.chem.usyd.edu.au
Head of School: Professor G G Warr

Academic advisers	
Junior year	Dr Adam Bridgeman
Intermediate year	Dr P J Rutledge
Senior year	Dr Rob Baker
Honours year	Dr Lou Rendina
Graduate adviser	Dr R J Clarke

Computational Science

See 'Physics'.

Computer Science

See 'Information Technologies'.

Centre for Research on Ecological Impacts of Coastal Cities

Old Geology Building, A11
Phone: +61 2 9351 4835
Fax: +61 2 9351 6713
Email: eicc@bio.usyd.edu.au
Website: www.eicc.bio.usyd.edu.au
Director: Professor Antony J Underwood

Academic adviser	
Graduate	Professor Antony Underwood

Environmental Studies

Admin: Room 435, Madsen Building, F09
Phone: +61 2 9351 4242
Fax: +61 2 9351 3644
Website: www.usyd.edu.au/envsci
Program Coordinator: Dr Phil McManus
Enquiries: Belinda McMillen
Geosciences enquiry desk: Room 348, Madsen Building

Academic advisers	
Undergraduate	Dr Phil McManus
Graduate	Dr Phil McManus

Fruit Fly Research Centre

Botany Building, A12
Phone: +61 2 9351 2298
Fax: +61 2 9351 4771
Email: ffrc@bio.usyd.edu.au
Website: www.bio.usyd.edu.au/fruitfly/index.htm
Chair: To be advised

School of Geosciences

Room 348, Madsen Building, F09
Phone: +61 2 9351 2886
Fax: +61 2 9351 3644
Email: admin@geosci.usyd.edu.au
Website: www.geosci.usyd.edu.au
Head of School: Associate Professor Dietmar Müller

Academic advisers	
Geosciences	
Junior year	Dr Melissa R Neave
Intermediate year	Associate Professor Gavin Birch
Senior year	Dr Stephen Gale
Honours year	Associate Professor Bill Pritchard
Graduate adviser	Dr Derek Wyman

History and Philosophy of Science Unit

Room 441, Carslaw Building, F07
Phone: +61 2 9351 4226
Fax: +61 2 9351 4124
Email: hps@science.usyd.edu.au
Website: www.usyd.edu.au/hps
Director: Dr Ofer Gal

Academic advisers	
Undergraduate	Dr Dean Rickles
Honours	Dr Dominic Murphy
Graduate	Dr Hans Pols

Immunology

See 'Central Clinical School'.

Infectious Diseases

See 'Central Clinical School'.

School of Information Technologies (Faculty of Engineering and Information Technologies)

School of IT Building, J12
1 Cleveland Street
Phone: +61 2 9351 3423
Fax: +61 2 9351 3838
Email: admin@it.usyd.edu.au
Website: www.it.usyd.edu.au
Head of School: Professor Albert Zomaya

Academic advisers	
Undergraduate	Dr Josiah Poon
Honours year	Dr Josiah Poon
Graduate (coursework)	Dr Uwe Roehm
Graduate (research)	Dr Bernhard Scholz

University of Sydney Institute of Marine Science

Room 308, Madsen Building, F09
Phone: +61 2 9036 9246
Fax: +61 2 9351 3644
Website: www.usyd.edu.au/marine
Director: Professor Doug Cato
Deputy Director: Associate Professor Ross Coleman
USIMS Coordinator: Dr Michelle Blewitt

Academic advisers	
Undergraduate	Dr Peter Cowell Associate Professor Ross Coleman
First year	Mel Neave Room 460, Madsen Building mneave@geosci.usyd.edu.au
Second year	Gavin Birch Room 462, Madsen Building gavin@geosci.usyd.edu.au
Third year	Stephen Gale Room 441, Madsen Building sgale@mail.usyd.edu.au
Hons	Associate Professor Bill Pritchard Room 439, Madsen Building pritchard@usyd.edu.au
Graduate	Associate Professor Ross Coleman

School of Mathematics and Statistics

Carslaw Building, F07
Phone: +61 2 9351 4533
Fax: +61 2 9351 4534
Email: firstyear@maths.usyd.edu.au
Email: enq@maths.usyd.edu.au
Email: statenq@maths.usyd.edu.au
Email: pg-director@maths.usyd.edu.au
Website: www.maths.usyd.edu.au
Head of School: Professor Nalini Joshi

Academic advisers	
Junior year	Student Office, Carslaw 520 Director, Ms Sandra Britton
Intermediate year	
Applied Mathematics	Dr Rosemary Thompson
Mathematical Statistics	Dr Jennifer Chan
Pure Mathematics	Dr Bill Palmer
Senior year	
Applied Mathematics	Dr David Ivers
Mathematical Statistics	Dr Samuel Mueller
Pure Mathematics	Dr Adrian Nelson
Honours year	
Applied Mathematics	Dr Martin Wechselberger
Mathematical Statistics	Dr Michael Stewart
Pure Mathematics	Dr Laurentiu Paunescu
Director PG studies	Associate Professor Andrew Mathas
Deputy Director	Dr Mary Myerscough
Talented Students Program	Dr Daniel Daners
Credit Transfer	Dr Adrian Nelson

Microbiology

See 'Molecular and Microbial Biosciences'.

Australian Key Centre for Microscopy and Microanalysis

Room LG21, Madsen Building, F09
Phone: +61 2 9351 2351
Fax: +61 2 9351 7682
Email: kcentre@emu.usyd.edu.au
Website: www.emu.usyd.edu.au
Director: Professor Simon Ringer

Academic adviser	
Graduate	Dr Lilian Soon

School of Molecular and Microbial Biosciences

Room 435, Biochemistry/Microbiology Building, G08
Phone: +61 2 9036 5417
Fax: +61 2 9351 5858
Email: mmb.studsupport@usyd.edu.au
Website: www.mmb.usyd.edu.au
Head of School: Associate Professor Arthur Conigrave

Academic advisers	
Graduate adviser	Dr Kim Bell-Anderson
Biochemistry	
Intermediate year Biochemistry	Associate Professor Gareth Denyer Associate Professor Charles Collyer
Junior and intermediate year Molecular Biology and Genetics	Dr Dale Hancock Ms Vanessa Gysbers
Medical Science	Mrs Helen Agus
Senior year	Mrs Jill Johnston
Honours year	Dr Stuart Cordwell
Human Nutrition	
Intermediate year	Dr Kim Bell-Anderson
Senior year	Ms Soumela Amanatidis
Honours year	Ms Beth Rohrlach Ms Margaret Nicholson
Postgraduate	Associate Professor Margaret Allman-Farinelli (Clinical Training) Associate Professor Samir Samman (Research Training)
Microbiology	
Intermediate year	Dr Andrew Holmes Ms Deborah Blanckenberg
Senior year	Mrs Helen Agus Associate Professor Dee Carter
Honours year and postgraduate	Dr Stuart Cordwell Dr Andrew Holmes
Molecular Biotechnology	
Intermediate year	Dr Matthew Todd
Senior year	Dr Neville Firth
Graduate adviser	Associate Professor Kevin Downard

Nutrition

See 'School of Molecular and Microbial Sciences'.

Department of Pathology

Room 501, Blackburn Building, D06
Phone: +61 2 9351 2414/2600
Fax: +61 2 9351 3429
Email: fi@pathology.usyd.edu.au
Website: www.med.usyd.edu.au/path
Head of Department: Professor Nicholas King

Academic advisers	
Undergraduate	Dr Bob Bao and Professor Nicholas King
Honours	Associate Professor Brett Hambly
Graduate	Dr Roger Pamphlett

Discipline of Pharmacology

Room 215, Blackburn Building, D06
Phone: +61 2 9351 2408
Fax: +61 2 9351 3868
Email: info@pharmacol.usyd.edu.au
Website: www.usyd.edu.au/su/pharmacology

Academic advisers	
Pharmacology	
Intermediate year	Contact the Discipline Office for the relevant unit of study coordinator
Senior year	Contact the Discipline Office for the relevant unit of study coordinator
Honours year	Dr Jasmine Henderson
Graduate adviser	Associate Professor Robert Vandenberg

School of Physics

Room 202, School of Physics, A28
Phone: +61 2 9351 3037
Fax: +61 2 9351 7726
Email: student_support@physics.usyd.edu.au
Website: www.physics.usyd.edu.au
Head of School: Professor Anne Green

Academic advisers	
Junior year	Dr Joe Khachan
Intermediate year	Dr Manjula Sharma
Senior year	Professor Tim Bedding
Honours	Dr Stephen Bartlett
Graduate coursework adviser	Dr Zdenka Kuncic
Graduate research adviser	Associate Professor Geraint Lewis
Computational science:	Dr Mike Wheatland

Discipline of Physiology

Room E212, Anderson Stuart Building, F13
Phone: +61 2 9351 3478
Fax: +61 2 9351 8400
Email: liaison@physiol.usyd.edu.au
Website: www.physiol.usyd.edu.au
Head of Department: Associate Professor Rebecca Mason

Academic advisers	
Intermediate year	Dr Meloni Muir
Medical Science	To be advised
Senior year	Professor Roger Dampney Dr Bill Phillips Dr Cathy Leamey Dr Dario Protti
Honours year	Professor David Allen
Graduate adviser	Dr Margot Day

Key Centre for Polymer Colloids

Phone: +61 2 9351 6968
Fax: +61 2 9351 8651
Email: s.perrier@chem.usyd.edu.au
Website: www.kcpc.usyd.edu.au
Director: Associate Professor S Perrier

School of Psychology

Room 325, Mungo MacCallum Building, A18
Phone: +61 2 9351 2872
Fax: +61 2 9036 5223
Email: enquiries@psych.usyd.edu.au
Website: www.psych.usyd.edu.au
Head of School: Professor Sally Andrews

Academic advisers	
Junior year	Dr Caleb Owens
Intermediate year	Dr Fiona White
Senior year	Dr Fiona White
Honours year	Dr Fiona Hibberd
Doctor of Clinical Psychology	Dr Caroline Hunt
Doctor of Clinical Neuropsychology	Dr Caroline Hunt
Applied Science (Coaching)	Dr Anthony Grant
Graduate adviser	Dr Pauline Howie
Graduate Diploma Psychology	Dr Mariana Szabo
Applied Science (Health Psychology)	Dr Barbara Mullen

Important policies relating to undergraduate candidature

Restrictions (general)

1. A candidate for a degree must satisfy the minimum eligibility requirements before commencing the degree units of study. Units of study taken before satisfying these requirements cannot normally be counted for degree purposes.
2. A candidate may not take a unit of study in any subject without having previously completed the qualifying unit(s) of study appropriate to that subject. Except with the permission of the Head of Department, he or she must also complete the prerequisites and corequisites as prescribed.
3. The only combinations of units of study available are those permitted by the timetable. A candidate may attend summer school, winter school and evening units of study if they are available.

Time limits

The faculty resolved at its meeting on 14 March 1995 that, except with the permission of the faculty, students must complete the requirements for award of their degree within ten calendar years of admission to candidature. This rule applies to all students who first enrolled in their degree after 1995, and applies from 1998 to students who first enrolled in their degree before 1996.

Suspension

The faculty resolved at its meeting on 14 March 1995 that all students must re-enrol each calendar year unless the faculty has approved suspension of candidature. Candidature will lapse if a student has not obtained approval for suspension and does not re-enrol. A student whose candidature has lapsed must be selected for admission again (usually by submitting an application to UAC) or the International Office before they can re-enrol.

Satisfactory progress

A student shall not have made satisfactory progress in any semester if the student:

1. fails to complete successfully more than 50 per cent of the credit points in which the student was enrolled for that semester; and/or
2. fails to complete successfully on the second or later attempt the same unit of study; and/or
3. is consequently unable to complete the degree within the maximum permitted time while carrying a normal student load.

A student who has not made satisfactory progress in accordance with the above will be placed on a faculty list of students at risk and will be required to take steps in accordance with the University's 'At Risk' policy as implemented by the Faculty of Science.

1. A student who is placed on the Faculty's At Risk list for any three semesters shall be required to show good cause why they should be permitted to re-enrol in the degree;
2. A student who has failed to show good cause in accordance with 12.2.1 shall be excluded from the degree.
3. A student who has been permitted to re-enrol after having been asked to show good cause and is placed on a faculty list of students at risk for the fourth time will be automatically excluded from the degree.

Faculty of Science attendance policy

Students enrolled in courses and units of study under the administration of the Faculty of Science are expected to attend a minimum of 80 per cent of tutorials, seminars and practical sessions etc associated with those courses or units, unless granted exemption by the Dean or Head of the relevant department.

The Head of Department may set additional requirements for the minimum number of assessment items such as practical reports, tutorial papers, seminars, essays, exercises, quizzes etc which must be completed.

On the recommendation of the relevant Head of Department the Dean may determine that a student fails a unit of study because of inadequate attendance or insufficient assessment items completed.

Credit

The faculty resolved at its meeting on 14 March 1995 that students who have previously completed studies which are considered by the Faculty to be equivalent to any unit of study listed in the Tables may be given credit for that unit of study providing that the unit of study was completed not more than ten years before admission to candidature in the faculty.

Examinations and assessment

The faculty resolved at its meeting on 9 March 1993 that the various forms of assessment of a student's performance in an undergraduate unit of study should include an examination or examinations conducted under University supervision and requiring written answers to unseen questions, provided that the general scope of a supervised examination paper may be made known to students in advance.

Results

For all junior, intermediate and senior units of study in the Bachelor of Science, Bachelor of Liberal Studies, Bachelor of Medical Science, Bachelor of Computer Science and Technology, Bachelor of Information Technology, Bachelor of Science in Media and Communications and Bachelor of Psychology degrees, the following mark ranges apply within the Faculty of Science:

HD	High Distinction	85 – 100
D	Distinction	75 – 84
CR	Credit	65 – 74
P	Pass	50 – 64
F	Fail	Below 46 or 50
AF	Absent Fail	
DF	Discontinued – Fail	
DNF	Discontinued – not to count as failure	

Key policies for undergraduate and postgraduate coursework students

Students enrolled in units of study offered by the Faculty of Science are required to familiarise themselves with the following six policies:

- Special Arrangements
- Special Consideration
- At Risk
- Code of Conduct for Students
- Student Plagiarism: coursework policy and procedure
- Intellectual Property

Special Arrangements
Students who are experiencing difficulty in meeting their assessment requirements due to competing essential community commitments may apply for special arrangements for examination and assessment.

Special Consideration
Students who have a serious illness or who have experienced misadventure which may affect their academic performance in a course or unit of study may request that they be given special consideration in relation to the determination of their results.

At Risk
To progress through a degree course, students are required to:

1. achieve the minimum progression rate specified by the faculty. In the Faculty of Science, students must pass more than 50 per cent of the credit points attempted in each semester
2. pass any field or clinical work, practicum, or other unit of study mandated by the faculty (listed in your degree requirements).

If you do not meet the progress requirements, you will be identified as a student at risk. The details of the policy can be found at:
www.usyd.edu.au/secretariat/students/risk_index.shtml

Code of Conduct for Students
The University has clear expectations of students in respect of academic matters and personal behaviour.

Student Plagiarism: coursework policy and procedure
The University of Sydney expects high standards of academic honesty in all student work. In particular, the University is opposed to and will not tolerate plagiarism.

Intellectual Property
Students and staff should be familiar with University of Sydney policies on intellectual property. The relevant policies are the:

University of Sydney (Intellectual Property) Rule 2002
www.usyd.edu.au/senate/policies/Intellectual_Property_Rule.pdf

Intellectual Property Rule Guide
www.usyd.edu.au/senate/policies/Intellectual_Property_Rule_Guide.pdf

Additional important policies

The *University of Sydney (Coursework Rule)* contains important policies for all students. A faculty has authority to determine what constitutes satisfactory progress for all students enrolled in award courses in that faculty, in accordance with the policies and directions of the Academic Board.

You may need to refer to the *Coursework Rule* from time to time, particularly in relation to discontinuation of enrolment and suspension of candidature, and unsatisfactory progress and exclusion.

The Coursework Rule can be found in the following locations:

- *University Calendar* (print or online version, found at www.usyd.edu.au/calendar)
- Policy Online (www.usyd.edu.au/policy)
- Handbooks website: www.usyd.edu.au/handbooks/university_information/01_uni_coursework_rule.shtml

See 'Essential Info for Students' at the back of this handbook for more information.

Special Arrangements

The University's assessment practices for 'Special Arrangements' and 'Special Consideration' are designed to ensure that conditions are as consistent as possible.

The Special Arrangements for Examination and Assessment policy is designed to support and assist students who are experiencing difficulty in meeting their assessment requirements due to competing essential community commitments.

Special Arrangements may be made available to any student enrolled within a Faculty of Science unit of study, who is unable to meet assessment requirements or attend examinations, because of one or more of the following situations:

- Essential religious commitments or essential beliefs.
- Compulsory legal absence (such as jury duty, court summons).
- Sporting or cultural commitments, including political and union commitments, where the student is representing the University, state or nation.
- Australian Defence Force commitments (including Army Reserve).

Special Arangements may only be considered in the above circumstances if the commitment falls on the same day as an assessment task or examination. Special arrangements will not be made if the commitment falls before or after the assessment task or examination.

The application for Special Arrangements must be submitted no later than seven (7) days prior to the due date of the assessment or examination for which alternative arrangements are being sought.

Students may elect to include details on preparation time required for the essential commitment (for example, travel time, training camps etc) but the Faculty of Science is under no obligation to make additional arrangements for preparation time.

This information should be noted on the application form, and supporting documentation detailing the tasks and time required to prepare must be submitted.

In cases of an extended absence, the relevant School should discuss the option of withdrawal without failure with students. An 'extended absence' is defined, for the purposes of Special Arrangements, as being a period of more than two weeks.

To apply for Special Arrangements the student must obtain and complete a Special Arrangements application pack from the Faculty of Science Information Office or from the faculty website.

- *For arrangements due to religious or ceremonial commitments* the student must have a religious authority complete the Statement of Essential Religious or Ceremonial Commitment (SERCC).
- *For arrangements due to compulsory legal absence, sporting or cultural commitments or Australian Defence Force commitments* the student must attach the appropriate documentation (Jury Summons, Notification of Selection for Sporting Event or Brigade Statement etc.)

Original paperwork should be lodged at the Student Information Office of the Faculty of Science, with one copy for each piece of assessment for which consideration is being sought.

All copies of the application will be stamped by faculty staff on receipt. The student is required to distribute stamped copies of the application to the School administrative office as directed by faculty staff.

Students will be notified of the academic judgement concerning their application for Special Arrangements by the Faculty of Science, via an email to their University email account.

Special Consideration

Generally, serious illness or misadventure will be taken into account when considering a student's academic performance in a course or units of study. There is a clear distinction between long-standing illness or difficulties which prevent students from attending classes or completing required work or which seriously interfere with their capacity to study for long periods, and short-term serious illness or misadventure that may prevent a well-prepared student from sitting for an examination or completing a particular assignment.

Applications must be received within seven (7) days from the end of the period for which consideration is sought (ie from the assignment due date or date of examination).

To apply for Special Consideration a student must obtain and complete a Special Consideration application pack from the Student Information Office of the Faculty of Science or from the Faculty website.

- *For consideration due to serious illness* the student must have a registered medical practitioner or counsellor complete the Professional Practitioner's Certificate.
- *For consideration due to misadventure* the student must attach the appropriate documentation (police reports, counselling service statements etc).

Original paperwork should be lodged at the Student Information Office of the Faculty of Science, with one copy for each piece of assessment for which consideration is being sought. All copies of the application will be stamped by faculty staff on receipt. The student is required to distribute stamped copies of the application to the School administrative office as directed by faculty staff.

Students will be notified of the academic judgement concerning their application for Special Consideration by the Faculty of Science, via an email to their University email account.

At Risk

The University of Sydney, through its Academic Board, has always been concerned to develop policies and procedures that promote the welfare and well-being of students of the University.

In particular, the Academic Board recognises the value of reliably and efficiently monitoring the progress of students in their studies, and of having systems in place to promote the early detection of students who are making poor or unsatisfactory progress and are therefore at risk of exclusion from their degree.

A benefit of early detection of students in this at risk category is that it allows timely intervention, and the provision of advice and assistance to support students in their ongoing studies.

This Policy and Procedure sets out:

- the University of Sydney's commitment to early identification and support of students At Risk of exclusion from the degree course
- the principles and processes to be followed by faculties in detecting and dealing with students who might be categorised as At Risk.

The progression of students At Risk is promoted by:

- regularly/effectively advising students of Progress Requirements
- identifying students At Risk
- alerting students that they are At Risk
- providing assistance to address the risk
- tracking the progress of students after they are identified as being At Risk.

For full details of the policy, visit the University website:
www.usyd.edu.au/secretariat/students/riskstudents.shtml

General progress requirements
To progress through a degree course, students are required to:

1. achieve the minimum Progression Rate specified by the faculty. In the Faculty of Science, students must pass more than 50 per cent of the credit points attempted in each semester
2. pass any field or clinical work, practicum, or other unit of study mandated by the Faculty (listed in your degree requirements).

If you do not meet the progress requirements, you will be identified as a student At risk. At the end of each semester the faculty will produce a report listing all undergraduate students within the faculty determined to be At Risk, based on these triggers:

- failure to successfully complete more than fifty per cent of the credit points for which the student was enrolled in the semester just completed
- failure to complete a mandated unit of study, field or clinical work, or practicum, as appropriate
- failure twice to pass the same unit of study
- an unsatisfactory student attendance record
- inability to complete their degree within the maximum permitted time while carrying a normal student load (24 credit points per semester full-time, 12 credit points per semester part-time.

Stages in the At Risk process

The reports generated each semester will be used to manage and advise students At Risk.

STAGE 1

The Faculty of Science will write to all students listed in the At Risk report for the first time, giving the following information and advice:

- that the student has been identified as At Risk
- how the student has been identified as At Risk
- that the student is required to complete a Back on Track survey, identifying and explaining any reasons for their academic performance in the preceding semester(s) being of a standard that caused them to be identified as an At Risk student
- that the student is required to attend a Staying on Track information session, which will cover study skills and introduce the student to remedial learning services, counselling services and relevant student association representatives
- that all correspondence and documents relating to the student's At Risk status will be recorded on their Progression Profile.

Students enrolled in postgraduate coursework degrees of less than two years (full-time) duration who are listed in the At Risk report are required to consult an Academic Advisor and attend a Staying on Track information session.

STAGE 2

The faculty will write to all students listed in the At Risk report for the second time, giving the following information and advice:

- that they have been identified as At Risk for the second time
- how they have been identified as At Risk for the second time
- that all correspondence and documents relating to their At Risk status will be recorded on their Progression Profile.
- that they are required to complete a Staying on Track Survey (Stage 2) which will:
  (i) invite each student to identify and explain any reasons for their academic performance in the preceding semester(s) being of a standard that caused them to be identified as an At Risk student
  (ii) ask that they provide information about any support services or other relevant remedial action they may have taken since they were identified as Stage 1 At Risk
  (iii) require students to consult with their year adviser or Associate Dean.
- that they are required to attend a Staying on Track information session, if they have not already done so.

Students enrolled in postgraduate coursework degrees of less than two years (full-time) duration who are listed in the At Risk report for a second time proceed directly to stage 3.

STAGE 3

The Faculty of Science will write to the all students listed in the At Risk report for the third time, asking them to show good cause why they should not be excluded from their degree course.

The faculty will consider and rule on whether a student has shown good cause in accordance with Division 6 of the *University of Sydney (Coursework) Rule 2000 (as amended)*.

Where a student has not established good cause, the Dean may, in accordance with clause 16 of the *University of Sydney (Coursework) Rule 2000 (as amended)*:

1. exclude the student from the degree course; or
2. permit the student to re-enrol in the degree course subject to restrictions on units of study, which may include:
   (i) completion of a unit or units of study within a specified time;
   (ii) exclusion from a unit or units of study; and
   (iii) specification of the earliest date on which a student may re-enrol in a unit or units of study.

The faculty will normally provide reasons for their decisions in their advice to the student, and record those reasons on the Progression Profile.

STAGE 4

The Faculty of Science will automatically exclude the following students from their degree:

- all students listed in an At Risk report for the fourth time after having been asked to 'show cause' and permitted to re-enrol after stage 3
- all students enrolled in award programs of two years or less (full-time) duration and listed in an At Risk report for the third time after having been asked to 'show cause' and permitted to re-enrol after stage 3.

Students first enrolled prior to 2008
The At Risk policy applies to all students from 1 January 2007. A student's record prior to 2007 is not considered when making the decision whether a student should appear on the At Risk list. Any undergraduate coursework student who appears on the At Risk list at the end of semester 1, 2007 will enter the process at stage 1.

Students enrolled in specialist undergraduate degrees
This covers students in specialised degrees such as Bachelor of Science (Nutrition), Bachelor of Science (Marine Science), Bachelor of Science (Molecular Biotechnology), Bachelor of Science (Molecular Biology and Genetics) and Advanced Mathematics streams. The At Risk rules supplement the existing progression rules for these degrees. They do not replace the existing progression requirements for these degrees.

Students enrolled in Applied Science coursework degrees
The At Risk rules supplement the existing progression rules for these degrees. They do not replace the existing progression requirements for these degrees. Satisfactory progress requirements are detailed in the resolutions for each degree.

Code of Conduct for Students

1. Principles

This Code of Conduct has been formulated to provide a clear statement of the University's expectations of students in respect of academic matters and personal behaviour.

Study at the University presents opportunities for interacting with other members of the University community. The University recognises and values the diversity of student experiences and expectations, and is committed to treating students, both academically and personally, in a fair and transparent manner.

All students, in return, are required to comply with the requirements set down in this Code of Conduct.

The University reaffirms its commitment to:

- high academic standards, intellectual rigour and a high quality education
- intellectual freedom and social responsibility
- recognition of the importance of ideas and the pursuit of critical and open enquiry
- tolerance, honesty and respect as the hallmarks of relationships throughout the University community
- high standards of ethical behaviour.

All students are required to be aware of and act consistently with these values.

2. Coverage

This Code of Conduct applies to all students of the University of Sydney, in respect of all actions and activities (including inaction or inactivity) relating to or impacting on the University or its students and employees. It must be read in conjunction with the statutes, rules, and resolutions of the University.

Definitions

In this Code of Conduct:

Student means all students of the University of Sydney, including but not limited to fee paying students, HECS-HELP students, FEE-HELP students, audit students, Centre for Continuing Education Students, Centre for English Teaching students, exchange students, Study Abroad students, Summer School students and Winter School students.

Employee means all staff of the University of Sydney, including full-time, part-time and casual staff.

4. Personal conduct

All students must:

- Treat all employees, honorary appointees, consultants, contractors, volunteers, any other members of the public, and other students with respect, dignity, impartiality, courtesy and sensitivity.
- Maintain a cooperative and collaborative approach to inter-personal relationships.
- Act honestly and ethically in their dealings with University employees, honorary appointees, consultants, contractors, volunteers, any other members of the public and other students.
- respect the privacy of University employees, honorary appointees, consultants, contractors, volunteers, any other members of the public and other students.
- Ensure that they do not act in a manner that unnecessarily or unreasonably impedes the ability of University employees, honorary appointees, consultants, contractors, volunteers, any other members of the public and other students to carry out their study, research or work at the University, including in the University of Sydney Library, lecture theatres and laboratories.
- Ensure that they do not act in a manner that unnecessarily or unreasonably impedes the ability of University employees, honorary appointees, consultants, contractors, volunteers, any other members of the public and other students to access or use the resources of the University, including the University Library resources, lecture theatres and laboratories.
- Ensure that they do not become involved in or encourage discrimination against or harassment or bullying of University employees, honorary appointees, consultants, contractors, volunteers, any other members of the public or other students.

5. Academic conduct

All students must:

- Ensure that their enrolment and progress in their award course is lawful and consistent with the statutes, rule and resolutions of the University of Sydney.
- Not enrol in additional units of study outside the degree resolutions, even if the student information system allows it when enrolling online.
- Take responsibility to maintain current information in the student information system, and observe key dates and deadlines.

- Read all official correspondence from the University, including email.
- Act ethically and honestly in the preparation, conduct, submission and publication of academic work, and during all forms of assessment, including formal examinations and informal tests.
- Avoid any activity or behaviour that would unfairly advantage or disadvantage another student academically.
- Conform to the University's requirements for working with humans, animals and biohazards.
- Behave professionally, ethically and respectfully in all dealings with the University's learning partners during extramural placements and practicums.
- Use the University's resources, including information and communication technology resources, in a lawful and ethical manner and for University purposes only, unless express permission has been granted for non-University or private usage.

6. Authority

This Code of Conduct was approved by the Academic Board pursuant to the *University of Sydney (Academic Governance) Rule 2003* on 2 February 2005.

For further details on the Code of Conduct for Students, see the Academic Board Policies website: www.usyd.edu.au/ab/policies.

Student plagiarism: Coursework policy and procedures

Part A – Purpose

1. Academic honesty and prohibition on plagiarism

(1) The role of the University of Sydney is to create, preserve, transmit and apply knowledge through teaching, research, creative works and other forms of scholarship. The University is committed to academic excellence and high standards of ethical behaviour as the cornerstones of scholastic achievement and quality assurance. The University requires all students to act honestly, ethically and with integrity in their dealings with the University, its employees, members of the public and other students.

(2) The University of Sydney is opposed to and will not tolerate Plagiarism. It is the responsibility of all students to:

- (a) ensure that they do not commit or collude with another person to commit Plagiarism;
- (b) report possible instances of Plagiarism; and
- (c) comply with this Policy and Procedure.

(3) The University will treat all identified cases of student Plagiarism seriously, in accordance with this Policy and Procedure, and with Chapter 8 of the University of Sydney By-Law 1999 (as amended) which deals with Student Discipline.

Part B – Preliminary

2. Commencement and coverage

This Policy and Procedure commences on 4 April 2005. It replaces all previous policies and procedures relating to Plagiarism by students enrolled in course work degrees, to the extent that any such previous policies and procedures are inconsistent with this Policy and Procedure.
www.usyd.edu.au/senate/policies/Plagiarism.pdf

The University's Code of Conduct for Responsible Research Practice and Guidelines for dealing with Allegations of Research Misconduct are accessible on the University's website at:
www.usyd.edu.au/policy.

3. Authority

The Policy and Procedures were approved by the Vice-Chancellor on 15 February 2005.

4. Definitions

In this Policy and Procedure:
Acknowledgement of the Source means identifying at least:

1. the author or person who owns the Work; and
2. the place from which the Work or part of the Work was sourced.

Dishonest Plagiarism is defined by Part B Clause 7.
Examiner means the person responsible for assessing the Work.
Legitimate Cooperation means any constructive educational and intellectual practice that aims to facilitate optimal learning outcomes through interaction between students, including:

1. researching, writing and/or presenting joint Work;
2. discussion of general themes and concepts;
3. interpretation of assessment criteria;
4. informal study/discussion groups; and
5. strengthening and development of academic writing skills through peer assistance.

Negligent Plagiarism is defined by Part B Clause 6.
Nominated Academic means the relevant Heads of School and/or Associate Deans responsible for handling Plagiarism, as nominated by the Dean of the Faculty in accordance with the University's Delegations of Authority.
Plagiarism is defined by Part B Clause 5.
Work means ideas, findings or written and/or published material.
Written Warning means a warning issued under Part D Clauses 11(2)(b) or 12(4)(b).

5. Plagiarism

(1) Plagiarism for the purpose of this Policy and Procedure (which applies to students enrolled in course work degrees) means presenting another person's Work as one's own Work by presenting, copying or reproducing it without Acknowledgement of the Source.

(2) Plagiarism includes presenting Work for assessment, publication, or otherwise, that includes:

- (a) sentences, paragraphs or longer extracts from published or unpublished Work (including from the Internet) without Acknowledgement of the Source; or
- (b) the Work of another person, without Acknowledgement of the Source and presented in a way that exceeds the boundaries of Legitimate Cooperation.

(3) Plagiarism can be negligent (Negligent Plagiarism) or dishonest (Dishonest Plagiarism).

6. Negligent Plagiarism

(1) Negligent Plagiarism means innocently, recklessly or carelessly presenting another person's Work as one's own Work without Acknowledgement of the Source.

(2) Negligent Plagiarism often arises from a student's fear of paraphrasing or writing in their own words, and/or ignorance of this Policy and Procedure. It arises from:

- (a) failure to follow appropriate referencing practices;
- (b) failure to determine or verify and acknowledge the source of the Work.

7. Dishonest plagiarism

(1) Dishonest Plagiarism means knowingly presenting another person's Work as one's own Work without Acknowledgement of the Source.

(2) Alleged Plagiarism will be deemed to be alleged Dishonest Plagiarism where:

- (a) substantial proportions of a student's Work have been copied from the Work of another person, in a manner that clearly exceeds the boundaries of Legitimate Cooperation;
- (b) a student's Work contains a substantial body of copied material (including from the Internet) without Acknowledgement of the Source, and in a manner that cannot be explained as Negligent Plagiarism;
- (c) there is evidence that the student engaged another person to produce or conduct research for the Work, either partly or wholly, for payment or other consideration; or
- (d) the student has previously received a Written Warning.

Part C – Preventing plagiarism

8. Compliance statements

All students are required to submit a signed statement of compliance with all Work submitted to the University for assessment, presentation or publication. A statement of compliance must be in the form of:

1. a University assignment cover sheet;
2. a University electronic form; or
3. a University written statement; certifying that no part of the Work constitutes a breach of this Policy.

Part D – Procedure for dealing with plagiarism

9. Procedural fairness

The University is committed to dealing with student Plagiarism in accordance with the principles of procedural fairness, including the right of a student to:

1. be informed of the allegations against them in sufficient detail to enable them to understand the precise nature of the allegations and to properly consider and respond;
2. have a reasonable period of time within which to respond to the allegations against them;
3. have the matter resolved in a timely manner;
4. be informed of their rights under this Policy and Procedure and under Chapter 8 of the University of Sydney By-Law 1999 (as amended);
5. invite a support person or student representative to any meeting regarding alleged Plagiarism;
6. impartiality in any investigation process; and
7. an absence of bias in any decision-maker.

10. Identification and assessment of alleged Plagiarism

(1) Where an Examiner detects or is made aware of alleged Plagiarism by a student, the Examiner must report the alleged Plagiarism to a Nominated Academic.

(2) Where:

- (a) an Examiner reports alleged Plagiarism to a Nominated Academic; or
- (b) a Nominated Academic otherwise becomes aware of alleged Plagiarism;

the Nominated Academic must, in consultation with the Examiner, make a preliminary assessment of whether the alleged Plagiarism would, if proven, constitute Negligent Plagiarism or Dishonest Plagiarism.

(3) The Nominated Academic and the Examiner will make a preliminary assessment of whether the alleged Plagiarism would, if proven, constitute Negligent Plagiarism or Dishonest Plagiarism on a case by case basis, taking into account factors such as:

- (a) the extent of the alleged Plagiarism measured against the student's original contribution to the Work;
- (b) the percentage value of the Work in the unit of study or course;
- (c) the student's overall academic performance in the unit of study or course; and
- (d) the circumstances in which the Plagiarism is alleged to have occurred.

11. Negligent plagiarism

(1) Cases of alleged Negligent Plagiarism will be handled by the Nominated Academic in accordance with this clause and with Part D Clause 9 (Procedural Fairness) above.

(2) Where, following discussion with the student, a Nominated Academic forms the view that the Student is guilty of Negligent Plagiarism, the Nominated Academic will:

- (a) counsel the student by explaining referencing guidelines, providing a copy of this Policy and Procedure, and referring the student to services for assistance; and
- (b) issue a Written Warning about the consequences of any subsequent breaches of this Policy.

(3) A copy of a Written Warning issued under Clause 11(2)(b) above must be:

- (a) signed and dated by the Nominated Academic and the student;
- (b) retained by the student; and
- (c) placed on a central file maintained by the Registrar.

(4) Where, following discussion with the student, the Nominated Academic forms the view that the student is guilty of Negligent Plagiarism, the Nominated Academic may also take other appropriate action, including:

- (a) requiring the student to resubmit the Work for assessment;
- (b) requiring the student to undertake another form of assessment;
- (c) requiring the student to undertake other remedial action; or
- (d) applying a fail grade to the Work or part thereof.

12. Dishonest Plagiarism

(1) Cases of alleged Dishonest Plagiarism will be handled in accordance with this clause and with Part D Clause 9 (Procedural Fairness) above.

(2) The Nominated Academic will make a preliminary assessment of whether the alleged Dishonest Plagiarism is serious enough, if proven, to constitute potential student misconduct under Chapter 8 of the University of Sydney By-Law 1999 (as amended).

(3) In making his or her assessment under Part D Clause 12(2) above, the Nominated Academic will take into account:

- (a) whether the student has previously received a Written Warning;
- (b) the extent of the alleged Dishonest Plagiarism measured against the student's original contribution to the Work;
- (c) the percentage value of the Work in the unit of study or course;
- (d) the capacity of the alleged Dishonest Plagiarism to adversely affect the student's peers and/or teachers; and
- (e) the capacity of the alleged Dishonest Plagiarism to impact adversely on the actual or perceived academic standards of the University.

(4) Where the Nominated Academic assesses that the alleged Dishonest Plagiarism is not serious enough, if proven, to constitute potential student misconduct under Chapter 8 of the University of Sydney By-Law 1999 (as amended), the Nominated Academic will, following discussion with the student:

- (a) counsel the student by explaining referencing guidelines, providing a copy of this Policy and Procedure, and referring the student to services for assistance; and
- (b) issue a Written Warning about the consequences of any subsequent breaches of this Policy.

(5) A copy of a Written Warning issued under Part D Clause 12(4)(b) above must be:

- (a) signed and dated by the Nominated Academic and the student;
- (b) retained by the student; and
- (c) placed on a central file maintained by the Registrar.

(6) Where the Nominated Academic assesses that the alleged Dishonest Plagiarism is not serious enough, if proven, to constitute potential student misconduct under Chapter 8 of the University of Sydney By-Law 1999 (as amended), the Nominated Academic may also, following discussion with the student, take other appropriate action, including:

- (a) requiring the student to resubmit the Work for assessment;
- (b) requiring the student to undertake another form of assessment;
- (c) requiring the student to undertake other remedial action;
- (d) applying a fail grade to the Work or part thereof; or
- (e) applying a fail grade to the unit of study.

(7) Where the Nominated Academic assesses that the alleged Dishonest Plagiarism is serious enough, if proven, to constitute potential student misconduct under Chapter 8 of the *University of*

Sydney By-Law 1999 (as amended), the Nominated Academic will refer the alleged Dishonest Plagiarism to the Registrar.

(8) The Nominated Academic will refer the alleged Dishonest Plagiarism to the Registrar in all cases of alleged Dishonest Plagiarism where the student has previously received a Written Warning.

13. Appeals

An appeal by a student against a decision made under Part D Clauses 11(4)(a)-(d) and 12(6)(a)-(e) of this Procedure will be handled by the University in accordance with the Resolutions of Senate and the Academic Board on Student Appeals against Academic Decisions.

Faculty of Science intervention and support strategies

The Faculty of Science has always been concerned to develop policies that promote the welfare and well-being of its student. A number of University and faculty rules and policies require the faculty to intervene and support students who may be at risk of not meeting progression requirements. These policies are:

- Any Satisfactory Progress requirements that are found in the resolutions for particular degrees.
- The University's Students At Risk policy.
- For international students, the National Code for Education Providers 2007.

An *intervention* is an action taken in relation to an individual student by the faculty in applying policies that deal with satisfactory progress. An intervention can take a number of forms, but is typically a referral to particular student support services or a direction in relation to a student's studies.

A *support strategy* is a plan or process to assist an individual student or group of students within the faculty to better achieve academic success.

All students should take advantage of the faculty's support strategies and the University's student support services. Do not wait until you are in severe difficulties to seek assistance!

The faculty has a number of strategies and intervention possibilities in place. These include, but are not limited to, the following:

Making available information on degree requirements in the Faculty of Science

The faculty publishes handbooks on an annual basis. Handbooks become available in the October prior to the calendar year, so the 2009 Handbook is available from October 2008. Handbooks are available online, for purchase in hardcopy format from the Student Centre, and are available at many public libraries.

Each Faculty of Science student receives an enrolment guide at in-person enrolment. These guides set out relevant contacts and degree rules. In addition, the faculty distributes information on University student support services.

Provision of specialist administrative staff

Administrative staff are available at the Faculty of Science office counter and by email and by telephone to assist with queries relating to degree requirements and other administrative matters. For opening times and contact details, see www.science.usyd.edu.au.

Faculty of Science Transition Workshop

To enable new first year undergraduate students to study effectively and enjoy a positive student experience, the Faculty of Science offers a transition workshop each year. Workshops are held prior to the commencement of the academic year. Details on registration are available at enrolment sites or on the faculty webpage at enrolment periods.

Faculty of Science website

The faculty's website is specifically for students enrolled in the Faculty of Science, and contains relevant information on degree requirements and many other things.

Implementing progression requirements

- The faculty administers progression requirements for undergraduate specialist degrees on an annual basis. Students who do not meet the progression requirements will be notified within 4 weeks of second semester results becoming available that they have not fulfilled satisfactory progression requirements. Students will be notified of the intervention to be implemented.
- The faculty administers progression requirements for postgraduate coursework degrees on a semester basis. Students who do not meet the progression requirements will be notified within 4 weeks of semester results becoming available that they have not fulfilled satisfactory progression requirements. Students will be notified of the intervention to be implemented.
- The faculty administers the University's At Risk policy on a semester by semester basis. Students are notified in accordance with the At Risk policy set out in Chapter 1 of the Faculty of Science Handbook.
- The faculty has a staff member dedicated to administration for International Student candidatures. The International Student Adviser works closely with the International Office to facilitate compliance with the ESOS code.

Interventions

Interventions are made with regard to the particular policy or rule being applied. Interventions include:

- Completion of a back on track survey by Students At Risk.
- Requirement to attend at an information session to raise awareness of student services.
- A referral to attend particular student services.
- An interview with the Associate Dean or other course adviser.
- Recommendations on study patterns.
- Recommendation on suspension or withdrawal from study.

Where a student has failed to make satisfactory progress as required, subsequent interventions include:

- Transfer to a more appropriate degree program as provided in degree resolutions or as recommended by an Associate Dean.
- Transfer to a more appropriate stream in a degree as provided in degree resolutions or as recommended by an Associate Dean.
- Direction to move from full-time to part-time enrolment.
- Direction to suspend studies for a period.
- Mandatory attendance at specified Learning Centre courses.
- Case management on an individual student basis.
- Exclusion for a specified period from a degree.

Support Strategies

The faculty supports students by:

- Making information on degree requirements easily available.
- Making information on University student support services easily available.
- Offering a Transition Workshop.
- Offering the Talented Student Program to support the development of talented Science students.
- Providing specialist administrative staff to advise on faculty policy and procedures.
- Providing individual consultations, by appointment, with Associate Deans.

The Schools within the Faculty of Science support students through:

- Issuing unit of study outlines detailing requirements and learning outcomes.
- Making available specialist administrative staff to advise on School policy and procedures.
- Making available specialist academic advisers to advise on academic matters within the School.

Faculty life and representation

Student membership of the faculty

The Constitution of the Faculty of Science provides that, in addition to the ex officio and academic staff members of the Faculty, there shall be the following categories of membership:

1. Not more than three persons distinguished in the field of Science and its teaching, appointed by the faculty on the nomination of the Dean.
2. Not more than six students, undergraduate or postgraduate, enrolled as candidates for a degree or diploma in the Faculty of Science elected in the manner prescribed by resolution of the Senate.
3. Not more than five persons, who have teaching, research or offer appropriate associations with the work of the faculty, appointed by the faculty on the nomination of the Dean.

Two of the six students are elected annually by the undergraduate students in the faculty, two are elected by the postgraduate students and one each is nominated by each of the Sydney University Science Society and the Sydney University Postgraduate Representative Association.

The Senate resolutions for the student membership of the Faculty of Science are set out in full in the *University of Sydney Calendar*.

Students may request permission to attend faculty meetings as observers. Details are available from the faculty office.

Sydney University Science Society (SCISOC)

As a student in the Faculty of Science you are a member of the Sydney University Science Society (SCISOC), the faculty society. SCISOC promotes activities of both an educational and a social nature.

The Society holds a number of activities throughout the year, including barbecues every two weeks and the highlight of the Science student year – the Annual Science 'Bucky' Ball. The Society appoints sports directors who help organise interfaculty sport.

The society runs a stall during orientation week, where t-shirts are sold and you can find out more about what the SCISOC does. The Aqua Regia (official publication of SCISOC) which heralds information concerning the activities of SCISOC and Science departmental societies, is produced weekly and can be found on official departmental noticeboards.

The postal address is Faculty of Science, Carslaw Building F07, University of Sydney, 2006.

The affairs of the society are governed by a council consisting of office bearers, delegate members from member societies, student members of faculty and nine members elected at the annual general meeting, at least three of whom are first year students. You are encouraged to attend the AGM (held in Semester 1) and to take an active part in the society and on council. Council meets regularly during term and all members are invited to attend the meetings. These are advertised in the *Daily Bull*. Your attendance will ensure that SCISOC effectively meets the needs of science students on campus. For more information, visit the website at www.sci.soc.usyd.edu.au.

Member societies

A number of the departments within the Faculty of Science have departmental societies, for example the Alchemist's Society, Biochemical Society, Biological Society, School of Geosciences Society (includes Geography, Geology, Environmental Science and Marine Science), Mathematical Society, Medical Science Society, Microbiology Society, Physics Society, and Psychological Society.

These societies organise talks, films, field trips and other activities relating to their particular discipline, as well as parties, wine and cheese evenings and other social activities. Most departmental societies have a stall during the orientation period.

Employment for graduates in Science

The field of employment for science graduates is extraordinarily wide, ranging from dedicated research scientist in a university or research laboratory to managing director of a large corporation, school teacher, technical representative, laboratory bench worker, production superintendent, consultant geologist, bird banding biologist, actuary, computer sales representative, beachcomber ... the list is endless and will depend on a student's subject choices and interests.

Many science graduates choose to undertake further study to prepare for employment. There is a wide range of Graduate Diplomas and coursework masters degrees available. These include Molecular Biotechnology, Bioinformatics, Nutrition and Dietetics, Information Technology, Environmental Science, Marine Ecology and Psychology.

Some science graduates complete a Bachelor of Engineering degree after an additional two years' study. This qualifies them as professional engineers, with a wide range of additional job opportunities in chemical, civil, electrical, mechanical and mining engineering.

If you wish to consider this option, it is important to make sure that you choose the appropriate prerequisite subjects in your science degree.

It is prudent to plan your course with a career in mind, or a couple of careers if possible. For example, even though you might be sure you want to teach mathematics, you might include some computer science in your course so that if you did not like teaching you would have another choice of career.

Alternatively, you might have your heart set on being a biologist, but as an insurance policy in case you could not get a job as a biologist, you might consider also majoring in biochemistry, microbiology or chemistry to widen the scope.

This is not to say you should give up too easily if you want to be a biologist. In areas where jobs are not too plentiful you have to start right at the beginning of your course to prepare to secure that job on graduation. Some suggestions are to learn scuba-diving, join the bush-walking or speleological clubs, work in the vacation for one of the national parks – for nothing if necessary – and make as many personal contacts as you can.

Such evidence of keenness and initiative impresses an employer. As you will have understood, it is not only your academic ability an employer looks at but also your personality, evidence of a sense of responsibility and activities beyond the set curriculum.

Similarly, if you want a job related to chemistry, physics, geology, computer science, biochemistry, etc, do your best to obtain a vacation job that will enable you to claim relevant experience when applying for your first job. These vacation jobs are hard to get, admittedly, but the extra legwork and initiative involved in finding one will pay off in the long run.

Some undergraduate degrees, such as the BSc (Molecular Biotechnology) feature industry or industry-related experience as part of the requirements for the degree. Such placements occur during semester teaching periods. Other departments can organise industry placements for their students, which do not count to the degree but provide valuable experience for a new graduate.

2. Undergraduate degree regulations

Undergraduate Resolutions

This chapter contains the regulations governing undergraduate degrees throughout the University and the regulations governing undergraduate degrees offered by the Faculty of Science.

1. The degrees in the Faculty of Science shall be:
1.1 Bachelor of Science (BSc), which shall also incorporate the specially designated streams:
1.1.1 Bachelor of Science (Advanced) (BSc(Advanced))
1.1.2 Bachelor of Science (Advanced Mathematics) (BSc(Advanced Mathematics))
1.1.3 Bachelor of Science (Marine Science) (BSc(Marine Science))
1.1.4 Bachelor of Science (Molecular Biology & Genetics) (BSc(Molecular Biology & Genetics))
1.1.5 Bachelor of Science (Molecular Biotechnology) (BSc(Molecular Biotechnology))
1.1.6 Bachelor of Science (Nutrition) (BSc (Nutrition))
1.2 Bachelor of Medical Science (BMedSc), which is offered in the following designated combined degree courses:
1.2.1 Bachelor of Medical Science/Bachelor of Medicine and Bachelor of Surgery (BMedSc/MBBS)
1.2.2 Bachelor of Engineering/Bachelor of Medical Science (BE/BMedSc)
1.3 Bachelor of Psychology (BPsych)
1.4 Bachelor of Science and Technology (BST)
2. The Bachelor of Science is offered in the following designated combined degree courses:
2.1 Bachelor of Science (Advanced)/Bachelor of Medicine and Bachelor of Surgery (BSc(Adv)/MBBS)
2.2 Bachelor of Science/Bachelor of Laws (BSc/LLB)
2.3 Bachelor of Science and Bachelor of Arts (BSc/BA)
2.4 Bachelor of Commerce and Bachelor of Science (BCom/BSc)
2.5 Bachelor of Science and Bachelor of Engineering (BSc/BE)
2.6 Bachelor of Engineering and Bachelor of Science (BE/BSc)
2.7 Bachelor of Education (Secondary:Science) and Bachelor of Science (BEd(Secondary:Science)/BSc)
2.8 Bachelor of Education (Secondary:Mathematics) and Bachelor of Science (BEd(Secondary:Mathematics)/BSc)
2.9 Bachelor of Education (Secondary:Science) and Bachelor of Science (BEd(Secondary)/BSc(Psychology))
2.10 Bachelor of Nursing and Bachelor of Science (BN/BSc)
2.11 Bachelor of Science/Master of Nursing Practice (BSc/MNP)
2.12 Bachelor of Applied Science (Exercise and Sport Science)/Bachelor of Science (Nutrition)
3. The degrees in the Faculty of Science offered in conjunction with other faculties shall be:
3.1 Bachelor of Liberal Studies (BLibStud), which shall incorporate the streams:
3.1.1 Bachelor of Liberal Studies (International) (BLibStud(International)
3.1.2 Bachelor of Liberal Studies (Advanced) (BLibStud(Advanced))
3.2 Bachelor of Arts and Science (BAS)

Note the specific glossaries attached to each degree, and the generic glossary common to all degrees.

The regulations governing postgraduate award courses can be found at the end of each postgraduate degree chapter.

University of Sydney (Coursework) Rule 2000 (as amended)

The resolutions in this chapter must be read in conjunction with the *University of Sydney (Coursework) Rule 2000 (as amended)* which sets out the requirements for all coursework courses, and the relevant Senate Resolutions which are available in the *University Calendar*.

The Calendar can also be viewed at www.usyd.edu.au/calendar.

Bachelor of Science

Course rules

1. **Admission**
1.1 All applications for admission to candidature to an undergraduate degree or combined undergraduate degree in the Faculty of Science will be subject to the Undergraduate Admissions policy of the University of Sydney.
1.2 A candidate for the BSc degree in any stream may apply to the Dean for permission to transfer candidature to any other stream.
2. **Units of study**
2.1 The units of study for the Bachelor of Science are set out under subject areas in Table I and Table VI, together with:
2.1.1 designation as junior, intermediate, senior or honours and, where appropriate, as advanced units of study
2.1.2 credit point values
2.1.3 assumed knowledge, corequisites and prerequisites
2.1.4 the semesters in which they are offered; and
2.1.5 the units of study with which they are mutually exclusive.
2.2 The Dean may permit a student of exceptional merit who is admitted to the Talented Student Program to undertake a unit or units of study within the Faculty other than those specified in Table I.
2.3 A student who enrols, in accordance with these resolutions, in a unit or units of study prescribed for a degree other than the Bachelor of Science, shall satisfy the prerequisites, corequisites and other requirements prescribed for such units of study.
3. **Requirements for the pass degree**
3.1 *Bachelor of Science*
3.1.1 To qualify for the award of the Bachelor of Science, a student shall complete units of study having a total value of at least 144 credit points, including:
3.1.1.1 at least 96 credit points from Science subject areas;
3.1.1.2 at least one major from those included in Table I;
3.1.1.3 at least 12 credit points from the Science subject areas of Mathematics and Statistics;
3.1.1.4 at least 24 credit points of Junior units of study from at least two Science subject areas other than Mathematics and Statistics; and
3.1.1.5 no more than 60 credit points from Junior units of study.
3.1.2 A major in the BSc normally requires the completion of a minimum of 24 credit points of senior units of study in one Science area, including any units of study specified in the Table of undergraduate units of study as compulsory for that major.
3.1.3 A major in Psychology requires 48 credit points across intermediate and senior Psychology* units of study including PSYC(2111 or 2011), PSYC(2112 or 2012), PSYC(2113 or 2013) and PSYC(2114 or 2014). No other intermediate Psychology units can be counted towards the major.
3.1.3.1 The senior units must include at least one of PSYC3011, 3012, 3013 and 3014.*Note: HPSC3023 Psychology and

Psychiatry History and Phil is available for Senior Psychology students and will count towards a major in Psychology. Successful completion of this unit of study is essential for students intending to take the Theoretical Thesis option in Psychology Honours.

3.1.4 A maximum of 48 credit points may be counted towards the degree requirements from units of study offered by faculties other than the Faculty of Science.

3.1.5 Units of study completed at the University of Sydney Summer School which correspond to units of study specified in sub-sections 2 and 3 may be credited towards the course requirements.

3.1.6 The testamur for the degree of Bachelor of Science shall specify the major(s) completed in order to qualify for the award.

3.2 *Bachelor of Science (Advanced)*

3.2.1 To qualify for the award of the pass degree in the BSc (Advanced) stream, a student shall complete the requirements for the BSc degree in sub-section 3.1 with the exception of 3.1.1.5 and in addition, except with the permission of the Dean:

3.2.1.1 include no more than 48 credit points from Junior units of study;

3.2.1.2 include at least 12 credit points of Intermediate units of study at either the Advanced level or as TSP units;

3.2.1.3 include at least 48 credit points of Senior units of study of which at least 24 are completed at the Advanced level or as TSP units in a single Science subject area; and

3.2.1.4 maintain in Intermediate and Senior units of study in Science subject areas an average mark of 65 or greater in each year of enrolment;

3.2.2 candidates who fail to maintain the required credit average will be transferred to candidature for the Bachelor of Science degree in their next year of enrolment with full credit for the units of study completed as Bachelor of Science (Advanced) candidates.

3.2.3 Candidates who fail to achieve a credit average across all units of study attempted in the year in which they have otherwise completed the requirements for the degree will be awarded the Bachelor of Science.

3.2.4 Students who have completed at least 48 credit points may be permitted to transfer to the BSc (Advanced) stream from the BSc or other degree programs if:

3.2.4.1 their mark averaged over all attempted units of study is 75 or greater; and

3.2.4.2 they are able to enrol in the required number of Advanced level units or TSP units.

3.2.5 The testamur for the degree of Bachelor of Science (Advanced) shall specify the major(s) completed in order to qualify for the award.

3.3 *Bachelor of Science (Advanced Mathematics)*

3.3.1 To qualify for the award of the pass degree in the BSc (Advanced Mathematics) stream, a student shall complete the requirements for the BSc degree in subsection 3.1 with the exception of 3.1.1.5 and in addition, except with the permission of the Dean:

3.3.1.1 include no more than 48 credit points from Junior units of study;

3.3.1.2 include at least 12 credit points of Intermediate units of study at either the Advanced level or as TSP units in the Science subject areas of Mathematics and Statistics;

3.3.1.3 include a major in Mathematics, Statistics or Financial Mathematics and Statistics;

3.3.1.4 include at least 48 credit points of senior units of study of which at least 24 are completed at the Advanced level or as TSP units in the Science subject areas of Mathematics and Statistics; and

3.3.1.5 maintain in intermediate and senior units of study in Science subject areas an average mark of 65 or greater in each year of enrolment;

3.3.2 candidates who fail to maintain the required credit average will be transferred to candidature for the Bachelor of Science degree in their next year of enrolment with full credit for the units of study completed as Bachelor of Science (Advanced Mathematics) candidates.

3.3.3 Candidates who fail to achieve a credit average across all units of study attempted in the year in which they have otherwise completed the requirements for the degree will be awarded the Bachelor of Science.

3.3.4 Students who have completed at least 48 credit points may be permitted to transfer to the BSc (Advanced Mathematics) stream from the BSc or other degree programs if:

3.3.4.1 their mark averaged over all attempted units of study is 75 or greater; and

3.3.4.2 they are able to enrol in the required number of Advanced level units or TSP units.

3.3.5 The testamur for the degree of Bachelor of Science (Advanced Mathematics) shall specify the major(s) completed in order to qualify for the award.

3.4 *Other streams of the Bachelor of Science*

3.4.1 In order to qualify for the award of the BSc degree in the following streams, a student shall, except with the permission of the Dean, complete the requirements for the BSc degree in subsection 3.1 with the exception of 3.1.1.2 and notwithstanding section 13 satisfy the requirements and complete the units of study set out in the respective *Tables of undergraduate units of study*:

3.4.1.1 Marine Science Table IC

3.4.1.2 Molecular Biology and Genetics Table ID

3.4.1.3 Molecular Biotechnology Table IE: or

3.4.1.4 in order to qualify for the award of honours degree in the Nutrition stream, a student shall, except with the permission of the Dean, complete the requirements for the BSc degree in subsections 3.1 and 4 and complete the units of study set out in Table IF.

4. Requirements for the honours degree

4.1 There shall be honours courses in all Science subject areas listed in Table VI (Honours units of study).

4.2 To qualify to enrol in an honours course, students shall:

4.2.1 have qualified for the award of a pass degree; or

4.2.2 be a graduate of the Faculty of Science; or

4.2.3 be a graduate holding a Bachelor of Science degree or an equivalent qualification from another institution;

4.2.4 have completed a minimum of 24 credit points of senior units of study relating to the intended honours course (or equivalent at another institution);

4.2.5 have achieved either:

4.2.5.1 a least a credit average in 48 credit points in relevant intermediate and senior Science units of study; or

4.2.5.2 a SCIWAM of at least 65 (or equivalent at another institution); and

4.2.6 satisfy any additional criteria set by the Head of Department concerned.

4.3 Students shall complete the requirements for the honours course full-time over two consecutive semesters.

4.4 If the Faculty is satisfied that a student is unable to attempt the honours course on a full-time basis and if the Head of Department concerned so recommends, permission may be granted to undertake honours half-time over four consecutive semesters.

4.5 To qualify for the award of an honours degree, students shall complete 48 credit points of honours units of study in Table VI of undergraduate units of study, as prescribed by the Head of Department concerned.

4.6 The grade of honours and the honours mark are determined by performance in the honours course.

4.7 Honours in the Bachelor of Science may be awarded in four classes as follows:

4.7.1 Class I (mark range: 80 and above)

4.7.2 Class II(1) (mark range: 75-79)

4.7.3 Class II(2) (mark range: 70-74)

4.7.4 Class III (mark range: 65-69)

4.8 A student with an honours mark of 90 or greater in an honours subject area and a minimum SCIWAM of 80 shall, if deemed to be of sufficient merit by the Dean, receive a bronze medal.

4.9 A student may not re-attempt an honours course in a single subject area.

4.10 A student who is qualified to enrol in two honours courses may either:

4.10.1 complete the honours courses in the two subject areas separately and in succession; or

4.10.2 complete a joint honours course, equivalent to an honours course in a single subject area, in the two subject areas.

4.11 A joint honours course shall comprise such parts of the two honours courses as may be decided by the Dean.

5. Transfer from the Bachelor of Engineering degree

5.1 *Bachelor of Science/Bachelor of Engineering double degree*

5.1.1 A student enrolled for a Bachelor of Engineering degree may be permitted to transfer to the Faculty of Science to complete a BSc degree at the end of Second Year or Third Year in the BE degree if:

5.1.1.1 except as provided in section 4.1.2 of the resolutions of the Bachelor of Engineering degree, all units of study attempted in the BE degree have been completed with a grade of pass or better;

5.1.1.2 at least 96 credit points from units of study in the BE degree have been completed;

5.1.1.3 the student is qualified to enrol in a major in a Science area; and

5.1.1.4 for admission to the Advanced streams, the student satisfies the requirements in subsections 3.2 and 3.3 of the Resolutions of the Faculty of Science relating to the BSc Degree.

5.1.2 Students will be under the supervision of the Faculty of Engineering for the period of BE degree enrolment and under the supervision of the Faculty of Science for the BSc enrolment and completion.

5.1.3 Units of study must be selected as shown in the Engineering Specialisation Tables for the core components of the chosen Engineering specialisation.

5.1.4 Units from the Science Faculty must be chosen from Table 1 of the Bachelor of Science as shown in the Science Faculty handbook to meet requirements of a Science major.

5.1.5 The Faculty Resolutions (which are reproduced in the Engineering and Science Handbooks, as the case may be) specify:

5.1.5.1 credit point values;

5.1.5.2 corequisites/prerequisites/assumed learning/assumed knowledge; and

5.1.5.3 any special conditions.

5.1.6 To qualify for the award of the pass BSc degree a student shall complete units of study to a value of at least 48 credit points including:

5.1.6.1 42 credit points of intermediate/senior units of study in Science subject areas; and

5.1.6.2 a major in a Science area.

5.1.7 To qualify for the award of the pass degree in the Advanced stream of the BSc a student shall meet the requirements in subsection 3.2.

5.1.7.1 To qualify for the award of the pass degree in the Advanced Mathematics stream of the BSc a student shall meet the requirements in subsection 3.3.

5.1.8 The requirements of subsection 5 must be completed in one year of full-time study or two years of part-time study.

5.1.9 Students who complete at least 42 but less than 48 credit points in the prescribed time limits may in the following year of enrolment in the BE complete the remaining units to satisfy the requirements of the Faculty of Science.

5.1.10 Students who complete less than 42 credit points may apply to be readmitted to the degree, subject to subsections 7-9 of the Resolutions of the Faculty of Science relating to the BSc degree.

5.1.11 Students who are so qualified may undertake an honours course in the BSc in accordance with subsection 4 relating to the BSc degree.

5.1.12 On completion of the requirements of the BSc degree or BSc Honours course, students will be eligible to resume their enrolment toward the BE degree according to the Faculty of Engineering resolutions for that degree.

5.1.13 Students may abandon the BSc degree enrolment at any stage and resume their enrolment in the BE degree.

5.1.14 Resolutions covering admission, enrolment restrictions, progression requirements, satisfactory progress, cross-institutional study and assessment criteria for the Engineering component of the double degree are equivalent to those for the BE degree and specialisations, as shown in the Faculty Handbook.

5.1.15 The Deans of the Faculties of Engineering and Science shall jointly exercise authority in any matter concerning the double degree not otherwise dealt with in these resolutions.

Faculty rules

6. Details of units of study

6.1 The units of study for the Bachelor of Science are listed in Table 1 and Table VI of these resolutions.

6.2 A candidate for the course shall proceed by completing units of study as prescribed by the Faculty.

6.3 A unit of study shall consist of such lectures, seminars, tutorial instruction, essays, exercises, practical work, or project work as may be prescribed.

6.4 In these resolutions, 'to complete a unit of study' or any derivative expression means:

6.4.1 to attend the lectures and the meetings, if any, for seminars or tutorial instruction;

6.4.2 to complete satisfactorily the essays, exercises, practical and project work if any; and

6.4.3 to pass any other examination of the unit of study that may apply.

6.5 All units of study for a particular subject area may not be available every semester.

6.6 The Dean may allow substitution of any unit of study by another unit of study, including units of study from other undergraduate programs in the Faculty or elsewhere in the University.

7. Enrolment in more/less than minimum load

7.1 A candidate may not enrol in additional units of study once the degree requirements of 144 credit points have been satisfied, without first obtaining permission from the Dean.

7.2 Students may enrol on either a full-time or part-time basis.

8. Cross-institutional study

8.1 Provided that permission has been obtained in advance, the Dean may permit a student to complete a unit of study at another institution and have that unit credited to his/her course requirements provided that either:

8.1.1 the unit of study content is material not taught in any corresponding unit of study in the University; or

8.1.2 the student is unable for good reason to attend a corresponding unit of study at the University.

9. Restrictions on enrolment

9.1 Units of study which overlap substantially in content are noted in the *Tables of undergraduate units of study*. Such units of study are mutually exclusive and no more than one of the overlapping units of study may be counted towards meeting the course requirements.

9.2 Where a student enrols in a unit of study which is the same as, or has a substantial amount in common with, a unit of study previously attempted but not completed at the grade of Pass or better, the Head of Department concerned may exempt the student from certain requirements of the unit of study if satisfied that the relevant competence has been demonstrated.

9.3 A student may not enrol in a unit of study which they have completed previously with a grade of Pass or better.

9.4 A candidate may not enrol in units of study having a total value of more than 30 credit points in a semester.

10. Discontinuation of enrolment

10.1 A student who does not enrol in any semester without first obtaining written permission from the Dean to suspend candidature will be deemed to have discontinued enrolment in the course.

10.2 Students who have discontinued from the course will be required to apply for admission to the course and be subject to admission requirements pertaining at that time.

11. Suspension of candidature

11.1 A student may seek written permission from the Dean to suspend candidature in the course.

11.2 Suspension may be granted for a maximum of one year on any one application.

12. Re-enrolment after an absence

12.1 A student who plans to re-enrol after a period of suspension must advise the Faculty of Science Office in writing of their intention by no later than the end of October for First Semester of the following year or the end of May for Second Semester of the same year.

13. Satisfactory progress

13.1 A student shall not have made satisfactory progress in any semester if the student:

13.1.1 fails to complete successfully more than 50% of the credit points in which the student was enrolled for that semester; and/or
13.1.2 fails to complete successfully on the second or later attempt the same unit of study; and/or
13.1.3 is consequently unable to complete the degree within the maximum permitted time while carrying a normal student load.
13.2 A student who has not made satisfactory progress in accordance with 13.1.1 or 13.1.2 will be placed on a Faculty list of students at risk and will be required to take steps in accordance with the University's At Risk policy as implemented by the Faculty of Science;
13.2.1 a student who is placed on the Faculty's At Risk list for any three semesters shall be required to show good cause why the student should be permitted to reenrol in the degree;
13.2.2 a student who has failed to show good cause in accordance with 13.2.1 shall be excluded from the degree;
13.2.3 a student who has been permitted to reenrol after having been asked to show good cause and is placed on a Faculty list of students at risk for the fourth time will be automatically excluded from the degree.

14. **Time limit**

14.1 A candidate must complete all the requirements for the award of the degree within ten calendar years of admission to candidature or readmission without credit.
14.1.1 If a candidate is readmitted with credit, the Faculty will determine a reduced time limit for completion of the degree.
14.2 Students shall complete the requirements for the honours course full-time over two consecutive semesters.
14.2.1 If the Faculty is satisfied that a student is unable to attempt the honours course on a full-time basis and if the Head of Department concerned so recommends, permission may be granted to undertake honours half-time over four consecutive semesters.

15. **Assessment policy**

15.1 Students may be tested by written and oral examinations, exercises, essays or practical work or any combination of these as the Faculty may determine.
15.2 Where a unit of study is offered at different levels of difficulty, the performance of students will be matched so that a grade obtained at one level indicates a quality of work comparable with that required for the same grade at the other level(s).
15.3 Heads of Department may arrange for further testing in cases of special consideration, in accordance with Academic Board policy governing illness and misadventure.

16. **Credit transfer policy**

16.1 Credit will not be granted for units of study completed ten years or more prior to application, except with the permission of the Dean.
16.2 Credit may be granted as specific credit if the unit of study is considered to be directly equivalent to a unit of study in Table I, or as non-specific credit.
16.3 The total amount of credit granted may not be greater than 96 credit points and may not include more than 48 credit points of units of study from other degrees for which credit is maintained or a degree has been conferred.
16.4 All students, notwithstanding any credit transfer, must complete at least 24 credit points of senior Science units of study towards a major taken at the University of Sydney.

17. **Candidates enrolled before 2005**

17.1 These resolutions apply to all candidates for the degree enrolling in units of study after 1 January 2005.
17.2 With the permission of the Faculty of Science, candidates who first enrolled for the degree prior to 2005 and have not had a period of suspension or exclusion may until 31 March 2008 choose to qualify for the degree under the old resolutions.
17.3 With the permission of the Faculty of Science, candidates who first enrolled for the degree as part-time candidates prior to 2005 and have not had a period of suspension or exclusion may until 31 March 2010 choose to qualify for the degree under the old resolutions.

18. **Glossary for the BSc**

18.1 Completion of a unit of study means that the assessment requirements have been satisfied and a grade of Pass or better has been achieved.
18.2 Junior unit of study is a 1000 or first-year stage unit. Its prerequisites or assumed knowledge are non-tertiary qualifications and corequisites are other Junior units of study.
18.3 Intermediate unit of study is a 2000 or second-year stage unit. Its prerequisites or assumed knowledge are Junior or Intermediate units of study and corequisites are other intermediate units of study. (Specific to the Faculty of Science).
18.4 Senior unit of study is a 3000 or third-year stage unit. Its prerequisites or assumed knowledge are Junior, Intermediate or Senior units of study and corequisites are other Senior units of study. (Specific to the Faculty of Science.)
18.5 Honours unit of study is a 4000 or fourth-year stage unit offered within an honours course.
18.6 Advanced unit of study is a unit which generally parallels a normal unit of study but which provides added breadth of material and/or sophistication of approach.
18.7 Major in the BSc normally requires the completion of a minimum of 24 credit points of Senior units of study in one Science area, including any units of study specified in the *Table of undergraduate units of study* as compulsory for that major. A student may not count a unit of study toward more than one major. (A major in Psychology requires 48 credit points of intermediate and senior Psychology units of study including PSYC(2111 or 2011), PSYC(2112 or 2012), PSYC(2113 or 2013) and PSYC(2114 or 2014). No other Intermediate Psychology units can be counted towards the major).
18.8 Dean means the Dean of Science.
18.9 Faculty means the Faculty of Science.
18.10 Science subject area means a defined field of study in science.
18.11 Degree means the degree of Bachelor of Science.
18.12 Requirements means coursework requirements for the award of the degree of Bachelor of Science.
18.13 Student means a person enrolled as a candidate for the degree of Bachelor of Science.
18.14 TSP means the Talented Student Program in the Faculty of Science.
18.15 SCIWAM means the weighted average mark calculated by the Faculty from the results for all Intermediate and Senior units of study with a weighting of 2 for intermediate units and 3 for senior units.

Bachelor of Medical Science

Course rules

1. **Admission**

1.1 All applications for admission to candidature to an undergraduate degree or combined undergraduate degree in the Faculty of Science will be subject to the Undergraduate Admissions policy of the University of Sydney.

2. **Units of study**

2.1 The units of study for the Bachelor of Medical Science are set out in Table IV together with:
2.1.1 designation as junior, intermediate, senior or honours and, where appropriate, as advanced units of study
2.1.2 credit point values
2.1.3 assumed knowledge, corequisites and prerequisites
2.1.4 the semesters in which they are offered; and
2.1.5 the units of study with which they are mutually exclusive.
2.2 A student may enrol, in accordance with subsection 3.1.5, in a unit of study prescribed for a degree other than the Bachelor of Medical Science and shall satisfy the prerequisites, corequisites, qualifying and other requirements prescribed for such units of study for that other degree.
2.3 The Dean may permit a student of exceptional merit who is admitted to the Talented Student Program to undertake a unit or units of study within the Faculty other than those specified in Table IV.
2.4 There shall be honours units of study in Science subject areas listed in Table IV D.

3. **Requirements for the pass degree**

3.1 In order to qualify for the award of the Bachelor of Medical Science degree a student shall complete units of study having a total value of at least 144 credit points, including:
3.1.1 at least 48 credit points from junior units of study, comprising MBLG1001 and 12 credit points each from Chemistry,

Mathematics and Physics or Computational Science and 6 credit points from Biology;

3.1.2 no more than 60 credit points from junior units of study;

3.1.3 48 credit points of Intermediate core units of study listed in Table IV;

3.1.4 at least 36 credit points of senior units of study taken from the subject areas of Anatomy/Histology, Biology (Genetics), Biochemistry, Cell Pathology, Immunology, Infectious Diseases, Microbiology, Pharmacology and Physiology;

3.1.5 no more than 12 credit points from units of study other than core units of study.

3.1.6 Units of study taken at the University of Sydney Summer School which correspond to units of study specified in subsection 3 may be credited towards the course requirements.

4. Requirements for the honours degree

4.1 Students may proceed to an honours course in the Bachelor of Medical Science.

4.2 In order to qualify to enrol in an honours course, students shall either:

4.2.1 have qualified for the award of the pass degree; or

4.2.2 be a pass graduate in Medical Science of the Faculty of Science; or

4.2.3 be a pass graduate holding a Bachelor of Medical Science degree or an equivalent qualification from another institution;

4.2.4 have completed a minimum of 24 credit points of senior units of study relating to the intended honours course (or equivalent at another institution);

4.2.5 have achieved either:

4.2.5.1 a least a credit average in 48 credit points in the relevant intermediate and senior Science units of study; or

4.2.5.2 a SCIWAM of at least 65 (or equivalent at another institution); and

4.2.5.3 satisfy any additional criteria set by the Head of Department concerned.

4.2.6 Students shall complete the requirements for the course full-time over two consecutive semesters.

4.2.6.1 If the Faculty is satisfied that a student is unable to attempt the honours course on a full-time basis and if the Head of Department concerned so recommends, permission may be granted to undertake honours half-time over four consecutive semesters.

4.3 To qualify for the award of an honours degree, students shall complete 48 credit points of honours units of study in one subject area from those listed in Table IV D.

4.4 The grade of honours and the honours mark are determined by performance in the honours course.

4.4.1 Honours in the Bachelor of Science may be awarded in four classes as follows:

4.4.1.1 Class I (mark range: 80 and above)

4.4.1.2 Class II(1) (mark range: 75-79)

4.4.1.3 Class II(2) (mark range: 70-74)

4.4.1.4 Class III (mark range: 65-69)

4.4.2 A student with an honours mark of 90 or greater in an honours subject area and a minimum SCIWAM of 80 shall, if deemed to be of sufficient merit by the Dean, receive a bronze medal.

4.5 A student who is qualified to enrol in two honours courses may either:

4.5.1 complete the honours courses in the two subject areas separately and in succession; or

4.5.2 complete a joint honours course, equivalent to an honours course in a single subject area, in the two subject areas.

4.6 A student may not re-attempt an honours course in a single subject area.

Faculty rules

5. Details of units of study

5.1 The units of study for the Bachelor of Medical Science are listed in Table IV of these resolutions.

5.2 A candidate for the course shall proceed by completing units of study as prescribed by the Faculty.

5.3 A unit of study shall consist of such lectures, seminars, tutorial instruction, essays, exercises, practical work, or project work as may be prescribed.

5.4 In these resolutions, 'to complete a unit of study' or any derivative expression means:

5.4.1 to attend the lectures and the meetings, if any, for seminars or tutorial instruction;

5.4.2 to complete satisfactorily the essays, exercises, practical and project work if any; and

5.4.3 to pass any other examination of the unit of study that may apply.

5.5 All units of study for a particular subject area may not be available every semester.

5.6 The Dean may allow substitution of any unit of study by another unit of study, including units of study from other undergraduate programs in the Faculty or elsewhere in the University.

6. Enrolment in more/less than minimum load

6.1 A candidate may not enrol in additional units of study once the degree requirements of 144 credit points have been satisfied, without first obtaining permission from the Dean.

6.2 Students may enrol on either a full-time or part-time basis.

7. Cross-institutional study

7.1 Provided that permission has been obtained in advance, the Dean may permit a student to complete a unit of study at another institution and have that unit credited to his/her course requirements provided that either:

7.1.1 the unit of study content is material not taught in any corresponding unit of study in the University; or

7.1.2 the student is unable for good reason to attend a corresponding unit of study at the University.

8. Restrictions on enrolment

8.1 Except with the permission of the Dean, candidates may not enrol in an intermediate core unit of study until they have completed 42 credit points of junior units of study prescribed by the Faculty.

8.2 Except with the permission of the Dean, candidates may not enrol in a senior unit of study:

8.2.1 until they have gained credit for at least 42 credit points from core intermediate units of study; and

8.2.2 until they have completed the intermediate units of study prescribed as prerequisites for the senior unit of study, as set out in Table IV.

8.2.3 Enrolment in some senior units of study may be subject to a quota.

8.3 Where a student enrols in a unit of study which is the same as, or has a substantial amount in common with, a unit of study previously attempted but not completed satisfactorily, the Head of Department concerned may exempt the student from certain requirements of the unit of study requirements if satisfied that the relevant competence has been demonstrated.

8.4 A student may not enrol in a unit of study which they have completed previously with a grade of pass or better.

8.5 A candidate may not enrol in units of study having a total value of more than 30 credit points in a semester.

8.6 In satisfying the requirements of subsection 3.1.3 a student may not enrol in units of study which overlap substantially in content with units of study listed in subsection 3.1.4.

8.7 A student may not enrol without first obtaining permission from the Dean in:

8.7.1 additional units of study once the degree requirements of 144 credit points have been satisfied; or

8.7.2 units of study which may not be counted towards the course requirements.

9. Discontinuation of enrolment

9.1 A student who does not enrol in any semester without first obtaining written permission from the Dean to suspend candidature will be deemed to have discontinued enrolment in the course.

9.2 Students who have discontinued from the course will be required to apply for admission to the course and be subject to admission requirements pertaining at that time.

10. Suspension of candidature

10.1 A student may seek written permission from the Dean to suspend candidature in the course.

10.2 Suspension may be granted for a maximum of one year on any one application.

11. Re-enrolment after an absence

11.1 A student who plans to re-enrol after a period of suspension must advise the Faculty of Science Office in writing of their intention by no later than the end of October for First Semester

of the following year or the end of May for Second Semester of the same year.

12. **Satisfactory progress**

12.1 A student shall not have made satisfactory progress in any semester if the student:

12.1.1 fails to complete successfully more than 50% of the credit points in which the student was enrolled for that semester; and/or

12.1.2 fails to complete successfully on the second or later attempt the same unit of study; and/or

12.1.3 is consequently unable to complete the degree within the maximum permitted time while carrying a normal student load.

12.2 A student who has not made satisfactory progress in accordance with 12.1.1 or 12.1.2 will be placed on a Faculty list of students at risk and will be required to take steps in accordance with the University's At Risk policy as implemented by the Faculty of Science;

12.2.1 a student who is placed on the Facultys At Risk list for any three semesters shall be required to show good cause why the student should be permitted to reenrol in the degree;

12.2.2 a student who has failed to show good cause in accordance with 12.2.1 shall be excluded from the degree;

12.2.3 a student who has been permitted to reenrol after having been asked to show good cause and is placed on a Faculty list of students at risk for the fourth time will be automatically excluded from the degree.

13. **Time limit**

13.1 A candidate must complete all the requirements for the award of the degree within ten calendar years of admission to candidature or readmission without credit.

13.1.1 If a candidate is readmitted with credit, the Faculty will determine a reduced time limit for completion of the degree.

14. **Assessment policy**

14.1 Students may be tested by written and oral examinations, exercises, essays or practical work or any combination of these as the Faculty may determine.

14.2 Where a unit of study is offered at different levels of difficulty, the performance of students will be matched so that a grade obtained at one level indicates a quality of work comparable with that required for the same grade at the other level(s).

14.3 Heads of Department may arrange for further testing in cases of special consideration, in accordance with Academic Board policy governing illness and misadventure.

15. **Credit transfer policy**

15.1 Credit will not be granted for units of study completed nine years or more prior to application, except with the permission of the Dean.

15.2 Credit may be granted as specific credit if the unit of study is considered to be directly equivalent to a unit of study in Tables I or IV, or as non-specific credit.

15.3 The total amount of credit granted may not be greater than 96 credit points and may not include more than 48 credit points of units of study from other degrees for which credit is maintained or a degree has been conferred.

15.4 All students, notwithstanding any credit transfer, must complete at least 36 credit points of senior Science units of study in accordance with subsection 3.1.4.

16. **Candidates enrolled before 2005**

16.1 These Resolutions apply to all candidates for the degree enrolling in units of study after 1 January 2005.

16.2 With the permission of the Faculty of Science, candidates who first enrolled for the degree prior to 2005 and have not had a period of suspension or exclusion may until 31 March 2008 choose to qualify for the degree under the old resolutions.

16.3 With the permission of the Faculty of Science, candidates who first enrolled for the degree as part-time candidates prior to 2005 and have not had a period of suspension or exclusion may until 31 March 2010 choose to qualify for the degree under the old resolutions.

17. **Specific glossary for the Bachelor of Medical Science**

17.1 AAM means the average mark over all units of study attempted in a given academic year (equivalent to the calendar year).

17.2 Completion of a unit of study means that the assessment requirements have been satisfied and a grade of pass or better has been achieved.

17.3 Intermediate unit of study is of second-year (2000) level. Its prerequisites or assumed knowledge are junior or intermediate units of study and corequisites are other intermediate units of study.

17.4 Senior unit of study is of third-year (3000) level. Its prerequisites or assumed knowledge are junior, intermediate or senior units of study and corequisites are other senior units of study.

17.5 Honours unit of study is a 4000 level unit offered within an honours course.

17.6 Advanced unit of study is a unit which generally parallels a normal unit of study but which provides added breadth of material and/or sophistication of approach.

17.7 Dean means the Dean of Science.

17.8 Faculty means the Faculty of Science.

17.9 Degree means the Bachelor of Medical Science.

17.10 Requirements means coursework requirements for the award of the degree of Bachelor of Medical Science.

17.11 Student means a person enrolled as a candidate for the degree of Bachelor of Medical Science.

17.12 TSP means the Talented Student Program in the Faculty of Science.

17.13 SCIWAM means the weighted average mark calculated by the Faculty from the results for all intermediate and senior units of study with a weighting of 2 for intermediate units and 3 for senior units.

Bachelor of Psychology

Course rules

1. **Admission**

1.1 All applications for admission to candidature to an undergraduate degree or combined undergraduate degree in the Faculty of Science will be subject to the Undergraduate Admissions policy of the University of Sydney.

2. **Units of study**

2.1 The units of study, which may be taken for the degree, are set out under subject areas in Table I together with:

2.1.1 designation as junior, intermediate, senior or honours and, where appropriate, as advanced units of study

2.1.2 credit point values

2.1.3 assumed knowledge, corequisites and prerequisites

2.1.4 the semesters in which they are offered; and

2.1.5 the units of study with which they are mutually exclusive.

2.2 The Dean may permit a student of exceptional merit who is admitted to the Talented Student Program to undertake a unit or units of study within the Faculty other than those specified in Table I.

2.3 A student who enrols, in accordance with these resolutions, in a unit or units of study prescribed for a degree other than the Bachelor of Psychology, shall satisfy the prerequisites, corequisites and other requirements prescribed for such units of study.

3. **Requirements for the degree**

3.1 To qualify for the award of the Bachelor of Psychology degree a student shall:

3.1.1 complete units of study having a total value of at least 192 credit points where:

3.1.1.1 at least 12 credit points are from Junior units of study in the Science subject area of Psychology, with an average grade of credit or better;

3.1.1.2 at least 54 credit points are from Intermediate and Senior units of study in the Science subject area of Psychology.

3.1.1.2.1 24 credit points are from Intermediate units of study PSYC2011 or 2111, PSYC2012 or 2112, PSYC2013 or 2113 and PSYC2014 or 2114 with an average grade of Distinction or better.

3.1.1.2.2 At least 30 credit points are from senior units of study in the Science subject area of Psychology which must include PSYC3010 and at least one of PSYC3011, 3012, 3013 and 3014. Except with the permission of the Faculty, the senior units must be completed with an average grade of Distinction or better.Note: HPSC3023 Psychology and Psychiatry: History and Phil is available for Senior Psychology students and will count towards a major in Psychology. Successful completion of this

unit of study is essential for students intending to take the Theoretical Thesis option in Psychology Honours.

3.1.1.2.3 Candidates who fail to maintain the required average in Psychology units will be transferred to candidature for the Bachelor of Science degree in their next year of enrolment with full credit for the units of study completed as Bachelor of Psychology candidates.

3.1.1.2.4 Candidates who fail to achieve the required average in Psychology units in the year in which they have otherwise completed the requirements for the degree will be awarded the Bachelor of Science;

3.1.1.3 at least 96 credit points are from Science subject areas;

3.1.1.4 at least 12 credit points are from the Science subject areas of Mathematics and Statistics;

3.1.1.5 at least 12 credit points are Junior units of study from Science subject areas other than Psychology and Mathematics and Statistics; and

3.1.1.6 no more than 60 credit points are from Junior units of study;

3.1.2 complete 48 credit points from fourth year (honours) units of study in the Science subject area of Psychology with a grade of honours.

3.1.3 A maximum of 48 credit points may be counted towards the degree requirements from units of study offered by faculties other than the Faculty of Science.

3.1.4 Units of study completed at the University of Sydney Summer School which correspond to units of study specified in subsections 2 and 3.1.3 may be credited towards the course requirements.

3.2 Students shall complete the requirements for the honours course full-time over two consecutive semesters.

3.3 If the Faculty is satisfied that a student is unable to attempt the honours course on a full-time basis and if the Head of Department concerned so recommends, permission may be granted to undertake honours half-time over four consecutive semesters.

3.4 The grade of honours and the honours mark are determined by performance in the honours course.

3.5 A student with an honours mark of 90 or greater and a minimum SCIWAM of 80 shall, if deemed to be of sufficient merit by the Dean, receive a bronze medal.

3.6 A student may not re-attempt the Psychology honours course.

Faculty rules

4. Details of units of study

4.1 The units of study for the Bachelor of Psychology are listed in Table 1 of the resolutions of the Bachelor of Science.

4.2 A candidate for the course shall proceed by completing units of study as prescribed by the Faculty.

4.3 A unit of study shall consist of such lectures, seminars, tutorial instruction, essays, exercises, practical work, or project work as may be prescribed.

4.4 In these resolutions, 'to complete a unit of study' or any derivative expression means:

4.4.1 to attend the lectures and the meetings, if any, for seminars or tutorial instruction;

4.4.2 to complete satisfactorily the essays, exercises, practical and project work if any; and

4.4.3 to pass any other examination of the unit of study that may apply.

4.5 All units of study for a particular subject area may not be available every semester.

4.6 The Dean may allow substitution of any unit of study by another unit of study, including units of study from other undergraduate programs in the Faculty or elsewhere in the University.

5. Enrolment in more/less than minimum load

5.1 A candidate may not enrol in additional units of study once the degree requirements of 192 credit points have been satisfied, without first obtaining permission from the Dean.

5.2 Students may enrol on either a full-time or part-time basis.

6. Cross-institutional study

6.1 Provided that permission has been obtained in advance, the Dean may permit a student to complete a unit of study at another institution and have that unit credited to his/her course requirements provided that either:

6.1.1 the unit of study content is material not taught in any corresponding unit of study in the University; or

6.1.2 the student is unable for good reason to attend a corresponding unit of study at the University.

7. Restrictions on enrolment

7.1 Units of study which overlap substantially in content are noted in the *Tables of undergraduate units of study*. Such units of study are mutually exclusive and no more than one of the overlapping units of study may be counted towards meeting the course requirements.

7.2 Where a student enrols in a unit of study which is the same as, or has a substantial amount in common with, a unit of study previously attempted but not completed at the grade of Pass or better, the Head of Department concerned may exempt the student from certain requirements of the unit of study if satisfied that the relevant competence has been demonstrated.

7.3 A student may not enrol in a unit of study which they have completed previously with a grade of Pass or better.

7.4 A candidate may not enrol in units of study having a total value of more than 30 credit points in a semester.

8. Discontinuation of enrolment

8.1 A student who does not enrol in any semester without first obtaining written permission from the Dean to suspend candidature will be deemed to have discontinued enrolment in the course.

8.2 Students who have discontinued from the course will be required to apply for admission to the course and be subject to admission requirements pertaining at that time.

9. Suspension of candidature

9.1 A student may seek written permission from the Dean to suspend candidature in the course.

9.2 Suspension may be granted for a maximum of one year on any one application.

10. Re-enrolment after an absence

10.1 A student who plans to re-enrol after a period of suspension must advise the Faculty of Science Office in writing of their intention by no later than the end of October for First Semester of the following year or the end of May for Second Semester of the same year.

11. Satisfactory progress

11.1 A student shall not have made satisfactory progress in any semester if the student:

11.1.1 fails to complete successfully more than 50% of the credit points in which the student was enrolled for that semester; and/or

11.1.2 fails to complete successfully on the second or later attempt the same unit of study; and/or

11.1.3 is consequently unable to complete the degree within the maximum permitted time while carrying a normal student load.

11.2 A student who has not made satisfactory progress in accordance with 12.1.1 or 12.1.2 will be placed on a Faculty list of students at risk and will be required to take steps in accordance with the University's At Risk policy as implemented by the Faculty of Science;

11.2.1 a student who is placed on the Faculty's At Risk list for any three semesters shall be required to show good cause why the student should be permitted to reenrol in the degree;

11.2.2 a student who has failed to show good cause in accordance with 12.2.1 shall be excluded from the degree;

11.2.3 a student who has been permitted to reenrol after having been asked to show good cause and is placed on a Faculty list of students at risk for the fourth time will be automatically excluded from the degree.

12. Time limit

12.1 A candidate must complete all the requirements for the award of the degree within ten calendar years of admission to candidature or readmission without credit.

12.1.1 If a candidate is readmitted with credit, the Faculty will determine a reduced time limit for completion of the degree.

13. Assessment policy

13.1 Students may be tested by written and oral examinations, exercises, essays or practical work or any combination of these as the Faculty may determine.

13.2 Where a unit of study is offered at different levels of difficulty, the performance of students will be matched so that a grade obtained at one level indicates a quality of work comparable with that required for the same grade at the other level(s).

13.3 Heads of Department may arrange for further testing in cases of special consideration, in accordance with Academic Board policy governing illness and misadventure.

14. **Credit transfer policy**

14.1 Credit will not be granted for units of study completed ten years or more prior to application, except with the permission of the Dean.

14.2 Credit may be granted as specific credit if the unit of study is considered to be directly equivalent to a unit of study in Table I or as non-specific credit.

14.3 The total amount of credit granted may not be greater than 96 credit points and may not include more than 48 credit points of units from other degrees for which credit is maintained or a degree has been conferred.

14.4 All students, notwithstanding any credit transfer, must complete at least 30 credit points of Senior Psychology units at the University of Sydney.

15. **Candidates enrolled before 2005**

15.1 These Resolutions apply to all candidates for the degree enrolling in units of study after 1 January 2005.

15.2 With the permission of the Faculty of Science, candidates who first enrolled for the degree as part-time candidates prior to 2005 and have not had a period of suspension or exclusion may until 31 March 2010 choose to qualify for the degree under the old resolutions.

16. **Glossary for the Bachelor of Psychology**

16.1 Completion of a unit of study means that the assessment requirements have been satisfied and a grade of Pass or better has been achieved.

16.2 Junior unit of study is a 1000 or first-year stage unit. Its prerequisites or assumed knowledge are non-tertiary qualifications and corequisites are other Junior units of study.

16.3 Intermediate unit of study is a 2000 or second-year stage unit. Its prerequisites or assumed knowledge are Junior or Intermediate units of study and corequisites are other Intermediate units of study. (Specific to the Faculty of Science.)

16.4 Senior unit of study is a 3000 or third-year stage unit. Its prerequisites or assumed knowledge are junior, intermediate or senior units of study and corequisites are other senior units of study. (Specific to the Faculty of Science.)

16.5 Honours unit of study is a 4000 or fourth-year stage unit offered within an honours course.

16.6 Advanced unit of study is a unit which generally parallels a normal unit of study but which provides added breadth of material and/or sophistication of approach.

16.7 Major in the Faculty of Science normally requires the completion of a minimum of 24 credit points of senior units of study in one Science area, including any units of study specified in the Table of undergraduate units of study as compulsory for that major.

16.7.1 A student may not count a unit of study toward more than one major. (A major in Psychology within the Bachelor of Psychology requires 54 credit points of Intermediate and Senior Psychology units of study including PSYC(2111 or 2011), PSYC(2112 or 2012), PSYC(2113 or 2013) and PSYC(2114 or 2014). No other Intermediate Psychology units can be counted towards the major).

16.8 Dean means the Dean of Science.

16.9 Faculty means the Faculty of Science.

16.10 Science subject area means a defined field of study in science.

16.11 Degree means the Bachelor of Psychology.

16.12 Requirements means coursework requirements for the award of the degree of Bachelor of Psychology.

16.13 Student means a person enrolled as a candidate for the degree of Bachelor of Psychology.

16.14 TSP means the Talented Student Program in the Faculty of Science.

16.15 SCIWAM means the weighted average mark calculated by the Faculty from the results for all Intermediate and Senior units of study with a weighting of 2 for Intermediate units and 3 for Senior units.

Bachelor of Science and Technology

Course rules

1. **Admission**

1.1 All applications for admission to candidature to an undergraduate degree or combined undergraduate degree in the Faculty of Science will be subject to the Undergraduate Admissions policy of the University of Sydney.

2. **Units of study**

2.1 The units of study available for the Bachelor of Science and Technology are set out together with:

2.1.1 Units of study listed in Table I, Table III in the Handbook of the Faculty of Science and the BCST table in the Faculty of Engineering Handbook, excluding all units with INFS codes.

2.1.2 Units of study listed in Table A in the Handbook of the Faculty of Arts.

2.1.3 Units of study in Legal Studies units listed as available for study in the Bachelor of Arts and Sciences offered by the Faculty of Arts.

2.1.4 Units of study completed at the University of Sydney Summer or Winter School which correspond to units of study specified in 2.1.1 and 2.1.2 above.

2.1.5 These units of study are listed as in subsections 2.1.1 to 2.1.3, together with:

2.1.5.1 designation as junior, intermediate, senior or honours and, where appropriate, as advanced units of study

2.1.5.2 credit point values

2.1.5.3 assumed knowledge, corequisites and prerequisites

2.1.5.4 the semesters in which they are offered; and

2.1.5.5 the units of study with which they are mutually exclusive.

2.2 With the permission of the Dean of Science, candidates may count towards the degree a maximum of 36 credit points not specified in subsections 3.1 to 3.1.6.1 but from within the University.

2.3 A student who enrols, in accordance with these resolutions, in a unit or units of study prescribed for a degree other than the Bachelor of Science and Technology, shall satisfy the prerequisites, corequisites and other requirements prescribed for such units of study.

3. **Requirements for the pass degree**

3.1 To qualify for the award of the pass degrees a student shall complete 144 credit points comprising:

3.1.1 a minimum of 12 credit points from the Science subject areas of Mathematics and Statistics;

3.1.2 a minimum of 12 credit points in Experimental Science units of study from those specified in Table VIIb in the Handbook of Faculty of Science;

3.1.3 a minimum of 12 credit points in Science/Technology associated Humanities and Social Sciences units of study from those specified in TableVIIc in the Handbook of Faculty of Science;

3.1.4 a minimum of 12 credit points in Technology/Applied Science units of study from those specified in Table VIId in the Handbook of Faculty of Science;

3.1.5 a minimum of 72 credit points in senior or intermediate units of study, or in units of study normally taken at second or third year level or higher;

3.1.6 a major in the Faculty of Science specified in Table I or a major from the list of majors in Table VIIe in the Handbook of Faculty of Science.

3.1.6.1 A major in the BST requires a minimum of 36 credit points at 2000 and 3000 level including a minimum of 12 credit points at 3000 level except in the case of a major in a Science area which normally requires the completion of 24 credit points of senior units of study, in addition to any other units of study specified in the table as compulsory for that major.

3.7 The testamur for the degree of Bachelor of Science and Technology shall specify the major(s) completed.

3.8 Notwithstanding 3.1.6 above, where, in exceptional circumstances arising from prerequisites or other restrictions in certain discipline areas, a student is unable to complete the formal requirements of a major in the normal course of the degree but is nevertheless able to demonstrate depth of study in a specified discipline area within a faculty by the completion of a total of 36 intermediate and senior credit points including

at least 12 senior credit points in a Faculty of Science, Faculty of Architecture or Faculty of Engineering discipline area, the Dean of Science may, on application from the student and a recommendation from the Head of Department, permit the student to graduate without a major. In such circumstances no major shall be specified on the transcript.

4. Requirements for honours degree

4.1 There shall be honours courses in all Science subject areas listed in Table VI (Honours units of study).
4.2 To qualify to enrol in an honours course, students shall:
4.2.1 have qualified for the award of a pass degree; or
4.2.2 be a pass graduate of the Faculty of Science; or
4.2.3 be a pass graduate holding a Bachelor of Science and Technology degree or an equivalent qualification from another institution.
4.2.4 have completed a minimum of 24 credit points of senior units of study relating to the intended honours course (or equivalent at another institution);
4.2.5 have achieved either:
4.2.5.1 at least a credit average in 48 credit points in relevant intermediate and senior Science units of study; or
4.2.5.2 a SCIWAM of at least 65 (or equivalent at another institution); and
4.2.5.3 satisfy any additional criteria set by the Head of Department concerned.
4.3 Students shall complete the requirements for the honours course full-time over two consecutive semesters.
4.4 If the Faculty is satisfied that a student is unable to attempt the honours course on a full-time basis and if the Head of Department concerned so recommends, permission may be granted to undertake honours half-time over four consecutive semesters.
4.5 To qualify for the award of an honours degree, students shall complete 48 credit points of honours units of study in the Table of undergraduate units of study, as prescribed by the Head of Department concerned.
4.6 The grade of honours and the honours mark are determined by performance in the honours course.
4.7 Honours in the Bachelor of Science may be awarded in four classes as follows:
4.7.1 Class I (mark range: 80 and above)
4.7.2 Class II(1) (mark range: 75-79)
4.7.3 Class II(2) (mark range: 70-74)
4.7.4 Class III (mark range: 65-69)
4.8 A student with an honours mark of 90 or greater in an honours subject area and a minimum SCIWAM of 80 shall, if deemed to be of sufficient merit by the Dean, receive a bronze medal.
4.9 A student may not re-attempt an honours course in a single subject area.
4.10 A student who is qualified to enrol in two honours courses may either:
4.10.1 complete the honours courses in the two subject areas separately and in succession; or
4.10.2 complete a joint honours course, equivalent to an honours course in a single subject area, in the two subject areas.
4.11 A joint honours course shall comprise such parts of the two honours courses as may be decided by the Dean.

Faculty rules

5. Details of units of study

5.1 The units of study for the Bachelor of Science and Technology are listed in subsection 2 of these resolutions.
5.2 A candidate for the course shall proceed by completing units of study as prescribed by the Faculty.
5.3 A unit of study shall consist of such lectures, seminars, tutorial instruction, essays, exercises, practical work, or project work as may be prescribed.
5.4 In these resolutions, 'to complete a unit of study' or any derivative expression means:
5.4.1 to attend the lectures and the meetings, if any, for seminars or tutorial instruction;
5.4.2 to complete satisfactorily the essays, exercises, practical and project work if any; and
5.4.3 to pass any other examination of the unit of study that may apply.
5.5 All units of study for a particular subject area may not be available every semester.
5.6 The Dean may allow substitution of any unit of study by another unit of study, including units of study from other undergraduate programs in the Faculty or elsewhere in the University.

6. Enrolment in more/less than minimum load

6.1 A student may not enrol without first obtaining permission from the Dean of Science in additional units of study once the degree requirements of 144 credit points have been satisfied.
6.2 A student may not enrol in units of study having a total value of more than 30 credit points in a semester.
6.3 Students may enrol on either a full-time or part-time basis.
6.4 Full-time students normally take units of study with a total credit point value of 24 credit points per semester for 6 semesters.

7. Cross-institutional study

7.1 Provided that permission has been obtained in advance, the Dean may permit a student to complete a unit of study at another institution and have that unit credited to his/her course requirements provided that either:
7.1.1 the unit of study content is material not taught in any corresponding unit of study in the University; or
7.1.2 the student is unable for good reason to attend a corresponding unit of study at the University.

8. Restrictions on enrolment

8.1 Units of study which overlap substantially in content are noted in Table I of units of study for the Bachelor of Science, in Table III for Bachelor of Computer Science & Technology and Table VII for the Bachelor of Information Technology and in the Tables of undergraduate units of study for the Bachelor of Arts, Bachelor of Engineering and Bachelor of Architecture.
8.1.1 Such units of study are mutually exclusive and no more than one of the overlapping units of study may be counted towards meeting the course requirements.
8.2 Where a student enrols in a unit of study which is the same as, or has a substantial amount in common with, a unit of study previously attempted but not completed at the grade of Pass or better, the Head of Department concerned may exempt the student from certain requirements of the unit of study if satisfied that the relevant competence has been demonstrated.
8.3 A student may not enrol in a unit of study which they have completed previously with a grade of Pass or better.
8.4 A candidate may not enrol in units of study having a total value of more than 30 credit points in a semester.

9. Discontinuation of enrolment

9.1 A student who does not enrol in any semester without first obtaining written permission from the Dean to suspend candidature will be deemed to have discontinued enrolment in the course.
9.2 Students who have discontinued from the course will be required to apply for admission to the course and be subject to admission requirements pertaining at that time.

10. Suspension of candidature

10.1 A student may seek written permission from the Dean to suspend candidature in the course.
10.2 Suspension may be granted for a maximum of one year on any one application.

11. Re-enrolment after an absence

11.1 A student who plans to re-enrol after a period of suspension must advise the Faculty of Science Office in writing of their intention by no later than the end of October for First Semester of the following year or the end of May for Second Semester of the same year.

12. Satisfactory progress

12.1 A student shall not have made satisfactory progress in any semester if the student:
12.1.1 fails to complete successfully more than 50% of the credit points in which the student was enrolled for that semester; and/or
12.1.2 fails to complete successfully on the second or later attempt the same unit of study; and/or
12.1.3 is consequently unable to complete the degree within the maximum permitted time while carrying a normal student load.
12.2 A student who has not made satisfactory progress in accordance with 12.1.1 or 12.1.2 will be placed on a Faculty list of students at risk and will be required to take steps in accordance with the University's At Risk policy as implemented by the Faculty of Science;

12.2.1 a student who is placed on the Facultys At Risk list for any three semesters shall be required to show good cause why the student should be permitted to reenrol in the degree;
12.2.2 a student who has failed to show good cause in accordance with 12.2.1 shall be excluded from the degree;
12.2.3 a student who has been permitted to reenrol after having been asked to show good cause and is placed on a Faculty list of students at risk for the fourth time will be automatically excluded from the degree.

13. **Time limit**

13.1 A candidate must complete all the requirements for the award of the degree within ten calendar years of admission to candidature or readmission without credit.
13.1.1 If a candidate is readmitted with credit, the Faculty will determine a reduced time limit for completion of the degree.

14. **Assessment policy**

14.1 Students may be tested by written and oral examinations, exercises, essays or practical work or any combination of these as the Faculty may determine.
14.2 Where a unit of study is offered at different levels of difficulty, the performance of students will be matched so that a grade obtained at one level indicates a quality of work comparable with that required for the same grade at the other level(s).
14.3 Heads of Department may arrange for further testing in cases of special consideration, in accordance with Academic Board policy governing illness and misadventure.

15. **Credit transfer policy**

15.1 Credit will not be granted for units of study completed more than nine years prior to application, except with the permission of the Dean of Science.
15.2 Credit may be granted as specific credit if the unit of study is considered to be directly equivalent to a unit of study from Table I, Table III or from Table VII or as non-specific credit.
15.3 The total amount of credit granted may not be greater than 96 credit points and may not include more than 48 credit points of units from other degrees for which credit is maintained or a degree has been conferred.
15.4 Except as provided by subsection 3.8, all students, notwithstanding any credit transfer, must complete a major at the University of Sydney from the list of majors in Table VIIe in the Handbook of Faculty of Science.

16. **Supervision**

16.1 Students shall be under the supervision of the Faculty of Science.
16.2 The Dean of the Faculty of Science shall exercise authority in any matter concerning the degree program not otherwise dealt with in the Resolutions of the Senate or Faculty.

17. **Glossary for the BST**

17.1 Completion of a unit of study means that the assessment requirements have been satisfied and a grade of Pass or better has been achieved.
17.2 Junior unit of study is a 1000 or first-year stage unit. Its prerequisites or assumed knowledge are non-tertiary qualifications and corequisites are other junior units of study.
17.3 Intermediate unit of study is a 2000 or second-year stage unit. Its prerequisites or assumed knowledge are Junior or Intermediate units of study and corequisites are other intermediate units of study.
17.4 Senior unit of study is a 3000 or third-year stage unit. Its prerequisites or assumed knowledge are junior, intermediate or senior units of study and corequisites are other senior units of study.
17.5 Honours unit of study is a 4000 or fourth-year stage unit offered within an honours course.
17.6 Advanced unit of study is a unit which generally parallels a normal unit of study but which provides added breadth of material and/or sophistication of approach.
17.7 Major in the BST normally requires a minimum of 36 credit points at 2000 and 3000 level including a minimum of 12 credit points at 3000 level except in the case of a major in a Science area which normally requires the completion of 24 credit points of senior units of study, in addition to any other units of study specified in the table as compulsory for that major.
17.8 A student may not count a unit of study toward more than one major. (A major in Psychology requires 48 credit points of Intermediate and Senior Psychology units of study including PSYC(2111 or 2011), PSYC(2112 or 2012), PSYC(2113 or 2013) and PSYC(2114 or 2014). No other Intermediate Psychology units can be counted towards the major).
17.9 Dean means the Dean of Science.
17.10 Faculty means the Faculty of Science.
17.11 Science subject area means a defined field of study in science.
17.12 Degree means the degree of Bachelor of Science and Technology.
17.13 Requirements means coursework requirements for the award of the degree of Bachelor of Science or Bachelor of Arts.
17.14 Student means a person enrolled as a candidate for the degree of Bachelor of Science and Technology.
17.15 SCIWAM means the weighted average mark calculated by the Faculty from the results for all intermediate and senior units of study with a weighting of 2 for intermediate units and 3 for senior units.

Science combined degrees

Bachelor of Science (Advanced)/MBBS

Course rules

1. **Admission**

1.1 All applications for admission to candidature for the combined Bachelor of Science (Advanced)/MBBS course will be subject to the Undergraduate Admissions policies of the Faculty of Science and of the Faculty of Medicine.

2. **Units of study**

2.1 The units of study for the Bachelor of Science (Advanced) are set out in Table I together with:
2.1.1 designation as junior, intermediate, senior or honours and, where appropriate, as advanced units of study
2.1.2 credit point values
2.1.3 assumed knowledge, corequisites and prerequisites
2.1.4 the semesters in which they are offered; and
2.1.5 the units of study with which they are mutually exclusive.
2.2 A student may enrol in a unit of study prescribed for a degree other than the Bachelor of Science (Advanced) and shall satisfy the prerequisites, corequisites, qualifying and other requirements prescribed for such units of study for that other degree.
2.3 The Dean may permit a student of exceptional merit who is admitted to the Talented Student Program to undertake a unit or units of study within the Faculty other than those specified in Table I.
2.4 There shall be honours units of study in Science subject areas listed in Table VI.
2.5 Units of study taken at the University of Sydney Summer School which correspond to units of study specified in subsections 4.1.1-4.1.3 may be credited towards the course requirements.

3. **Requirements for the award of the degrees**

3.1 To qualify for the award of the Bachelor of Science (Advanced)/MBBS degrees a student shall:
3.1.1 complete units of study having a total value of at least 336 credit points;
3.1.2 Complete the Bachelor of Science (Advanced) in minimum time and maintain, as a minimum, a credit average in the Bachelor of Science (Advanced), being the minimum level of academic performance required for admission to candidature for the degrees of MBBS;
3.1.3 satisfactorily complete three zero credit point units in the first three years of the program; and
3.1.4 meet the requirements of the Bachelor of Science (Advanced) degree outlined below.
3.1.5 Students who fail to satisfy subsections 3.1.2 and/or 3.1.3 will be transferred to candidature for the Bachelor of Science (Advanced) degree.
3.1.6 To qualify for the award of the degrees of Bachelor of Medicine and Bachelor of Surgery, a student shall complete units of study having a total value of 192 credit points as required by the Resolutions of the Faculty of Medicine.
3.1.7 Students may abandon the combined degree course and elect to complete the BSc (Advanced) degree.

4. **Requirements for the award of the Bachelor of Science (Advanced)**

4.1 To qualify for the award of the pass degree in the BSc (Advanced) stream, a student shall complete the requirements for the BSc degree as described below with the exception of 5.1.5 and in addition, except with the permission of the Dean:

4.1.1 include no more than 48 credit points from Junior units of study;

4.1.2 include at least 12 credit points of Intermediate units of study at either the Advanced level or as TSP units;

4.1.3 include at least 48 credit points of senior units of study of which at least 24 are completed at the Advanced level or as TSP units in a single Science subject area; and

4.1.4 maintain in Intermediate and Senior units of study in Science subject areas an average mark of 65 or greater in each year of enrolment;

4.2 candidates who fail to maintain the required credit average will be transferred to candidature for the Bachelor of Science degree in their next year of enrolment with full credit for the units of study completed as Bachelor of Science (Advanced) candidates.

4.3 Candidates who fail to achieve a credit average across all units of study attempted in the year in which they have otherwise completed the requirements for the degree will be awarded the Bachelor of Science.

5. **Requirements for the award of the Bachelor of Science**

5.1 To qualify for the award of the Bachelor of Science, a student shall complete units of study having a total value of at least 144 credit points, including:

5.1.1 at least 96 credit points from Science subject areas;

5.1.2 at least one major from those included in Table I;

5.1.3 at least 12 credit points from the Science subject areas of Mathematics and Statistics;

5.1.4 at least 24 credit points of Junior units of study from at least two Science subject areas other than Mathematics and Statistics; and

5.1.5 no more than 60 credit points from Junior units of study.

5.2 A major in the BSc normally requires the completion of a minimum of 24 credit points of senior units of study in one Science area, including any units of study specified in the Table of undergraduate units of study as compulsory for that major.

5.3 A major in Psychology requires 48 credit points across intermediate and senior Psychology* units of study including PSYC (2111 or 2011), PSYC (2112 or 2012), PSYC (2113 or 2013) and PSYC (2114 or 2014). No other intermediate Psychology units can be counted towards the major.

5.4 The senior units must include at least one of PSYC 3011, 3012, 3013 and 3014.*Note: HPSC3023 Psychology & Psychiatry History & Phil is available for Senior Psychology students and will count towards a major in Psychology. Successful completion of this unit of study is essential for students intending to take the Theoretical Thesis option in Psychology Honours.

5.5 A maximum of 48 credit points may be counted towards the degree requirements from units of study offered by faculties other than the Faculty of Science.

5.6 The testamur for the degree of Bachelor of Science shall specify the major(s) completed in order to qualify for the award.

6. **Requirements for the Honours degree**

6.1 Students who qualify to undertake honours in the Bachelor of Science (Advanced) degree may elect to do so either:

6.1.1 by suspending candidature from the MBBS degrees for one year, with the permission of the Faculty of Medicine; or

6.1.2 after completion of the combined course.

6.2 In order to qualify to enrol in an honours course in the Bachelor of Science (Advanced), students shall either:

6.2.1 have qualified for the award of the pass degree; or

6.2.2 be a graduate of the Faculty of Science; or

6.2.3 be a graduate holding a Bachelor of Science degree or an equivalent qualification from another institution;

6.2.4 have completed a minimum of 24 credit points of senior units of study relating to the intended honours course (or equivalent at another institution);

6.2.5 have achieved either:

6.2.5.1 at least a credit average in 48 credit points in relevant intermediate and senior Science units of study; or

6.2.5.2 a SCIWAM of at least 65; and

6.2.5.3 satisfy any additional criteria set by the Head of Department concerned.

6.3 Students shall complete the requirements for the course full-time over two consecutive semesters.

6.4 If the Faculty is satisfied that a student is unable to attempt the honours course on a full-time basis and if the Head of Department concerned so recommends, permission may be granted to undertake honours half-time over four consecutive semesters.

6.5 To qualify for the award of an honours degree, students shall complete 48 credit points of honours units of study in one subject area from those listed in Table VI.

6.6 The grade of honours and the honours mark are determined by performance in the honours course.

6.6.1 Honours in the Bachelor of Science (Advanced) may be awarded in four classes as follows:

6.6.1.1 Class I (mark range: 80 and above)

6.6.1.2 Class II(1) (mark range: 75-79)

6.6.1.3 Class II(2) (mark range: 70-74)

6.6.1.4 Class III (mark range: 65-69)

6.6.2 A student with an honours mark of 90 or greater in an honours subject area and a minimum SCIWAM of 80 shall, if deemed to be of sufficient merit by the Dean, receive a bronze medal.

6.7 A student who is qualified to enrol in two honours courses may either:

6.7.1 complete the honours courses in the two subject areas separately and in succession; or

6.7.2 complete a joint honours course, equivalent to an honours course in a single subject area, in the two subject areas.

6.7.3 A joint honours course shall comprise such parts of the two honours courses as may be decided by the Dean.

6.8 A student may not re-attempt an honours course in a single subject area.

7. **Supervision**

7.1 Students will be under the general supervision of the Faculty of Science until the end of the semester in which they complete the requirements for the Science degree. After that they will be under the general supervision of the Faculty of Medicine.

7.2 The Deans of the Faculties of Medicine and Science shall jointly exercise authority in any matter concerning the combined degree program not otherwise dealt with in these resolutions.

Faculty rules

8. **Details of units of study**

8.1 The units of study for the Bachelor Science (Advanced) are listed in Table I of the resolutions for the Bachelor of Science.

8.2 A candidate for the course shall proceed by completing units of study as prescribed by the Faculty.

8.3 A unit of study shall consist of such lectures, seminars, tutorial instruction, essays, exercises, practical work, or project work as may be prescribed.

8.4 In these resolutions, 'to complete a unit of study' or any derivative expression means:

8.4.1 to attend the lectures and the meetings, if any, for seminars or tutorial instruction;

8.4.2 to complete satisfactorily the essays, exercises, practical and project work if any; and

8.4.3 to pass any other examination of the unit of study that may apply.

8.5 All units of study for a particular subject area may not be available every semester.

9. **Enrolment in more/less than minimum load**

9.1 A candidate may not enrol in additional units of study once the degree requirements of 336 credit points have been satisfied, without first obtaining permission from the Dean.

9.2 Students may enrol on either a full-time or part-time basis.

10. **Cross-institutional study**

10.1 Provided that permission has been obtained in advance, the Dean may permit a student to complete a unit of study at another institution and have that unit credited to his/her course requirements provided that either:

10.1.1 the unit of study content is material not taught in any corresponding unit of study in the University; or

10.1.2 the student is unable for good reason to attend a corresponding unit of study at the University.

11. **Restrictions on enrolment**

11.1 Units of study which overlap substantially in content are noted in the tables of undergraduate units of study. Such units of study are mutually exclusive and no more than one of the overlapping units of study may be counted towards meeting the course requirements.

12. **Discontinuation of enrolment**

12.1 A student who does not enrol in any semester without first obtaining written permission from the Dean to suspend candidature will be deemed to have discontinued enrolment in the course.

12.2 Students who have discontinued from the course will be required to apply for admission to the course and be subject to admission requirements pertaining at that time.

13. **Suspension of candidature**

13.1 A student may seek written permission from the Dean to suspend candidature in the course.

13.2 Suspension may be granted for a maximum of one year on any one application.

14. **Re-enrolment after an absence**

14.1 A student who plans to re-enrol after a period of suspension must advise the Faculty of Science Office in writing of their intention by no later than the end of October for First Semester of the following year or the end of May for Second Semester of the same year.

15. **Satisfactory progress**

15.1 A student shall not have made satisfactory progress in any semester if the student:

15.1.1 15.1.1 fails to complete successfully more than 50% of the credit points in which the student was enrolled for that semester; and/or

15.1.2 15.1.2 fails to complete successfully on the second or later attempt the same unit of study; and/or

15.1.3 15.1.3 is consequently unable to complete the degree within the maximum permitted time while carrying a normal student load.

15.2 15.2 A student who has not made satisfactory progress in accordance with 12.1.1 or 12.1.2 will be placed on a Faculty list of students at risk and will be required to take steps in accordance with the University's At Risk policy as implemented by the Faculty of Science;

15.2.1 15.2.1 a student who is placed on the Faculty's At Risk list for any three semesters shall be required to show good cause why the student should be permitted to reenrol in the degree;

15.2.2 15.2.2 a student who has failed to show good cause in accordance with 12.2.1 shall be excluded from the degree;

15.2.3 15.2.3 a student who has been permitted to reenrol after having been asked to show good cause and is placed on a Faculty list of students at risk for the fourth time will be automatically excluded from the degree.

16. **Time limit**

16.1 A candidate must complete all the requirements for the award of the degrees within ten calendar years of admission to candidature or readmission without credit.

16.1.1 If a candidate is readmitted with credit, the Faculty will determine a reduced time limit for completion of the degree.

17. **Assessment policy**

17.1 Students may be tested by written and oral examinations, exercises, essays or practical work or any combination of these as the Faculty may determine.

17.2 Where a unit of study is offered at different levels of difficulty, the performance of students will be matched so that a grade obtained at one level indicates a quality of work comparable with that required for the same grade at the other level(s).

17.3 Heads of Department may arrange for further testing in cases of special consideration, in accordance with Academic Board policy governing illness and misadventure.

18. **Credit transfer policy**

18.1 Credit will not be granted for units of study completed ten years or more prior to application, except with the permission of the Dean.

18.2 Credit may be granted as specific credit if the unit of study is considered to be directly equivalent to a unit of study in Tables I, or as non-specific credit.

18.3 The total amount of credit granted may not be greater than 96 credit points and may not include more than 48 credit points of units of study from other degrees for which credit is maintained or a degree has been conferred.

18.4 All students, notwithstanding any credit transfer, must complete at least 24 credit points of senior Science units of study towards a major taken at the University of Sydney.

19. **Candidates enrolled before 2005**

19.1 These Resolutions apply to all candidates for the degree enrolling in units of study after 1 January 2005.

19.2 With the permission of the Faculty of Science, candidates who first enrolled for the degree prior to 2005 and have not had a period of suspension or exclusion may until 31 March 2008 choose to qualify for the degree under the old resolutions.

19.3 With the permission of the Faculty of Science, candidates who first enrolled for the degree as part-time candidates prior to 2005 and have not had a period of suspension or exclusion may until 31 March 2010 choose to qualify for the degree under the old resolutions.

20. **Specific glossary for the Bachelor of Science (Advanced)/MBBS**

20.1 AAM means the average mark over all units of study attempted in a given academic year (equivalent to the calendar year).

20.2 Completion of a unit of study means that the assessment requirements have been satisfied and a grade of pass or better has been achieved.

20.3 Intermediate unit of study is of second-year (2000) level. Its prerequisites or assumed knowledge are junior or intermediate units of study and corequisites are other intermediate units of study.

20.4 Senior unit of study is of third-year (3000) level. Its prerequisites or assumed knowledge are junior, intermediate or senior units of study and corequisites are other senior units of study.

20.5 Honours unit of study is a 4000 level unit offered within an honours course.

20.6 Advanced unit of study is a unit which generally parallels a normal unit of study but which provides added breadth of material and/or sophistication of approach.

20.7 Dean means the Dean of Science for the duration of the candidature for the Bachelor of Science (Advanced), and the Dean of Medicine for the duration of candidature for the MBBS.

20.8 Faculty means the Faculty of Science for the duration of candidature in the Bachelor of Science (Advanced) and the Faculty of Medicine for the duration of candidature in the MBBS.

20.9 Degree means the Bachelor of Science (Advanced)/MBBS.

20.10 Requirements means coursework requirements for the award of the degree of Bachelor of Science (Advanced)/MBBS.

20.11 Student means a person enrolled as a candidate for the degree of Bachelor of Science (Advanced)/MBBS.

20.12 TSP means the Talented Student Program in the Faculty of Science.

20.13 SCIWAM means the weighted average mark calculated by the Faculty from the results for all intermediate and senior units of study with a weighting of 2 for intermediate units and 3 for senior units.

Bachelor of Medical Science/MBBS

Course rules

1. **Admission**

1.1 All applications for admission to candidature to the combined Bachelor of Medical Science/MBBS course will be subject to the Undergraduate Admissions policies of the Faculty of Science and of the Faculty of Medicine.

1.2 A candidate may elect to abandon the combined degree course and elect to complete the BMedSc degree.

2. **Units of study**

2.1 The units of study for the Bachelor of Medical Science are set out in Table IV together with:

2.1.1 designation as junior, intermediate, senior or honours and, where appropriate, as advanced units of study

2.1.2 credit point values

2.1.3 assumed knowledge, corequisites and prerequisites

2.1.4 the semesters in which they are offered; and

2.1.5 the units of study with which they are mutually exclusive.

2.2 A student may enrol, in accordance with subsection 4.1.5, in a unit of study prescribed for a degree other than the Bachelor

of Medical Science and shall satisfy the prerequisites, corequisites, qualifying and other requirements prescribed for such units of study for that other degree.

2.3 The Dean may permit a student of exceptional merit who is admitted to the Talented Student Program to undertake a unit or units of study within the Faculty other than those specified in Table IV.

2.4 There shall be honours units of study in Science subject areas listed in Table IV D.

2.5 Units of study taken at the University of Sydney Summer School which correspond to units of study specified in subsection 4 may be credited towards the course requirements.

3. Requirements for the award of the degrees

3.1 To qualify for the award of the BMedSc/MBBS degrees a student shall:

3.1.1 complete units of study having a total value of at least 336 credit points;

3.1.2 complete the Bachelor of Medical Science in minimum time and maintain, as a minimum, a credit average in the Bachelor of Medical Science, being the minimum level of academic performance required for admission to candidature for the degrees of MBBS;

3.1.3 satisfactorily complete three zero credit point units in the first three years of the program; and

3.1.4 meet the requirements of the Bachelor of Medical Science degree.

3.1.5 Students who fail to satisfy 3.1.2 and/or 3.1.3 will be transferred to candidature for the Bachelor of Medical Science degree.

3.1.6 To qualify for the award of the degrees of Bachelor of Medicine and Bachelor of Surgery a student shall complete units of study having a total value of 192 credit points as required by the Resolutions of the Faculty of Medicine.

3.1.7 Students may abandon the combined degree course and elect to complete the Bachelor of Medical Science.

4. Requirements for the award of the Bachelor of Medical Science

4.1 In order to qualify for the award of the Bachelor of Medical Science degree a student shall complete units of study having a total value of at least 144 credit points, including:

4.1.1 at least 48 credit points from junior units of study, comprising MBLG1001 and 12 credit points each from Chemistry, Mathematics and Physics or Computational Science and 6 credit points from Biology;

4.1.2 no more than 60 credit points from junior units of study;

4.1.3 48 credit points of Intermediate core units of study listed in Table IV;

4.1.4 at least 36 credit points of senior units of study taken from the subject areas of Anatomy/Histology, Biology (Genetics), Biochemistry, Cell Pathology, Immunology, Infectious Diseases, Microbiology, Pharmacology and Physiology;

4.1.5 no more than 12 credit points from units of study other than core units of study.

4.1.6 Units of study taken at the University of Sydney Summer School which correspond to units of study specified in subsection 3 may be credited towards the course requirements.

5. Requirements for the honours degree

5.1 Students who qualify to undertake honours in the Bachelor of Medical Science degree may elect to do so either:

5.1.1 by suspending candidature from the MBBS degrees for one year, with the permission of the Faculty of Medicine; or

5.1.2 after completion of the combined course.

5.2 In order to qualify to enrol in an honours course in the BMedSc, students shall either:

5.2.1 have qualified for the award of the Bachelor of Medical Science degree; or

5.2.2 be a pass graduate in Medical Science of the Faculty of Science; or

5.2.3 be a pass graduate holding a Bachelor of Medical Science degree or an equivalent qualification from another institution;

5.2.4 have completed a minimum of 24 credit points of senior units of study relating to the intended honours course (or equivalent at another institution);

5.2.5 have achieved either:

5.2.5.1 at least a credit average in 48 credit points in relevant intermediate and senior Science units of study; or

5.2.5.2 a SCIWAM of at least 65; and

5.2.5.3 satisfy any additional criteria set by the Head of Department concerned.

5.3 Students shall complete the requirements for the course full-time over two consecutive semesters.

5.4 If the Faculty is satisfied that a student is unable to attempt the honours course on a full-time basis and if the Head of Department concerned so recommends, permission may be granted to undertake honours half-time over four consecutive semesters.

5.5 To qualify for the award of honours in the Bachelor of Medical Science degree, students shall complete 48 credit points of honours units of study in one subject area from those listed in Table IV D.

5.6 The grade of honours and the honours mark are determined by performance in the honours course.

5.6.1 Honours in the Bachelor of Medical Science may be awarded in four classes as follows:

5.6.1.1 Class I (mark range: 80 and above)

5.6.1.2 Class II(1) (mark range: 75-79)

5.6.1.3 Class II(2) (mark range: 70-74)

5.6.1.4 Class III (mark range: 65-69)

5.6.2 A student with an honours mark of 90 or greater in an honours subject area and a minimum SCIWAM of 80 shall, if deemed to be of sufficient merit by the Dean, receive a bronze medal.

5.7 A student who is qualified to enrol in two honours courses may either:

5.7.1 complete the honours courses in the two subject areas separately and in succession; or

5.7.2 complete a joint honours course, equivalent to an honours course in a single subject area, in the two subject areas.

5.8 A student may not re-attempt an honours course in a single subject area.

6. Supervision

6.1 Students will be under the general supervision of the Faculty of Science until the end of the semester in which they complete the requirements for the BMedSc degree. After that they will be under the general supervision of the Faculty of Medicine.

6.2 The Deans of the Faculties of Medicine and Science shall jointly exercise authority in any matter concerning the combined degree program not otherwise dealt with in these resolutions.

Faculty rules

7. Details of units of study

7.1 The units of study for the Bachelor of Medical Science are listed in Table IV of these resolutions.

7.2 A candidate for the course shall proceed by completing units of study as prescribed by the Faculty.

7.3 A unit of study shall consist of such lectures, seminars, tutorial instruction, essays, exercises, practical work, or project work as may be prescribed.

7.4 In these resolutions, 'to complete a unit of study' or any derivative expression means:

7.4.1 to attend the lectures and the meetings, if any, for seminars or tutorial instruction;

7.4.2 to complete satisfactorily the essays, exercises, practical and project work if any; and

7.4.3 to pass any other examination of the unit of study that may apply.

7.5 All units of study for a particular subject area may not be available every semester.

8. Enrolment in more/less than minimum load

8.1 A candidate may not enrol in additional units of study once the degree requirements of 336 credit points have been satisfied, without first obtaining permission from the Dean.

8.2 Students may enrol on either a full-time or part-time basis.

9. Cross-institutional study

9.1 Provided that permission has been obtained in advance, the Dean may permit a student to complete a unit of study at another institution and have that unit credited to his/her course requirements provided that either:

9.1.1 the unit of study content is material not taught in any corresponding unit of study in the University; or

9.1.2 the student is unable for good reason to attend a corresponding unit of study at the University.

10. Restrictions on enrolment

10.1 Except with the permission of the Dean, candidates may not enrol in an intermediate core unit of study until they have completed 42 credit points of junior units of study prescribed by the Faculty.

10.2 Except with the permission of the Dean, candidates may not enrol in a senior unit of study:

10.2.1 until they have gained credit for at least 42 credit points from core intermediate units of study; and

10.2.2 until they have completed the intermediate units of study prescribed as prerequisites for the senior unit of study, as set out in Table IV.

10.2.3 Enrolment in some senior units of study may be subject to a quota.

10.3 Where a student enrols in a unit of study which is the same as, or has a substantial amount in common with, a unit of study previously attempted but not completed satisfactorily, the Head of Department concerned may exempt the student from certain requirements of the unit of study requirements if satisfied that the relevant competence has been demonstrated.

10.4 A student may not enrol in a unit of study which they have completed previously with a grade of pass or better.

10.5 A candidate may not enrol in units of study having a total value of more than 30 credit points in a semester.

10.6 In satisfying the requirements of subsection 4.1.3 a student may not enrol in units of study which overlap substantially in content with units of study listed in subsection 4.1.4.

10.7 A student may not enrol without first obtaining permission from the Dean in:

10.7.1 additional units of study once the degree requirements of 144 credit points have been satisfied; or

10.7.2 units of study which may not be counted towards the course requirements.

11. Discontinuation of enrolment

11.1 A student who does not enrol in any semester without first obtaining written permission from the Dean to suspend candidature will be deemed to have discontinued enrolment in the course.

11.2 Students who have discontinued from the course will be required to apply for admission to the course and be subject to admission requirements pertaining at that time.

12. Suspension of candidature

12.1 A student may seek written permission from the Dean to suspend candidature in the course.

12.2 Suspension may be granted for a maximum of one year on any one application.

13. Re-enrolment after an absence

13.1 A student who plans to re-enrol after a period of suspension must advise the Faculty of Science Office in writing of their intention by no later than the end of October for First Semester of the following year or the end of May for Second Semester of the same year.

14. Satisfactory progress

14.1 14.1 A student shall not have made satisfactory progress in any semester if the student:

14.1.1 14.1.1 fails to complete successfully more than 50% of the credit points in which the student was enrolled for that semester; and/or

14.1.2 14.1.2 fails to complete successfully on the second or later attempt the same unit of study; and/or

14.1.3 14.1.3 is consequently unable to complete the degree within the maximum permitted time while carrying a normal student load.

14.2 14.2 A student who has not made satisfactory progress in accordance with 12.1.1 or 12.1.2 will be placed on a Faculty list of students at risk and will be required to take steps in accordance with the University's At Risk policy as implemented by the Faculty of Science;

14.2.1 14.2.1 a student who is placed on the Faculty's At Risk list for any three semesters shall be required to show good cause why the student should be permitted to reenrol in the degree;

14.2.2 14.2.2 a student who has failed to show good cause in accordance with 12.2.1 shall be excluded from the degree;

14.2.3 14.2.3 a student who has been permitted to reenrol after having been asked to show good cause and is placed on a Faculty list of students at risk for the fourth time will be automatically excluded from the degree.

15. Time limit

15.1 A candidate must complete all the requirements for the award of the degrees within ten calendar years of admission to candidature or readmission without credit.

15.1.1 If a candidate is readmitted with credit, the Faculty will determine a reduced time limit for completion of the degree.

16. Assessment policy

16.1 Students may be tested by written and oral examinations, exercises, essays or practical work or any combination of these as the Faculty may determine.

16.2 Where a unit of study is offered at different levels of difficulty, the performance of students will be matched so that a grade obtained at one level indicates a quality of work comparable with that required for the same grade at the other level(s).

16.3 Heads of Department may arrange for further testing in cases of special consideration, in accordance with Academic Board policy governing illness and misadventure.

17. Credit transfer policy

17.1 Credit will not be granted for units of study completed 10 years or more prior to application, except with the permission of the Dean.

17.2 Credit may be granted as specific credit if the unit of study is considered to be directly equivalent to a unit of study in Tables I or IV, or as non-specific credit.

17.3 The total amount of credit granted may not be greater than 96 credit points and may not include more than 48 credit points of units of study from other degrees for which credit is maintained or a degree has been conferred.

17.4 All students, notwithstanding any credit transfer, must complete at least 36 credit points of senior Science units of study in accordance with subsection 3.1.4.

18. Candidates enrolled before 2005

18.1 These Resolutions apply to all candidates for the degree enrolling in units of study after 1 January 2005.

18.2 With the permission of the Faculty of Science, candidates who first enrolled for the degree prior to 2005 and have not had a period of suspension or exclusion may until 31 March 2008 choose to qualify for the degree under the old resolutions.

18.3 With the permission of the Faculty of Science, candidates who first enrolled for the degree as part-time candidates prior to 2005 and have not had a period of suspension or exclusion may until 31 March 2010 choose to qualify for the degree under the old resolutions.

19. Specific glossary for the Bachelor of Medical Science/MBBS

19.1 AAM means the average mark over all units of study attempted in a given academic year (equivalent to the calendar year).

19.2 Completion of a unit of study means that the assessment requirements have been satisfied and a grade of pass or better has been achieved.

19.3 Intermediate unit of study is at second-year (2000) level. Its prerequisites or assumed knowledge are junior or intermediate units of study and corequisites are other intermediate units of study.

19.4 Senior unit of study is at third-year (3000) level. Its prerequisites or assumed knowledge are junior, intermediate or senior units of study and corequisites are other senior units of study.

19.5 Honours unit of study is a 4000 level unit offered within an honours course.

19.6 Advanced unit of study is a unit which generally parallels a normal unit of study but which provides added breadth of material and/or sophistication of approach.

19.7 Dean means the Dean of Science for the duration of the candidature for the Bachelor of Medical Science, and the Dean of Medicine for the duration of candidature for the MBBS.

19.8 Faculty means the Faculty of Science for the duration of candidature in the Bachelor of Medical Science and Faculty of Medicine for the duration of candidature in the MBBS.

19.9 Degrees means the Bachelor of Medical Science/MBBS.

19.10 Student means a person enrolled as a candidate for the degree of Bachelor of Medical Science.

19.11 TSP means the Talented Student Program in the Faculty of Science.

19.12 SCIWAM means the weighted average mark calculated by the Faculty from the results for all intermediate and senior units of study with a weighting of 2 for intermediate units and 3 for senior units.

Bachelor of Science and Bachelor of Laws (BSc/LLB)

1. Cross-Faculty management of combined degree course

1.1 Students will be under the general supervision of the Faculty of Science until the end of the semester in which they complete the requirements for the Bachelor of Science (BSc).

1.2 They will then be under the general supervision of the Faculty of Law.

1.3 The Deans of the Faculty of Science and the Faculty of Law shall jointly exercise authority in any matter concerning the combined award course not otherwise dealt with in these Resolutions.

2. Units of study

2.1 The units of study which may be taken for the Bachelor of Science (BSc) are set out under *Tables of units of study* in the Faculty of Science Handbook, together with:

2.1.1 credit point value;

2.1.2 the units of study with which they are mutually exclusive;

2.1.3 assumedknowledge/prerequisites/corequisites/ prohibition; and

2.1.4 any special conditions.

2.2 The units of study which may be taken for the Bachelor of Laws (LLB) are set out in the *Undergraduate units of study table* in the Faculty of Law Handbook, together with:

2.2.1 designation as compulsory or optional;

2.2.2 credit point value;

2.2.3 the units of study with which they are mutually exclusive;

2.2.4 assumed knowledge/prerequisites/corequisites/ prohibition; and

2.2.5 any special conditions.

3. Requirements for the Bachelor of Science (BSc) and the Bachelor of Laws (LLB)

3.1 To qualify for the award of the pass degrees a student must complete successfully units of study amounting to a total of 240 credit points.

3.2 To qualify for the award of the pass degree of Bachelor of Science (BSc) in the Bachelor of Science and Bachelor of Laws (BSc/LLB)combined degree program a student must complete 144 credit points in total, comprising 48 credit points of LAWS units of study as listed below in 3.6.1 and 96 credit points from Science units of study set out under Table I, in chapter 3 of the Faculty of Science Handbook, including:

3.2.1 at least 12 credit points from the Science subject areas of Mathematics and Statistics;

3.2.2 24 credit points of Junior units of study from at least two Science subject areas other than Mathematics or Statistics;

3.2.3 60 credit points of Intermediate/Senior units of study in Science subject areas; and

3.2.4 a major in a Science area.

3.3 To qualify for the award of the pass degree in an advanced stream of the Bachelor of Science (BSc) degree, a student must complete the requirements for the BSc degree in Section 3.2 above and in addition, except with the permission of the Dean of Science:

3.3.1 at least 12 credit points of Intermediate units of study at either the Advanced level or as TSP units in Science subject areas;

3.3.2 include at least 24 credit points of Senior units of study at the Advanced level or as TSP units in a single Science subject area;

3.3.3 maintain in Intermediate and Senior units of study in Science subject areas an average mark of 65 or greater in each year of enrolment.

3.4 Candidates in the Advanced stream of the BSc degree who fail to maintain the required Credit average will be transferred to candidature for the Bachelor of Science (BSc) degree in their next year of enrolment with full credit for the units of study completed in the Advanced stream.

3.5 Candidates in the Advanced stream of the BSc degree who fail to achieve a Credit average across all Science units of study attempted in the year in which they would have otherwise completed the requirements for the degree will be awarded the Bachelor of Science (BSc).

3.6 To qualify for the degree of Bachelor of Laws (LLB), in the Bachelor of Science and Bachelor of Laws (BSc/LLB) combined degree program, a student must complete units of study to the value of 144 credit points, made up of the following:

3.6.1 96 credit points of compulsory units of study, which includes the 48 credit points of LAWS units of study listed below in table 3.8.1 and counted towards the Bachelor of Science;

3.6.2 48 credit points of elective units of study in the Faculty of Law Handbook that must include:

3.6.2.1 a maximum of 42 credit points from the units of study listed in Part 1 of the *Undergraduate units of study table*, and

3.6.2.2 a minimum of six credit points from the units of study listed in Part 2 of the *Undergraduate units of study table*.

3.7 Candidates may credit the following units of study to both the Bachelor of Science (BSc) and the Bachelor of Laws (LLB):

3.7.1 Contracts

3.7.2 Criminal Law

3.7.3 Foundations of Law

3.7.4 International Law

3.7.5 Legal Research I

3.7.6 Legal Research II

3.7.7 Civil and Criminal Procedure

3.7.8 Public Law

3.7.9 Torts

3.7.10 Torts and Contracts II

3.8.1 Candidates in Combined Law must complete the law units of study in the following sequence:

Year	Unit of study	Credit points
Combined Law 1	Foundations of Law	6
	Legal Research I	0
	Torts	6
Combined Law 2	Contracts	6
	Civil and Criminal Procedure	6
	Criminal Law	6
Combined Law 3	International Law	6
	Legal Research II	0
	Public Law	6
	Torts and Contracts II	6

3.8.2 On completion of the requirements for the degree of Bachelor of Science (BSc) a student must then complete the following compulsory units of study towards the Bachelor of Laws (LLB) degree.

Year	Unit of study	Credit points
Combined Law 4	Administrative Law	6
	Corporations Law	6
	Equity	6
	Evidence	6
	Federal Constitutional Law	6
	Introduction to Property and Commercial Law	6
	Real Property	6
	The Legal Profession	6
Combined Law 5	Elective units of study selected from Part 1 and Part 2	48

3.9 Except with the permission of the Dean or Associate Dean (Undergraduate), candidates in a Combined Law program must successfully complete *Foundations of Law* before enrolling in any other Bachelor of Laws (LLB) units of study.

3.10 Students must complete the requirements for the Bachelor of Science (BSc) before proceeding to the Bachelor of Laws (LLB) (unless they have permission from the Faculty of Law stating otherwise).

4. Requirements for award of honours

4.1 Both the Bachelor of Science (BSc) and the Bachelor of Laws (LLB) may be awarded with honours.

4.2 Students who qualify to undertake Honours in the Bachelor of Science (BSc) degree by completion of an Honours year in accordance with the resolutions of the Bachelor of Science (BSc) may elect to do so:

4.2.1 by suspending candidature from the Bachelor of Laws (LLB) degree for one year, with the permission of the Faculty of Law; or
4.2.2 undertake the honours course after completion of both degrees in the combined program.
4.2.3 Honours in the Bachelor of Science (BSc) may be awarded in four classes: Class I, Class II(1), Class II(2) and Class III in accord with the resolutions of the Bachelor of Science.
4.3 Honours in the Bachelor of Laws (LLB) may be awarded in two classes: Class I and Class II.
4.3.1 To qualify for the award of honours in the Bachelor of Laws (Honours) a student must obtain the following WAM across all Law units, including those taken as part of the combined award course and any failures:
4.3.1.1 First class honours are awarded to students who obtain an average mark of 75 percent or higher (weighted in accordance with the credit points for each unit of study).
4.3.1.2 Second class honours are awarded to students who obtain an average mark of between 70 percent and 74.9 percent (weighted in accordance with the credit points for each unit of study).
4.3.2 Students who qualify for the award of first class honours, and whose work is of outstanding merit in the opinion of the Faculty, may be considered for the award of a University medal.
4.3.3 An honours year is not required.

Bachelor of Science and Bachelor of Arts

Course rules

1. **Admission**

1.1 All applications for admission to candidature to an undergraduate degree or combined degree in the Faculty of Science will be subject to the Undergraduate Admissions policy of the University of Sydney.
1.1.1 A candidate for the BSc, BSc(Advanced) or BSc(Advanced Mathematics) may apply to the Dean for permission to transfer candidature to any other stream.
1.2 Cross-Faculty Management of Combined Degree Course
1.2.1 The primary Faculty for management of the combined course is the Faculty of Science. The Deans of the Faculties of Arts and Science shall jointly exercise authority in any matter concerning the combined degrees not otherwise dealt with in these resolutions.

2. **Requirements for the degree**

2.1 To qualify for the award of the pass degrees a student shall complete from the *Table of undergraduate units of study* for the Bachelor of Science and from the *Table of units of study* for the Bachelor of Arts, units of study having a total value of 240 credit points, including:
2.1.1 no more than 96 credit points from junior units of study, with no more than 18 junior credit points from the same Arts subject area;
2.1.2 at least 96 credit points from Science subject areas, including
2.1.2.1 at least 12 credit points from the Science subject area of Mathematics and Statistics;
2.1.2.2 at least 24 credit points of junior units of study from at least two Science subject areas other than Mathematics & Statistics;
2.1.2.3 a major in a Science area as defined in Table I for the Bachelor of Science, normally requiring the completion of 24 credit points of senior units of study in one Science area, including any units of study specified in the table as compulsory for that major;
2.1.3 at least 72 credit points of senior units of study in Arts subject areas from Part A including
2.1.3.1 a Part A major consisting of 36 senior credit points in a single subject area listed in Part A of the table of units of study for the Bachelor of Arts or of at least 18 senior credit points from a Part A subject area combined with no more than 18 senior credit points from units of study approved by the Dean of Arts for cross-listing with the major, except in the case of Medieval Studies, Film Studies, European Studies and Asian Studies where the entire major may be cross-listed, and in such other subject areas as may be approved by the Dean of Arts;
2.1.3.2 no more than 60 senior credit points from the same Arts subject area.
2.1.4 A student may not count a unit of study toward more than one major.
2.1.5 The testamurs for the degrees of Bachelor of Science and Bachelor of Arts shall specify the major(s) completed in order to qualify for the awards.

3. **Specially designated streams**

3.1 A student may proceed concurrently to the degrees of Bachelor of Science and Bachelor of Arts, Bachelor of Science (Advanced) and Bachelor of Arts or Bachelor of Science (Advanced Mathematics) and Bachelor of Arts.

3.2 **BSc(Advanced)**

3.2.1 To qualify for the award of the pass degree in the Advanced stream of the BSc degree, a student shall complete the requirements for the BSc degree in subsection 2 and in addition, except with the permission of the Dean:
3.2.1.1 include at least 12 credit points of Intermediate Science units of study at either the Advanced level or as TSP units;
3.2.1.2 include at least 24 credit points of Senior units of study at the Advanced level or as TSP units in a single Science subject area; and
3.2.1.3 maintain in Intermediate and Senior units of study in Science subject areas an average mark of 65 or greater in each year of enrolment.
3.2.2 Candidates who fail to maintain the required Credit average will be transferred to candidature for the Bachelor of Science degree in their next year of enrolment with full credit for the units of study completed in the Advanced stream. Candidates who fail to achieve a Credit average across all units of study attempted in the year in which they have otherwise completed the requirements for the degree will be awarded the Bachelor of Science.
3.2.3 Students who have completed at least 48 credit points may be permitted to transfer to the BSc (Advanced) stream from the BSc or BSc (Advanced Mathematics) if:
3.2.3.1 their mark averaged over all attempted units of study is 75 or greater; and
3.2.3.2 they are able to enrol in the required number of Advanced level units or TSP units.
3.2.4 The testamur for the degree of Bachelor of Science (Advanced) shall specify the major(s) completed in order to qualify for the award.

3.3 **BSc (Advanced Mathematics)**

3.3.1 To qualify for the award of the pass degree in the Advanced Mathematics stream of the BSc degree, a student shall complete the requirements for the BSc degree in subsection 2 and in addition, except with the permission of the Dean:
3.3.1.1 include no more than 48 credit points from junior Science units of study;
3.3.1.2 include at least 12 credit points of intermediate units of study at either the Advanced level or as TSP units in the Science subject areas of Mathematics and Statistics;
3.3.1.3 include a major in Mathematics, Statistics or Financial Mathematics and Statistics;
3.3.1.4 include at least 48 credit points of senior units of study of which at least 24 are completed at the Advanced level or as TSP units in the Science subject areas of Mathematics and Statistics; and
3.3.1.5 maintain in intermediate and senior units of study in Science subject areas an average mark of 65 or greater in each year of enrolment.
3.3.2 Candidates who fail to maintain the required Credit average will be transferred to candidature for the Bachelor of Science degree in their next year of enrolment with full credit for the units of study completed as Bachelor of Science (Advanced Mathematics) candidates. Candidates who fail to achieve a Credit average across all units of study attempted in the year in which they have otherwise completed the requirements for the degree will be awarded the Bachelor of Science.
3.3.3 Students who have completed at least 48 credit points may be permitted to transfer to the BSc (Advanced Mathematics) stream from the BSc or BSc(Advanced) if:
3.3.3.1 their mark averaged over all attempted units of study is 75 or greater; and
3.3.3.2 they are able to enrol in the required number of Advanced level units or TSP units.

4. Honours in Science and Arts

4.1 Students who are qualified to do so may undertake honours courses in either or both degrees or a joint honours course at the completion of the combined degrees.

4.2 There shall be honours courses in the following Science subject areas:

4.2.1 Agricultural Chemistry
4.2.2 Anatomy and Histology
4.2.3 Biochemistry
4.2.4 Biology
4.2.5 Cell Pathology
4.2.6 Chemistry
4.2.7 Computational Science
4.2.8 Computer Science
4.2.9 Environmental Studies
4.2.10 Geography
4.2.11 Geology
4.2.12 Geophysics
4.2.13 History and Philosophy of Science
4.2.14 Immunology
4.2.15 Information Systems
4.2.16 Marine Science
4.2.17 Applied Mathematics
4.2.18 Pure Mathematics
4.2.19 Microbiology
4.2.20 Molecular Biotechnology
4.2.21 Pharmacology
4.2.22 Physics
4.2.23 Physiology
4.2.24 Psychology
4.2.25 Soil Science
4.2.26 Mathematical Statistics

4.3 To qualify to enrol in an honours course, students shall:

4.3.1 have qualified for the award of a pass degree;

4.3.2 have completed a minimum of 24 credit points of Senior units of study relating to the intended honours course;

4.3.3 have achieved either:

4.3.3.1 at least a credit average in 48 credit points in relevant intermediate and senior Science units of study; or

4.3.3.2 a SCIWAM of at least 65; and

4.3.3.3 satisfy any additional criteria set by the Head of Department concerned.

4.4 Students shall complete the requirements for the honours course full-time over two consecutive semesters.

4.5 If the Faculty is satisfied that a student is unable to attempt the honours course on a full-time basis and if the Head of Department concerned so recommends, permission may be granted to undertake honours half-time over four consecutive semesters.

4.6 To qualify for the award of an honours degree, students shall complete 48 credit points of honours units of study in the Table of undergraduate units of study, as prescribed by the Head of Department concerned.

4.7 The grade of honours and the honours mark are determined by performance in the honours course.

4.8 Honours in the Bachelor of Science may be awarded in four classes as follows:

4.8.1 Class I (mark range: 80 and above)
4.8.2 Class II(1) (mark range: 75-79)
4.8.3 Class II(2) (mark range: 70-74)
4.8.4 Class III (mark range: 65-69)

4.9 A student with an honours mark of 90 or greater in an honours subject area and a minimum SCIWAM of 80 shall, if deemed to be of sufficient merit by the Dean of Science, receive a bronze medal.

4.10 A student may not re-attempt an honours course in a single subject area.

4.11 A student who is qualified to enrol in two honours courses may either:

4.11.1 complete the honours courses in the two subject areas separately and in succession; or

4.11.2 complete a joint honours course, equivalent to an honours course in a single subject area, in the two subject areas. A joint honours course shall comprise such parts of the two honours courses as may be decided by the Dean of Science.

4.12 There shall be honours courses in the following Arts subject areas:

4.12.1 Ancient History
4.12.2 Social Anthropology
4.12.3 Archaeology
4.12.4 Art History and Theory
4.12.5 Australian Literature
4.12.6 Chinese Studies
4.12.7 Classics
4.12.8 Economics
4.12.9 Education
4.12.10 English
4.12.11 French Studies
4.12.12 Gender Studies
4.12.13 Germanic Studies
4.12.14 Government and International Relations
4.12.15 Greek (Ancient)
4.12.16 Hebrew (Classical)
4.12.17 History
4.12.18 Indonesian Studies
4.12.19 Industrial Relations and Human Resource Management
4.12.20 Italian Studies
4.12.21 Japanese Studies
4.12.22 Jewish Civilisation, Thought and Culture
4.12.23 Korean Studies
4.12.24 Latin
4.12.25 Linguistics
4.12.26 Medieval Studies
4.12.27 Modern Greek Studies
4.12.28 Music
4.12.29 Performance Studies
4.12.30 Philosophy
4.12.31 Political Economy
4.12.32 Sanskrit
4.12.33 Sociology
4.12.34 Studies in Religion

4.13 To qualify to enrol in an honours course, students shall

4.13.1 have qualified for the award of the pass degree; and

4.13.2 have completed at least 48 senior credit points in the subject area concerned, completed at an average of credit level, or

4.13.3 have completed the requirements of the Faculties of Economics and Business, and Education and Social Work, for subject areas listed in Part B of the table of units of study for the BA, as appropriate; and

4.13.4 have met any other entry requirements as specified in the table of units of study for the BA, except that the entry requirement must not exceed 64 senior credit points in the subject area concerned; and

4.13.5 have the written approval of the Chair of department concerned.

4.14 A student who is qualified to enrol in two honours courses may either:

4.14.1 complete the honours courses in the two subject areas separately and in succession, or

4.14.2 complete a joint honours course, equivalent to an honours course in a single subject area, in the two subject areas. A joint honours course shall comprise such parts of the two honours courses as may be decided by the Dean of Arts.

4.15 Candidature is normally full-time. Full-time students must complete the requirements over two consecutive semesters.

4.16 A student may seek permission from the Dean of Arts to undertake the honours course on a part-time basis. Part-time candidature must not exceed four consecutive semesters.

4.17 A student may seek written permission from the Dean of Arts to suspend candidature.

4.18 Suspension may be granted for a maximum period of one semester.

4.19 In the case of a student being granted suspension the student must not exceed five consecutive semesters, including the semester of suspension.

4.20 Students resuming the honours course after a period of suspension must advise the Faculty of Arts office in writing of their intention to re-enrol.

4.21 A student may not:

4.22.1 enrol in any fourth year unit of study without first qualifying for the award of the pass degree,

4.22.2 be awarded the pass degree while enrolled in final year honours, or

4.22.3 enrol concurrently in a fourth year unit of study and any other course or unit of study,

4.22.4 enrol in more than two fourth year units per semester.

4.23 Candidates for combined degrees are required to transfer to the single Bachelor of Arts candidature when enrolled in fourth year units of study.
4.24 To qualify for the award of an honours degree, students shall complete 48 credit points of honours units of study, comprising four, 12 credit point semester length units of study.
4.25 The grade of honours and the honours mark are determined by performance in the honours course.
4.26 The award of honours degrees, the level at which they are awarded and the award of the University Medal shall be determined by the Dean of Arts on the advice of the Faculty Honours Committee.
4.27 A student with an honours mark of 90 and a meritorious record in previous studies may be considered by the Dean of Arts on the advice of the Faculty Honours Committee for the award of the University Medal.
4.28 The testamur for the honours course shall specify the subject area or areas and the grade of honours, and the medal if awarded. It shall not include majors.
4.29 Students who fail or discontinue - fail final year honours may not re-enrol in it.

Faculty rules

5. Units of study

5.1 The units of study which may be taken for the degrees of Bachelor of Science and Bachelor of Arts are set out under subject areas in Tables I and VI for the Bachelor of Science and Table Part A and Part B for the Bachelor of Arts together with:
5.1.1 designation as junior, intermediate (in the case of Science units), senior or Honours, and where appropriate as Advanced, units of study
5.1.2 credit point values
5.1.3 corequisites/prerequisites/assumedlearning/assumed knowledge
5.1.4 the semesters in which they are offered
5.1.5 the units of study with which they are mutually exclusive
5.1.6 units of study in Part A of the table of units available to BA students cannot be cross-listed to majors in Part B of the table of units of study available to BA students
5.1.7 the faculty responsible for the unit of study; and
5.1.8 any special conditions.
5.2 The Dean may permit a student of exceptional merit who is admitted to the Talented Student Program to undertake a unit or units of study within the Faculty other than those specified in Table I.
5.3 Units of study completed at the University of Sydney Summer/Winter School which correspond to units of study in the table of units of study for the Bachelor of Arts and the Bachelor of Science may be credited towards the course requirements.

6. Enrolment in more/less than minimum load

6.1 A student may not enrol without first obtaining permission from the Dean in additional units of study once the combined degree requirements of 240 credit points have been satisfied.
6.2 Students may enrol on either a full-time or part-time basis.

7. Cross-institutional enrolment

7.1 Provided that permission has been obtained in advance, the Dean may permit a student to complete a unit of study at another institution and have that unit credited to his/her course requirements provided that either
7.1.1 the unit of study content is material not taught in any corresponding unit of study in the University; or
7.1.2 the student is unable for good reason to attend a corresponding unit of study at the University.

8. Restrictions on enrolment

8.1 Units of study in subject areas in the Faculty of Arts which are restricted to a specific degree are as follows:
8.1.1 Bachelor of Arts Informatics - units of study with the prefix ARIN except ARIN2100 Web Tools available to Bachelor of Arts with departmental permission and ARIN3000 Technocultures available to Bachelor of Arts.
8.1.2 Bachelor of Arts (Media and Communications) - units of study with the prefix MECO
8.1.3 Bachelor of Social Sciences - units of study with the prefix SSCI
8.1.4 Bachelor of Arts (Honours), Bachelor of Arts (Asian Studies) (Honours), Bachelor of Arts (Languages) (Honours), Bachelor of Arts (Media and Communications) (Honours), Bachelor of Informatics (Honours), Bachelor of Social Sciences (Honours) - Bachelor of Arts and Sciences (Honours) all Fourth Year Honours units (4000 units)
8.1.5 Bachelor of Arts/Bachelor of Laws - units of study with the prefix LAWS
8.1.6 Bachelor of Arts and Sciences degree - units of study with the prefix SLSS
8.2 A student may not enrol in a language based unit of study, if, in the opinion of the Chair of the department involved, on the advice of the teacher of the unit, the student's linguistic knowledge or competence would unfairly advantage them over other students in the unit. If enrolment has already taken place, the Dean may direct that the student be withdrawn without penalty from the unit.
8.3 A candidate may not count a particular unit of study more than once towards the degrees or count two units of study which overlap substantially in content.
8.4 Units of study which overlap substantially in content are noted in the *Tables of undergraduate units of study*. Such units of study are mutually exclusive and no more than one of the overlapping units of study may be counted towards meeting the combined course requirements.
8.5 A candidate may not enrol in units of study having a total value of more than 30 credit points in a semester.

9. Time limits

9.1 A candidate must complete all the requirements for the award of the degrees within ten calendar years of admission to candidature or readmission without credit. If a candidate is readmitted with credit, the Faculty will determine a reduced time limit for completion of the degrees.

10. Repeating a unit of study

10.1 Where a student enrols in a unit of study which is the same as, or has a substantial amount in common with, a unit of study previously attempted but not completed at the grade of Pass or better, the Head of Department concerned may exempt the student from certain requirements of the unit of study if satisfied that the relevant competence has been demonstrated.
10.2 A student may not enrol in a unit of study which they have completed previously with a grade of Pass or better.

11. Discontinuation of enrolment

11.1 Students may abandon the combined degree course and elect to complete either a Bachelor of Science or a Bachelor of Arts in accordance with the resolutions governing these degrees.
11.2 A student who does not enrol in any semester without first obtaining written permission from the Dean to suspend candidature will be deemed to have discontinued enrolment in the course. Students who have discontinued from the course will be required to apply for admission to the course and be subject to admission requirements pertaining at that time.

12. Suspension of candidature

12.1 A student may seek written permission from the Dean to suspend candidature in the combined course. Suspension may be granted for a maximum period of one year on any one application.

13. Re-enrolment after an absence

13.1 A student who intends to re-enrol after a period of suspension must advise the Faculty of Science Office in writing of their intention by no later than the end of October for First semester of the following year or the end of May for Second semester of the same year.

14. Satisfactory progress

14.1 If a student fails or discontinues enrolment in one unit of study twice, a warning will be issued that if the unit is failed a third time, the student may be asked to show good cause why he or she should be allowed to re-enrol in that unit of study.

15. Assessment policy

15.1 Students may be tested by written and oral examinations, exercises, essays or practical work or any combination of these as the Faculty may determine.
15.2 Where a unit of study is offered at different levels of difficulty, the performance of students will be matched so that a grade obtained at one level indicates a quality of work comparable with that required for the same grade at the other level(s).

15.3 Heads of Department may arrange for further testing in cases of special consideration, in accordance with Academic Board policy governing illness and misadventure.

16. **Credit Transfer Policy**

16.1 Credit will not be granted for units of study completed more than 10 years prior to application, except with the permission of the Dean.

16.2 Credit may be granted as specific credit if the unit of study is considered to be directly equivalent to a unit of study in Table I or as non-specific credit.

16.3 The total amount of credit granted may not be greater than 96 credit points and may not include more than 48 credit points of units of study from other degrees for which credit is maintained or a degree has been conferred.

16.4 All students, notwithstanding any credit transfer, must complete at least 24 credit points of Senior Science units of study towards a major taken at the University of Sydney.

17. **Candidates enrolled before 2006**

17.1 These Resolutions apply to all candidates for the degrees enrolling in units of study after 1 January, 2006.

17.2 With the permission of the Faculty of Science, candidates who first enrolled for the degrees prior to 2006 and have not had a period of suspension or exclusion may until 31 March 2009 choose to qualify for the degrees under the old resolutions.

17.3 With the permission of the Faculty of Science, candidates who first enrolled for the degrees as part-time candidates prior to 2006 and have not had a period of suspension or exclusion may until 31 March 2011 choose to qualify for the degrees under the old resolutions.

18. **Glossary for the BSc/BA**

18.1 Completion of a unit of study means that the assessment requirements have been satisfied and a grade of Pass or better has been achieved.

18.2 Junior unit of study is a 1000 or first-year stage unit. Its prerequisites or assumed knowledge are non-tertiary qualifications and corequisites are other Junior units of study

18.3 Intermediate unit of study is a 2000 or second-year stage unit. Its prerequisites or assumed knowledge are Junior or Intermediate units of study and corequisites are other Intermediate units of study. (Specific to the Faculty of Science).

18.4 Senior unit of study is a 3000 or third-year stage unit. Its prerequisites or assumed knowledge are Junior, Intermediate or Senior units of study and corequisites are other Senior units of study. (Specific to the Faculty of Science.)

18.5 Honours unit of study is a 4000 or fourth-year stage unit offered within an honours course.

18.6 Advanced unit of study is a unit which generally parallels a normal unit of study but which provides added breadth of material and/or sophistication of approach.

18.7 Major in the BSc normally requires the completion of a minimum of 24 credit points of Senior units of study in one Science area, including any units of study specified in the *Table of undergraduate units of study* as compulsory for that major. A student may not count a unit of study toward more than one major. (A major in Psychology requires 48 credit points of Intermediate and Senior Psychology units of study including PSYC(2111 or 2011), PSYC(2112 or 2012), PSYC(2113 or 2013) and PSYC(2114 or 2014). No other Intermediate Psychology units can be counted towards the major).

18.8 Major in the Faculty of Arts is normally 36 credit points from Senior units of study in an Arts subject area.

18.9 Major in the Faculty of Economics and Business is usually a three year sequence of study (in some cases a two year sequence) in a particular Economics and Business subject area.

18.10 Major in the Faculty of Education is 36 credit points from Senior units of study in the subject area of Education.

18.11 Dean means the Dean of Science.

18.12 Faculty means the Faculty of Science.

18.13 Science subject area means a defined field of study in science.

18.14 Degrees means the degrees of Bachelor of Science and Bachelor of Arts.

18.15 Requirements means coursework requirements for the award of the degree of Bachelor of Science or Bachelor of Arts.

18.16 Student means a person enrolled as a candidate for the degrees of Bachelor of Science and Bachelor of Arts.

18.17 TSP means the Talented Student Program in the Faculty of Science.

18.18 SCIWAM means the weighted average mark calculated by the Faculty from the results for all Intermediate and Senior units of study with a weighting of 2 for Intermediate units and 3 for Senior units.

Bachelor of Commerce and Bachelor of Science

Participating Faculties: Faculty of Economics and Business, Faculty of Science

Course rules

1. **Cross-faculty management of the combined award course**

1.1 The Faculty of Economics and Business is the primary Faculty of management for the combined award course.

1.2 The Deans of the Faculty of Economics and Business and the Faculty of Science shall jointly exercise authority in any matter concerning the combined award course not otherwise dealt with in these Resolutions.

2. **Units of study**

2.1 The units of study which may be taken for the combined award course are set out under the tables of undergraduate units of study in the Faculty of Economics and Business Handbook, and the Undergraduate tables and units of study in the Faculty of Science Handbook together with:

2.1.1 designation as junior, intermediate, senior or honours level;

2.1.2 credit point value;

2.1.3 the units of study with which they are mutually exclusive;

2.1.4 the semesters in which they are offered;

2.1.5 corequisites/prerequisites/assumed learning/assumed knowledge;

2.1.6 the faculty responsible for the unit of study; and

2.1.7 any special conditions.

2.2 The Dean of the Faculty of Science may permit a student admitted to the Talented Student Program to undertake Science units of study other than those specified in Table I: Bachelor of Science in the Faculty of Science Handbook (see the tables of undergraduate units of study in the Faculty of Economics and Business Handbook).

3. **Requirements for the Bachelor of Commerce and Bachelor of Science**

3.1 To qualify for the award of the pass degrees a student must complete successfully units of study amounting to a total of 240 credit points (but no more than 96 credit points of junior units of study), including:

3.2 *In the Faculty of Economics and Business:*

3.2.1 at least 96 credit points (minimum of 48 senior credit points) of units of study from the Faculty of Economics and Business, as specified in the Faculty of Economics and Business Handbook, which must include;

3.2.1.1 7 core units of study (comprising 36 junior and 6 senior credit points), as specified in the Faculty of Economics and Business Handbook; and

3.2.1.2 either a major (minimum of 36 senior credit points) or an extended major (minimum of 48 senior credit points), comprising units of study as specified in the Faculty of Economics and Business Handbook, from one of the following subject areas:

3.2.1.2.1 Accounting;

3.2.1.2.2 Business Information Systems;

3.2.1.2.3 Commercial Law;

3.2.1.2.4 Econometrics;

3.2.1.2.5 Economics;

3.2.1.2.6 Finance;

3.2.1.2.7 Industrial Relations and Human Resource Management;

3.2.1.2.8 International Business;

3.2.1.2.9 Management;

3.2.1.2.10 Marketing; or

3.2.1.2.11 Operations Management and Decision Sciences

3.3 *In the Faculty of Science:*

3.3.1 at least 12 credit points of units of study from the Science subject area of Mathematics and Statistics;

3.3.2 24 credit points of junior units of study from at least two Science subject areas (excluding Mathematics and Statistics);

3.3.3 at least 60 credit points of intermediate and senior Science units of study;
3.3.4 a major (normally 24 senior credit points) comprising units of study specified in Table I: Bachelor of Science listed in the Undergraduate tables and units of study in the Faculty of Science Handbook.
3.4 In the Bachelor of Science (Advanced), those requirements specified in 4(2) and in addition, except with the permission of the Dean of the Faculty of Science:
3.4.1 include no more than 48 credit points of junior Science units of study;
3.4.2 include at least 12 credit points of intermediate Science units of study at either the advanced level or as TSP units;
3.4.3 include at least 48 credit points of senior Science units of study of which at least 24 credit points are units of study in a single Science subject area, taken at the advanced level (or as TSP units); and
3.4.4 maintain in intermediate and senior units of study in Science subject areas an average mark of 65 or greater in each year of enrolment.
3.5 In the Bachelor of Science (Advanced Mathematics), those requirements specified in 4(2) and in addition, except with the permission of the Dean of the Faculty of Science:
3.5.1 include no more than 48 credit points of junior Science units of study;
3.5.2 include at least 12 credit points of intermediate Mathematics and Statistics units of study at either the advanced level or as TSP units;
3.5.3 include at least 48 credit points of senior Science units of study of which at least 24 are completed at the advanced level (or as TSP units) in Mathematics and Statistics; and
3.5.4 maintain in intermediate and senior units of study in Science subject areas an average mark of 65 or greater in each year of enrolment.

4. Transfer between Bachelor of Science streams

4.1 Students in the Bachelor of Science (Advanced) or Bachelor of Science (Advanced Mathematics) streams who fail to maintain a Credit average will be transferred to the Bachelor of Science in the next year of enrolment with full credit for units completed in the Advanced or Advanced Mathematics stream.
4.2 Students in the Bachelor of Science (Advanced) or Bachelor of Science (Advanced Mathematics) streams who fail to achieve a Credit average across all units attempted in their final year of the degree will be awarded the Bachelor of Science.
4.3 To transfer to the Bachelor of Science (Advanced) or Bachelor of Science (Advanced Mathematics), a student must satisfy the following:
4.3.1 completion of at least 48 credit points;
4.3.2 an average of 75 or greater over all attempted units of study; and
4.3.3 be able to enrol in the required number of advanced level or TSP units.

5. Requirements for the Honours degrees

5.1 On completion of the Bachelor of Commerce and Bachelor of Science (or equivalent), students who are qualified to do so may undertake an honours year in either or both of the award courses.
5.2 Joint honours courses are also available.
5.3 To qualify for the award of honours in the Bachelor of Commerce a student must complete successfully an additional year of study (the honours year), as specified in the Faculty of Economics and Business Handbook.
5.3.1 The Bachelor of Commerce may be awarded with honours in any of the subject areas where honours units are listed in the *Table of undergraduate units of study* - Faculty of Economics and Business or, as approved by the Faculty of Economics and Business, with joint honours in two of these subject areas.
5.3.2 Honours may also be awarded in any other area offered by another Faculty of the University, as approved by the Faculty of Economics and Business.
5.3.3 To enrol in the honours year, a student must satisfy the following:
5.3.3.1 confirmation of the student's eligibility for entry to the honours year from the relevant Discipline(s)/Department; and
5.3.3.2 any other requirements for entry into the honours year set by the relevant Discipline(s)/Department and the Faculty of Economics and Business, unless otherwise approved by the Faculty of Economics and Business.
5.4 To qualify for the award of honours in the Bachelor of Science a student must complete successfully an additional year of study (the honours year), as specified in the Faculty of Science Handbook.
5.4.1 The Bachelor of Science may be awarded with honours in any of the subject areas in Table VI: Honours units of study listed in Undergraduate tables and units of study of the Faculty of Science Handbook or, as approved by the Faculty of Science, with joint honours in two of these subject areas.
5.4.2 To qualify to enrol in an honours course a student must satisfy the following:
5.4.2.1 have completed a minimum of 24 credit points of senior units of study relating to the intended honours course;
5.4.2.2 have achieved either at least a credit average in 48 credit points in relevant intermediate and senior Science units of study or a SCIWAM of at least 65; and
5.4.2.3 any additional criteria set by the Head of Department concerned.
5.5 The classes for the award of honours are specified in the following table:

Description	*Mark range*
Honours Class I and University Medal	90 to 100*
Honours Class I	80 to 100
Honours Class II (Division 1)	75 to 79
Honours Class II (Division 2)	70 to 74
Honours Class III	65 to 69
Pass	50 to 64
**Please note: This is a minimum criterion only, other criteria apply.*	

6. Award of Bachelor of Commerce and Bachelor of Science

6.1 A student who completes the requirements for the Bachelor of Commerce and the Bachelor of Science shall receive at graduation a separate testamur for each of the degrees.
6.2 The Bachelor of Commerce and the Bachelor of Science may be awarded in two grades, namely pass and honours.
6.2.1 The testamur for the pass degrees shall specify the major(s) completed.
6.2.2 The testamur for the honours degrees shall specify the subject area(s) and the class of honours.
6.2.3 It shall not include majors.
6.3 The Bachelor of Science may be awarded in the following streams:
6.3.1 Bachelor of Science;
6.2.2 Bachelor of Science (Advanced); or
6.2.3 Bachelor of Science (Advanced Mathematics).
6.3 Students may abandon the combined award course and elect to complete either the Bachelor of Commerce or the Bachelor of Science in accordance with the Resolutions governing those award courses.

Bachelor of Engineering and Bachelor of Science

Combined degree course rules

1. Cross-faculty management of the combined award course

1.1 A student may proceed concurrently to the degrees of Bachelor of Science, Bachelor of Science (Advanced) or Bachelor of Science (Advanced Mathematics) and Bachelor of Engineering. Admission, progression and assessment criteria apply and are described in the resolutions for the BE specialisations shown above.
1.2 Students will be under the general supervision of the Faculty of Engineering and Information Technologies for administrative matters.
1.3 The Faculty of Science and the Faculty of Engineering and Information Technologies shall jointly exercise authority in any academic matter concerning the combined course not otherwise dealt with in these resolutions.

2. **Units of study**

2.1 Units of study must be selected as shown in the Engineering specialisation tables for the core components of the chosen Engineering specialisation. Units from the Science Faculty must be chosen as shown in the Science Faculty Handbook to meet requirements of a Science major.

2.2 The faculty Resolutions (which are reproduced in the Engineering and Information Technologies and Science Handbooks, as the case may be) specify:

2.2.1 credit point values;

2.2.2 corequisites/prerequisites and assumed learning/ assumed knowledge; and

2.2.3 any special conditions.

3. **Requirements for the BE/BSc Pass degree**

3.1 To qualify for the award of the pass degrees a student shall complete units of study having a total value of at least 240 credit points including:

3.1.1 96 credit points of units from Science subject areas,

3.1.2 a major in a Science area, and

3.1.3 Units of study as prescribed in the tables of BE specialisation requirements for the specialisation that the student is pursuing.

3.2 To qualify for the award of the pass degree in the Advanced or Advanced Mathematics stream of the BSc a student shall in addition to the requirements of resolution 3.1:

3.2.1 complete at least 54 credit points of intermediate/senior Science units of study of which at least 36 shall be completed at the Advanced level or as TSP units;

3.2.2 complete at least 24 credit points of senior Science units of study at the Advanced level or as TSP units in a single Science subject area; and

3.2.3 maintain in intermediate and senior Science units of study an average mark of 65 or greater in each year of enrolment.

4. **Requirement for Honours degrees**

4.1 BE with Honours

4.1.1 On completion of the requirements for the combined degrees, a student may qualify for the award of BE degree with Honours in accordance with the requirements set out in the Resolutions of the Faculty of Engineering and Information Technologies relating to the BE degree.

4.2 BSc with Honours

4.2.1 On completion of the requirements for the combined degrees, a student may be qualified to enrol in Honours in the Bachelor of Science.

4.2.2 To qualify for the award of the BSc with Honours, a student must complete successfully an additional year of study (the Honours year), as specified in the Faculty of Science Handbook.

5. **Award of the degrees**

5.1 A student who completes the requirements for the Bachelor of Engineering and Bachelor of Science degrees shall receive at graduation a separate testamur for each of the degrees.

5.2 Students may at any stage abandon the combined degree course and elect to complete either a BSc or a BE in accordance with the resolutions governing those degrees.

5.3 Resolutions covering admission, enrolment restrictions, progression requirements, satisfactory progress, cross-institutional study and assessment criteria for the combined degree are equivalent to those for the BE degree and specialisations, as shown in the Faculty of Engineering and Information Technologies Handbook.

6. The Deans of the Faculties of Engineering and Information Technologies and Science shall jointly exercise authority in any matter concerning the combined degrees not otherwise dealt with in these resolutions.

Bachelor of Engineering and Bachelor of Science double degree

Double degree course rules

1. **Transfer to Science requirements**

1.1 A student enrolled for a Bachelor of Engineering degree may be permitted to transfer to the Faculty of Science to complete a BSc degree at the end of Second Year or Third Year in the BE degree if:

1.1.1 all units of study attempted in the BE degree have been completed with a grade of Pass or better;

1.1.2 at least 96 credit points from units of study in the BE degree have been completed, of which no more than 12 credit points are from units of study with the grade of Pass (Concessional);

1.1.3 the student is qualified to enrol in a major in a Science area; and

1.1.4 for admission to the Advanced streams, the student satisfies the requirements in Section 3.2 or 3.3 of the Resolutions of the Faculty of Science relating to the BSc degree.

2. Students will be under the supervision of the Faculty of Engineering and Information Technologies for the period of BE degree enrolment and under the supervision of the Faculty of Science for the BSc enrolment and completion.

3. **Units of study**

3.1 Units of study must be selected as shown in the Engineering specialisation tables for the core components of the chosen Engineering specialisation.

3.2 Units from the Science Faculty must be chosen as shown in the Science Faculty Handbook to meet requirements of a Science major.

3.3 The faculty Resolutions (which are reproduced in the Engineering and Information Technologies and Science Handbooks, as the case may be) specify:

3.3.1 credit point values;

3.3.2 corequisites/prerequisites/assumed-learning/assumed knowledge; and

3.3.3 any special conditions.

4. **Award of Pass degree in Science**

4.1 To qualify for the award of the pass BSc degree a student shall complete units of study to a value of at least 48 credit points including:

4.1.1 42 credit points of intermediate/senior units of study in Science subject areas; and

4.1.2 a major in a Science area.

4.2 To qualify for the award of the pass degree in the Advanced or Advanced Mathematics stream of the BSc a student shall in addition to the requirements of Section 4.1:

4.2.1 include at least 72 credit points of intermediate/senior Science units of study;

4.2.2 include at least 24 credit points of senior Science units of study at the Advanced level or as TSP units in a single Science subject area; and

4.2.3 maintain in intermediate and senior Science units of study an average mark of 65 or greater in each year of enrolment.

4.3 The requirements of sections 4.1 or 4.2 must be completed in one year of full-time study or two years of part-time study.

4.4 Students who complete at least 42 but less than 48 credit points in the prescribed time limits may in the following year of enrolment in the BE complete the remaining units to satisfy the requirements of the Faculty of Science.

4.5 Students who complete less than 42 credit points may apply to be readmitted to the degree, subject to sections 92–95 of the Resolutions of the Faculty of Science relating to the BSc degree.

5. **Award of Honours in Science**

5.1 Students who are so qualified may undertake an Honours course in the BSc in accordance with sections 12–20 of the Resolutions of the Faculty of Science relating to the BSc degree.

6. On completion of the requirements of the BSc degree or BSc Honours course, students will be eligible to resume their enrolment toward the BE degree according the Faculty of Engineering and Information Technologies Resolutions for that degree.

7. Students may abandon the BSc degree enrolment at any stage and resume their enrolment in the BE degree.

8. Resolutions covering admission, enrolment restrictions, progression requirements, satisfactory progress, cross-institutional study and assessment criteria for the Engineering component of the double degree are equivalent to those for the BE degree and specialisations, as shown in the Faculty Handbook.

9. The Deans of the Faculties of Engineering and Information Technologies and Science shall jointly exercise authority in any matter concerning the double degree not otherwise dealt with in these resolutions.

Bachelor of Engineering and Bachelor of Medical Science

Combined degree course rules

1. **Requirements of the BE/BMedSc**

1.1 A student may proceed concurrently to the degrees of Bachelor of Medical Science, and Bachelor of Engineering.

1.1 To qualify for the award of the BE/BMedSc combined degree a student must:

1.1.1 complete successfully units of study giving credit for a total of 240 credit points; and

1.1.2 satisfy the requirements of all other relevant By-laws, Rules and Resolutions of the University.

1.2 Admission, progression and assessment criteria apply and are described in the resolutions for the BE specialisations shown in the relevant section of the faculty handbook.

1.3 Students will be under the general supervision of the Faculty of Engineering and Information Technologies for administrative matters.

1.4 The Faculty of Science and the Faculty of Engineering and Information Technologies shall jointly exercise authority in any academic matter concerning the combined course not otherwise dealt with in these Resolutions.

2. **Specialisations, streams and majors**

2.1 The combined award course, BE/BMedSc, will be awarded in all of the Engineering specialisations that are available for the BE degree and all majors as are applicable under the resolutions of the Faculty of Science.

3. **Requirements for the BE/BMedSc Pass degree**

3.1 To qualify for the award of the Pass degrees a student shall complete units of study having a total value of at least 240 credit points including:

3.1.1 Units of study as prescribed in the tables of BE specialisation requirements for the specialisation that the student is pursuing;

3.1.2 at least 24 credit points from junior Science units of study (which may be common with those of 3.1.1, but including CHEM1101, CHEM1102 Chemistry 1A,1B, MBLG1001 Introductory Molecular Biology & Genetics and 12 credit points of Mathematics);

3.1.3 48 credit points of Intermediate core units of study as listed in Table IV of the Science Faculty Handbook of units of study for the BMedSc;

3.1.4 at least 24 credit points of Senior units of study taken from the subject areas of Anatomy/Histology, Biology (Genetics), Biochemistry, Cell Pathology, Immunology, Infectious Diseases, Microbiology, Pharmacology and Physiology;

3.1.5 a 12 credit point interdisciplinary thesis jointly supervised by Schools from Engineering and Information Technologies and Science.

4. **Requirements for the Honours degree**

4.1 BE with Honours

4.1.2 On completion of the requirements for the combined degrees, a student may qualify for the award of BE degree with Honours in accordance with the requirements set out in the Resolutions of the Faculty of Engineering and Information Technologies relating to the BE degree.

4.2 BMedSc with Honours

4.2.1 On completion of the requirements for the combined degrees, a student may be qualified to enrol in Honours in the Bachelor of Medical Science.

4.2.2 To qualify for the award of the BMedSc with Honours, a student must complete successfully an additional year of study (the Honours year), as specified in the Faculty of Science Handbook.

5. **Units of study**

5.1 Units of study must be selected as shown in the Engineering specialisation tables for the core components of the chosen Engineering specialisation and as specified for the MedSc component in clause 3.1 above.

5.2 Units from the Science Faculty must be chosen as shown in the Science Faculty Handbook to meet requirements of a Science major.

5.3 The faculty Resolutions (which are reproduced in the Engineering and Information Technologies and Science Handbooks, as the case may be) specify:

5.3.1 credit point values;

5.3.2 corequisites/prerequisites/assumed learning/ assumed knowledge; and

5.3.3 any special conditions.

6. Students may at any stage abandon the combined degree course and elect to complete either a BMedSc or a BE in accordance with the resolutions governing those degrees.

7. Resolutions covering admission, enrolment restrictions, progression requirements, satisfactory progress, cross-institutional study and assessment criteria for the combined degree are equivalent to those for the BE degree and specialisations, as shown in the faculty handbook.

8. The Deans of the Faculties of Engineering and Information Technologies and Science shall jointly exercise authority in any matter concerning the combined degrees not otherwise dealt with in these resolutions.

Bachelor of Education (Secondary: Science)/Bachelor of Science or Bachelor of Science (Advanced)

1. **Special provisions**

1.1 A student may proceed concurrently to the degrees of Bachelor of Education and Bachelor of Science or Bachelor of Science (Advanced). Refer to *Section 3* below.

1.2 No more than 100 credit points may be from Junior units of study.

2. **Program of study**

2.1 *Year I*

2.1.1 Junior units of study in Education, as specified in the *Table of units of study*, total of 12 credit points; and

2.1.2 Junior units of study in Mathematics, offered by the School of Mathematics and Statistics in the Faculty of Science, equivalent to 12 credit points; and

2.1.3 Junior units of study offered by the Faculty of Science, equivalent to 12 credit points, in an approved teaching area, selected from *Science Table 1*; and

2.1.4 Junior units of study offered by the Faculty of Science in an approved teaching area, equivalent to 12 credit points selected from *Science Table 1*.

2.2 *Year II*

2.2.1 Senior, 200 level, units of study in Education, as specified in the *Table of units of study*, total of 18 credit points; and

2.2.2 Senior units of study, in Curriculum and Professional Studies in Secondary Education, as specified in the *Table of units of study*, total of 6 credit points; and

2.2.3 Intermediate units of study in the minor sequence, 12 credit points, offered by the Faculty of Science selected from *Science Table 1*; and

2.2.4 Intermediate units of study in the major sequence, 12 credit points, offered by the Faculty of Science selected from *Science Table 1*.

2.3 *Year III*

2.3.1 Senior units of study in Education, selected from the *Table of units of study*, total of 6 credit points; and

2.3.2 Senior units of study in Curriculum and Professional Studies in Secondary Education, selected from the *Table of units of study*, including specified units, total of 30 credit points; and

2.3.3 Senior units of study in major sequence, total of 12 credit points, offered by the Faculty of Science, selected from *Science Table 1*.

2.4 *Year IV*

2.4.1 Two Senior, 300 level, units of study in Education selected from the *Table of units of study*, including specified units, total of 12 credit points;

2.4.2 Senior units of study in Curriculum and Professional Studies in Secondary Education, selected from the *Table of units of study*, including specified units, total of 24 credit points; and

2.4.3 Senior units of study in the major sequence, total of 12 credit points, offered by the Faculty of Science, selected from *Science Table 1*.

2.5 *Year V*

2.5.1 Curriculum and Professional Studies in Secondary Education as specified in the *Table of units of study*, 24 credit points; and

2.5.2 Senior or intermediate units of study, 24 credit points, in the major sequence, to complete requirements for award of the Bachelor of Science (Science).

3. **Requirements for award**

3.1 To qualify for the award of the pass degree in an Advanced stream of the BSc degree, a student shall complete the requirements for the BSc degree according to these resolutions and those of the Faculty of Science and, in addition, and except with the permission of the Dean of the Faculty of Science:

3.1.1 include at least 16 credit points of Intermediate units of study at either the Advanced level or as TSP units;

3.1.2 include at least 24 credit points of Senior units of study at the Advanced level or as TSP units in a single Science subject area; and

3.1.3 maintain in Intermediate and Senior units of study at the Advanced level in Science subject areas an average of 65 or greater in each year of enrolment.

Bachelor of Education (Secondary: Mathematics)/Bachelor of Science or Bachelor of Science (Advanced)

1. **Special provisions**

1.1 A student may proceed concurrently to the degrees of Bachelor of Education and Bachelor of Science or Bachelor of Science (Advanced Mathematics). Refer to *Section 3* below.

1.2 No more than 100 credit points may be from Junior units of study.

2. **Program of study**

2.1 *Year I*

2.1.1 Junior units of study in Education, as specified in the *Table of units of study*, total of 12 credit points; and

2.1.2 Junior units of study in Mathematics, offered by the School of Mathematics and Statistics in the Faculty of Science, total of 12 credit points; and

2.1.3 Junior units of study offered by the Faculty of Science, total of 12 credit points, in an approved teaching area, selected from *Science Table 1*; and

2.1.4 Junior units of study offered by the Faculty of Science total of 12 credit points.

2.2 *Year II*

2.2.1 Senior units of study in Education, as specified in the *Table of units of study*, total of 18 credit points; and

2.2.2 Senior units of study, in Curriculum and Professional Studies in Secondary Education, as specified in the *Table of units of study*, total of 6 credit points; and

2.2.3 Intermediate units of study, 12 credit points, in Mathematics and Statistics; and

2.2.4 Intermediate units of study offered by the Faculty of Science, total of 12 credit points, in the second approved teaching area selected from *Science Table 1*.

2.3 *Year III*

2.3.1 Senior units of study in Education, selected from the *Table of units of study*, 6 credit points; and

2.3.2 Senior units of study in Curriculum and Professional Studies in Secondary Education taken from those listed in the *Table of units of study*, including specified units, total of 30 credit points; and

2.3.3 Senior units of study in Mathematics and Statistics, 12 credit points, offered by the Faculty of Science.

2.4 *Year IV*

2.4.1 Two Senior, 300 level, units of study in Education selected from the *Table of units of study*, including specified units, total of 12 credit points; and

2.4.2 Senior units of study in Curriculum and Professional Studies in Secondary Education selected from the *Table of units of study*, including specified units, total of 24 credit points; and

2.4.3 Senior units of study in Mathematics and Statistics, 12 credit points, offered by the Faculty of Science.

2.5 *Year V*

2.5.1 Curriculum and Professional Studies in Secondary Education, as specified in the *Table of units of study*, total of 24 credit points;

2.5.2 Senior or intermediate units of study, 24 credit points, to complete requirements for award of the Bachelor of Science (Mathematics).

3. **Requirements for award**

3.1 To qualify for the award of the pass degree in an Advanced stream of the BSc degree, a student shall complete the requirements for the BSc degree according to these resolutions and those of the Faculty of Science and in addition, and except with the permission of the Dean of the Faculty of Science.

3.1.1 include at least 16 credit points of Intermediate units of study at either the Advanced level or as TSP units;

3.1.2 include at least 24 credit points of Senior units of study at the Advanced level or as TSP units in a single Science subject area; and

3.1.3 maintain in Intermediate and Senior units of study at the Advanced level in Science subject areas an average of 65 or greater in each year of enrolment.

Bachelor of Education (Secondary)/Bachelor of Science (Psychology)

1. *Year I*

1.1 Junior units of study in Education, as specified in the *Table of units of study*, total of 12 credit points; and

1.2 Specified Junior units of study in Psychology, 12 credit points; and

1.3 Junior units of study in Science, 24 credit points, of which 12 credit points must be in Mathematics and 12 in Chemistry.

2. *Year II*

2.1 Units of study in Education, as specified in the *Table of units of study*, total of 18 credit points; and

2.2 Specified Intermediate level units of study in Psychology, 18 credit points; and

2.3 Intermediate level units of study selected from *Science Table 1*, 12 credit points, which must be in the selected Science teaching subject.

3. *Year III*

3.1 Units of study in Education, as specified in the *Table of units of study*, total of 18 credit points; and

3.2 Specified Senior units of study in Psychology, 30 credit points.

4. *Year IV*

4.1 Units of study in Education, as specified in the *Table of units of study*, including professional experience, 24 credit points; and

4.2 Specified units of study in Psychology, 24 credit points.

5. *Year V*

5.1 Units of study in Education, as specified in the *Table of units of study*, including professional experience, 16 credit points; and

5.2 Specified units of study in Psychology, 20 credit points; and

5.3 Senior units of study selected from *Science Table 1*, 12 credit points, to complete study in the Science teaching subject.

Bachelor of Science/Bachelor of Nursing

For course resolutions refer to the 2006 Faculty of Science handbook.

Bachelor of Applied Science (Exercise and Sport Science)/Bachelor of Science (Nutrition)

For course resolutions refer to the 2009 Faculty of Health Sciences handbook.

Bachelor of Liberal Studies

For course resolutions refer to the 2009 Faculty of Arts handbook.

Bachelor of Arts and Sciences

For course resolutions refer to the 2009 Faculty of Arts Handbook.

3. Bachelor of Science, BSc(Adv), BSc(Adv Maths), BSc(Adv)/MBBS

This chapter is intended to give enrolment advice to undergraduate students enrolling in the Bachelor of Science degree and its streams: the BSc(Advanced), the BSc (Advanced)/MBBS and the BSc (Advanced Mathematics). You will find answers to frequently asked questions covering all students.

Following this are specific summaries of the requirements for each degree including examples of how unit of study choices can be made over the duration of the degree. With some degrees there is information on recommended combinations of units of study, especially in first year, to help guide you to your goals.

It should be stressed that the information in this chapter is intended to be a rough guide only. All students will have to decide for themselves how to plan their degree to suit their own particular interests and situation.

All students are expected to read the degree resolutions for their course before they commence their studies, and from time to time during their studies. Undergraduate degree resolutions appear in chapter 2. The table of undergraduate units of study available for the Bachelor of Science degree and degree streams is included towards the end of this chapter.

Students enrolled in units of study offered by the Faculty of Science are required to familiarise themselves with the following key policies:

Special Arrangements

Students who are experiencing difficulty in meeting their assessment requirements due to competing essential community commitments may apply for Special Arrangements for examination and assessment.

Special Consideration

Students who have a serious illness or who have experienced misadventure which may affect their academic performance in a course or unit of study may request that they be given Special Consideration in relation to the determination of their results.

At Risk

In order to progress through a degree course, students must:

1. achieve the minimum Progression Rate specified by the Faculty; in the Faculty of Science, students must pass more than 50% of the units attempted in each semester
2. pass any field or clinical work, practicum, or other unit of study mandated by the Faculty (listed in your degree requirements)
3. avoid fail grades in repeated units of study
4. maintain a weighted average mark of more than 50.

If you do not meet the progress requirements, you will be identified as a student at risk.

Code of Conduct for Students

The University has clear expectations of students in respect of academic matters and personal behaviour.

Student Plagiarism: coursework Policy and Procedure

The University of Sydney expects high standards of academic honesty in all student work. In particular, the University is opposed to and will not tolerate plagiarism.

Details on Special Arrangements, Special Consideration, Code of Conduct for Students, and Student Plagiarism Policy are provided in chapter 1 of this handbook.

Inside the back cover of this handbook you will find a planner to assist you to map out your degree. It is recommended that you plan your studies carefully with an eye to your final years, so that you take the correct prerequisites in the preceding years. It will be useful to revisit this planner during your studies as your interests take more detailed shape.

Enrolment day FAQs

What is a 'major'?

Students enrolled in the Bachelor of Science degree and its streams are required to complete at least one major. A major is a specialisation in the senior year of your degree. It is useful to have an idea of what major, or group of majors, interest you now, so that you can plan your junior and intermediate years properly.

The Bachelor of Science majors Neuroscience and Nanoscience and Technology require earlier planning than most others. If you are interested in these then read Table I (Bachelor of Science: at the end of this chapter) carefully and/or seek advice.

A major is usually defined as 24 credit points of study at the Senior level in a single Science Area. Neuroscience and Psychology both have additional requirements. Depending on the majors chosen, it is possible to complete more than one major in your degree.

How many credit points should I take per semester?

You should take 24 credit points each semester if you are a full-time student. There is an upper limit of 30 credit points per semester. If you take fewer than 18 credit points in each semester you will automatically become part-time.

To finish your degree in the recommended minimum time you will have to take 48 credit points per year, or 24 per semester. If you enrol part -time you can take as few credit points as you like. You must keep in mind however that you have a 10 year limit to finish your degree.

Students wishing to accelerate their degree programs may consider undertaking units offered at Summer School or undertaking up to 30 credit points each semester. The degree summaries and sample programs in this chapter assume you will enrol full-time.

Do I need to be full-time?

International Students must enrol full-time in a minimum of 24 credit points per semester unless there are exceptional circumstances. Failure to enrol in 24 credit points per semester may have serious ramifications for your visa.

Australian citizens and permanent residents are considered full-time if they are enrolled in 18 or more credit points per semester. Australian citizens and permanent residents who wish to receive a transport concession card must be full-time students.

If you receive any financial support, whether from a University scholarship or from the government, you may well need to enrol as a full-time student. Check the terms and conditions of that support before going part-time.

Can I take units of study from other faculties?

Yes – generally you can take any unit of study offered by the Faculty of Arts and the Faculty of Economics and Business. Lists of available units of study will be available on enrolment day, or in each faculty's handbook. Each faculty website has links to Departmental and unit of study information.

Also available are undergraduate units from any other faculty at the University. The onus is on you to get written permission from the relevant department and bring it to the Faculty of Science.

There are limits, and exclusions. You should refer to the degree summary sections of this chapter for specific information about your particular degree. The Bachelor of Science allows for up to 48 credit points of Non-Science units of study to be included in the 3-year program. Junior Econometrics (ECMT units) and General Statistical Methods (STAT units) are specifically excluded from the BSc. Students in specialist programs and combined degrees may have less flexibility.

Can I get receive credit for previous tertiary study?

Yes. The amount of credit you may receive depends on your individual circumstances, but in general the total amount of credit granted may not be greater than 96 credit points and may not include more than 48 credit points from degrees that have been completed.

On the day that you enrol you must lodge an application for credit from previous study. Because of the large numbers of applications received at enrolment there can be a considerable delay in processing your application, but all credit offers will be sent to students well in advance of the last day to add a unit of study for the semester in which they enrol.

The faculty must sight originals of your academic transcripts, as well as detailed descriptions of prior units of study completed, as at the time of completion of the units. Descriptions will normally be an extract from a Handbook or a unit of study syllabus/outline, and should include the credit point value, learning outcomes, assessment details, texts and references, and contact details for each unit of study. You must bring this information with you on the day that you enrol.

On enrolment day you will have to make unit of study choices as if you have had no previous university study. Alternatively, you may be able to obtain special permission to enrol in Intermediate or Senior units of study by taking a copy of your transcript and unit of study descriptions to Academic advisers for each individual unit of study. Unit of study Academic advisers are listed under unit of study descriptions in this Handbook.

Information on the current application process for credit, including the application form, is available from the Faculty of Science website.

Are there any bridging courses available?

There are bridging courses in Biology, Chemistry, Mathematics and Physics, designed to cover the assumed knowledge that students would normally cover in the HSC. They run in February each year after enrolment and are recommended for students who either didn't take a subject at the HSC or feel they need some revision.

Who can enrol in Advanced units of study?

Advanced units of study are available to those students enrolled in any program in the Faculty of Science who have performed at a high level in science subjects in the HSC or who perform well in their studies at the University.

Consult a departmental adviser about your eligibility to enrol in advanced level subjects in the first year of study.

Students should also consult the unit of study tables for assumed and prerequisite marks in the HSC required to enrol in advanced units of study.

For students in an Advanced degree it is recommended that you enrol in no more than 24 credit points of advanced units of study in a year. Advanced units of study are very demanding and students are required to perform at a higher standard than in the normal units of study.

What is the Talented Student Program?

The Talented Student Program (TSP) is tailored to meet students' individual needs and is restricted to the very top students.

Students may be able to bypass some first year study and enrol directly in a second year course. If you have outstanding results in any of your HSC science subjects you may wish to negotiate a special program of study with one of the departments in the Faculty of Science.

The Talented Student Program is available in most areas of Science. Students receive special supervision by academic staff and often engage in studies on an individual basis with small numbers of fellow students, all of whom have a special interest in the same subject.

Am I eligible for the Talented Student Program?

Entry to the TSP is by invitation from the Dean which you should have received by the time you enrol. The following guidelines apply generally, although Departments may have additional (and sometimes more stringent) requirements for entry into the program.

To get into the program in your first year, you should normally have a UAI (or equivalent) of at least 99.00 and a result in band 6 in at least one HSC Science subject area and/or a mark of 95 or better in HSC Mathematics Extension 2.

For entry into the program in your second and third years, you should normally have a weighted average mark of 85 or over and a high distinction grade in a relevant subject area.

Enrolment guide by major

The following information is for *first year students*. Listed below are the essential and recommended combinations of junior units of study if you are intending to complete a major in a particular Science Subject Area. Students should also consult Table I (Bachelor of Science: at the end of this chapter) and school/department advisers for further information on major requirements.

Mathematics requirements for all Science degrees

In addition to the specific requirements for each major all science degrees require a minimum of 12 credit points of Mathematics and Statistics units of any level and a minimum of 24 credit points of other Junior Science to complete.

Planning for an Agricultural Chemistry major
Essential: 12 credit points of Junior Chemistry.

Planning for an Anatomy and Histology major
Essential: 12 credit points of Junior Biology or 12 credit points of Junior Psychology.

Planning for a Biochemistry major
Essential: 12 credit points of Junior Chemistry and Molecular Biology and Genetics Intro; MBLG1001/1901.
Recommended: 6 credit points of Junior Biology

Planning for a Bioinformatics major
Essential: 12 credit points of Junior units of study in Mathematics and Statistics (including MATH1015/1005/1905), 12 credit points of Junior units of study in Biology (including MBLG1001/1901), 12 credit points of Junior units of study in Chemistry, and 12 credit points from Junior units of study in Information Technologies (ie, INFO1103/1903 and INFO1105/1905).

Planning for a Biology major
Essential: 12 credit points of Junior Biology/ Molecular Biology & Genetics and 12 credit points of Junior Chemisty are needed to enrol in Intermediate units of study in Biology.
Recommended: BIOL(1001 or 1901) and BIOL(1002 or 1902) and 12 credit points of Junior Chemistry and 12 credit points of Junior Mathematics and 6 credit points of MBLG(1001 or 1901). Students who have not completed HSC or equivalent Biology are strongly recommended to take the Biology Bridging Course in February. Details are available from www-secure.cce.usyd.edu.au.

Planning for a Cell Pathology major
Recommended: a combination of MBLG, Junior Biology, Junior Chemistry and Junior Psychology.

Planning for a Chemistry major
Essential: 12 credit points of Junior Chemistry and 6 credit points of Junior Mathematics are needed to enrol in Intermediate units of study in Chemistry.
Recommended: 12 credit points of CHEM(1101 or 1901 or 1903) and CHEM(1102 or 1902 or 1904) and 12 credit points of Junior Mathematics and 24 credit points from other areas of study selected in consultation with an adviser.

Planning for a Computational Science major
Computational Science is an interdisciplinary major comprising core and elective units of study at the Senior level offered by several Schools and Departments in the Faculty of Science (see Table I).
Recommended: COSC1001 and COSC1002 and INFO1103 and INFO1105 and 12 credit points of Junior Mathematics and 18 credit points selected in consultation with an adviser.

Planning for a Computer Science major
Essential: 12 credit points of Junior Computer Science Units.
Recommended: INFO1103 and INFO1105 and 12 credit points of Junior Mathematics and 24 credit points of electives including PHIL1012 and INFO1003.

Planning for an Environmental Studies major
Essential: 12 credit points of Junior Geosciences units. If you wish to take the second year units ENVI2111 and ENVI2112 you must include 12 credit points of Junior Biology and 12 credit points of Junior Chemistry or Physics units respectively as part of your first year program.

Planning for a Financial Mathematics and Statistics major
Essential: 12 credit points of Junior MATH.
Recommended: MATH1001 and MATH1002 and MATH1003 and MATH1005 and 24 credit points of other Junior units of study. Each of the above units of study may be replaced by the corresponding Advanced unit of study.

Planning for a Geography major
Essential: GEOS(1001 or 1901) and GEOS(1002 or 1902) and 12 credit points of other Junior units of study.

Planning for a major in Geology and Geophysics
Essential: GEOS(1001 or 1901) and GEOS(1003 or 1903) and 12 credit points of other Junior units of study.

Planning for a major in History and Philosophy of Science
Essential: 24 credit points of Junior study are required to enrol in Intermediate units of study in the History and Philosophy of Science.
Recommended: HPSC(1000 or 1900) and 12 credit points of elective units of study from History, Philosophy, Gender Studies, Physics, Psychology, or other related areas of study in arts or science in consultation with the Unit for History and Philosophy of Science.
A major in HPS consists of 24 credit points of HPS Units of Study (which must include the compulsory unit HPSC3022). Most of our senior Units of Study have the following prerequisite: EITHER (both HPSC(2100 or 2900) and HPSC2101 or 2910)) OR a CR or above in either (HPSC (2100 or 2900) or HPSC(2101 or 2910)).

Planning an Immunobiology major
Recommended: A combination of Junior Biology, MBLG and Junior Chemistry.

Planning an Information Systems major
Essential: 12 credit points of Junior Information Systems units.
Recommended: INFO1003 and INFO1103 and 12 credit points of Junior Mathematics including MATH (1015 or 1005 or 1905) and 24 credit points of electives including PHIL1012 and INFO1105 and a language unit (ENGL1005 or LNGS1001/1002/ 1005).

Planning for a Marine Biology major
Recommended: To complete a Marine Biology major the minimum requirement is 24 credit points of BIOL units listed under Table 1 for marine science. It is recommended to prepare for this that a student complete 12 credit points of Junior Biology, 12 credit points of Junior Chemistry and 12 credit points of Junior Geosciences.

Planning for a Marine Geoscience major
Essential: 24 credit points of Junior Science study.
Recommended: To complete a Marine Geoscience major the minimum requirement is 24 credit points of GEOS units listed under Table 1 for marine science. It is recommended to prepare for this that a student complete 12 credit points of junior Biology, 12 credit points of Junior Chemistry and 12 credit points of Junior Geosciences.

Planning for a Marine Science major
Essential: 24 credit points of Junior Science study.
Recommended: To complete a Marine Science major the minimum requirement is 24 credit points of GEOS or BIOL units listed under Table 1 for marine science which must include one senior BIOL unit and one senior GEOS unit. It is recommended to prepare for this that a student complete 12 credit points of Junior Biology, 12 credit points of Junior Chemistry and 12 credit points of Junior Geosciences.

Planning for a Mathematics major
12 credit points of Junior Mathematics are generally needed to enrol in Intermediate units of study in Mathematics. Students intending to major in Mathematics should take at least 12 credit points of Intermediate Mathematics.
Recommended: MATH(1001 or 1901 or 1906) and MATH(1002 or 1902) and MATH(1003 or 1903 or 1907) and MATH(1004 or 1005/1905) and 36 other Junior credit points.

Mathematics in other majors
Statistics majors: must include MATH(1015 or 1005 or 1905) and MATH(1003 or 1903).
Computer Science majors: Should include MATH(1005 or 1905).
Biological and other Life Science majors: should include MATH(1015 or 1005 or 1905).

Planning for a Medicinal Chemistry major
Essential: 12 credit points of Junior Chemistry and 6 credit points of Junior BIOL or MBLG.

Planning for a Microbiology major
Essential: 6 credit points of Junior BIOL, MBLG1001 and 6 credit points of Junior Chemistry.

Planning for a Nanoscience and Technology major
Recommended: A combination of Junior Physics, Junior Chemistry and Junior Mathematics

Planning for a Neuroscience major
Recommended: A combination of Junior Biology, MBLG, Junior Psychology and Junior Chemistry.

Planning for a Pharmacology major
Essential: 6 credit points of Junior BIOL/MBLG1001/MBLG1901 and 6 credit points of Junior Chemistry.

Planning for a Physics major
Essential: 12 credit points of Junior Physics are needed to enrol in Intermediate units of study in Physics.
Recommended: 12 credit points of Junior units of study in each of Physics and Mathematics (MATH1001/1901 and MATH 1002/1902 and MATH1003/1903 and 1005/1905) and 24 credit points of other Junior units of study selected in consultation with an adviser.
Students interested in Astronomy may enrol in PHYS1500. However, it should be noted that it is a general interest course and cannot be counted towards progression into Intermediate Physics.

Planning for a Physiology major
Essential: 6 credit points of Junior Chemistry and 30 credit points of Junior study from the areas of MATH, BIOL, PSYC, CHEM and PHYS.

Recommended: 12 credit points of Junior Mathematics units and 6 credit points of MBLG(1001 or 1901).

Planning a Plant Science major
Essential: 12 credit points of Junior Chemistry and 12 credit points of Junior Biology.
Recommended: 6 credit points of BIOL(1002 or 1902). Students wishing to enrol in Intermediate PLNT using BIOL(1003 or 1903) will need to do some preparatory reading.

Planning for a Psychology major
Essential: 12 credit points of Junior Psychology (PSYC1001 and PSYC1002).
Recommended: PSYC1001 and PSYC1002 and 12 credit points of Junior units of study in Mathematics including MATH1015 or 1005 or 1905 (statistics) and 12 credit points of Junior Science electives and 12 credit points of Junior electives.

Planning a major in Soil Science
Essential: 6 credit points of Junior Geoscience units.
Recommended: 6 credit points of GEOS1001 or GEOS1002.

Planning for a Statistics major
The Junior Mathematics units, MATH1005/1905 and MATH1001/1901/1906, are needed to enrol in Intermediate units of study in Statistics and one of: MATH1003/1903/1907 is required to complete a major in Statistics. Students intending to major in Statistics should take 12 credit points of Intermediate Statistics.

Statistics in other majors
Computer Science majors: Should include MATH1005/1905.
Biological and other Life Science majors: should include MATH1015/1005/1905.

Bachelor of Science (BSc)

Degree Code: LH000

Summary of requirements
The requirements for the degree are set out in the Senate and Faculty Resolutions (see chapter 2) which should be read by all intending candidates. In particular it is important to ensure that any proposed course of study will comply with the basic requirements for the degree. Important aspects of the Resolutions are summarised below. These should be consulted for any clarification of the summary points.

Enrolment guide
In your junior year you should complete:

- 12 credit points from the Science subject areas of Mathematics and Statistics
- 24 credit points of Junior units of study from at least two Science subject areas other than Mathematics and Statistics
- 12 credit points of elective units of study from Science, Arts, Economics and Business, Engineering and Information Technologies or other faculties.

To complete your degree you must gain credit for at least 144 credit points. The 144 credit points required for the degree must include:

- At least 96 credit points from Science subject areas.
- At least one major from those included in Table I (see Table I: Bachelor of Science: end of this chapter).
- At least 12 credit points from the Science subject areas of Mathematics and Statistics.
- at least 24 credit points of Junior units of study from at least two Science subject areas other than Mathematics and Statistics;
- no more than 60 credit points from Junior units of study;
- all students, notwithstanding any credit transfer, must complete at least 24 credit points of Senior Science units of study towards a major taken at the University of Sydney. A major in the BSc normally requires the completion of 24 credit points of Senior units of study in one Science area, including any units of study specified in the table of undergraduate units of study as compulsory for that major.

You should also note the following:

- A student may not count a unit of study toward more than one major.
- A maximum of 48 credit points may be counted towards the degree requirements from units of study offered by faculties other than the Faculty of Science.
- Units of study completed at the University of Sydney Summer School which correspond to units of study permitted to count to this degree may be credited towards the course requirements.
- A standard full- time enrolment is 24 credit points per semester; less than 18 credit points per semester is considered to be part-time.
- You may not enrol in more than 30 credit points in any one semester without permission.
- You may not enrol in a unit of study, before meeting any prerequisites and corequisites for that unit of study.
- Advanced units of study are indicated by a 9 (or 8) as the second digit of the unit of study code, and usually have higher entry requirements than the equivalent normal units.
- Once the award course requirements of 144 credit points have been satisfied a student may not enrol in additional units of study without first obtaining the permission of the Dean.
- If a student fails or discontinues enrolment in one unit of study twice, a warning will be issued that if the unit is failed a third time, the student may be asked to show good cause why he or she should be allowed to re-enrol in that unit of study.

Plans of study
It is important when choosing units of study at any stage of your university career that you consider your overall degree program. There is a sample degree program below as well as information about each major and recommended first year combinations of units of study. There is also a degree planner inside the back cover. Consultation with a faculty adviser is always recommended.

Units of study
The Science units of study available for this degree are set out in Table I: Bachelor of Science in this chapter. Unit descriptions follow in Chapter 9. You may also wish to refer to the handbooks of other faculties as the degree resolutions allow.

Honours
There will be Honours courses in all Science subject areas. Please refer to Honours Information and to Table VI: Honours units of study in chapter 10.

Discontinuation
If you wish to discontinue a unit of study it is important to talk to staff in the Faculty Office. In some circumstances, discontinuation can affect your access to units of study, prizes and scholarships. Deadlines for withdrawal and discontinuation can be found on the second page of this handbook.

Special permission
You should note that the faculty can, in certain circumstances, permit exceptions to the normal requirements for a degree. Applications should be made in writing to the Associate Dean (Undergraduate) after discussion with staff in the Faculty Office.

Transferring into the BSc
Students may transfer into the BSc from any of the streams within the BSc, with the permission of the Dean.

Universities Admissions Index (UAI)
The minimum UAI for admission to the course varies each year.

Degree resolutions
See chapter 2.

Sample Bachelor of Science

	Sem	Unit of study 1 & credit points	Unit of study 2 & credit points	Unit of study 3 & credit points	Unit of study 4 & credit points	Unit of study 5 & credit points	Unit of study 6 & credit points	Total
Year 1	1	MATH 1XXX	MATH 1XXX	Science elective A 1XXX	Science elective B 1XXX	Elective		
		3	3	6	6	6		24
	2	MATH 1XXX	MATH 1XXX	Science elective A 1XXX	Science elective B 1XXX	Elective		
		3	3	6	6	6		24
Year 2	1	Major 1 Intermediate 2XXX	Major 2 Intermediate or Science elective	Science elective	Elective			
		6	6	6	6			24
	2	Major 1 Intermediate 2XXX	Major 2 Intermediate or Science elective	Elective	Elective			
		6	6	6	6			24
Year 3	1	Major 1 3XXX	Major 1 3XXX	Major 2 or elective	Major 2 or elective			
		6	6	6	6			24
	2	Major 1 3XXX	Major 1 3XXX	Major 2 or elective	Major 2 or elective			
		6	6	6	6			24
							Total credit points:	144
Require: 144cp total, one major. 96cp Science, min. 36cp Junior Science incl. 12cp Maths, max. 60cp Junior.								

Require: 144 credit points total, one major. Minimum 96 credit points in Science, minimum 36 credit points in Junior Science, including 12 credit points of Maths. Maximum 60 credit points in Junior.

Bachelor of Science (Advanced)

Degree Code: LH000 Stream: 4
Summary of requirements
The requirements for the degree are set out in the Senate and Faculty Resolutions (see chapter 2) which should be read by all intending candidates. In particular it is important to ensure that any proposed course of study will comply with the basic requirements for the degree. Important aspects of the resolutions are summarised below. These should be consulted for any clarification of the summary points.

Enrolment guide
In your junior year you should complete:

- 12 credit points from the Science subject areas of Mathematics and Statistics.
- 24 credit points of Junior units of study from at least two Science subject areas other than Mathematics and Statistics.
- 12 credit points of elective units of study from Science, Arts, Economics and Business, Engineering and Information Technologies or other faculties.
- No more than 48 credit points from Junior units of study.

Advanced students usually take 24 credit points of the above at the Advanced level.

To complete your degree you must satisfy the requirements outlined for the BSc and gain credit for at least 144 credit points. The 144 credit points required for the degree must include:

- at least 12 credit points of Intermediate units of study at either the Advanced level or as TSP units.
- at least 48 credit points of Senior units of study of which at least 24 credit points are completed at the Advanced level or as TSP units in a single Science subject area.
- at least 12 credit points from the Science subject areas of Mathematics and Statistics.

Progression requirements
You should note that you must maintain in intermediate and senior units of study in Science subject areas an average mark of 65 or greater in each year of enrolment, or be transferred to the BSc.

Plans of study
It is important when choosing units of study at any stage of your university career that you consider your overall degree program. See the Bachelor of Science entry for information about each major and recommended first year combinations of units of study. There is a sample degree program on the next page and a degree planner inside the back cover. Consultation with a faculty adviser is always recommended.

Units of study
The Science units of study available for this degree are set out in Table I: Bachelor of Science towards the end of this chapter. Unit descriptions may be found in chapter 9. You may also wish to refer to the handbooks of other faculties as the degree resolutions allow.

Honours
There are Honours courses in all Science subject areas. Please refer to Honours Information and Table VI: Honours units of study in chapter 10.

Discontinuation
If you wish to discontinue a unit of study it is important to talk to staff in the Faculty Office. In some circumstances, discontinuation can affect your access to units of study, prizes and scholarships. Deadlines for withdrawal and discontinuation can be found on the second page of this handbook.

Special permission
You should note that the faculty can, in certain circumstances, permit exceptions to the normal requirements for a degree. Applications should be made in writing to the Associate Dean (Undergraduate) after discussion with staff in the Faculty Office.

Transferring into the BSc (Advanced)
Students who have completed at least 48 credit points may, with the permission of the Dean, transfer to the BSc (Advanced) from the BSc or any of its streams if their mark averaged over all attempted units of study is 75 or greater, and they are able to enrol in the required number of Advanced level units or TSP units.

Universities Admissions Index (UAI)
The minimum UAI for admission to the faculty varies each year.

Degree resolutions
See chapter 2.

Sample Bachelor of Science (Advanced)

	Sem	Unit of study 1 & credit points	Unit of study 2 & credit points	Unit of study 3 & credit points	Unit of study 4 & credit points	Unit of study 5 & credit points	Unit of study 6 & credit points	Total
Year 1	1	MATH 1XXX	MATH 1XXX	Science elective A 1XXX/19XX	Science elective B 1XXX/19XX	Elective		
		3	3	6	6	6		24
	2	MATH 1XXX	MATH 1XXX	Science elective A 1XXX/19XX	Science elective B 1XXX/19XX	Elective		
		3	3	6	6	6		24
Year 2	1	Major 1 Intermediate 29XX	Major 2 Intermediate or Science elective 2XXX	Intermediate or Senior Science elective	Intermediate or Senior elective			
		6	6	6	6			24
	2	Major 1 Intermediate 29XX	Major 2 Intermediate or Science elective 2XXX	Intermediate or Senior elective	Intermediate or Senior elective			
		6	6	6	6			24
Year 3	1	Major 1 39XX	Major 1 39XX	Major 2 or elective 3XXX	Major 2 or elective 3XXX			
		6	6	6	6			24
	2	Major 1 39XX	Major 1 39XX	Major 2 or elective 3XXX	Major 2 or elective 3XXX			
		6	6	6	6			24
							Total credit points:	144
Require: 144cp total, min. 96cp Science, max. 48cp Junior, min 36cp Junior Science incl. 12cp Maths, min. 48cp Senior, min. 12cp Intermediate Advanced and/or TSP, min. 24cp Senior Advanced and/or TSP major.								

Bachelor of Science (Advanced Mathematics)

Degree Code: LH000 Stream Code: 9

Summary of requirements

The requirements for the degree are set out in the Senate and Faculty Resolutions (see chapter 2) which should be read by all intending candidates. In particular it is important to ensure that any proposed course of study will comply with the basic requirements for the degree. Important aspects of the resolutions are summarised below. The resolutions should be consulted for any clarification of the summary points.

Enrolment guide

In your junior year you should complete:

- 12 credit points from Junior Advanced Mathematics and Statistics units of study.
- 24 credit points of Junior units of study from at least two Science subject areas other than Mathematics and Statistics.
- 12 credit points of elective units of study from Science, Arts, Economics and Business, Engineering and Information Technologies or other faculties.

Advanced students usually take 24 credit points of the above at the Advanced level.

To complete your degree you must satisfy the requirements outlined for the BSc and gain credit for at least 144 credit points. The 144 credit points required for the degree must include:

- No more than 48 credit points from junior units of study.
- At least 12 credit points of Intermediate units of study at either the Advanced level or as TSP units in the Science subject areas of Mathematics and Statistics.
- At least 48 credit points of senior units of study of which at least 24 credit points are completed at the Advanced level or as TSP units in the Science subject areas of Mathematics and Statistics.
- A major in Mathematics or Statistics at advanced level.

Progression requirements

You should note that you must maintain in intermediate and senior units of study in science subject areas an average mark of 65 or greater in each year of enrolment, or be transferred to the BSc.

Plans of study

It is important when choosing units of study at any stage of your university career that you consider your overall degree program. See the Bachelor of Science entry for information about majors in Mathematics and Statistics and recommended first year combinations of units of study. There is a sample degree program below and a degree planner inside the back cover. Consultation with a faculty adviser is always recommended.

Units of study

The Science units of study available for this degree are set out in Table I: Bachelor of Science towards the end of this chapter. Unit descriptions may be found in chapter 9. You may also wish to refer to the handbooks of other faculties as the degree resolutions allow.

Honours

There are Honours courses in Mathematics and Statistics. Please refer to Honours Information and Table VI: Honours units of study in chapter 10

Discontinuation

If you wish to discontinue a unit of study it is important to talk to staff in the Faculty Office. In some circumstances, discontinuation can affect your access to units of study, prizes and scholarships. Deadlines for withdrawal and discontinuation can be found on the second page of this handbook.

Special permission

You should note that the faculty can, in certain circumstances, permit exceptions to the normal requirements for a degree. Applications should be made in writing to the Associate Dean (Undergraduate) after discussion with staff in the Faculty Office.

Transferring into the BSc (Advanced Mathematics)

Students who have completed at least 48 credit points may, with the permission of the Dean, transfer to the BSc (Advanced Mathematics) from the BSc or any of its streams if their mark averaged over all attempted units of study is 75 or greater, and they are able to enrol in the required number of Advanced level units or TSP units.

Universities Admissions Index (UAI)

The minimum UAI for admission to the Faculty varies each year.

Degree resolutions

See chapter 2.

Sample Bachelor of Science (Advanced Mathematics)

	Sem	Unit of study 1 & credit points	Unit of study 2 & credit points	Unit of study 3 & credit points	Unit of study 4 & credit points	Unit of study 5 & credit points	Unit of study 6 & credit points	Total
Year 1	1	MATH 1XXX	MATH 1XXX	Science elective A 1XXX/19XX	Science elective B 1XXX/19XX	Elective		
		3	3	6	6	6		24
	2	MATH 1XXX	MATH 1XXX	Science elective A 1XXX/19XX	Science elective B 1XXX/19XX	Elective		
		3	3	6	6	6		24
Year 2	1	MATH 29XX	MATH 29XX	Intermediate or Senior elective	Intermediate or Senior elective			
		6	6	6	6			24
	2	MATH 29XX	MATH 29XX	Intermediate or Senior elective	Intermediate or Senior elective			
		6	6	6	6			24
Year 3	1	MATH 39XX	MATH 39XX	Major 2 or elective 3XXX	Major 2 or elective 3XXX			
		6	6	6	6			24
	2	MATH 39XX	MATH 39XX	Major 2 or elective 3XXX	Major 2 or elective 3XXX			
		6	6	6	6			24
							Total credit points:	144
Require: 144cp total, min. 96cp Science, max. 48cp Junior, min 36cp Junior Science incl. 12cp Maths, min. 48cp Senior, min. 12cp Intermediate Advanced and/or TSP, min. 24cp Senior Advanced and/or TSP major.								

Combined Science/Medicine degrees

Degree codes: LH033/LH034

Summary of requirements
The requirements for the degree are set out in the Senate and Faculty Resolutions (see chapter 2) which should be read by all intending candidates.

A student may proceed through the degree of Bachelor of Science (Advanced) or the Bachelor of Medical Science to the degrees of Bachelor of Medicine and Bachelor of Surgery.

Enrolment guide
To qualify for the award of the degrees a student shall complete units of study to a total value of at least 336 credit points including:

- Satisfactorily completing three SMTP units in the first three years of the program;.
- Meeting the requirements of the BSc (Adv) or BMedSc degree outlined above.
- Completing 192 credit points towards the MBBS degree as required by the Resolutions of the Faculty of Medicine.

Progression Requirements
Students are required to maintain a minimum AAM of 65 or above and to satisfactorily complete three SMTP units of study in the first three years of the program. Students who fail to satisfy these requirements will be transferred to the BSc (Adv) or BMedSc.

Plans of study
It is important when choosing units of study at any stage of your university career that you consider your overall degree program. See the Bachelor of Science (Advanced) or Bachelor of Medical Science entry for information about recommended first year combinations of units of study and the sample degree program. There is a degree planner inside the back cover. Consultation with a Faculty adviser is always recommended.

Units of study
The Science units of study available for this degree are set out in Table I: Bachelor of Science in this chapter and Table IV: Bachelor of Medical Science in chapter five. Unit descriptions appear in chapter 9. The Medicine units of study available for this degree are set out in the Faculty of Medicine handbook.

Honours
Students who qualify to undertake Honours in the BSc (Adv) or BMedSc degree may elect to do so by either suspending their candidature from the MBBS degree for one year, or after completion of the combined course. Please refer to honours information in chapter 10.

Abandoning and discontinuing
Students may abandon the combined degree course and elect to complete the BSc (Adv) or BMedSc degree.

If you wish to discontinue a unit of study it is important to talk to staff in the Faculty Office. In some circumstances, discontinuation can affect your access to units of study, prizes and scholarships. Deadlines for withdrawal and discontinuation can be found on the second page of this handbook.

Special permission
You should note that the Faculty can, in certain circumstances, permit exceptions to the normal requirements for a degree. Applications should be made in writing to the Associate Dean (Undergraduate) after discussion with staff in the Faculty Office.

Supervision
Students will be under the general supervision of the Faculty of Science until the end of the semester in which they complete the requirements for the BSc (Adv) or BMedSc degree. After that they will be under the general supervision of the Faculty of Medicine.

Universities Admissions Index (UAI)
The minimum UAI for admission into the course varies from year to year.

Degree resolutions
See chapter 2.

Table 1: Bachelor of Science

Table 1 lists units of study available to students in the Bachelor of Science and combined degrees. The units are available to students enrolled in other degrees in accordance with their degree resolutions.

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
Agricultural Chemistry			
For a major in Agricultural Chemistry: AGCH3025 and AGCH3026; and either			
(AGCH3032 and SOIL3010); or			
(BCHM3X72 and BCHM3X82)			
Intermediate units of study			
AGCH2003 **Rural Environmental Chemistry**	6	**P** 12 credit points of Junior Chemistry **N** AGCH2001, AGCH2002 and CHEM2404	Semester 1
Senior units of study (compulsory for a major in Agricultural Chemistry)			
AGCH3025 **Chemistry and Biochemistry of Foods**	6	**A** 12 credit points of Junior chemistry **P** 6 credit points of Intermediate units in either Agricultural Chemistry or Chemistry or PLNT2001 or PLNT2901 or BCHM2071 or BCHM2072 **N** AFNR5102	Semester 1
AGCH3026 **Food Biotechnology**	6	**A** 12 units of Junior chemistry **P** 6 credit points of Intermediate Agricultural Chemistry or PLNT2001 or PLNT2901 or BCHM2071 or BCHM2072 **C** AGCH3025 **N** AFNR5103	Semester 1
Senior unit of study (counts towards the major when taken with SOIL3010)			
AGCH3032 **Land and Water Ecochemistry**	6	**P** AGCH2003 or AGCH2004 or PLNT2001 or CHEM24XX or BCHM2XXX or ENVI2001 **N** AGCH3030, AGCH3031	Semester 2
Anatomy and Histology			
For a major in Anatomy and Histology, the minimum requirement is 24 credit points from any ANAT, HSTO, EMHU or NEUR Senior units of study.			
Intermediate units of study			
The completion of 6 credit points of MBLG units of study is highly recommended			
ANAT2008 **Principles of Histology**	6	**A** General concepts in human biology **P** 12 credit points of Junior Biology or Junior Psychology **N** ANAT2001	Semester 1
ANAT2009 **Comparative Primate Anatomy**	6	**A** Knowledge of basic vertebrate biology **P** 12 credit points of Junior Biology or Junior Psychology or Junior Archaeology. **N** ANAT2002	Semester 2
ANAT2010 **Concepts of Neuroanatomy**	6	**A** Background in basic cell biology and basic mammalian biology. **P** BIOL (1003 or 1903) and one of: ANAT2008 or BIOL (1002 or 1902) or MBLG(1001 or 1901 or 2071 or 2971) or PSYC (1001 and 1002). Students must have a grade of credit in at least one of the prerequisite units. **N** ANAT2003	Semester 2
Senior units of study			
ANAT3006 **Forensic Osteology**	6	**A** An understanding of basic human musculoskeletal anatomy. **P** Credit in ANAT2009 or Credit in ANAT2002 (for students who completed Intermediate study before 2005) *The completion of 6 credit points of MBLG is highly recommended.*	Semester 1
ANAT3007 **Visceral Anatomy**	6	**A** General knowledge of biology. **P** ANAT2009 or ANAT2010	Semester 1
HSTO3001 **Microscopy & Histochemistry Theory**	6	**A** Basic understanding of biology. **P** (ANAT2008 or ANAT2001) or (BMED 2803 or 2804 or 2805 or 2806) **C** HSTO3002	Semester 1
HSTO3002 **Microscopy & Histochemistry Practical**	6	**A** Basic understanding of biology. **P** (ANAT2008 or ANAT2001) or (BMED 2803 or 2804 or 2805 or 2806) **C** HSTO3001	Semester 1
NEUR3001 **Neuroscience: Special Senses**	6	**A** It is strongly recommended that students also take unit NEUR3002. PHSI2005 and ANAT2010 are assumed knowledge. **P** For BMedSc students: BMED(2801 or 2503) and BMED(2806 or 2505) For other students: (PHSI(2101 or 2001 or 2901 or 2005 or 2905) or ANAT(2003 or 2010)) and 6 credit points of MBLG. **N** PHSI3001, NEUR3901	Semester 1
NEUR3901 **Neuroscience: Special Senses (Advanced)**	6	**A** PHSI2005 and ANAT2010 **P** For BMedSc students: Credit average in BMED(2801 or 2503) and BMED(2806 or 2505) For other students: Credit average in (PHSI(2101 or 2001 or 2901 or 2005 or 2905) or ANAT(2003 or 2010)) and 6 credit points of MBLG. **N** NEUR3001, PHSI3001, PHSI3901 *Permission from the coordinators is required for entry into this course. It is strongly recommended that students also take unit NEUR3002 or NEUR3902.*	Semester 1
NEUR3002 **Neuroscience: Motor Systems & Behaviour**	6	**A** It is strongly recommended that students also take unit NEUR3001. ANAT2010 and PHSI2005 is assumed knowledge. **P** For BMedSc students: BMED(2801 or 2503) and BMED(2806 or 2505) For other students: (PHSI(2101 or 2001 or 2901 or 2005 or 2905) or ANAT(2003 or 2010)) and 6 credit points of MBLG. **N** PHSI3001, NEUR3902	Semester 1

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
NEUR3902 **Neuroscience: Motor Systems & Behav. Adv**	6	**A** ANAT2010 and PHSI2005 is assumed knowledge. **P** For BMedSc students: Credit average in BMED(2801 or 2503) and BMED(2806 or 2505) For other students: Credit average in (PHSI(2101 or 2001 or 2901 or 2005 or 2905) or ANAT(2003 or 2010)) and 6 credit points of MBLG. **N** NEUR3002, PHSI3001 *Permission from the coordinators is required for entry into this course. It is strongly recommended that students also take unit NEUR3001 or NEUR3901.*	Semester 1
ANAT3004 **Cranial and Cervical Anatomy**	6	**A** General knowledge of biology. **P** ANAT2009 or ANAT2010 or BMED2803 or BMED2804 or BMED2805 or BMED2806 **N** ANAT3904 *The completion of 6 credit points of MBLG is highly recommended.*	Semester 2
ANAT3904 **Cranial & Cervical Anatomy (Advanced)**	6	**P** For Medical Science: Credit in BMED(2803 or 2804 or 2805 or 2806). For BSc and other students Credit in ANAT(3007 or 2010 or 2009). **N** ANAT3004 *Note: Department permission required for enrolment* *Students must receive permission from the coordinators for enrolment. Course is subject to availability of donor material for dissection.*	Semester 2
ANAT3008 **Musculoskeletal Anatomy**	6	**A** Some knowledge of basic mammalian biology **P** ANAT2009 or ANAT2002 (for students who completed Intermediate study before 2005) or BMED2803 or BMED2804 or BMED2805 or BMED2806 **N** ANAT3005	Semester 2
EMHU3001 **Electron Microscopy and Imaging/Theory**	6	**A** General concepts in Biology, and in Biochemistry or in Chemistry. **P** At least 12 cp of Intermediate Science units from any of the following: Anatomy & Histology, Biochemistry, Biology, Chemistry, Mathematics, Microbiology, Molecular Biology & Genetics, Pharmacology, Physics, Physiology or Statistics. For BMedSc students: either 36 cp of Intermediate units including BMed (2501, 2503 & 2505) or 42 cp of BMed Intermediate units including (2801, 2802, 2803 & 2806)	Semester 2
EMHU3002 **Electron Microscopy and Imaging/Prac**	6	**A** General concepts in Biology, Histology and in Biochemistry or in Chemistry. **P** 12 cp as follows: 6 cp from ANAT2008 OR 4 cp from ANAT2001 plus at least 6 cp OR 8 cp respectively of Intermediate Science units of study. For BMedSci: Either 36 credit points of intermediate units including BMed (2501, 2503 & 2505) or 42 credit points of BMed Intermediate units including BMed (2801, 2802, 2803 & 2806) **C** EMHU3001	Semester 2
HSTO3003 **Cells and Development: Theory**	6	**A** (i) An understanding of the basic structure of vertebrates; (ii) An understanding of elementary biochemistry and genetics. **P** For BSc students: ANAT2008 For BMedSc students: 42 credit points of Intermediate BMED units, including: BMED2801, 2802, 2805. **N** EMHU3001, EMHU3002 *The completion of 6 credit points of MBLG is highly recommended.*	Semester 2
HSTO3004 **Cells and Development: Practical (Adv)**	6	**P** Note: This advanced unit of study is only available to select students who have achieved a mark of 65 or above in the following prerequisite units of study. For BSc students: ANAT2008. For BMedSc students: 42 credit points of Intermediate BMED units, including: BMED2801, 2802, 2805. **C** HSTO3003 **N** EMHU3001, EMHU3002 *The completion of 6 credit points of MBLG is highly recommended.*	Semester 2
NEUR3003 **Cellular and Developmental Neuroscience**	6	**A** Students should be familiar with the material in Bear, Connors & Paradiso Neuroscience: Exploring the Brain. **P** For BMedSci: 42 credit points of intermediate BMed units. For others: 18 credit points of Intermediate science units of study from Anatomy & Histology, Biochemistry, Biology, Chemistry, Computer Science, Mathematics, Microbiology, Molecular Biology and Genetics, Physiology, Psychology or Statisitics **N** NEUR3903, PHSI3002, PHSI3902 *Enrolment in NEUR3004 is HIGHLY RECOMMENDED. Courses are designed to be taken in conjunction with each other.*	Semester 2
NEUR3903 **Cellular & Developmental Neurosci. (Adv)**	6	**A** Students should be familiar with the material in Bear, Connors & Paradiso Neuroscience: Exploring the Brain. **P** For BMedSci: 42 credit points of intermediate BMed units. For others: 18 credit points of Intermediate science units of study from Anatomy & Histology, Biochemistry, Biology, Chemistry, Computer Science, Mathematics, Microbiology, Molecular Biology and Genetics, Physiology, Psychology or Statisitics. Plus, students must have a CREDIT (or better) in NEUR3001/3901 and NEUR3002/3902. **N** NEUR3003, PHSI3002, PHSI3902 *Note: Department permission required for enrolment* *Enrollment in NEUR3004/3904 is HIGHLY RECOMMENDED. Courses are designed to be taken in conjunction with each other. Students must receive permission from the coordinators for enrollment.*	Semester 2
NEUR3004 **Integrative Neuroscience**	6	**A** Students should be familiar with the material in Bear, Connors & Paradiso Neuroscience: Exploring the Brain. **P** For BMedSci: 42 credit points of intermediate BMed units. For others: 18 credit points of Intermediate science units of study from Anatomy & Histology, Biochemistry, Biology, Chemistry, Computer Science, Mathematics, Microbiology, Molecular Biology and Genetics, Physiology, Psychology or Statisitics. **N** NEUR3904, PHSI3002, PHSI3902 *Enrolment in NEUR3003 is HIGHLY RECOMMENDED. Courses are designed to be taken in conjunction with each other.*	Semester 2
NEUR3904 **Integrative Neuroscience (Advanced)**	6	**A** Students should be familiar with the material in Bear, Connors & Paradiso Neuroscience: Exploring the Brain. **P** For BMedSCI: 42 credit points of intermediate BMed units. For others: 18 credit points of Intermediate science units of study from Anatomy & Histology, Biochemistry, Biology, Chemistry, Computer Science, Mathematics, Microbiology, Molecular Biology and Genetics, Physiology, Psychology or Statisitics. Plus, students must have a CREDIT (or better) in NEUR3001/3901 and NEUR3002/3902. **N** NEUR3004, PHSI3002, PHSI3902 *Note: Department permission required for enrolment* *Enrolment in NEUR3003/3903 is HIGHLY RECOMMENDED. Courses are designed to be taken in conjunction with each other. Students must receive permission from the coordinators for enrolment.*	Semester 2
for other NEUR units, see the Physiology subject area entry in this table			

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
# Biochemistry			
For a major in Biochemistry, the minimum requirement is 24 credit points from senior units of study listed in this subject area.			
Intermediate units of study			
The completion of 6 credit points of MBLG units of study is highly recommended.			
BCHM2071 **Protein Biochemistry**	6	**A** CHEM (1101 and 1102) **P** 12 credit points of Junior Chemistry and MBLG (1001 or 1901) **C** Recommended concurrent units of study: MBLG2071 and BCHM2072 for progression to Senior Biochemistry. **N** BCHM2011, BCHM2971	Semester 1
BCHM2971 **Protein Biochemistry (Advanced)**	6	**P** 12 credit points of Junior Chemistry and Distinction in MBLG1001 or MBLG1901 **N** BCHM2011, BCHM2071	Semester 1
BCHM2072 **Human Biochemistry**	6	**P** Either MBLG (1001 or 1901) and 12 credit points of Junior Chemistry or either MBLG2071 or MBLG2971 **N** BCHM2972, BCHM2002, BCHM2102, BCHM2902, BCHM2112	Semester 2
BCHM2972 **Human Biochemistry (Advanced)**	6	**P** Distinction in one of (BCHM (2071 or 2971) or MBLG(2071 or 2971)) or (Distinction in MBLG (1001 or 1901) and Distinction average in all other Junior Science Units of Study undertaken). **N** BCHM2072, BCHM2002, BCHM2102, BCHM2902, BCHM2112	Semester 2
Senior units of study			
BCHM3071 **Molecular Biology & Biochemistry- Genes**	6	**P** MBLG (1001 or 1901) and 12 CP of Intermediate BCHM/MBLG units (taken from MBLG2071/2971 or BCHM2071/2971 or BCHM2072/2972) or 42CP of Intermediate BMedSc units, including BMED2802 and BMED2804. **N** BCHM3971, BCHM3001, BCHM3901	Semester 1
BCHM3971 **Molecular Biology & Biochem- Genes (Adv)**	6	**P** MBLG (1001 or 1901) and Distinction in 12 CP of Intermediate BCHM/MBLG units (taken from MBLG2071/2971 or BCHM2071/2971 or BCHM2072/2972) or 42CP of Intermediate BMedSc units, with Distinction in BMED2802 and BMED2804. **N** BCHM3071, BCHM3001, BCHM3901	Semester 1
BCHM3081 **Mol Biology & Biochemistry- Proteins**	6	**P** MBLG (1001 or 1901) and 12 CP of Intermediate BCHM/MBLG units (taken from MBLG2071/2971 or BCHM2071/2971 or BCHM2072/2972) or 42CP of Intermediate BMedSc units, including BMED2802 and BMED2804. **N** BCHM3981, BCHM3001, BCHM3901	Semester 1
BCHM3981 **Mol Biology & Biochemistry- Proteins Adv**	6	**P** MBLG (1001 or 1901) and Distinction in12 CP of Intermediate BCHM/MBLG units (taken from MBLG2071/2971 or BCHM2071/2971 or BCHM2072/2972) or 42CP of Intermediate BMedSc units, with Distinction in BMED2802 and BMED2804. **N** BCHM3081, BCHM3001, BCHM3901	Semester 1
BCHM3072 **Human Molecular Cell Biology**	6	**P** (MBLG (1001 or 1901) and 12 CP of Intermediate BCHM/MBLG units (taken from MBLG2071/MBLG2971or BCHM2071/2971 or BCHM2072/2972)) or (42CP of Intermediate BMedSc units, including BMED2802 and BMED2804) **N** BCHM3972, BCHM3002, BCHM3902, BCHM3004, BCHM3904 *BExSci/BSc(Nutrition) students successfully progressing though the combined degree meet the pre-requisites for this unit of study*	Semester 2
BCHM3972 **Human Molecular Cell Biology (Advanced)**	6	**P** MBLG (1001 or 1901) and Distinction in 12 CP of Intermediate BCHM/MBLG units (taken from MBLG2071/MBLG2971 or BCHM2071/2971 or BCHM2072/2972) or 42CP of Intermediate BMedSc units, with Distinction in BMED2802 and BMED2804. **C** MBLG3999 **N** BCHM3072, BCHM3002, BCHM3004, BCHM3902, BCHM3904	Semester 2
BCHM3082 **Medical and Metabolic Biochemistry**	6	**P** MBLG (1001 or 1901) and 12 CP of Intermediate BCHM/MBLG units (taken from MBLG2071/2971 or BCHM2071/2971 or BCHM2072/2972) or 42CP of Intermediate BMedSc units, including BMED2802 and BMED2804. **N** BCHM3982, BCHM3002, BCHM3004, BCHM3902, BCHM3904 *BExSci/BSc(Nutrition) students successfully progressing though the combined degree meet the pre-requisites for this unit of study*	Semester 2
BCHM3982 **Medical and Metabolic Biochemistry (Adv)**	6	**P** MBLG (1001 or 1901) and Distinction in 12 CP of Intermediate BCHM/MBLG units (taken from MBLG2071/2971 or BCHM2071/2971 or BCHM2072/2972) or 42CP of Intermediate BMedSc units, with Distinction in BMED2802 and BMED2804. **N** BCHM3082, BCHM3002, BCHM3004, BCHM3902, BCHM3904	Semester 2
BCHM3092 **Proteomics and Functional Genomics**	6	**P** MBLG (1001 or 1901) and 12 CP of Intermediate BCHM/MBLG units (taken from MBLG2071/2971 or BCHM2071/2971 or BCHM2072/2972) or 42CP of Intermediate BMedSc units, including BMED2802 and BMED2804. **N** BCHM3992, BCHM3098	Semester 2
BCHM3992 **Proteomics and Functional Genomics (Adv)**	6	**P** MBLG (1001 or 1901) and Distinction in 12 CP of Intermediate BCHM/MBLG units (taken from MBLG2071/2971 or BCHM2071/2971 or BCHM2072/2972) or 42CP of Intermediate BMedSc units, with Distinction in BMED2802 and BMED2804. **N** BCHM3092, BCHM3098	Semester 2
# Bioinformatics			
For a major in Bioinformatics, students must complete a minimum of 24 credit points from senior units of study in the Life Sciences, Statistics, and Information Technologies, including:-			
(A) At least one of BIOL3027 or BIOL3927 or BCHM3092 or BCHM3992			
(B) At least one of STAT3012 or STAT3912 or STAT3014 or STAT3914			
(C) COMP3456			
(D) BINF3101			
For further information on how to prepare for a major in Bioinformatics, please consult the Faculty of Science's web page (http://www.science.usyd.edu.au/fstudent/undergrad/course/)			
Bioinformatics major (A) units of study			
BIOL3027 **Bioinformatics and Genomics**	6	**P** 12 credit points from MBLG (2071/2971), MBLG (2072/2972) and Intermediate Biology units. For BMedSc students: 36 credit points of Intermediate BMED units including BMED 2802. **N** BIOL3927	Semester 1

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
BIOL3927 **Bioinformatics and Genomics (Advanced)**	6	**P** Distinction average in 12 credit points from MBLG (2071/2971), MBLG (2072/2972) and Intermediate Biology units. For BMedSc students: 36 credit points of Intermediate BMED units including Distinction in BMED2802. **N** BIOL3027	Semester 1
BCHM3092 **Proteomics and Functional Genomics**	6	**P** MBLG (1001 or 1901) and 12 CP of Intermediate BCHM/MBLG units (taken from MBLG2071/2971 or BCHM2071/2971 or BCHM2072/2972) or 42CP of Intermediate BMedSc units, including BMED2802 and BMED2804. **N** BCHM3992, BCHM3098	Semester 2
BCHM3992 **Proteomics and Functional Genomics (Adv)**	6	**P** MBLG (1001 or 1901) and Distinction in 12 CP of Intermediate BCHM/MBLG units (taken from MBLG2071/2971 or BCHM2071/2971 or BCHM2072/2972) or 42CP of Intermediate BMedSc units, with Distinction in BMED2802 and BMED2804. **N** BCHM3092, BCHM3098	Semester 2
Bioinformatics major (B) units of study			
STAT3012 **Applied Linear Methods**	6	**P** STAT(2012 or 2912 or 2004) and MATH(1002 or 1014 or 1902). **N** STAT3912, STAT3002, STAT3902, STAT3004, STAT3904	Semester 1
STAT3912 **Applied Linear Methods Advanced**	6	**P** (STAT2912 or Credit in STAT2004 or Credit in STAT2012) and MATH(2061 or 2961 or 1902). **N** STAT3012, STAT3002, STAT3902, STAT3004, STAT3904	Semester 1
STAT3014 **Applied Statistics**	6	**A** STAT(3012 or 3912). **P** STAT(2012 or 2912 or 2004). **N** STAT3914, STAT3002, STAT3902, STAT3006	Semester 2
STAT3914 **Applied Statistics Advanced**	6	**A** STAT3912 **P** STAT2912 or credit or better in (STAT2004 or STAT2012). **N** STAT3014, STAT3002, STAT3902, STAT3006, STAT3907	Semester 2
Bioinformatics major (C) unit of study			
COMP3456 **Computational Methods for Life Sciences**	6	**P** INFO1105 and (COMP2007 or INFO2120) and 6 credit points from BIOL or MBLG	Semester 2
Bioinformatics major (D) unit of study			
BINF3101 **Bioinformatics Project**	6	**A** INFO2110 and (INFO1103 or INFO1903) **P** INFO3402 and 12 credit points from Intermediate Biology, Molecular Biology and Genetics, Biochemistry, Microbiology, Pharmacology **N** COMP3206, BINF3001, INFO3600, SOFT3300, SOFT3600, SOFT3200, SOFT3700	Semester 2
# Biology			
For a major in Biology, the minimum requirement is 24 credit points from senior BIOL units of study listed in this subject area. Senior PLNT units and BIOL3009/3909, 3017/3917 may be counted towards a major in Biology or Plant science, not both			
Junior units of study			
BIOL1001 **Concepts in Biology**	6	**A** None. However, students who have not completed HSC Biology (or equivalent) are strongly advised to take the Biology Bridging Course (in February). **N** BIOL(1911 or 1101 or 1901) *It is recommended that BIOL (1001 or 1911) be taken concurrently with all other Junior units of study in Biology. Students who have completed HSC Biology and scored 80+ should enrol in BIOL1911. Students who lack 80+ in HSC Biology but have a UAI of at least 93 may enrol in BIOL1911 with permission from the UEO. The completion of MBLG 1001 is highly recommended.*	Semester 1 Summer Main
BIOL1911 **Concepts in Biology (Advanced)**	6	**P** 80+ in HSC 2-unit Biology (or equivalent) or Distinction or better in a University level Biology unit, or by invitation. **N** BIOL (1001, 1101, 1901). *Note: Department permission required for enrolment* *It is recommended that BIOL (1001 or 1911) be taken concurrently with all other Junior units of study in Biology. The completion of MBLG1001 is highly recommended.*	Semester 1
BIOL1003 **Human Biology**	6	**A** HSC 2-unit Biology. Students who have not taken HSC biology are strongly advised to take the Biology Bridging Course in February. **N** BIOL1903, EDUH1016. *It is recommended that BIOL (1001 or 1911) be taken concurrently with this unit of study.*	Semester 1 Summer Main
BIOL1903 **Human Biology (Advanced)**	6	**P** UAI of at least 93 and HSC Biology result in the 90+, or Distinction or better in a University level Biology unit, or by invitation. **N** BIOL1003, BIOL1904, EDUH1016	Semester 1
BIOL1002 **Living Systems**	6	**A** HSC 2-unit Biology. Students who have not undertaken an HSC biology course are strongly advised to complete a Biology Bridging Course (in February). **N** BIOL1902 *It is recommended that BIOL (1001 or 1911) be taken before this unit of study. This unit of study, together with BIOL (1001 or 1911) provides entry to all Intermediate units of study in biology in the School of Biological Sciences.*	Semester 2
BIOL1902 **Living Systems (Advanced)**	6	**P** UAI of at least 93 and HSC Biology result in the 90th percentile or better, or Distinction or better in a University level Biology unit, or by invitation. **N** BIOL1002, BIOL1904, BIOL1905 *Note: Department permission required for enrolment*	Semester 2
Intermediate units of study			
The completion of 6 credit points of MBLG units of study is highly recommended.			
BIOL2011 **Invertebrate Zoology**	6	**A** BIOL (1002 or 1902). **P** BIOL (1001 or 1911 or 1101 or 1901) and 6 additional credit points of Junior Biology (BIOL/MBLG/EDUH). 12 credit points of Junior Chemistry (or for students in the BSc[Marine Science] stream: 6 credit points of Junior Chemistry and 6 credit points of Junior Physics). **N** BIOL2911. *This unit of study may be taken alone, but when taken with BIOL2012 provides entry into certain Senior Biology units of study. The content of BIOL (1002 or 1902) is assumed knowledge and students entering without BIOL (1002 or 1902) will need to do some preparatory reading. The completion of 6 credit points of MBLG units of study is highly recommended.*	Semester 1

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
BIOL2911 **Invertebrate Zoology (Advanced)**	6	**A** BIOL (1002 or 1902). **P** Distinction average in BIOL (1001 or 1911 or 1101 or 1901) and 6 additional credit points of Junior Biology (BIOL/MBLG/EDUH). 12 credit points of Junior Chemistry (or for students in BSc[Marine Science] stream: 6 credit points of Junior Chemistry and 6 credit points of Junior Physics). These requirements may be varied and students with lower averages should consult the Unit Executive Officer **N** BIOL2011. *The completion of 6 credit points of MBLG units of study is highly recommended.*	Semester 1
BIOL2016 **Cell Biology**	6	**P** 6 credit points of BIOL (1001 or 1911 or 1101 or 1901) and 6 additional credit points of Junior Biology (BIOL/MBLG/EDUH). 12 credit points of Junior Chemistry (or for students in the BSc (Marine Science) 6 credit points of Junior Chemistry and either an additional 6 credit points of Junior Chemistry or 6 credit points of Junior Physics). **N** BIOL2916. *The completion of MBLG1001 is highly recommended.*	Semester 1
BIOL2916 **Cell Biology (Advanced)**	6	**P** Distinction average in BIOL (1001 or 1911 or 1101 or 1901) and 6 additional credit points of Junior Biology. 12 credit points of Junior Chemistry (or for students in the BSc (Marine Science) 6 credit points of Junior Chemistry and either an additional 6 credit points of Junior Chemistry or 6 credit points of Junior Physics. These requirements may be varied and students with lower averages should consult the Unit Executive Officer. This is a core Intermediate unit in the BSc (Molecular Biology and Genetics) award course. **N** BIOL2016. *The completion of MBLG1001 is highly recommended.*	Semester 1
PLNT2001 **Plant Biochemistry and Molecular Biology**	6	**P** 12 credit points of Junior Chemistry and 12 credit points of Junior Biology (or with the Dean's permission BIOL1201 and BIOL1202) **N** PLNT2901, AGCH2001	Semester 1
PLNT2901 **Plant Biochem & Molecular Biology (Adv)**	6	**P** A Distinction average in 12 credit points of Junior Chemistry and 12 credit points of Junior Biology (or with the Dean's permission BIOL1201 and BIOL1202) **N** PLNT2001, AGCH2001	Semester 1
PLNT2002 **Aust Flora: Ecology and Conservation**	6	**P** 6 credit points of a Junior unit of study **N** PLNT2902	Semester 1
PLNT2902 **Aust Flora: Ecology & Conservation (Adv)**	6	**A** The contents of BIOL(1002 or 1902) is assumed knowledge. Students wishing to enroll in Intermediate Biology (BIOL) and Plant Science (PLNT) units of study using BIOL(1003 or 1903) will need to do some preparatory reading **P** Distinction average in 6 credit points of Junior units of study **N** PLNT2002	Semester 1
ENVI2111 **Conservation Biology and Applied Ecology**	6	**P** 24 credit points of Junior Science units, including 12 credit points of Junior Biology (BIOL/MBLG/EDUH). **N** ENVI2911, ENVI2001.	Semester 1
ENVI2911 **Conservation Biology (Advanced)**	6	**P** Distinction average in BIOL (1001 or 1911 or 1101 or 1901) and 6 additional credit points of Junior Biology (BIOL/MBLG/EDUH). 12 credit points of Junior Chemistry (or for BSc (Marine Science) students 6 credit points of Junior Chemistry and 6 credit points of Junior Physics). These requirements may be varied and students with lower averages should consult the Unit Executive Officer. **N** ENVI2111, ENVI2001.	Semester 1
BIOL2012 **Vertebrates and their Origins**	6	**A** The content of BIOL (1002 or 1902) is assumed knowledge and students who have not completed BIOL (1002 or 1902) will need to do some preparatory reading. **P** BIOL (1001 or 1911 or 1101 or 1901) and 6 additional credit points of Junior Biology (BIOL/MBLG/EDUH). 12 credit points of Junior Chemistry (or for students in the BSc[Marine Science] stream: 6 credit points of Junior Chemistry and 6 credit points of Junior Physics). **N** BIOL 2912. *This unit of study may be taken alone, but when taken with BIOL2011 provides entry into certain Senior Biology units of study. The completion of MBLG1001 is highly recommended.*	Semester 2
BIOL2912 **Vertebrates and their Origins (Advanced)**	6	**A** The content of BIOL (1002 or 1902) is assumed knowledge and students who have not completed BIOL (1002 or 1902) will need to do some preparatory reading. **P** Distinction average in BIOL (1001 or 1911 or 1101 or 1901) and 6 additional credit points of Junior Biology (BIOL/MBLG/EDUH). 12 credit points of Junior Chemistry (or for students in BSc[Marine Science] stream: 6 credit points of Junior Chemistry and 6 credit points of Junior Physics). These requirements may be varied and students with lower averages should consult the Unit Executive Officer **N** BIOL2012. *The completion of MBLG1001 is highly recommended.*	Semester 2
BIOL2017 **Entomology**	6	**A** BIOL (2011 or 2911). **P** BIOL (1001 or 1911 or 1101 or 1901) and 6 additional credit points of Junior Biology (BIOL/MBLG/EDUH). 12 credit points of Junior Chemistry (or for BSc (Marine Science) students 6 credit points of Junior Chemistry and either an additional 6 credit points of Junior Chemistry or 6 credit points of Junior Physics. **N** BIOL2917.	Semester 2
BIOL2917 **Entomology (Advanced)**	6	**A** BIOL (2011 or 2911). **P** Distinction average in BIOL (1001 or 1911 or 1101 or 1901) and 6 additional credit points of Junior Biology (BIOL/MBLG/EDUH). 12 credit points of Junior Chemistry (or for BSc (Marine Science) students: 6 credit points of Junior Chemistry and either an additonal 6 credit points of Junior Chemistry or 6 credit points of Junior Physics. These requirements may be varied and students with lower averages should consult the Unit Executive Officer. **N** BIOL2017.	Semester 2
BIOL2018 **Introduction to Marine Biology**	6	**A** 12 credit points of Junior Biology; MARS2005. **P** BIOL (1001 or 1911 or 1101 or 1901) and 6 additional credit points of Junior Biology (BIOL/MBLG/EDUH). 12 credit points of Junior Chemistry (or for BSc (Marine Science) students 6 credit points of Junior Chemistry and either an additional 6 credit points of Junior Chemistry or 6 credit points of Junior Physics). **N** BIOL2918, MARS (2006 or 2906 or 2007 or 2907).	Semester 2
BIOL2918 **Introduction to Marine Biology (Adv)**	6	**A** 12 credit points of Junior Biology; MARS2005. **P** Distinction average in BIOL (1001 or 1911 or 1101 or 1901) and 6 additional credit points of Junior Biology (BIOL/MBLG/EDUH). 12 credit points of Junior Chemistry (or for BSc (Marine Science) students 6 credit points of Junior Chemistry and either an additional 6 credit points of Junior Chemistry or 6 credit points of Junior Physics. These requirements may be varied and students with lower averages should consult the Unit Executive Officer. **N** BIOL2018, MARS (2006 or 2906 or 2007 or 2907). *Entry is restricted and selection is made from applicants on the basis of previous performance.*	Semester 2

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
PLNT2003 **Plant Form and Function**	6	**A** 12 credit points of Junior Biology, or equivalent eg BIOL (1001 or 1101 or 1901 or 1911) and BIOL (1002 or 1902 or 1003 or 1903) **N** PLNT2903, BIOL2003, BIOL2903, CROP2001	Semester 2
PLNT2903 **Plant Form and Function (Advanced)**	6	**A** 12 credit points of Junior Biology, or equivalent eg BIOL (1001 or 1101 or 1901 or 1911) and BIOL (1002 or 1902 or 1003 or 1903) **N** PLNT2003, BIOL2003, BIOL2903, CROP2001	Semester 2
Senior units of study			
BIOL3010 **Tropical Wildlife Biology and Management**	6	**A** None, although BIOL2011/2911 would be useful. **P** 12 credit points of Intermediate Biology (BIOL/ENVI/PLNT). **N** BIOL3910 *Dates: 15 February - 20 February 2009 Northern Territory, followed by tutorials and practical classes at the University of Sydney 23 February - 27 February 2009.*	S1 Intensive
BIOL3910 **Tropical Wildlife Biol & Management Adv**	6	**A** None, although Vertebrates and their Origins would be useful. **P** Distinction average in 12 credit points of Intermediate Biology (BIOL/ENVI/PLNT). **N** BIOL3010 *Note: Department permission required for enrolment* *Department permission required for enrolment. Dates: 15 - 20 February 2009 Northern Territory followed by tutorials and practical classes at the University of Sydney 23 - 27 February 2009.*	S1 Intensive
BIOL3017 **Fungi in the Environment**	6	**P** 12 credit points of Intermediate Biology, or 6 credit points of Intermediate Biology and 6 Intermediate credit points of either Microbiology or Geography. **N** BIOL3917 *Dates: 16-27 February 2009. The completion of 6 credit points of MBLG units is highly recommended.*	S1 Intensive
BIOL3917 **Fungi in the Environment (Advanced)**	6	**P** Distinction average in 12 credit points of Intermediate Biology, or 6 credit points of Intermediate Biology and 6 Intermediate credit points of either Microbiology or Geography. **N** BIOL3017 *The completion of 6 credit points of MBLG units is highly recommended.*	S1 Intensive
BIOL3006 **Ecological Methods**	6	**A** BIOL (2011 or 2911 or 2012 or 2912) or PLNT (2002 or 2902). **P** 12 credit points of Intermediate Biology; or 6 credit points of Intermediate BIOL units and ENVI2111 or MARS2006; or 12 credit points of Intermediate MARS units, including MARS2006. **N** BIOL3906, MARS3102	Semester 1
BIOL3906 **Ecological Methods (Advanced)**	6	**A** BIOL (2011 or 2911 or 2012 or 2912) or PLNT (2002 or 2902). **P** Distinction average in 12 credit points of Intermediate Biology; or 6 credit points of Intermediate BIOL and ENVI2111 or MARS2006; or 12 credit points of Intermediate MARS units, including MARS2006. These requirements may be varied and students with lower averages should consult the Unit Executive Officer. **N** BIOL3006, MARS3102	Semester 1
BIOL3011 **Ecophysiology**	6	**A** BIOL (2012 or 2912 or 2016 or 2916) or PLNT (2003 or 2903). **P** 12 credit points of Intermediate Biology; or 6 credit points of Intermediate BIOL and ENVI2111 or MARS2006; or 12 credit points of Intermediate MARS units, including MARS2006. **N** BIOL3911 *The completion of 6 credit points of MBLG units is highly recommended.*	Semester 1
BIOL3911 **Ecophysiology (Advanced)**	6	**A** BIOL (2012 or 2912 or 2016 or 2916) or PLNT (2003 or 2903) **P** Distinction average in 12 credit points of Intermediate Biology; or 6 credit points of Intermediate BIOL and ENVI2111 or MARS2006; or 12 credit points of Intermediate MARS units, including MARS2006. These requirements may be varied and students with lower averages should consult the Unit Executive Officer. **N** BIOL3011 *The completion of 6 credit points of MBLG units is highly recommended.*	Semester 1
BIOL3012 **Animal Physiology**	6	**P** 12 credit points of Intermediate Biology including BIOL (2012 or 2912 or 2016 or 2916) or PLNT (2003 or 2903) and 6 additional credit points of Intermediate Biology (BIOL/MBLG/PLNT/ENVI). **N** BIOL3912 *The completion of 6 credit points of MBLG units is highly recommended.*	Semester 1
BIOL3912 **Animal Physiology (Advanced)**	6	**P** Distinction average in 12 credit points of Intermediate Biology including BIOL (2012 or 2912 or 2016 or 2916) or PLNT (2003 or 2903) and 6 additional credit points of Intermediate Biology. These requirements may be varied and students with lower averages should consult the Unit Executive Officer. **N** BIOL3012 *The completion of 6 credit points of MBLG units is highly recommended.*	Semester 1
BIOL3013 **Marine Biology**	6	**A** BIOL 2018 or MARS2006 **P** 12 credit points of Intermediate Biology, or 6 credit points of Intermediate BIOL and ENVI2111 or MARS2006; or 12 credit points of Intermediate MARS units, including MARS2006. **N** BIOL3913 *The completion of 6 credit points of MBLG units is highly recommended.*	Semester 1
BIOL3913 **Marine Biology (Advanced)**	6	**A** BIOL2018 or MARS2006 **P** Distinction average in 12 credit points of Intermediate Biology; or 6 credit points of Intermediate BIOL and ENVI2111 or MARS2006; or 12 credit points of Intermediate MARS units, including MARS2006. **N** BIOL3013 *The completion of 6 credit points of MBLG units is highly recommended.*	Semester 1
BIOL3018 **Applications of Recombinant DNA Tech**	6	**P** 12 credit points from MBLG (2071/297), MBLG (2072/2972) and Intermediate Biology units. For BMedSc students: 36 credit points of Intermediate BMED units including BMED 2802. **N** BIOL3918	Semester 1
BIOL3918 **Applications of Recombinant DNA Tech Adv**	6	**P** Distinction average in 12 credit points from MBLG (2071/2971), MBLG (2072/2972) and Intermediate Biology units. For BMedSc students: 36 credit points of Intermediate BMED units including Distinction in BMED2802. **N** BIOL3018	Semester 1
BIOL3027 **Bioinformatics and Genomics**	6	**P** 12 credit points from MBLG (2071/2971), MBLG (2072/2972) and Intermediate Biology units. For BMedSc students: 36 credit points of Intermediate BMED units including BMED 2802. **N** BIOL3927	Semester 1
BIOL3927 **Bioinformatics and Genomics (Advanced)**	6	**P** Distinction average in 12 credit points from MBLG (2071/2971), MBLG (2072/2972) and Intermediate Biology units. For BMedSc students: 36 credit points of Intermediate BMED units including Distinction in BMED2802. **N** BIOL3027	Semester 1

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
PLNT3003 **Systematics and Evolution of Plants**	6	**P** 6 credit points of any Intermediate unit of study from BIOL, PLNT, LWSC, HORT, GEOS, GEOG, ENVI, SOIL. **N** PLNT3903, BIOL3015/3915.	Semester 1
PLNT3903 **Systematics and Evolution of Plants Adv**	6	**P** Distinction average in 6 credit points of any Intermediate unit of study from BIOL, PLNT, LWSC, HORT, GEOS, GEOG, ENVI, SOIL. These requirements may be varied and students with lower averages should consult the Unit Executive Officer. **N** PLNT3003, BIOL3015/3915.	Semester 1
BIOL3008 **Marine Field Ecology**	6	**A** BIOL (3006 or 3906). Prior completion of one of these units is very strongly recommended. **P** 12 credit points of Intermediate Biology; or 6 credit points of Intermediate BIOL and ENVI2111 or MARS2006; or 12 credit points of Intermediate MARS units, including MARS2006. **N** BIOL3908, MARS3102. *Dates: 2 - 9 July 2009.*	S2 Intensive
BIOL3908 **Marine Field Ecology (Advanced)**	6	**A** BIOL (3006 or 3906). Prior completion of one of these units is very strongly recommended. **P** Distinction average in 12 credit points of Intermediate Biology; or 6 credit points of Intermediate Biology and ENVI2111 or MARS2006; or 12 credit points of Intermediate MARS units, including MARS2006. **N** BIOL3008, MARS3102. *Dates: 2 - 9 July 2009. Plus four 1 hour tutorials during semester 2.*	S2 Intensive
BIOL3009 **Terrestrial Field Ecology**	6	**A** BIOL (3006 or 3906). Prior completion of one of these units is very strongly recommended. **P** 12 credit points of Intermediate Biology or ANSC2004 and BIOM2001. **N** BIOL3909 *One 6 day field trip held in the pre-semester break (19 - 24 July 2009) and 4 practical classes during weeks 1-4 in Semester 2.*	S2 Intensive
BIOL3909 **Terrestrial Field Ecology (Advanced)**	6	**A** BIOL (3006 or 3906). Prior completion of one of these units is very strongly recommended. **P** Distinction average in 12 credit points of Intermediate Biology or ANSC2004 and BIOM2001 **N** BIOL3009. *One 6 day field trip held in the pre-semester break (19 - 24 July 2009) and 4 practical classes during weeks 1-4 in Semester 2.*	S2 Intensive
BIOL3007 **Ecology**	6	**A** Although not prerequisites, knowledge obtained from BIOL3006/3906, and BIOL3008/3908 and/or BIOL3009/3909, is strongly recommended. **P** 12 credit points of Intermediate Biology; or 6 credit points of Intermediate BIOL, and ENVI2111 or MARS2006 ; or 12 credit points of MARS units, including MARS2006 **N** BIOL3907, MARS3102	Semester 2
BIOL3907 **Ecology (Advanced)**	6	**A** Although not prerequisites, knowledge obtained from BIOL3006/3906, and BIOL3008/3908 and/or BIOL3009/3909, is strongly recommended. Students entering this unit of study should have achieved Distinction average. **P** Distinction average in 12 credit points of Intermediate Biology; or 6 credit points of Intermediate BIOL and ENVI2111 or MARS2006; or 12 credit points of Intermediate MARS units, including MARS2006. **N** BIOL3007, MARS3102	Semester 2
BIOL3025 **Evolutionary Genetics & Animal Behaviour**	6	**P** 12 credit points from (MBLG 2071/2971), MBLG (2072/2972) and Intermediate Biology units. For BMedSc students: 36 credit points of Intermediate BMED units including BMED2802. **N** BIOL3925	Semester 2
BIOL3925 **Evolutionary Gen. & Animal Behaviour Adv**	6	**P** Distinction average in12 credit points from (MBLG2071/2971), (MBLG2072/2972) and Intermediate Biology units. For BMedSc students: 36 credit points of Intermediate BMED units including Distinction in BMED2802. **N** BIOL3025.	Semester 2
BIOL3026 **Developmental Genetics**	6	**P** 12 credit points from MBLG (2071/2971) and MBLG (2072/2972). For BMedSc students: 36 credit points of Intermediate BMED units including BMED2802. **N** BIOL3926	Semester 2
BIOL3926 **Developmental Genetics (Advanced)**	6	**P** Distinction average in 12 credit points from MBLG (2071/2971), and MBLG (2072/2972). For BMedSc students: 36 credit points of Intermediate BMED units including Distinction in BMED2802. **N** BIOL3026	Semester 2

Cell Pathology

For a major in Cell Pathology, the minimum requirement is 24 credit points from:

(i) CPAT3201 and CPAT3202; and

(ii) any two of the listed senior units of study

Senior units of study

The completion of 6 credit points of MBLG units of study is highly recommended.

CPAT3201 **Pathogenesis of Human Disease 1**	6	**P** At least 6cp intermediate of one of the following: ANAT or BCHM or MBLG or BIOL or HPSC or MICR or PCOL or PHSI, or as the head of department determines.	Semester 2
CPAT3202 **Pathogenesis of Human Disease 2**	6	**P** At least 6cp intermediate of one of the following: ANAT or BCHM or MBLG or BIOL or HPSC or MICR or PCOL or PHSI, or as the head of department determines. **C** CPAT3201	Semester 2
HSTO3001 **Microscopy & Histochemistry Theory**	6	**A** Basic understanding of biology. **P** (ANAT2008 or ANAT2001) or (BMED 2803 or 2804 or 2805 or 2806) **C** HSTO3002	Semester 1
HSTO3002 **Microscopy & Histochemistry Practical**	6	**A** Basic understanding of biology. **P** (ANAT2008 or ANAT2001) or (BMED 2803 or 2804 or 2805 or 2806) **C** HSTO3001	Semester 1
HSTO3003 **Cells and Development: Theory**	6	**A** (i) An understanding of the basic structure of vertebrates; (ii) An understanding of elementary biochemistry and genetics. **P** For BSc students: ANAT2008 For BMedSc students: 42 credit points of Intermediate BMED units, including: BMED2801, 2802, 2805. **N** EMHU3001, EMHU3002 *The completion of 6 credit points of MBLG is highly recommended.*	Semester 2

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
HSTO3004 **Cells and Development: Practical (Adv)**	6	**P** Note: This advanced unit of study is only available to select students who have achieved a mark of 65 or above in the following prerequisite units of study. For BSc students: ANAT2008. For BMedSc students: 42 credit points of Intermediate BMED units, including: BMED2801, 2802, 2805. **C** HSTO3003 **N** EMHU3001, EMHU3002 *The completion of 6 credit points of MBLG is highly recommended.*	Semester 2
BCHM3071 **Molecular Biology & Biochemistry- Genes**	6	**P** MBLG (1001 or 1901) and 12 CP of Intermediate BCHM/MBLG units (taken from MBLG2071/2971 or BCHM2071/2971 or BCHM2072/2972) or 42CP of Intermediate BMedSc units, including BMED2802 and BMED2804. **N** BCHM3971, BCHM3001, BCHM3901	Semester 1
BCHM3971 **Molecular Biology & Biochem- Genes (Adv)**	6	**P** MBLG (1001 or 1901) and Distinction in 12 CP of Intermediate BCHM/MBLG units (taken from MBLG2071/2971 or BCHM2071/2971 or BCHM2072/2972) or 42CP of Intermediate BMedSc units, with Distinction in BMED2802 and BMED2804. **N** BCHM3071, BCHM3001, BCHM3901	Semester 1
BCHM3972 **Human Molecular Cell Biology (Advanced)**	6	**P** MBLG (1001 or 1901) and Distinction in 12 CP of Intermediate BCHM/MBLG units (taken from MBLG2071/MBLG2971 or BCHM2071/2971 or BCHM2072/2972) or 42CP of Intermediate BMedSc units, with Distinction in BMED2802 and BMED2804. **C** MBLG3999 **N** BCHM3072, BCHM3002, BCHM3004, BCHM3902, BCHM3904	Semester 2
BCHM3081 **Mol Biology & Biochemistry- Proteins**	6	**P** MBLG (1001 or 1901) and 12 CP of Intermediate BCHM/MBLG units (taken from MBLG2071/2971 or BCHM2071/2971 or BCHM2072/2972) or 42CP of Intermediate BMedSc units, including BMED2802 and BMED2804. **N** BCHM3981, BCHM3001, BCHM3901	Semester 1
BCHM3981 **Mol Biology & Biochemistry- Proteins Adv**	6	**P** MBLG (1001 or 1901) and Distinction in12 CP of Intermediate BCHM/MBLG units (taken from MBLG2071/2971 or BCHM2071/2971 or BCHM2072/2972) or 42CP of Intermediate BMedSc units, with Distinction in BMED2802 and BMED2804. **N** BCHM3081, BCHM3001, BCHM3901	Semester 1
BCHM3082 **Medical and Metabolic Biochemistry**	6	**P** MBLG (1001 or 1901) and 12 CP of Intermediate BCHM/MBLG units (taken from MBLG2071/2971 or BCHM2071/2971 or BCHM2072/2972) or 42CP of Intermediate BMedSc units, including BMED2802 and BMED2804. **N** BCHM3982, BCHM3002, BCHM3004, BCHM3902, BCHM3904 *BExSci/BSc(Nutrition) students successfully progressing though the combined degree meet the pre-requisites for this unit of study*	Semester 2
BCHM3982 **Medical and Metabolic Biochemistry (Adv)**	6	**P** MBLG (1001 or 1901) and Distinction in 12 CP of Intermediate BCHM/MBLG units (taken from MBLG2071/2971 or BCHM2071/2971 or BCHM2072/2972) or 42CP of Intermediate BMedSc units, with Distinction in BMED2802 and BMED2804. **N** BCHM3082, BCHM3002, BCHM3004, BCHM3902, BCHM3904	Semester 2
MICR3011 **Microbes in Infection**	6	**P** At least 6 credit points of MBLG units and MICR (2022 or 2922 or 2002 or 2902). For BMedSc students: 42 credit points of Intermediate BMED units including BMED (2807 and 2808). For BScAgr students: PLNT (2001 or 2901) and MICR (2022 or 2922). **N** MICR3911, MICR3001, MICR3901	Semester 1
MICR3911 **Microbes in Infection (Advanced)**	6	**P** At least 6 credit points of MBLG units and Distinction in MICR (2022 or 2922 or 2002 or 2902). For BMedSc students: 42 credit points of Intermediate BMED units including in BMED (2807 or 2808) with a Distinction in one of these two. For BScAgr students: PLNT (2001 or 2901) and MICR (2022 or 2922) including one Distinction. **N** MICR3011, MICR3001, MICR3901	Semester 1
MICR3012 **Molecular Biology of Pathogens**	6	**P** At least 6 credit points of MBLG units and MICR (2022 or 2922 or 2002 or 2902). For BMedSc students: 42 credit points of Intermediate BMED units including BMED (2802, 2807 and 2808). For BScAgr students: PLNT (2001 or 2901) and MICR2024. **N** MICR3912, MICR3002, MICR3902, MICR3003, MICR3903, MICR3004, MICR3904	Semester 2
MICR3912 **Molecular Biology of Pathogens (Adv)**	6	**P** At least 6 credit points of MBLG units and Distinction in MICR (2022 or 2922 or 2002 or 2902). For BMedSc students: 42 credit points of Intermediate BMED units including BMED (2802 or 2807 or 2808) with a Distinction in one of these three. For BScAgr students: PLNT (2001 or 2901) and MICR2024 including one Distinction. **N** MICR3012, MICR3002, MICR3902, MICR3003, MICR3903, MICR3004, MICR3904	Semester 2
MICR3022 **Microbial Biotechnology**	6	**P** At least 6 credit points of MBLG units and 6 credit points of Intermediate MICR units. For BMedSc students: 42 credit points of Intermediate BMED units including BMED (2802 and 2807). For BScAgr students: PLNT (2001 or 2901) and MICR2024. **N** MICR3922, MICR3002, MICR3902	Semester 2
MICR3922 **Microbial Biotechnology (Advanced)**	6	**P** At least 6 credit points of MBLG units and Distinction in 6 credit points of Intermediate MICR units. For BMedSc students: 42 credit points of Intermediate BMED units including BMED (2802 and 2807) with a Distinction in at least one of these two. For BScAgr students: PLNT (2001 or 2901) and MICR2024 including one Distinction. **N** MICR3022, MICR3002, MICR3902	Semester 2
PHSI3005 **Human Cellular Physiology: Theory**	6	**A** 6 credit points of MBLG **P** Except for BMedSc students: PHSI(2005 or 2905) and PHSI(2006 or 2906) For BMedSc: BMED (2801 and 2802). **N** PHSI3905, PHSI3004, PHSI3904 *It is highly recommended that this unit of study be taken in conjunction with PHSI3006.*	Semester 1
PHSI3905 **Human Cellular Physiology (Adv): Theory**	6	**A** 6 credit points of MBLG **P** Credit average in PHSI(2005 or 2905) and PHSI(2006 or 2906) or in BMED (2801 and 2802). Students enrolling in this unit should have a WAM of at least 70. **N** PHSI3005, PHSI3004, PHSI3904 *Note: Department permission required for enrolment* *It is highly recommended that this unit of study be taken in combination with PHSI3906*	Semester 1
PHSI3006 **Human Cellular Physiology: Research**	6	**P** Except for BMedSc students: PHSI (2005 or 2905) and PHSI(2006 or 2906) For BMedSc: BMED (2801 and 2802). **C** PHSI3005 **N** PHSI3906, PHSI3004, PHSI3904	Semester 1
PHSI3906 **Human Cellular Physiology (Ad): Research**	6	**A** 6 credit points of MBLG **P** PHSI (2005 or 2905) and PHSI(2006 or 2906) or in BMED (2801 and 2802). Students enroling in this unit should have a WAM of at least 70. **C** PHSI3905 **N** PHSI3006, PHSI3004, PHSI3904 *Note: Department permission required for enrolment*	Semester 1

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
Information on these units may be found under the relevant teaching department entries.			
Chemistry			
For a major in chemistry, the minimum requirement is 24 credit points from senior units of study listed in this subject area, which must include the associated laboratory units.			
Junior units of study			
CHEM1001 **Fundamentals of Chemistry 1A**	6	**A** There is no assumed knowledge of chemistry for this unit of study, but students who have not undertaken an HSC chemistry course are strongly advised to complete a chemistry bridging course before lectures commence. **N** CHEM1101, CHEM1901, CHEM1109, CHEM1903	Semester 1
CHEM1002 **Fundamentals of Chemistry 1B**	6	**P** CHEM (1001 or 1101) or equivalent **N** CHEM1102, CHEM1108, CHEM1902, CHEM1904	Semester 2
CHEM1101 **Chemistry 1A**	6	**A** HSC Chemistry and Mathematics **C** Recommended concurrent units of study: 6 credit points of Junior Mathematics **N** CHEM1001, CHEM1109, CHEM1901, CHEM1903	Semester 1 Semester 2 Summer Main
CHEM1102 **Chemistry 1B**	6	**P** CHEM (1101 or 1901) or a Distinction in CHEM1001 or equivalent **C** Recommended concurrent units of study: 6 credit points of Junior Mathematics **N** CHEM1002, CHEM1108, CHEM1902, CHEM1904	Semester 1 Semester 2 Summer Main
CHEM1901 **Chemistry 1A (Advanced)**	6	**P** UAI of at least 96.4 and HSC Chemistry result in band 5 or 6, or Distinction or better in a University level Chemistry unit, or by invitation **C** Recommended concurrent unit of study: 6 credit points of Junior Mathematics **N** CHEM1001, CHEM1101, CHEM1109, CHEM1903 *Note: Department permission required for enrolment*	Semester 1
CHEM1902 **Chemistry 1B (Advanced)**	6	**P** CHEM (1901 or 1903) or Distinction in CHEM1101 or equivalent **C** Recommended concurrent unit of study: 6 credit points of Junior Mathematics **N** CHEM1002, CHEM1102, CHEM1108, CHEM1904 *Note: Department permission required for enrolment*	Semester 2
CHEM1903 **Chemistry 1A (Special Studies Program)**	6	**P** UAI of at least 98.7 and HSC Chemistry result in Band 6 **C** Recommended concurrent unit of study: 6 credit points of Junior Mathematics. **N** CHEM1001, CHEM1101, CHEM1109, CHEM1901 *Note: Department permission required for enrolment* *Entry is by invitation. This unit of study is deemed to be an Advanced unit of study.*	Semester 1
CHEM1904 **Chemistry 1B (Special Studies Program)**	6	**P** Distinction in CHEM1903 **C** Recommended concurrent units of study: 6 credit points of Junior Mathematics. **N** CHEM1002, CHEM1102, CHEM1108, CHEM1902 *Note: Department permission required for enrolment* *Entry is by invitation. This unit of study is deemed to be an Advanced unit of study.*	Semester 2
Intermediate units of study			
CHEM2401 **Molecular Reactivity and Spectroscopy**	6	**P** CHEM (1101 or 1901 or 1903 or 1907 or 1908 or 1108) and CHEM (1102 or 1902 or 1904 or 1909 or 1109), 6 credit points of Junior Mathematics **N** CHEM2001, CHEM2101, CHEM2301, CHEM2311, CHEM2502, CHEM2901, CHEM2903, CHEM2911, CHEM2915 *This is a required chemistry unit of study for students intending to major in chemistry.*	Semester 1
CHEM2911 **Molecular Reactivity & Spectroscopy Adv**	6	**P** Credit average or better in CHEM (1101 or 1901 or 1903 or 1907 or 1908 or 1108) and CHEM (1102 or 1902 or 1904 or 1909 or 1109). 6 credit points of Junior Mathematics. **N** CHEM2001, CHEM2101, CHEM2301, CHEM2311, CHEM2401, CHEM2502, CHEM2901, CHEM2903, CHEM2915	Semester 1
CHEM2915 **Molecular Reactivity & Spectroscopy SSP**	6	**P** By invitation. High WAM and a Distinction average in CHEM (1101 or 1901 or 1903 or 1907 or 1908 or 1108) and CHEM (1102 or 1902 or 1904 or 1909 or 1109). 6 credit points of Junior Mathematics **N** CHEM2001, CHEM2101, CHEM2301, CHEM2311, CHEM2401, CHEM2502, CHEM2901, CHEM2903, CHEM2911 *Note: Department permission required for enrolment* *The number of places in this unit of study is strictly limited and entry is by invitation only. Enrolment is conditional upon available places.*	Semester 1
CHEM2402 **Chemical Structure and Stability**	6	**P** CHEM (1101 or 1901 or 1903 or 1907 or 1908 or 1108) and CHEM (1102 or 1902 or 1904 or 1909 or 1109), 6 credit points of Junior of Mathematics **N** CHEM2202, CHEM2302, CHEM2902, CHEM2912, CHEM2916 *This is a required chemistry unit of study for students intending to major in chemistry.*	Semester 2
CHEM2912 **Chemical Structure and Stability (Adv)**	6	**P** Credit average or better in CHEM (1101 or 1901 or 1903 or 1907 or 1908 or 1108) and CHEM (1102 or 1902 or 1904 or 1909 or 1109). 6 credit points of Junior Mathematics. **N** CHEM2202, CHEM2302, CHEM2402, CHEM2902, CHEM2916	Semester 2
CHEM2916 **Chemical Structure and Stability (SSP)**	6	**P** By invitation. High WAM and a Distinction average in CHEM (1101 or 1901 or 1903 or 1907 or 1908 or 1108) and CHEM (1102 or 1902 or 1904 or 1909 or 1109). 6 credit points of Junior Mathematics. **N** CHEM2202, CHEM2302, CHEM2402, CHEM2902, CHEM2912 *Note: Department permission required for enrolment* *The number of places in this unit of study is strictly limited and entry is by invitation only. Enrolment is conditional upon available places.*	Semester 2
CHEM2404 **Forensic and Environmental Chemistry**	6	**P** 12 credit points of Junior Chemistry; 6 credit points of Junior Mathematics **N** CHEM3107, CHEM3197 *To enrol in Senior Chemistry in 2010 students are required to have completed CHEM (2401 or 2911 or 2915) and CHEM (2402 or 2912 or 2916). Students are advised that combinations of CHEM2 units that do not meet this requirement will generally not allow progression to Senior Chemistry.*	Semester 1
CHEM2403 **Chemistry of Biological Molecules**	6	**P** 12 credit points of Junior Chemistry; 6 credit points of Junior Mathematics **N** CHEM2001, CHEM2901, CHEM2311, CHEM2903, CHEM2913 *To enrol in Senior Chemistry in 2010 students are required to have completed CHEM (2401 or 2911 or 2915) and CHEM (2402 or 2912 or 2916). Students are advised that combinations of CHEM2 units that do not meet this requirement will generally not allow progression to Senior Chemistry.*	Semester 2

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
Senior units of study			
CHEM3110 Biomolecules: Properties and Reactions	6	**P** CHEM(2401 or 2911 or 2915) and CHEM(2402 or 2912 or 2916) **N** CHEM3910	Semester 1
CHEM3910 Biomolecules: Properties & Reactions Adv	6	**P** WAM of 65 or greater and a Credit or better in: CHEM (2401 or 2911 or 2915) and CHEM (2402 or 2912 or 2916). **N** CHEM3110	Semester 1
CHEM3111 Organic Structure and Reactivity	6	**P** CHEM(2401 or 2911 or 2915) and CHEM(2402 or 2912 or 2916) **N** CHEM3911	Semester 1
CHEM3911 Organic Structure and Reactivity (Adv)	6	**P** WAM of 65 or greater and a Credit or better in: CHEM (2401 or 2911 or 2915) and CHEM (2402 or 2912 or 2916). **N** CHEM3111	Semester 1
CHEM3112 Materials Chemistry	6	**P** CHEM(2401 or 2911 or 2915) and CHEM(2402 or 2912 or 2916) **N** CHEM3912	Semester 1
CHEM3912 Materials Chemistry (Adv)	6	**P** WAM of 65 or greater and a Credit or better in: CHEM (2401 or 2911 or 2915) and CHEM (2402 or 2912 or 2916). **N** CHEM3112	Semester 1
CHEM3113 Catalysis and Sustainable Processes	6	**P** CHEM(2401 or 2911 or 2915) and CHEM(2402 or 2912 or 2916) **N** CHEM3913	Semester 1
CHEM3913 Catalysis and Sustainable Process (Adv)	6	**P** WAM of 65 or greater and a Credit or better in: CHEM (2401 or 2911 or 2915) and CHEM (2402 or 2912 or 2916). **N** CHEM3113	Semester 1
CHEM3114 Metal Complexes: Medicine and Materials	6	**P** CHEM(2401 or 2911 or 2915) and CHEM(2402 or 2912 or 2916) **N** CHEM3914	Semester 2
CHEM3914 Metal Complexes: Medic. & Mater. (Adv)	6	**P** WAM of 65 or greater and a Credit or better in: CHEM (2401 or 2911 or 2915) and CHEM (2402 or 2912 or 2916). **N** CHEM3114	Semester 2
CHEM3115 Synthetic Medicinal Chemistry	6	**P** CHEM(2401 or 2911 or 2915) and CHEM(2402 or 2912 or 2916) **N** CHEM3915	Semester 2
CHEM3915 Synthetic Medicinal Chemistry (Adv)	6	**P** WAM of 65 or greater and a Credit or better in: CHEM (2401 or 2911 or 2915) and CHEM (2402 or 2912 or 2916). **N** CHEM3115	Semester 2
CHEM3116 Membranes, Self Assembly and Surfaces	6	**P** CHEM(2401 or 2911 or 2915) and CHEM(2402 or 2912 or 2916) **N** CHEM3916	Semester 2
CHEM3117 Molecular Spectroscopy & Quantum Theory	6	**P** CHEM(2401 or 2911 or 2915) and CHEM(2402 or 2912 or 2916) **N** CHEM3917	Semester 2
CHEM3917 Mol. Spectroscopy & Quantum Theory (Adv)	6	**P** WAM of 65 or greater and a Credit or better in: CHEM (2401 or 2911 or 2915) and CHEM (2402 or 2912 or 2916). **N** CHEM3117	Semester 2
# Computational Science			
For a major in Computational Science the minimum requirement is 24 credit points chosen from the core or elective senior units of study listed for this subject area, of which at least 12 credit points are from the core senior units of study.			
Junior units of study			
COSC1001 Computational Science in Matlab	3	**A** HSC Mathematics **N** COSC1901	Semester 2
COSC1901 Computational Science in Matlab (Adv)	3	**A** HSC Mathematics **P** UAI of at least 90, or COSC1902, or a distinction or better in COSC1002, SOFT (1001, 1002, 1901 or 1902). **N** COSC1001	Semester 2
COSC1002 Computational Science in C	3	**A** HSC Mathematics **N** COSC1902	Semester 2
COSC1902 Computational Science in C (Adv)	3	**A** HSC Mathematics **P** UAI of at least 90, or COSC1901, or a distinction or better in COSC1001, SOFT (1001, 1002, 1901 or 1902). **N** COSC1002	Semester 2
Senior core units of study			
COSC3011 Scientific Computing	6	**A** Programming experience in MATLAB **P** 12 credit points chosen from Junior Mathematics and Statistics, 12 credit points of Intermediate units in Science subject areas. **N** COSC3911, COSC3001, COSC3901, PHYS3301, PHYS3901	Semester 2
COSC3911 Scientific Computing (Advanced)	6	**A** Programming experience in MATLAB **P** 12 credit points chosen from Junior Mathematics and Statistics, 12 credit points of Intermediate units in Science subject areas with a credit average. **N** COSC3011, COSC3001, COSC3901, PHYS3301, PHYS3901	Semester 2
MATH3076 Mathematical Computing	6	**P** 12 credit points of Intermediate Mathematics and one of MATH(1001 or 1003 or 1901 or 1903 or 1906 or 1907) **N** MATH3976, MATH3016, MATH3916	Semester 1
MATH3976 Mathematical Computing (Advanced)	6	**P** 12 credit points of Intermediate Mathematics and one of MATH(1903 or 1907) or Credit in MATH1003 **N** MATH3076, MATH3016, MATH3916	Semester 1

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
Senior elective units of study			
BINF3101 **Bioinformatics Project**	6	**A** INFO2110 and (INFO1103 or INFO1903) **P** INFO3402 and 12 credit points from Intermediate Biology, Molecular Biology and Genetics, Biochemistry, Microbiology, Pharmacology **N** COMP3206, BINF3001, INFO3600, SOFT3300, SOFT3600, SOFT3200, SOFT3700	Semester 2
BIOL3006 **Ecological Methods**	6	**A** BIOL (2011 or 2911 or 2012 or 2912) or PLNT (2002 or 2902). **P** 12 credit points of Intermediate Biology; or 6 credit points of Intermediate BIOL units and ENVI2111 or MARS2006; or 12 credit points of Intermediate MARS units, including MARS2006. **N** BIOL3906, MARS3102	Semester 1
BIOL3906 **Ecological Methods (Advanced)**	6	**A** BIOL (2011 or 2911 or 2012 or 2912) or PLNT (2002 or 2902). **P** Distinction average in 12 credit points of Intermediate Biology; or 6 credit points of Intermediate BIOL and ENVI2111 or MARS2006; or 12 credit points of Intermediate MARS units, including MARS2006. These requirements may be varied and students with lower averages should consult the Unit Executive Officer. **N** BIOL3006, MARS3102	Semester 1
BIOL3027 **Bioinformatics and Genomics**	6	**P** 12 credit points from MBLG (2071/2971), MBLG (2072/2972) and Intermediate Biology units. For BMedSc students: 36 credit points of Intermediate BMED units including BMED 2802. **N** BIOL3927	Semester 1
BIOL3927 **Bioinformatics and Genomics (Advanced)**	6	**P** Distinction average in 12 credit points from MBLG (2071/2971), MBLG (2072/2972) and Intermediate Biology units. For BMedSc students: 36 credit points of Intermediate BMED units including Distinction in BMED2802. **N** BIOL3027	Semester 1
COMP3308 **Introduction to Artificial Intelligence**	6	**A** COMP2007 **N** COMP (3608 or 3002 or 3902)	Semester 1
COMP3608 **Intro. to Artificial Intelligence (Adv)**	6	**P** Distinction-level results in some 2nd year COMP or MATH or SOFT units. **N** COMP (3308 or 3002 or 3902)	Semester 1
COMP3456 **Computational Methods for Life Sciences**	6	**P** INFO1105 and (COMP2007 or INFO2120) and 6 credit points from BIOL or MBLG	Semester 2
GEOS3009 **Coastal Environments & Processes**	6	**P** (6 credit points of Intermediate Geoscience* units) and (6 further credit points of Intermediate Geoscience or 6 credit points of Physics or Mathematics or Information Technology or Engineering units) or ((MARS2005 or MARS2905) and (MARS2006 or MARS2906)) **N** GEOS3909, MARS3003, MARS3105 ** Geoscience is the disciplines of Geography, Geology and Geophysics.*	Semester 1
MATH3063 **Differential Equations & Biomaths**	6	**A** MATH2061 **P** 12 credit points of Intermediate Mathematics **N** MATH3020, MATH3920, MATH3003, MATH3923, MATH3963	Semester 1
MATH3963 **Differential Equations & Biomaths (Adv)**	6	**A** MATH2961 **P** 12 credit points of Intermediate Mathematics **N** MATH3020, MATH3920, MATH3003, MATH3923, MATH3063	Semester 1
MATH3078 **PDEs and Waves**	6	**A** MATH(2061/2961) and MATH(2065/2965) **P** 12 credit points of Intermediate Mathematics **N** MATH3978, MATH3018, MATH3921	Semester 2
MATH3978 **PDEs and Waves (Advanced)**	6	**A** MATH(2061/2961) and MATH(2065/2965) **P** 12 credit points of Intermediate Mathematics with at least Credit average **N** MATH3078, MATH3018, MATH3921	Semester 2
STAT3011 **Stochastic Processes and Time Series**	6	**P** STAT (2011 or 2911 or 2001 or 2901) and MATH (1003 or 1903 or 1907). **N** STAT3911, STAT3003, STAT3903, STAT3005, STAT3905	Semester 1
STAT3911 **Stochastic Processes and Time Series Adv**	6	**P** (STAT2911 or credit in STAT2011) and MATH(1003 or 1903 or 1907). **N** STAT3011, STAT3003, STAT3903, STAT3005, STAT3905	Semester 1
STAT3012 **Applied Linear Methods**	6	**P** STAT(2012 or 2912 or 2004) and MATH(1002 or 1014 or 1902). **N** STAT3912, STAT3002, STAT3902, STAT3004, STAT3904	Semester 1
STAT3912 **Applied Linear Methods Advanced**	6	**P** (STAT2912 or Credit in STAT2004 or Credit in STAT2012) and MATH(2061 or 2961 or 1902). **N** STAT3012, STAT3002, STAT3902, STAT3004, STAT3904	Semester 1

Computer Science

For a major in Computer Science the minimum requirement is 24 credit points chosen from the senior units of study listed for this subject area including COMP3615 and INFO3402 (students enrolled in the BSc(Adv) should enrol in INFO3600 instead of COMP3615). Students are also required to complete the following intermediate units: COMP2007/2907, COMP2129, INFO2110 and INFO2120/2820.

Students enrolled in non-IT degrees or majors, are eligible (upon application) for a Minor in Information Technology if they complete at least 18 credit points of intermediate or above units of study offered by the School of IT, within a completed degree. For further information, please refer to: http://www.it.usyd.edu.au/future_students/undergrad/minor.shtml

Students should note that applications for special consideration on the basis of illness or misadventure for INFO, ISYS, COMP, ELEC units should be lodged with the Faculty of Engineering.

Junior units of study			
ELEC1601 **Foundations of Computer Systems**	6	**A** HSC Mathematics extension 1 **N** NETS2008 Computer System Organisation, NETS2908 Computer System Organisation (Adv), COMP2001 Computer Systems, COMP2901 Computer Systems (Adv).	Semester 2
INFO1003 **Foundations of Information Technology**	6	**N** INFO (1903 or 1000) or INFS1000	Semester 1 Semester 2
INFO1103 **Introduction to Programming**	6	**A** HSC Mathematics **N** INFO1903 or SOFT (1001 or 1901) or COMP (1001 or 1901) or DECO2011	Semester 1 Semester 2

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
INFO1903 **Informatics (Advanced)**	6	**A** HSC Mathematics **P** UAI sufficient to enter BCST(Adv), BIT or BSc(Adv), or portfolio of work suitable for entry **N** INFO1003, INFO1103 *Note: Department permission required for enrolment*	Semester 1
INFO1105 **Data Structures**	6	**A** Programming, as for INFO1103 **N** INFO1905 or SOFT (1002 or 1902) or COMP (1002 or 1902 or 2160 or 2860 or 2111 or 2811 or 2002 or 2902)	Semester 2
INFO1905 **Data Structures (Advanced)**	6	**P** Distinction-level performance in INFO1103 or INFO1903 or SOFT1001 or SOFT1901. **N** INFO1105 or SOFT (1002 or 1902) or COMP (1002 or 1902)	Semester 2
Intermediate units of study			
COMP2007 **Algorithms and Complexity**	6	**A** INFO1105, MATH1004 or MATH1904Discrete Maths **N** COMP (2907 or 3309 or 3609 or 3111 or 3811)	Semester 2
COMP2907 **Algorithms and Complexity (Advanced)**	6	**P** Distinction level result in INFO (1105 or 1905) or SOFT (1002 or 1902) **N** COMP (2007 or 3309 or 3609 or 3111 or 3811)	Semester 2
COMP2129 **Operating Systems and Machine Principles**	6	**A** Programming, as from INFO1103 **N** SOFT (2130 or 2830 or 2004 or 2904) or COMP (2004 or 2904)	Semester 1
INFO2110 **Systems Analysis and Modelling**	6	**A** Experience with a data model as in INFO1003 or INFO1103 or INFS1000 **N** INFO (2810 or 2000 or 2900)	Semester 2
INFO2120 **Database Systems 1**	6	**A** Some exposure to programming and some familiarity with data model concepts such as taught in INFO1103 or INFO1003 or INFS1000 or INFO1903 **N** INFO (2820 or 2005 or 2905)	Semester 1
INFO2820 **Database Systems 1 (Advanced)**	6	**P** Distinction-level result in INFO (1003 or 1103 or 1903 or 1105 or 1905) or SOFT (1001 or 1901 or 1002 or 1902) **N** INFO (2120 or 2005 or 2905)	Semester 1
INFO2315 **Introduction to IT Security**	6	**A** Computer literacy **N** NETS (3305 or 3605 or 3016 or 3916) or ELEC (5610 or 5616)	Semester 2
Senior units of study			
ELEC3506 **Data Communications and the Internet**	6	**A** SOFT2004 Software Development Methods 1 or COMP2004 Programming Practice or SOFT2130 Software Construction. **N** NETS2150 Fundamentals of Networking, NETS2009 Network Organisation, NETS2909 Network Organisation (Adv), NETS3007 Network Protocols, NETS3907 Network Protocols (Advanced), ELEC3504 Data Communications and the Internet, ELEC4501 Data Communication Networks.	Semester 2
ELEC3609 **Internet Software Platforms**	6	**P** INFO1103, INFO2110, INFO2120 **N** EBUS4001 E-Business Engineering	Semester 2
ELEC3610 **E-Business Analysis and Design**	6	**P** INFO2120 **N** EBUS3003 E-Business System Design, EBUS3001 Introduction to e-Commerce Systems	Semester 1
COMP3109 **Programming Languages and Paradigms**	6	**A** COMP2007	Semester 2
COMP3308 **Introduction to Artificial Intelligence**	6	**A** COMP2007 **N** COMP (3608 or 3002 or 3902)	Semester 1
COMP3608 **Intro. to Artificial Intelligence (Adv)**	6	**P** Distinction-level results in some 2nd year COMP or MATH or SOFT units. **N** COMP (3308 or 3002 or 3902)	Semester 1
COMP3419 **Graphics and Multimedia**	6	**A** COMP2007, MATH1002 **N** MULT (3306 or 3606 or 3019 or 3919 or 3004 or 3904) or COMP(3004 or 3904)	Semester 1
COMP3456 **Computational Methods for Life Sciences**	6	**P** INFO1105 and (COMP2007 or INFO2120) and 6 credit points from BIOL or MBLG	Semester 2
COMP3520 **Operating Systems Internals**	6	**A** COMP2129, INFO1105 **N** NETS (3304 or 3604 or 3009 or 3909) or COMP (3009 or 3909)	Semester 1
COMP3615 **Software Development Project**	6	**P** INFO3402 **N** INFO3600 or SOFT (3300 or 3600 or 3200 or 3700)	Semester 2
INFO3220 **Object Oriented Design**	6	**A** INFO2110, INFO1105 **N** SOFT (3301 or 3601 or 3101 or 3801) or COMP (3008 or 3908)	Semester 1
INFO3315 **Human-Computer Interaction**	6	**A** INFO2110 **N** MULT (3307 or 3607 or 3018 or 3918) or SOFT (3102 or 3802) or COMP (3102 or 3802)	Semester 2
INFO3402 **Management of IT Projects and Systems**	6	**A** INFO (2000 or 2110 or 2810 or 2900) **N** ISYS (3000 or 3012) or ELEC3606	Semester 1
INFO3404 **Database Systems 2**	6	**A** Introductory database study such as INFO2120 or INFO2820 or INFO2005 or INFO2905. Students are expected to be familiar with SQL and the relational data model, and to have some programming experience. **N** INFO (3504 or 3005 or 3905) or COMP (3005 or 3905)	Semester 2
INFO3504 **Database Systems 2 (Adv)**	6	**P** Distinction-level result in INFO (2120 or 2820) or COMP (2007 or 2907) **N** INFO (3404 or 3005 or 3905) or COMP (3005 or 3905)	Semester 2
INFO3600 **Major Development Project (Advanced)**	12	**P** INFO3402 **N** COMP3615 or ISYS3400 or SOFT (3300 or 3600 or 3200 or 3700) *Only available to students in BIT, BCST(Adv) or BSc(Adv)*	Semester 2
Environmental Studies			
For a major in Environmental Studies, students are required to complete a minimum of 24 credit points from Senior units of study listed below, including at least 12 credit points from Senior ENVI units			

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
Junior units of study			
Students are recommended to take at least one of the following units of study			
GEOS1001, GEOS1901, GEOS1002, GEOS1902, GEOS1003, GEOS1903			
GEOS1001 **Earth, Environment and Society**	6	**N** GEOS1901, GEOG1001, GEOG1002, GEOL1001, GEOL1002, GEOL1902	Semester 1
GEOS1901 **Earth, Environment and Society Advanced**	6	**P** Departmental permission is required for enrolment. A UAI above 93 is normally required for admission. This requirement may be varied and students should consult the unit of study coordinator. **N** GEOS1001, GEOG1001, GEOG1002, GEOL1001, GEOL1002, GEOL1902 *Note: Department permission required for enrolment*	Semester 1
GEOS1002 **Introductory Geography**	6	**N** GEOS1902, GEOG1001, GEOG1002	Semester 2
GEOS1902 **Introductory Geography (Advanced)**	6	**P** Departmental permission is required for enrolment. A UAI above 93 is normally required for admission. This requirement may be varied and students should consult the unit of study coordinator. **N** GEOS1002, GEOG1001, GEOG1002 *Note: Department permission required for enrolment*	Semester 2
GEOS1003 **Introduction to Geology**	6	**N** GEOS1903, GEOL1002, GEOL1902	Semester 2
GEOS1903 **Introduction to Geology (Advanced)**	6	**P** Departmental permission is required for enrolment. A UAI above 93 is normally required for admission. This requirement may be varied and students should consult the unit of study coordinator. **N** GEOL1002, GEOL1902, GEOS1003 *Note: Department permission required for enrolment*	Semester 2
Intermediate units of study			
The completion at least one of the following units of study is highly recommended:			
ENVI2111 **Conservation Biology and Applied Ecology**	6	**P** 24 credit points of Junior Science units, including 12 credit points of Junior Biology (BIOL/MBLG/EDUH). **N** ENVI2911, ENVI2001.	Semester 1
ENVI2911 **Conservation Biology (Advanced)**	6	**P** Distinction average in BIOL (1001 or 1911 or 1101 or 1901) and 6 additional credit points of Junior Biology (BIOL/MBLG/EDUH). 12 credit points of Junior Chemistry (or for BSc (Marine Science) students 6 credit points of Junior Chemistry and 6 credit points of Junior Physics). These requirements may be varied and students with lower averages should consult the Unit Executive Officer. **N** ENVI2111, ENVI2001.	Semester 1
ENVI2112 **Atmospheric Processes and Climate**	6	**P** 24 credit points of Junior Science units, including 12 credit points of Junior Chemistry or Physics **N** ENVI2002	Semester 2
GEOS2111 **Natural Hazards: a GIS Approach**	6	**P** 24 credit points of junior units of study including one of GEOS1001 or GEOS1002 or GEOS1003 or GEOG1001 or GEOG1002 or ENVI1002 or GEOL1001 or GEOL1002 or GEOS1902 or GEOL1501 or GEOS1901 or GEOS1903 **N** GEOG2411, GEOS2911	Semester 1
GEOS2113 **Making the Australian Landscape**	6	**P** 24 credit points of Junior units of study, including GEOS1002 or GEOS1003 or GEOS1902 or GEOS1903 or GEOG1001 or ENVI1002 or GEOL1001 or GEOL1002 or GEOL1902 **N** GEOS2913	Semester 1
GEOS2121 **Environmental and Resource Management**	6	**P** 24 credit points of junior units of study, including one of: GEOS1001 or GEOS1002 or GEOS1003 or GEOS1901 or GEOS1902 or GEOS1903 or ECOP1001 or ECOP1002 or GEOL1002 or GEOL1902 or GEOL1501 **N** GEOG2421, GEOL2202, GEOS2921	Semester 2
GEOS2122 **Urban Geography**	6	**P** 24 credit points of Junior units of study, including GEOS1001 or GEOS1002 or GEOS1003 or ECOP1001 or ECOP1002. **N** GEOS2922, GEOG2521	Semester 2
GEOS2911 **Natural Hazards: a GIS Approach Advanced**	6	**P** 24 credit points of junior units of study including a distinction in one of GEOS1001 or GEOS1002 or GEOS1003 or GEOS1901 or GEOS1902 or GEOS1903 or GEOG1001 or GEOG1002 or ENVI1002 or GEOL1001 or GEOL1002 or GEOL1902 or GEOL1501 **N** GEOG2411, GEOS2111	Semester 1
GEOS2921 **Environmental & Resource Management Adv**	6	**P** 24 credit points of Junior units of study, including a distinction in one of: GEOS1001 or GEOS1901 or GEOS1002 or GEOS1902 or GEOS1003 or GEOS1903 or ECOP1001 or ECOP1002 or GEOG1001 or GEOG1002 or GEOL1002 or GEOL1902 or GEOL1501. This requirement may be varied and students should consult the unit of study coordinator. **N** GEOG2421, GEOL2202, GEOS2121	Semester 2
GEOS2922 **Urban Geography (Advanced)**	6	**P** 24 credit points of Junior units of study, including a distinction in one of: GEOS1001 or GEOS1901 or GEOS1002 or GEOS 1902 or GEOS1003 or GEOS1903 or ECOP1001 or ECOP1002 or GEOG1001 or GEOG1002 **N** GEOS2122	Semester 2
Senior units of study			
ENVI3111 **Environmental Law and Ethics**	6	**A** Intermediate Environmental Science. **P** 12 credit points of Intermediate Science or Agriculture units. **N** ENVI3001, ENVI3003.	Semester 1
ENVI3112 **Environmental Assessment**	6	**A** Intermediate Environmental Science. **P** 12 credit points of Intermediate Science or Agriculture units. **N** ENVI3002, ENVI3004.	Semester 2
ENVI3113 **Environmental Economics and Planning** *This unit of study is not available in 2009*	6	**A** Intermediate Environmental Science **P** 12 credit points of Intermediate Science or Agriculture units **N** ENVI3001 *Note: Department permission required for enrolment*	Semester 1
ENVI3114 **Energy and the Environment**	6	**A** Junior Physics or Intermediate Environmental Science. **P** 12 credit points of Intermediate Science or Agriculture units. **N** ENVI3001, PHYS3600.	Semester 2

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
GEOS3014 **GIS in Coastal Management**	6	**P** MARS(2005 or 2905) and MARS(2006 or 2906), or 12 credit points of Intermediate Geoscience* units, or (GEOS(2115 or 2915) and BIOL(2018 or 2918)) **N** GEOS3914, MARS3104. ** Geoscience is the disciplines of Geography, Geology and Geophysics.*	Semester 2
GEOS3018 **Rivers: Science, Policy and Management**	6	**P** (24 credit points of Intermediate units of study including 6 credit points of Intermediate Geography units of study) or ((MARS2005 or MARS2905) and (MARS2006 or MARS2906)) **N** GEOS3918	Semester 1
GEOS3511 **Understanding Australia's Regions** *This unit of study is not available in 2009*	6	**P** 24 credit points of Intermediate Units of study including 6 credit points of Intermediate Geography units of study - one of GEOG2311,GEOG2321, GEOG2411, GEOG2421, GEOG2511, GEOG2521, GEOS2111, GEOS2112, GEOS2113, GEOS2121, GEOS2122, GEOS2124, GEOS2911, GEOS2912, GEOS2921, GEOS2922, GEOS2924 **N** GEOS3911	Semester 1
GEOS3513 **Regional Development and Environment**	6	**P** 24 credit points of intermediate and/or senior units of study including 6 credit points of Intermediate units of study in Geography. **N** ENVI3113, GEOS3511, GEOS3911, GEOS3913	Semester 1
GEOS3913 **Regional Development & Environment (Adv)**	6	**P** 24 credit points of intermediate and/or senior units of study including 6 credit points of intermediate units of study in Geography with a grade of Credit or better **N** ENVI3113, GEOS3513, GEOS3911	Semester 1
GEOS3914 **GIS in Coastal Management (Advanced)**	6	**P** Distinction average in 12 credit points of intermediate geography or geology units or GEOS (2115 or 2915) and BIOL (2018 or 2918) Department permission required for enrolment. **N** GEOS3014, MARS3104 *Note: Department permission required for enrolment* *A distinction average in prior Geography, Geology or Marine Science units of study is normally required for admission. This requirement may be varied and students should consult the unit of study coordinator.*	Semester 2
GEOS3918 **Rivers: Science and Management (Adv)**	6	**P** Distinction average in (24 credit points of Intermediate units of study including 6 credit points of Intermediate Geography units of study) or ((MARS2005 or MARS2905) and (MARS2006 or MARS2906)) **N** GEOS3018	Semester 1
# Financial Mathematics and Statistics			
For a major in Financial Mathematics and Statistics, students are required to complete:			
Junior units of study			
At least 12 credit points of junior units of study from the Science Subject Area of Mathematics including:-			
(i) MATH (1001 or 1901) and MATH (1002 or 1902) and MATH (1003 or 1903) and MATH (1005 or 1905)			
MATH1001 **Differential Calculus**	3	**A** HSC Mathematics Extension 1 **N** MATH1011, MATH1901, MATH1906, MATH1111	Semester 1 Summer Main
MATH1901 **Differential Calculus (Advanced)**	3	**A** HSC Mathematics Extension 2 **P** HSC Mathematics Extension 2. This requirement may be varied. Students with an interest in mathematics, but without HSC mathematics Extension 2, should consult the unit of study coordinator. **N** MATH1111, MATH1011, MATH1001, MATH1906	Semester 1
MATH1002 **Linear Algebra**	3	**A** HSC Mathematics Extension 1 **N** MATH1902, MATH1012, MATH1014	Semester 1 Summer Main
MATH1902 **Linear Algebra (Advanced)**	3	**A** HSC Mathematics Extension 2 **P** HSC Mathematics Extension 2. This requirement may be varied. Students with an interest in mathematics, but without HSC mathematics Extension 2, should consult the unit of study coordinator. **N** MATH1002, MATH1012, MATH1014	Semester 1
MATH1003 **Integral Calculus and Modelling**	3	**A** HSC Mathematics Extension 2 or MATH1001 or MATH1111 **N** MATH1013, MATH1903, MATH1907	Semester 2 Summer Main
MATH1903 **Integral Calculus and Modelling Advanced**	3	**A** HSC Mathematics Extension 2 or Credit or better in MATH1001 or MATH1901 **P** HSC Mathematics Extension 2. This requirement may be varied. Students with an interest in mathematics, but without HSC mathematics Extension 2, should consult the unit of study coordinator. **N** MATH1003, MATH1013, MATH1907	Semester 2
MATH1005 **Statistics**	3	**A** HSC Mathematics **N** MATH1015, MATH1905, STAT1021, STAT1022, ECMT1010	Semester 2 Summer Main
MATH1905 **Statistics (Advanced)**	3	**A** HSC Mathematics Extension 2 **P** HSC Mathematics Extension 2. This requirement may be varied. Students with an interest in mathematics, but without HSC mathematics Extension 2, should consult the unit of study coordinator. **N** MATH1015, MATH1005, STAT1021, STAT1022, ECMT1010	Semester 2
Core intermediate units of study			
18 credit points from the following units of study:			
(i) MATH2070 or 2970); and			
(ii) STAT (2011 or 2911) and STAT (2012 or 2912)			
MATH2070 **Optimisation and Financial Mathematics**	6	**A** MATH (1003 or 1903 or 1907) **P** MATH (1001 or 1901 or 1906) and MATH (1002 or 1902) **N** MATH2010, MATH2033, MATH2933, MATH2970, ECMT3510 *Students may enrol in both MATH2070 and MATH3075 in the same semester*	Semester 2
MATH2970 **Optimisation & Financial Mathematics Adv**	6	**A** MATH (1903 or 1907) or Credit in MATH1003 **P** MATH (1901 or 1906 or Credit in 1001) and MATH (1902 or Credit in 1002) **N** MATH2010, MATH2033, MATH2933, MATH2070 *Students may enrol in both MATH2970 and MATH3975 in the same semester*	Semester 2
STAT2011 **Statistical Models**	6	**P** MATH (1001 or 1901 or 1906 or 1011) and [MATH (1005 or 1905 or 1015) or STAT1021] **N** STAT2901, STAT2001, STAT2911	Semester 1

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
STAT2911 **Probability and Statistical Models (Adv)**	6	**P** MATH (1903 or 1907 or Credit in 1003) and MATH (1905 or 1904 or Credit in 1005) **N** STAT2001, STAT2011, STAT2901	Semester 1
STAT2012 **Statistical Tests**	6	**P** MATH (1005 or 1905 or 1015) **N** STAT2004, STAT2912	Semester 2
STAT2912 **Statistical Tests (Advanced)**	6	**A** STAT (2911 or 2901) **P** MATH1905 or Credit in MATH1005 **N** STAT2004, STAT2012	Semester 2
Senior units of study			
At least 24 credit points comprising the following units of study:			
(i) MATH(3075 or 3975) and STAT(3011 or 3911) and STAT(3012 or 3912)			
MATH3075 **Financial Mathematics**	6	**P** 12 credit points of Intermediate Mathematics **N** MATH3975, MATH 3015, MATH3933	Semester 2
MATH3975 **Financial Mathematics (Advanced)**	6	**P** 12 credit points of Intermediate Mathematics with at least Credit average **N** MATH3933, MATH3015, MATH3075	Semester 2
STAT3011 **Stochastic Processes and Time Series**	6	**P** STAT (2011 or 2911 or 2001 or 2901) and MATH (1003 or 1903 or 1907). **N** STAT3911, STAT3003, STAT3903, STAT3005, STAT3905	Semester 1
STAT3911 **Stochastic Processes and Time Series Adv**	6	**P** (STAT2911 or credit in STAT2011) and MATH(1003 or 1903 or 1907). **N** STAT3011, STAT3003, STAT3903, STAT3005, STAT3905	Semester 1
STAT3012 **Applied Linear Methods**	6	**P** STAT(2012 or 2912 or 2004) and MATH(1002 or 1014 or 1902). **N** STAT3912, STAT3002, STAT3902, STAT3004, STAT3904	Semester 1
STAT3912 **Applied Linear Methods Advanced**	6	**P** (STAT2912 or Credit in STAT2004 or Credit in STAT2012) and MATH(2061 or 2961 or 1902). **N** STAT3012, STAT3002, STAT3902, STAT3004, STAT3904	Semester 1
(ii) One of the following units of study:- STAT(3013 or 3913), STAT(3014 or 3914), MATH(3078 or 3978), MATH(3076 or 3976), MATH3067 or INFO(3404 or 3504)			
STAT3013 **Statistical Inference**	6	**P** STAT(2012 or 2912 or 2003 or 2903) and STAT (2011 or 2911) **N** STAT3913, STAT3001, STAT3901	Semester 2
STAT3913 **Statistical Inference Advanced**	6	**P** STAT(2911 or 2903). **N** STAT3013, STAT3001, STAT3901	Semester 2
STAT3014 **Applied Statistics**	6	**A** STAT(3012 or 3912). **P** STAT(2012 or 2912 or 2004). **N** STAT3914, STAT3002, STAT3902, STAT3006	Semester 2
STAT3914 **Applied Statistics Advanced**	6	**A** STAT3912 **P** STAT2912 or credit or better in (STAT2004 or STAT2012). **N** STAT3014, STAT3002, STAT3902, STAT3006, STAT3907	Semester 2
MATH3078 **PDEs and Waves**	6	**A** MATH(2061/2961) and MATH(2065/2965) **P** 12 credit points of Intermediate Mathematics **N** MATH3978, MATH3018, MATH3921	Semester 2
MATH3978 **PDEs and Waves (Advanced)**	6	**A** MATH(2061/2961) and MATH(2065/2965) **P** 12 credit points of Intermediate Mathematics with at least Credit average **N** MATH3078, MATH3018, MATH3921	Semester 2
MATH3076 **Mathematical Computing**	6	**P** 12 credit points of Intermediate Mathematics and one of MATH(1001 or 1003 or 1901 or 1903 or 1906 or 1907) **N** MATH3976, MATH3016, MATH3916	Semester 1
MATH3976 **Mathematical Computing (Advanced)**	6	**P** 12 credit points of Intermediate Mathematics and one of MATH(1903 or 1907) or Credit in MATH1003 **N** MATH3076, MATH3016, MATH3916	Semester 1
MATH3067 **Information and Coding Theory** *This unit of study is not available in 2009*	6	**P** 12 credit points of Intermediate Mathematics **N** MATH3007, MATH3010	Semester 2
INFO3404 **Database Systems 2**	6	**A** Introductory database study such as INFO2120 or INFO2820 or INFO2005 or INFO2905. Students are expected to be familiar with SQL and the relational data model, and to have some programming experience. **N** INFO (3504 or 3005 or 3905) or COMP (3005 or 3905)	Semester 2
INFO3504 **Database Systems 2 (Adv)**	6	**P** Distinction-level result in INFO (2120 or 2820) or COMP (2007 or 2907) **N** INFO (3404 or 3005 or 3905) or COMP (3005 or 3905)	Semester 2
Geography			
For a major in Geography, the minimum requirement is 24 credit points from senior units of study listed below which must include GEOS3015 and GEOS3018 OR at least 12 credit points from the following units: GEOS3513, GEOS3514, GEOG3521 and GEOS3522			
Junior units of study			
GEOS1001 **Earth, Environment and Society**	6	**N** GEOS1901, GEOG1001, GEOG1002, GEOL1001, GEOL1002, GEOL1902	Semester 1
GEOS1002 **Introductory Geography**	6	**N** GEOS1902, GEOG1001, GEOG1002	Semester 2
GEOS1901 **Earth, Environment and Society Advanced**	6	**P** Departmental permission is required for enrolment. A UAI above 93 is normally required for admission. This requirement may be varied and students should consult the unit of study coordinator. **N** GEOS1001, GEOG1001, GEOG1002, GEOL1001, GEOL1002, GEOL1902 *Note: Department permission required for enrolment*	Semester 1

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
GEOS1902 **Introductory Geography (Advanced)**	6	**P** Departmental permission is required for enrolment. A UAI above 93 is normally required for admission. This requirement may be varied and students should consult the unit of study coordinator. **N** GEOS1002, GEOG1001, GEOG1002 *Note: Department permission required for enrolment*	Semester 2
Intermediate units of study			
GEOG2321 **Fluvial and Groundwater Geomorphology**	6	**P** GEOG(2311 or 2001) or 36 credit points of Junior study including GEOS1001 or GEOS1901 or GEOG1001 or ENVI (1001 or 1002) or GEOL (1001 or 1002 or 1501). Students in the Bachelor of Resource Economics should have 36 credit points of study in Biology (or Land and Water Science), Chemistry and Mathematics. Students in the Bachelor of Land and Water Science should have ENVI1002, 12 credit points of Chemistry, 6 credit points of Biology, BIOM1002. **N** GEOG (2002 or 2302 or 2303) or MARS2002 or MARS2006	Semester 2
GEOS2111 **Natural Hazards: a GIS Approach**	6	**P** 24 credit points of junior units of study including one of GEOS1001 or GEOS1002 or GEOS1003 or GEOG1001 or GEOG1002 or ENVI1002 or GEOL1001 or GEOL1002 or GEOS1902 or GEOL1501 or GEOS1901 or GEOS1903 **N** GEOG2411, GEOS2911	Semester 1
GEOS2112 **Economic Geography of Global Development**	6	**P** 24 credit points of Junior units of study, including GEOS1001 or GEOS1002 or GEOS1003 or GEOS1901 or GEOS1902 or GEOS1903 or ECOP1001 or ECOP1002 or GEOG1002 or GEOG1001 or GEOL1002 or GEOL1902 **N** GEOS2912, GEOG2511	Semester 1
GEOS2113 **Making the Australian Landscape**	6	**P** 24 credit points of Junior units of study, including GEOS1002 or GEOS1003 or GEOS1902 or GEOS1903 or GEOG1001 or ENVI1002 or GEOL1001 or GEOL1002 or GEOL1902 **N** GEOS2913	Semester 1
GEOS2115 **Oceans, Coasts and Climate Change**	6	**A** At least one of (GEOG1001, GEOL1001, GEOL1002, GEOS1003, GEOS1903, ENVI1002, GEOL1902, GEOL1501) **P** 48 credit points from Junior Units of Study **N** GEOS2915, MARS2006	Semester 1
GEOS2121 **Environmental and Resource Management**	6	**P** 24 credit points of junior units of study, including one of: GEOS1001 or GEOS1002 or GEOS1003 or GEOS1901 or GEOS1902 or GEOS1903 or ECOP1001 or ECOP1002 or GEOL1002 or GEOL1902 or GEOL1501 **N** GEOG2421, GEOL2202, GEOS2921	Semester 2
GEOS2122 **Urban Geography**	6	**P** 24 credit points of Junior units of study, including GEOS1001 or GEOS1002 or GEOS1003 or ECOP1001 or ECOP1002. **N** GEOS2922, GEOG2521	Semester 2
GEOS2124 **Fossils and Tectonics**	6	**P** 24 credit points of Junior units of study, including GEOS1003 or GEOS1903 or GEOL1002 or GEOL1902 or GEOL1501 **N** GEOS2924, GEOL2123, GEOL2124	Semester 2
GEOS2911 **Natural Hazards: a GIS Approach Advanced**	6	**P** 24 credit points of junior units of study including a distinction in one of GEOS1001 or GEOS1002 or GEOS1003 or GEOS1901 or GEOS1902 or GEOS1903 or GEOG1001 or GEOG1002 or ENVI1002 or GEOL1001 or GEOL1002 or GEOL1902 or GEOL1501 **N** GEOG2411, GEOS2111	Semester 1
GEOS2915 **Oceans, Coasts and Climate Change (Adv)**	6	**A** (GEOG1001, GEOL1001, GEOL1002, GEOS1003, GEOS1903, ENVI1002, GEOL1902, GEOL1501) **P** Distinction average in 48 credit points from Junior units of study **N** GEOS2115, MARS2006	Semester 1
GEOS2912 **Economic Geography of Global Dev. Adv.**	6	**P** 24 credit points of Junior units of study, including a distinction in one of: GEOS1001 or GEOS1901 or GEOS1002 or GEOS1902 or GEOS1003 or GEOS1903 or ECOP1001 or ECOP1002 or GEOG1001 or GEOG1002 or GEOL1002 or GEOL1902 or GEOL1501 **N** GEOS2112, GEOG2511	Semester 1
GEOS2921 **Environmental & Resource Management Adv**	6	**P** 24 credit points of Junior units of study, including a distinction in one of: GEOS1001 or GEOS1901 or GEOS1002 or GEOS1902 or GEOS1003 or GEOS1903 or ECOP1001 or ECOP1002 or GEOG1001 or GEOG1002 or GEOL1002 or GEOL1902 or GEOL1501. This requirement may be varied and students should consult the unit of study coordinator. **N** GEOG2421, GEOL2202, GEOS2121	Semester 2
GEOS2922 **Urban Geography (Advanced)**	6	**P** 24 credit points of Junior units of study, including a distinction in one of: GEOS1001 or GEOS1901 or GEOS1002 or GEOS 1902 or GEOS1003 or GEOS1903 or ECOP1001 or ECOP1002 or GEOG1001 or GEOG1002 **N** GEOS2122	Semester 2
GEOS2924 **Fossils and Tectonics (Advanced)**	6	**P** Distinction in GEOS1003 or Distinction average in 12 credit points of Junior Geoscience units (Geoscience is the disciplines of Geography, Geology and Geophysics) **N** GEOS2124, GEOL2123, GEOL2124	Semester 2
Senior units of study			
GEOS3009 **Coastal Environments & Processes**	6	**P** (6 credit points of Intermediate Geoscience* units) and (6 further credit points of Intermediate Geoscience or 6 credit points of Physics or Mathematics or Information Technology or Engineering units) or ((MARS2005 or MARS2905) and (MARS2006 or MARS2906)) **N** GEOS3909, MARS3003, MARS3105 ** Geoscience is the disciplines of Geography, Geology and Geophysics.*	Semester 1
GEOS3909 **Coastal Environments and Processes (Adv)**	6	**P** Distinction average in ((6 credit points of Intermediate Geoscience* units) and (6 further credit points of Intermediate Geoscience or 6 credit points of Physics, Mathematics, Information Technology or Engineering units) or ((MARS2005 or MARS2905) and (MARS2006 or MARS2906))) **N** GEOS3009, MARS3003, MARS3105 *A distinction average in prior Geography or Geology units is normally required for admission. This requirement may be varied and students should consult the unit of study coordinator.*	Semester 1
GEOS3015 **Environmental Geomorphology**	6	**A** Intermediate geomorphology/ physical geography/ geology. **P** 24 credit points of Intermediate units, including 6 credit points of Intermediate Geography. **N** GEOS3915	Semester 2
GEOS3915 **Environmental Geomorphology (Advanced)**	6	**P** Distinction average in 24 credit points of Intermediate units of study including 6 credit points of Intermediate Geography units of study. **N** GEOS3015 *Note: Department permission required for enrolment*	Semester 2

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
GEOS3014 **GIS in Coastal Management**	6	**P** MARS(2005 or 2905) and MARS(2006 or 2906), or 12 credit points of Intermediate Geoscience* units, or (GEOS(2115 or 2915) and BIOL(2018 or 2918)) **N** GEOS3914, MARS3104. ** Geoscience is the disciplines of Geography, Geology and Geophysics.*	Semester 2
GEOS3914 **GIS in Coastal Management (Advanced)**	6	**P** Distinction average in 12 credit points of intermediate geography or geology units or GEOS (2115 or 2915) and BIOL (2018 or 2918) Department permission required for enrolment. **N** GEOS3014, MARS3104 *Note: Department permission required for enrolment* *A distinction average in prior Geography, Geology or Marine Science units of study is normally required for admission. This requirement may be varied and students should consult the unit of study coordinator.*	Semester 2
GEOS3018 **Rivers: Science, Policy and Management**	6	**P** (24 credit points of Intermediate units of study including 6 credit points of Intermediate Geography units of study) or ((MARS2005 or MARS2905) and (MARS2006 or MARS2906)) **N** GEOS3918	Semester 1
GEOS3918 **Rivers: Science and Management (Adv)**	6	**P** Distinction average in (24 credit points of Intermediate units of study including 6 credit points of Intermediate Geography units of study) or ((MARS2005 or MARS2905) and (MARS2006 or MARS2906)) **N** GEOS3018	Semester 1
GEOS3053 **Asia-Pacific Field School-Assessment A**	6	**P** 6 credit points of Intermediate units of study in Geography. Department permission is required for enrolment. **C** GEOS3054 **N** GEOG3201, GEOS3953 *Note: Department permission required for enrolment* *Students must contact the unit coordinator no later than the end of May in the year before taking this Unit.*	S1 Intensive
GEOS3953 **Asia-Pacific Field School-A (Adv)**	6	**P** Distinction average in 24 credit points of Intermediate units of study including 6 credit points of Intermediate Geography units of study. Department permission required for enrolment. **C** GEOS3954 **N** GEOS3053 *Note: Department permission required for enrolment* *Students must contact the unit coordinator no later than the end of May in the year before taking this Unit.*	S1 Intensive
GEOS3054 **Asia-Pacific Field School-Assessment B**	6	**P** 6 credit points of Intermediate units of study in Geography. Department permission required for enrolment. **C** GEOS3053 **N** GEOG3201, GEOS3954 *Note: Department permission required for enrolment* *Students must contact the unit coordinator no later than the end of May in the year before taking this Unit.*	S1 Intensive
GEOS3954 **Asia-Pacific Field School-B (Adv)**	6	**P** Distinction average in 24 credit points of Intermediate units of study including 6 credit points of Intermediate Geography units of study. Department permission required for enrolment. **C** GEOS3953 **N** GEOS3054 *Note: Department permission required for enrolment* *Students must contact the unit coordinator no later than the end of May in the year before taking this Unit.*	S1 Intensive
GEOS3522 **Cities and Citizenship**	6	**P** 6 credit points of intermediate geography. **N** GEOG3203, GEOS3922	Semester 2
GEOS3922 **Cities and Citizenship (Advanced)**	6	**P** Distinction average in 24 credit points of Intermediate Units of study including 6 credit points of Intermediate Geography units of study. **N** GEOS3522	Semester 2
GEOG3521 **Sustainable Cities**	6	**P** 24 credit points of Intermediate Units of study including 6 credit points of Intermediate Geography units of study. **N** GEOG3921, GEOG3202	Semester 2
GEOG3921 **Sustainable Cities (Adv)**	6	**P** Distinction average 24 credit points of Intermediate Units of study including 6 credit points of Intermediate Geography units of study. **N** GEOG3521, GEOG3202	Semester 2
GEOS3911 **Understanding Australia's Regions (Adv)** *This unit of study is not available in 2009*	6	**P** Distinction average in 24 credit points of Intermediate Units of study including 6 credit points of Intermediate Geography units of study - one of GEOG2311,GEOG2321, GEOG2411, GEOG2411, GEOG2421, GEOG2511, GEOG2521, GEOS2111, GEOS2112, GEOS2113, GEOS2121, GEOS2122, GEOS2124, GEOS2911, GEOS2912, GEOS2921, GEOS2922, GEOS2924 **N** GEOS3511 *Note: Department permission required for enrolment*	Semester 1
Geology & Geophysics			
For a major in Geology & Geophysics, the minimum requirement is 24 credit points from Senior units listed in this subject area, which must include GEOS(3008 or 3908) and GEOS(3101 or 3801)			
GEOS1001 **Earth, Environment and Society**	6	**N** GEOS1901, GEOG1001, GEOG1002, GEOL1001, GEOL1002, GEOL1902	Semester 1
GEOS1003 **Introduction to Geology**	6	**N** GEOS1903, GEOL1002, GEOL1902	Semester 2
GEOS1901 **Earth, Environment and Society Advanced**	6	**P** Departmental permission is required for enrolment. A UAI above 93 is normally required for admission. This requirement may be varied and students should consult the unit of study coordinator. **N** GEOS1001, GEOG1001, GEOG1002, GEOL1001, GEOL1002, GEOL1902 *Note: Department permission required for enrolment*	Semester 1
GEOS1903 **Introduction to Geology (Advanced)**	6	**P** Departmental permission is required for enrolment. A UAI above 93 is normally required for admission. This requirement may be varied and students should consult the unit of study coordinator. **N** GEOL1002, GEOL1902, GEOS1003 *Note: Department permission required for enrolment*	Semester 2

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
Intermediate units			
GEOS2111 **Natural Hazards: a GIS Approach**	6	**P** 24 credit points of junior units of study including one of GEOS1001 or GEOS1002 or GEOS1003 or GEOG1001 or GEOG1002 or ENVI1002 or GEOL1001 or GEOL1002 or GEOS1902 or GEOL1501 or GEOS1901 or GEOS1903 **N** GEOG2411, GEOS2911	Semester 1
GEOS2112 **Economic Geography of Global Development**	6	**P** 24 credit points of Junior units of study, including GEOS1001 or GEOS1002 or GEOS1003 or GEOS1901 or GEOS1902 or GEOS1903 or ECOP1001 or ECOP1002 or GEOG1002 or GEOG1001 or GEOL1002 or GEOL1902 **N** GEOS2912, GEOG2511	Semester 1
GEOS2114 **Volcanoes, Hot Rocks and Minerals**	6	**P** One of (GEOG1001, GEOL1001, GEOL1002, GEOS1003, GEOS1903, ENVI1002, GEOL1902, GEOL1501) and 24 credit points of Junior Science units of study. **N** GEOL2111, GEOL2911, GEOS2914	Semester 1
GEOS2121 **Environmental and Resource Management**	6	**P** 24 credit points of junior units of study, including one of: GEOS1001 or GEOS1002 or GEOS1003 or GEOS1901 or GEOS1902 or GEOS1903 or ECOP1001 or ECOP1002 or GEOL1002 or GEOL1902 or GEOL1501 **N** GEOG2421, GEOL2202, GEOS2921	Semester 2
GEOS2124 **Fossils and Tectonics**	6	**P** 24 credit points of Junior units of study, including GEOS1003 or GEOS1903 or GEOL1002 or GEOL1902 or GEOL1501 **N** GEOS2924, GEOL2123, GEOL2124	Semester 2
GEOS2115 **Oceans, Coasts and Climate Change**	6	**A** At least one of (GEOG1001, GEOL1001, GEOL1002, GEOS1003, GEOS1903, ENVI1002, GEOL1902, GEOL1501) **P** 48 credit points from Junior Units of Study **N** GEOS2915, MARS2006	Semester 1
GEOS2911 **Natural Hazards: a GIS Approach Advanced**	6	**P** 24 credit points of junior units of study including a distinction in one of GEOS1001 or GEOS1002 or GEOS1003 or GEOS1901 or GEOS1902 or GEOS1903 or GEOG1001 or GEOG1002 or ENVI1002 or GEOL1001 or GEOL1002 or GEOL1902 or GEOL1501 **N** GEOG2411, GEOS2111	Semester 1
GEOS2912 **Economic Geography of Global Dev. Adv.**	6	**P** 24 credit points of Junior units of study, including a distinction in one of: GEOS1001 or GEOS1901 or GEOS1002 or GEOS1902 or GEOS1003 or GEOS1903 or ECOP1001 or ECOP1002 or GEOG1001 or GEOG1002 or GEOL1002 or GEOL1902 or GEOL1501 **N** GEOS2112, GEOG2511	Semester 1
GEOS2914 **Volcanoes, Hot Rocks and Minerals Adv**	6	**P** 24 credit points of Junior Science units of study and Distinction in one of GEOL1002 or GEOS1002 or ENVI1002 or GEOL1501 or GEOL1902 or GEOS1003 or GEOS1903.This requirement may be varied and students should consult the unit of study coordinator. **N** GEOL2001, GEOS2114	Semester 1
GEOS2921 **Environmental & Resource Management Adv**	6	**P** 24 credit points of Junior units of study, including a distinction in one of: GEOS1001 or GEOS1901 or GEOS1002 or GEOS1902 or GEOS1003 or GEOS1903 or ECOP1001 or ECOP1002 or GEOG1001 or GEOG1002 or GEOL1002 or GEOL1902 or GEOL1501. This requirement may be varied and students should consult the unit of study coordinator. **N** GEOG2421, GEOL2202, GEOS2121	Semester 2
GEOS2924 **Fossils and Tectonics (Advanced)**	6	**P** Distinction in GEOS1003 or Distinction average in 12 credit points of Junior Geoscience units (Geoscience is the disciplines of Geography, Geology and Geophysics) **N** GEOS2124, GEOL2123, GEOL2124	Semester 2
Senior units of study			
GEOS3008 **Field Geology and Geophysics**	6	**P** 12 credit points of Intermediate GEOS units **N** GEOL3103, GEOS3908	Semester 2
GEOS3101 **Earth's Structure and Evolution**	6	**A** GEOS2114, GEOS2124 **P** GEOS(2114 or 2914) and GEOS(2124 or 2924); or 24 credit points of Intermediate Science units of study and GEOS1003 with permission of the Head of School **N** GEOS(3801 and 3003 and 3903 and 3004 and 3904 and 3006 and 3906 and 3017 and 3917)	Semester 1
GEOS3102 **Global Energy and Resources**	6	**A** GEOS 2114 and GEOS2124 **P** GEOS(2114 or 2914) and GEOS(2124 or 2924); or 24 credit points of Intermediate Science units of study and GEOS1003 with permission of the Head of School **N** GEOS3802, 3003, 3903, 3004, 3904, 3006,3906, 3017 and 3917	Semester 1
GEOS3103 **Environmental & Sedimentary Geology**	6	**A** GEOS1003, GEOS2124 **P** GEOS(2124 or 2924) and GEOS(2111 or 2911 or 2114 or 2914 or 2113 or 2913); or GEOS(1003 or 1903) and 24 credit points of intermediate Science units of study with permission of the Head of School **N** GEOS3803	Semester 2
GEOS3104 **Geophysical Methods**	6	**A** GEOS2114 and GEOS2124 **P** 24 credit points of intermediate Science units of study or (GEOS(2114, 2914) and GEOS(2124, 2924)) **N** GEOS3804, GEOS3003, GEOS 3903, GEOS3006, GEOS3906, GEOS3016, GEOS3916, GEOS3017, GEOS3917	Semester 2
GEOS3908 **Field Geology and Geophysics (Advanced)**	6	**P** Distinction average in 12 credit points of Intermediate GEOS units. Department permission required for enrolment. **N** GEOS3008 *Note: Department permission required for enrolment* *A Distinction average in prior Geology units of study is normally required for admission. This requirement may be varied and students should consult the unit of study coordinator.*	Semester 2
GEOS3801 **Earth's Structure and Evolutions (Adv)**	6	**A** GEOS2114, GEOS2124 **P** Distinctions in GEOS(2114 or 2914) and GEOS(2124 or 2924); Students who have a credit average for all Geoscience units may enrol in this unit with the permission of the Head of School **N** GEOS3101, GEOS3003, GEOS3903, GEOS3004, GEOS3904, GEOS3006, GEOS3906, GEOS3017 and GEOS3917	Semester 1
GEOS3802 **Global Energy and Resources (Adv)**	6	**A** GEOS2114 and GEOS2124 **P** Distinction in GEOS(2114 or 2914) and GEOS(2124 or 2924); Students who have a credit average for all Geoscience units may enrol in this unit with the permission of the Head of School. **N** GEOS3102, GEOS3003, GEOS3903, GEOS3004, GEOS3904, GEOS3006, GEOS3906, GEOS3017, and GEOS3917	Semester 1

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
GEOS3803 **Environmental & Sedimentary Geology(Adv)**	6	**A** GEOS1003, GEOS2124 **P** Distinctions in GEOS(2114 or 2914) and GEOS(2124 or 2924); Students who have a credit average for all Geoscience units may enrol in this unit with permission of the Head of School **N** GEOS3103	Semester 2
GEOS3804 **Geophysical Methods (Advanced)**	6	**P** Distinction in GEOS2114 or GEOS2914 and GEOS2124 or GEOS2924; Students who have a credit average for all Geoscience units may enrol in this unit with the permission of the Head of School **N** GEOS3104, GEOS3003, GEOS3903, GEOS3006, GEOS3906, GEOS3016, GEOS3916, GEOS3017, GEOS3917	Semester 2
History and Philosophy of Science			
For a major in History and Philosophy of Science, the minimum requirement is 24 credit points from senior units of study listed in this subject area. Students must include the core unit of HPSC3022 Science and Society (6cp) or HPSC3003 social Relations of Science (4cp)(last offered in 2003 and now superceded by HPSC3022)			
Junior units of study			
HPSC1000 **Bioethics**	6	**N** HPSC1900 *This Junior unit of study is highly recommended to Intermediate and Senior Life Sciences students.*	Semester 1
HPSC1900 **Bioethics (Advanced)**	6	**N** HPSC1000 *Note: Department permission required for enrolment*	Semester 1
Intermediate units of study			
HPSC2100 **The Birth of Modern Science**	6	**P** 24 credit points of Junior units of study **N** HPSC2002, HPSC2900	Semester 1
HPSC2900 **The Birth of Modern Science (Advanced)**	6	**P** Enrolment in the Talented Student Program or 24 credit points of Junior study with a Distinction average **N** HPSC2002, HPSC2100 *Note: Department permission required for enrolment*	Semester 1
HPSC2101 **What Is This Thing Called Science?**	6	**P** 24 credit points of Junior units of study **N** HPSC2001, HPSC2901	Semester 2 Summer Main
HPSC2901 **What Is This Thing Called Science? (Adv)**	6	**P** Enrolment in the Talented Student Program or 24 credit points of Junior study with a Distinction average **N** HPSC2002, HPSC2100 *Note: Department permission required for enrolment*	Semester 2
Senior units of study			
HPSC3002 **History of Biological/Medical Sciences**	6	**A** HPSC (2001 and 2002) or HPSC (2100 and 2101) **P** At least 12 credit points of Intermediate HPSC units or Credit or better in at least 6 credit points of Intermediate HPSC units, and at least 24 credit points of Intermediate or Senior units	Semester 2
HPSC3016 **The Scientific Revolution**	6	**A** HPSC (2100 and 2101) or HPSC (2001 and 2002) **P** At least 12 credit points of Intermediate HPSC units or Credit or better in at least 6 credit points of Intermediate HPSC units, and at least 24 credit points of Intermediate or Senior units. **N** HPSC3001, HPSC3106 *This unit will not be offered every year.*	Semester 2
HPSC3021 **Philosophy and Sociology of Biology**	6	**A** HPSC (2100 and 2101) or HPSC (2001 and 2002). **P** At least 12 credit points of Intermediate HPSC units or Credit or better in at least 6 credit points of Intermediate HPSC units, and at least 24 credit points of Intermediate or Senior units. **N** HPSC3103	Semester 1
HPSC3022 **Science and Society**	6	**A** HPSC (2100 and 2101) or HPSC (2001 and 2002). **P** At least 12 credit points of Intermediate HPSC units or Credit or better in at least 6 credit points of Intermediate HPSC units, and at least 24 credit points of Intermediate or Senior units. **N** HPSC3003 *This unit is a requirement for HPS majors.*	Semester 1
HPSC3023 **Psychology & Psychiatry: History & Phil**	6	**A** Basic knowledge about the history of modern science as taught in HPSC2100 AND the principles of philosophy of science as taught in HPSC2101 OR knowledge of the various sub-disciplines within Psychology. **P** (at least 12 credit points of intermediate HPSC Units of study) OR (a CR or above in one HPSC intermediate Unit of Study) OR (12 intermediate credit points in psychology). **N** PSYC3202	Semester 1
HPSC3024 **Science and Ethics**	6	**P** At least 24 credit points of Intermediate or Senior units of study **N** HPSC3007 *This unit will not be offered every year.*	Semester 2
Immunobiology			
For a major in Immunobiology, the minimum requirement is 24 credit points comprising:			
(i) IMMU3102 Cellular and Molecular Immunology and IMMU3202 Immunology in Human Disease; and			
(ii) a minimum of 12 credit points from the following senior elective units of study: BCHM 3071/3971, BCHM 3081/3981, BCHM3072/3972, BCHM 3082/3982, BIOL3018/3918, BIOL3026/3926, BIOL3027/3927, CPAT3201, CPAT3202, MICR 3011/3911/PHSI3005/3905, PHSI 3006/3906, VIRO3001/3901, VIRO3002			
Intermediate units of study			
The completion of MBLG(2001 or 2101 or 2901) is highly recommended.			
IMMU2101 **Introductory Immunology**	6	**A** Junior Biology and Junior Chemistry. **P** 24 credit points of Junior units of study from any of the Science discipline areas. **N** IMMU2001, BMED2506, BMED2807 *This is a prerequisite unit of study for IMMU3102 and IMMU3202. The completion of 6 credit points of MBLG units of study is highly recommended.*	Semester 1

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
Senior core units of study			
IMMU3102 **Molecular and Cellular Immunology**	6	**A** Intermediate biochemistry and molecular biology and genetics. **P** BMED2807 or BMED2506 or IMMU2101 or IMMU2001 and 6cp of Intermediate units of study from Biochemistry or Biology or Microbiology or Molecular Biology and Genetics or Pharmacology or Physiology. **N** IMMU3002, BMED3003 *The completion of 6 CP of MBLG units of study is highly recommended. Concurrent study of IMMU3202 Immunology in Human Disease is strongly recommended.*	Semester 2
IMMU3202 **Immunology in Human Disease**	6	**A** Intermediate biochemistry and molecular biology and genetics. **P** BMED2807 or BMED2506 or IMMU2101 or IMMU2001 and 6cp of Intermediate units of study from Biochemistry, or Biology or Microbiology or Molecular Biology and Genetics or Pharmacology or Physiology. **N** IMMU3002, BMED3003 *The completion of 6CP of MBLG units of study is highly recommended. Concurrent study of IMMU3102 Molecular and Cellular Immunology is very strongly recommended.*	Semester 2
Senior elective units of study			
BCHM3071 **Molecular Biology & Biochemistry-Genes**	6	**P** MBLG (1001 or 1901) and 12 CP of Intermediate BCHM/MBLG units (taken from MBLG2071/2971 or BCHM2071/2971 or BCHM2072/2972) or 42CP of Intermediate BMedSc units, including BMED2802 and BMED2804. **N** BCHM3971, BCHM3001, BCHM3901	Semester 1
BCHM3971 **Molecular Biology & Biochem- Genes (Adv)**	6	**P** MBLG (1001 or 1901) and Distinction in 12 CP of Intermediate BCHM/MBLG units (taken from MBLG2071/2971 or BCHM2071/2971 or BCHM2072/2972) or 42CP of Intermediate BMedSc units, with Distinction in BMED2802 and BMED2804. **N** BCHM3071, BCHM3001, BCHM3901	Semester 1
BCHM3081 **Mol Biology & Biochemistry- Proteins**	6	**P** MBLG (1001 or 1901) and 12 CP of Intermediate BCHM/MBLG units (taken from MBLG2071/2971 or BCHM2071/2971 or BCHM2072/2972) or 42CP of Intermediate BMedSc units, including BMED2802 and BMED2804. **N** BCHM3981, BCHM3001, BCHM3901	Semester 1
BCHM3981 **Mol Biology & Biochemistry- Proteins Adv**	6	**P** MBLG (1001 or 1901) and Distinction in12 CP of Intermediate BCHM/MBLG units (taken from MBLG2071/2971 or BCHM2071/2971 or BCHM2072/2972) or 42CP of Intermediate BMedSc units, with Distinction in BMED2802 and BMED2804. **N** BCHM3081, BCHM3001, BCHM3901	Semester 1
BCHM3072 **Human Molecular Cell Biology**	6	**P** (MBLG (1001 or 1901) and 12 CP of Intermediate BCHM/MBLG units (taken from MBLG2071/MBLG2971or BCHM2071/2971 or BCHM2072/2972)) or (42CP of Intermediate BMedSc units, including BMED2802 and BMED2804) **N** BCHM3972, BCHM3002, BCHM3902, BCHM3004, BCHM3904 *BExSci/BSc(Nutrition) students successfully progressing though the combined degree meet the pre-requisites for this unit of study*	Semester 2
BCHM3972 **Human Molecular Cell Biology (Advanced)**	6	**P** MBLG (1001 or 1901) and Distinction in 12 CP of Intermediate BCHM/MBLG units (taken from MBLG2071/MBLG2971 or BCHM2071/2971 or BCHM2072/2972) or 42CP of Intermediate BMedSc units, with Distinction in BMED2802 and BMED2804. **C** MBLG3999 **N** BCHM3072, BCHM3002, BCHM3004, BCHM3902, BCHM3904	Semester 2
BCHM3082 **Medical and Metabolic Biochemistry**	6	**P** MBLG (1001 or 1901) and 12 CP of Intermediate BCHM/MBLG units (taken from MBLG2071/2971 or BCHM2071/2971 or BCHM2072/2972) or 42CP of Intermediate BMedSc units, including BMED2802 and BMED2804. **N** BCHM3982, BCHM3002, BCHM3004, BCHM3902, BCHM3904 *BExSci/BSc(Nutrition) students successfully progressing though the combined degree meet the pre-requisites for this unit of study*	Semester 2
BCHM3982 **Medical and Metabolic Biochemistry (Adv)**	6	**P** MBLG (1001 or 1901) and Distinction in 12 CP of Intermediate BCHM/MBLG units (taken from MBLG2071/2971 or BCHM2071/2971 or BCHM2072/2972) or 42CP of Intermediate BMedSc units, with Distinction in BMED2802 and BMED2804. **N** BCHM3082, BCHM3002, BCHM3004, BCHM3902, BCHM3904	Semester 2
BIOL3018 **Applications of Recombinant DNA Tech**	6	**P** 12 credit points from MBLG (2071/297), MBLG (2072/2972) and Intermediate Biology units. For BMedSc students: 36 credit points of Intermediate BMED units including BMED 2802. **N** BIOL3918	Semester 1
BIOL3918 **Applications of Recombinant DNA Tech Adv**	6	**P** Distinction average in 12 credit points from MBLG (2071/2971), MBLG (2072/2972) and Intermediate Biology units. For BMedSc students: 36 credit points of Intermediate BMED units including Distinction in BMED2802. **N** BIOL3018	Semester 1
BIOL3026 **Developmental Genetics**	6	**P** 12 credit points from MBLG (2071/2971) and MBLG (2072/2972). For BMedSc students: 36 credit points of Intermediate BMED units including BMED2802. **N** BIOL3926	Semester 2
BIOL3926 **Developmental Genetics (Advanced)**	6	**P** Distinction average in 12 credit points from MBLG (2071/2971), and MBLG (2072/2972). For BMedSc students: 36 credit points of Intermediate BMED units including Distinction in BMED2802. **N** BIOL3026	Semester 2
BIOL3027 **Bioinformatics and Genomics**	6	**P** 12 credit points from MBLG (2071/2971), MBLG (2072/2972) and Intermediate Biology units. For BMedSc students: 36 credit points of Intermediate BMED units including BMED 2802. **N** BIOL3927	Semester 1
BIOL3927 **Bioinformatics and Genomics (Advanced)**	6	**P** Distinction average in 12 credit points from MBLG (2071/2971), MBLG (2072/2972) and Intermediate Biology units. For BMedSc students: 36 credit points of Intermediate BMED units including Distinction in BMED2802. **N** BIOL3027	Semester 1
CPAT3201 **Pathogenesis of Human Disease 1**	6	**P** At least 6cp intermediate of one of the following: ANAT or BCHM or MBLG or BIOL or HPSC or MICR or PCOL or PHSI, or as the head of department determines.	Semester 2
CPAT3202 **Pathogenesis of Human Disease 2**	6	**P** At least 6cp intermediate of one of the following: ANAT or BCHM or MBLG or BIOL or HPSC or MICR or PCOL or PHSI, or as the head of department determines. **C** CPAT3201	Semester 2
MICR3011 **Microbes in Infection**	6	**P** At least 6 credit points of MBLG units and MICR (2022 or 2922 or 2002 or 2902). For BMedSc students: 42 credit points of Intermediate BMED units including BMED (2807 and 2808). For BScAgr students: PLNT (2001 or 2901) and MICR (2022 or 2922). **N** MICR3911, MICR3001, MICR3901	Semester 1

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
MICR3911 **Microbes in Infection (Advanced)**	6	**P** At least 6 credit points of MBLG units and Distinction in MICR (2022 or 2922 or 2002 or 2902). For BMedSc students: 42 credit points of Intermediate BMED units including in BMED (2807 or 2808) with a Distinction in one of these two. For BScAgr students: PLNT (2001 or 2901) and MICR (2022 or 2922) including one Distinction. **N** MICR3011, MICR3001, MICR3901	Semester 1
PHSI3005 **Human Cellular Physiology: Theory**	6	**A** 6 credit points of MBLG **P** Except for BMedSc students: PHSI(2005 or 2905) and PHSI(2006 or 2906) For BMedSc: BMED (2801 and 2802). **N** PHSI3905, PHSI3004, PHSI3904 *It is highly recommended that this unit of study be taken in conjunction with PHSI3006.*	Semester 1
PHSI3905 **Human Cellular Physiology (Adv): Theory**	6	**A** 6 credit points of MBLG **P** Credit average in PHSI(2005 or 2905) and PHSI(2006 or 2906) or in BMED (2801 and 2802). Students enrolling in this unit should have a WAM of at least 70. **N** PHSI3005, PHSI3004, PHSI3904 *Note: Department permission required for enrolment* *It is highly recommended that this unit of study be taken in combination with PHSI3906*	Semester 1
PHSI3006 **Human Cellular Physiology: Research**	6	**P** Except for BMedSc students: PHSI (2005 or 2905) and PHSI(2006 or 2906) For BMedSc: BMED (2801 and 2802). **C** PHSI3005 **N** PHSI3906, PHSI3004, PHSI3904	Semester 1
PHSI3906 **Human Cellular Physiology (Ad): Research**	6	**A** 6 credit points of MBLG **P** PHSI (2005 or 2905) and PHSI(2006 or 2906) or in BMED (2801 and 2802). Students enroling in this unit should have a WAM of at least 70. **C** PHSI3905 **N** PHSI3006, PHSI3004, PHSI3904 *Note: Department permission required for enrolment*	Semester 1
VIRO3001 **Virology**	6	**A** MICR (2021 or 2921 or 2022 or 2922) **P** At least 6 credit points of MBLG units and at least 6 credit points in Intermediate MICR or BCHM or BIOL or IMMU or PCOL or PHSI or PLNT units. For BMedSc students: 42 credit points of Intermediate BMED units including BMED2802. For BScAgr students: PLNT (2001 or 2901) and MICR2024. **N** VIRO3901 *Students are very strongly advised to complete VIRO (3001 or 3901) before enrolling in VIRO3002 Medical and Applied Virology in Session 2.*	Semester 1
VIRO3901 **Virology (Advanced)**	6	**A** MICR (2021 or 2921 or 2022 or 2922) **P** At least 6 credit points of MBLG units and at least 6 credit points including one Distinction in Intermediate MICR or BCHM or BIOL or IMMU or PCOL or PHSI or PLNT units. For BMedSc students: 42 credit points of Intermediate BMED units including Distinction in BMED2802. For BScAgr students: PLNT (2001 or 2901) and MICR2024 including one Distinction. **N** VIRO3001 *Students are very strongly advised to complete VIRO (3001 or 3901) before enrolling in VIRO3002 Medical and Applied Virology in Session 2.*	Semester 1
VIRO3002 **Medical and Applied Virology**	6	**A** Intermediate microbiology, immunology, molecular biology and genetics. **P** 6 CP MBLG units and at least 6 CP from Intermediate MICR or BCHM or BIOL or IMMU or PCOL or PHSI units. For BMedSc Students: 42 credit points of Intermediate BMED units including BMED2807. *Students are very strongly recommended to complete VIRO(3001 or 3901) before enrolling in VIRO3002 Medical and Applied Virology in Semester 2.*	Semester 2

Information Systems

For a major in Information Systems, the minimum requirement is 24 credit points chosen from the senior units of study listed for this subject area including INFO3402, ISYS3401, and ISYS3400. Students are also required to complete the following intermediate units: INFO2110, INFO2120/2820 and ISYS2140.

Students enrolled in non-IT degrees or majors are eligible (upon application) for a Minor in Information Technology if they complete at least 18 credit points of intermediate or above units of study offered by the School of IT, within a completed degree. For further information, please refer to: http://www.it.usyd.edu.au/future_students/undergrad/minor.shtml

Junior units of study

INFO1003 **Foundations of Information Technology**	6	**N** INFO (1903 or 1000) or INFS1000	Semester 1 Semester 2
INFO1103 **Introduction to Programming**	6	**A** HSC Mathematics **N** INFO1903 or SOFT (1001 or 1901) or COMP (1001 or 1901) or DECO2011	Semester 1 Semester 2
INFO1903 **Informatics (Advanced)**	6	**A** HSC Mathematics **P** UAI sufficient to enter BCST(Adv), BIT or BSc(Adv), or portfolio of work suitable for entry **N** INFO1003, INFO1103 *Note: Department permission required for enrolment*	Semester 1
INFO1105 **Data Structures**	6	**A** Programming, as for INFO1103 **N** INFO1905 or SOFT (1002 or 1902) or COMP (1002 or 1902 or 2160 or 2860 or 2111 or 2811 or 2002 or 2902)	Semester 2
INFO1905 **Data Structures (Advanced)**	6	**P** Distinction-level performance in INFO1103 or INFO1903 or SOFT1001 or SOFT1901. **N** INFO1105 or SOFT (1002 or 1902) or COMP (1002 or 1902)	Semester 2

Intermediate units of study

COMP2007 **Algorithms and Complexity**	6	**A** INFO1105, MATH1004 or MATH1904Discrete Maths **N** COMP (2907 or 3309 or 3609 or 3111 or 3811)	Semester 2
COMP2907 **Algorithms and Complexity (Advanced)**	6	**P** Distinction level result in INFO (1105 or 1905) or SOFT (1002 or 1902) **N** COMP (2007 or 3309 or 3609 or 3111 or 3811)	Semester 2
COMP2129 **Operating Systems and Machine Principles**	6	**A** Programming, as from INFO1103 **N** SOFT (2130 or 2830 or 2004 or 2904) or COMP (2004 or 2904)	Semester 1
INFO2110 **Systems Analysis and Modelling**	6	**A** Experience with a data model as in INFO1003 or INFO1103 or INFS1000 **N** INFO (2810 or 2000 or 2900)	Semester 2

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
INFO2120 **Database Systems 1**	6	**A** Some exposure to programming and some familiarity with data model concepts such as taught in INFO1103 or INFO1003 or INFS1000 or INFO1903 **N** INFO (2820 or 2005 or 2905)	Semester 1
INFO2820 **Database Systems 1 (Advanced)**	6	**P** Distinction-level result in INFO (1003 or 1103 or 1903 or 1105 or 1905) or SOFT (1001 or 1901 or 1002 or 1902) **N** INFO (2120 or 2005 or 2905)	Semester 1
INFO2315 **Introduction to IT Security**	6	**A** Computer literacy **N** NETS (3305 or 3605 or 3016 or 3916) or ELEC (5610 or 5616)	Semester 2
ISYS2140 **Information Systems**	6	**A** INFO1003 or INFS1000 **N** ISYS (2006 or 2007)	Semester 1
Senior units of study			
ELEC3610 **E-Business Analysis and Design**	6	**P** INFO2120 **N** EBUS3003 E-Business System Design, EBUS3001 Introduction to e-Commerce Systems	Semester 1
INFO3220 **Object Oriented Design**	6	**A** INFO2110, INFO1105 **N** SOFT (3301 or 3601 or 3101 or 3801) or COMP (3008 or 3908)	Semester 1
INFO3315 **Human-Computer Interaction**	6	**A** INFO2110 **N** MULT (3307 or 3607 or 3018 or 3918) or SOFT (3102 or 3802) or COMP (3102 or 3802)	Semester 2
INFO3402 **Management of IT Projects and Systems**	6	**A** INFO (2000 or 2110 or 2810 or 2900) **N** ISYS (3000 or 3012) or ELEC3606	Semester 1
INFO3404 **Database Systems 2**	6	**A** Introductory database study such as INFO2120 or INFO2820 or INFO2005 or INFO2905. Students are expected to be familiar with SQL and the relational data model, and to have some programming experience. **N** INFO (3504 or 3005 or 3905) or COMP (3005 or 3905)	Semester 2
INFO3504 **Database Systems 2 (Adv)**	6	**P** Distinction-level result in INFO (2120 or 2820) or COMP (2007 or 2907) **N** INFO (3404 or 3005 or 3905) or COMP (3005 or 3905)	Semester 2
INFO3600 **Major Development Project (Advanced)**	12	**P** INFO3402 **N** COMP3615 or ISYS3400 or SOFT (3300 or 3600 or 3200 or 3700) *Only available to students in BIT, BCST(Adv) or BSc(Adv)*	Semester 2
ISYS3400 **Information Systems Project**	6	**A** INFO2120 **P** (INFO3402 or ISYS3012) and (ISYS3401 or ISYS3015) **N** INFO3600 or ISYS3207	Semester 2
ISYS3401 **Analytical Methods & Information Systems**	6	**A** INFO2110, ISYS2140 **N** ISYS3015	Semester 1
Marine Biology			
For a major in Marine Biology, the minimum requirement is 24 credit points from senior units listed in this subject area. Intermediate units leading to a major in Marine Biology are 12 credit points of intermediate BIOL units that include BIOL2018 or 2918.			
BIOL3006 **Ecological Methods**	6	**A** BIOL (2011 or 2911 or 2012 or 2912) or PLNT (2002 or 2902). **P** 12 credit points of Intermediate Biology; or 6 credit points of Intermediate BIOL units and ENVI2111 or MARS2006; or 12 credit points of Intermediate MARS units, including MARS2006. **N** BIOL3906, MARS3102	Semester 1
BIOL3906 **Ecological Methods (Advanced)**	6	**A** BIOL (2011 or 2911 or 2012 or 2912) or PLNT (2002 or 2902). **P** Distinction average in 12 credit points of Intermediate Biology; or 6 credit points of Intermediate BIOL and ENVI2111 or MARS2006; or 12 credit points of Intermediate MARS units, including MARS2006. These requirements may be varied and students with lower averages should consult the Unit Executive Officer. **N** BIOL3006, MARS3102	Semester 1
BIOL3007 **Ecology**	6	**A** Although not prerequisites, knowledge obtained from BIOL3006/3906, and BIOL3008/3908 and/or BIOL3009/3909, is strongly recommended. **P** 12 credit points of Intermediate Biology; or 6 credit points of Intermediate BIOL, and ENVI2111 or MARS2006 ; or 12 credit points of MARS units, including MARS2006 **N** BIOL3907, MARS3102	Semester 2
BIOL3907 **Ecology (Advanced)**	6	**A** Although not prerequisites, knowledge obtained from BIOL3006/3906, and BIOL3008/3908 and/or BIOL3009/3909, is strongly recommended. Students entering this unit of study should have achieved Distinction average. **P** Distinction average in 12 credit points of Intermediate Biology; or 6 credit points of Intermediate BIOL and ENVI2111 or MARS2006; or 12 credit points of Intermediate MARS units, including MARS2006. **N** BIOL3007, MARS3102	Semester 2
BIOL3008 **Marine Field Ecology**	6	**A** BIOL (3006 or 3906). Prior completion of one of these units is very strongly recommended. **P** 12 credit points of Intermediate Biology; or 6 credit points of Intermediate BIOL and ENVI2111 or MARS2006; or 12 credit points of Intermediate MARS units, including MARS2006. **N** BIOL3908, MARS3102. *Dates: 2 - 9 July 2009.*	S2 Intensive
BIOL3908 **Marine Field Ecology (Advanced)**	6	**A** BIOL (3006 or 3906). Prior completion of one of these units is very strongly recommended. **P** Distinction average in 12 credit points of Intermediate Biology; or 6 credit points of Intermediate Biology and ENVI2111 or MARS2006; or 12 credit points of Intermediate MARS units, including MARS2006. **N** BIOL3008, MARS3102. *Dates: 2 - 9 July 2009. Plus four 1 hour tutorials during semester 2.*	S2 Intensive
BIOL3011 **Ecophysiology**	6	**A** BIOL (2012 or 2912 or 2016 or 2916) or PLNT (2003 or 2903). **P** 12 credit points of Intermediate Biology; or 6 credit points of Intermediate BIOL and ENVI2111 or MARS2006; or 12 credit points of Intermediate MARS units, including MARS2006. **N** BIOL3911 *The completion of 6 credit points of MBLG units is highly recommended.*	Semester 1

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
BIOL3911 **Ecophysiology (Advanced)**	6	**A** BIOL (2012 or 2912 or 2016 or 2916) or PLNT (2003 or 2903) **P** Distinction average in 12 credit points of Intermediate Biology; or 6 credit points of Intermediate BIOL and ENVI2111 or MARS2006; or 12 credit points of Intermediate MARS units, including MARS2006. These requirements may be varied and students with lower averages should consult the Unit Executive Officer. **N** BIOL3011 *The completion of 6 credit points of MBLG units is highly recommended.*	Semester 1
BIOL3013 **Marine Biology**	6	**A** BIOL 2018 or MARS2006 **P** 12 credit points of Intermediate Biology, or 6 credit points of Intermediate BIOL and ENVI2111 or MARS2006; or 12 credit points of Intermediate MARS units, including MARS2006. **N** BIOL3913 *The completion of 6 credit points of MBLG units is highly recommended.*	Semester 1
BIOL3913 **Marine Biology (Advanced)**	6	**A** BIOL2018 or MARS2006 **P** Distinction average in 12 credit points of Intermediate Biology; or 6 credit points of Intermediate BIOL and ENVI2111 or MARS2006; or 12 credit points of Intermediate MARS units, including MARS2006. **N** BIOL3013 *The completion of 6 credit points of MBLG units is highly recommended.*	Semester 1
## Marine Geoscience			
For a major in Marine Geoscience, the minimum requirement is 24 credit points from senior units listed in this subject area. Intermediate units leading to a major in Marine Geoscience are 12 credit points of intermediate GEOS units OR 6 credit points of intermediate GEOS units and 6 credit points of either BIOL2018 or 2918			
GEOS3009 **Coastal Environments & Processes**	6	**P** (6 credit points of Intermediate Geoscience* units) and (6 further credit points of Intermediate Geoscience or 6 credit points of Physics or Mathematics or Information Technology or Engineering units) or ((MARS2005 or MARS2905) and (MARS2006 or MARS2906)) **N** GEOS3909, MARS3003, MARS3105 * *Geoscience is the disciplines of Geography, Geology and Geophysics.*	Semester 1
GEOS3014 **GIS in Coastal Management**	6	**P** MARS(2005 or 2905) and MARS(2006 or 2906), or 12 credit points of Intermediate Geoscience* units, or (GEOS(2115 or 2915) and BIOL(2018 or 2918)) **N** GEOS3914, MARS3104. * *Geoscience is the disciplines of Geography, Geology and Geophysics.*	Semester 2
GEOS3015 **Environmental Geomorphology**	6	**A** Intermediate geomorphology/ physical geography/ geology. **P** 24 credit points of Intermediate units, including 6 credit points of Intermediate Geography. **N** GEOS3915	Semester 2
GEOS3018 **Rivers: Science, Policy and Management**	6	**P** (24 credit points of Intermediate units of study including 6 credit points of Intermediate Geography units of study) or ((MARS2005 or MARS2905) and (MARS2006 or MARS2906)) **N** GEOS3918	Semester 1
GEOS3918 **Rivers: Science and Management (Adv)**	6	**P** Distinction average in (24 credit points of Intermediate units of study including 6 credit points of Intermediate Geography units of study) or ((MARS2005 or MARS2905) and (MARS2006 or MARS2906)) **N** GEOS3018	Semester 1
GEOS3103 **Environmental & Sedimentary Geology**	6	**A** GEOS1003, GEOS2124 **P** GEOS(2124 or 2924) and GEOS(2111 or 2911 or 2114 or 2914 or 2113 or 2913); or GEOS(1003 or 1903) and 24 credit points of intermediate Science units of study with permission of the Head of School **N** GEOS3803	Semester 2
GEOS3803 **Environmental & Sedimentary Geology(Adv)**	6	**A** GEOS1003, GEOS2124 **P** Distinctions in GEOS(2114 or 2914) and GEOS(2124 or 2924); Students who have a credit average for all Geoscience units may enrol in this unit with permission of the Head of School **N** GEOS3103	Semester 2
GEOS3104 **Geophysical Methods**	6	**A** GEOS2114 and GEOS2124 **P** 24 credit points of intermediate Science units of study or (GEOS(2114, 2914) and GEOS(2124, 2924)) **N** GEOS3804, GEOS3003, GEOS 3903, GEOS3006, GEOS3906, GEOS3016, GEOS3916, GEOS3017, GEOS3917	Semester 2
GEOS3804 **Geophysical Methods (Advanced)**	6	**P** Distinction in GEOS2114 or GEOS2914 and GEOS2124 or GEOS2924; Students who have a credit average for all Geoscience units may enrol in this unit with the permission of the Head of School **N** GEOS3104, GEOS3003, GEOS3903, GEOS3006, GEOS3906, GEOS3016, GEOS3916, GEOS3017, GEOS3917	Semester 2
## Marine Science			
For a major in Marine Science, the minimum requirement is 24 credit points of senior units listed under the major in Marine Geoscience and the major in Marine Biology, which must include at least 6 credit points of GEOS3XXX and at least 6 credit points BIOL3XXX from the units listed below.			
Intermediate units of study			
BIOL2018 **Introduction to Marine Biology**	6	**A** 12 credit points of Junior Biology; MARS2005. **P** BIOL (1001 or 1911 or 1101 or 1901) and 6 additional credit points of Junior Biology (BIOL/MBLG/EDUH). 12 credit points of Junior Chemistry (or for BSc (Marine Science) students 6 credit points of Junior Chemistry and either an additional 6 credit points of Junior Chemistry or 6 credit points of Junior Physics). **N** BIOL2918, MARS (2006 or 2906 or 2007 or 2907).	Semester 2
BIOL2918 **Introduction to Marine Biology (Adv)**	6	**A** 12 credit points of Junior Biology; MARS2005. **P** Distinction average in BIOL (1001 or 1911 or 1101 or 1901) and 6 additional credit points of Junior Biology (BIOL/MBLG/EDUH). 12 credit points of Junior Chemistry (or for BSc (Marine Science) students 6 credit points of Junior Chemistry and either an additional 6 credit points of Junior Chemistry or 6 credit points of Junior Physics. These requirements may be varied and students with lower averages should consult the Unit Executive Officer. **N** BIOL2018, MARS (2006 or 2906 or 2007 or 2907). *Entry is restricted and selection is made from applicants on the basis of previous performance.*	Semester 2
GEOS2115 **Oceans, Coasts and Climate Change**	6	**A** At least one of (GEOG1001, GEOL1001, GEOL1002, GEOS1003, GEOS1903, ENVI1002, GEOL1902, GEOL1501) **P** 48 credit points from Junior Units of Study **N** GEOS2915, MARS2006	Semester 1

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
GEOS2915 **Oceans, Coasts and Climate Change (Adv)**	6	**A** (GEOG1001, GEOL1001, GEOL1002, GEOS1003, GEOS1903, ENVI1002, GEOL1902, GEOL1501) **P** Distinction average in 48 credit points from Junior units of study **N** GEOS2115, MARS2006	Semester 1
Senior units of study			
BIOL3006 **Ecological Methods**	6	**A** BIOL (2011 or 2911 or 2012 or 2912) or PLNT (2002 or 2902). **P** 12 credit points of Intermediate Biology; or 6 credit points of Intermediate BIOL units and ENVI2111 or MARS2006; or 12 credit points of Intermediate MARS units, including MARS2006. **N** BIOL3906, MARS3102	Semester 1
BIOL3007 **Ecology**	6	**A** Although not prerequisites, knowledge obtained from BIOL3006/3906, and BIOL3008/3908 and/or BIOL3009/3909, is strongly recommended. **P** 12 credit points of Intermediate Biology; or 6 credit points of Intermediate BIOL, and ENVI2111 or MARS2006 ; or 12 credit points of MARS units, including MARS2006 **N** BIOL3907, MARS3102	Semester 2
BIOL3008 **Marine Field Ecology**	6	**A** BIOL (3006 or 3906). Prior completion of one of these units is very strongly recommended. **P** 12 credit points of Intermediate Biology; or 6 credit points of Intermediate BIOL and ENVI2111 or MARS2006; or 12 credit points of Intermediate MARS units, including MARS2006. **N** BIOL3908, MARS3102. *Dates: 2 - 9 July 2009.*	S2 Intensive
BIOL3011 **Ecophysiology**	6	**A** BIOL (2012 or 2912 or 2016 or 2916) or PLNT (2003 or 2903). **P** 12 credit points of Intermediate Biology; or 6 credit points of Intermediate BIOL and ENVI2111 or MARS2006; or 12 credit points of Intermediate MARS units, including MARS2006. **N** BIOL3911 *The completion of 6 credit points of MBLG units is highly recommended.*	Semester 1
BIOL3013 **Marine Biology**	6	**A** BIOL 2018 or MARS2006 **P** 12 credit points of Intermediate Biology, or 6 credit points of Intermediate BIOL and ENVI2111 or MARS2006; or 12 credit points of Intermediate MARS units, including MARS2006. **N** BIOL3913 *The completion of 6 credit points of MBLG units is highly recommended.*	Semester 1
GEOS3103 **Environmental & Sedimentary Geology**	6	**A** GEOS1003, GEOS2124 **P** GEOS(2124 or 2924) and GEOS(2111 or 2911 or 2114 or 2914 or 2113 or 2913); or GEOS(1003 or 1903) and 24 credit points of intermediate Science units of study with permission of the Head of School **N** GEOS3803	Semester 2
GEOS3104 **Geophysical Methods**	6	**A** GEOS2114 and GEOS2124 **P** 24 credit points of intermediate Science units of study or (GEOS(2114, 2914) and GEOS(2124, 2924)) **N** GEOS3804, GEOS3003, GEOS 3903, GEOS3006, GEOS3906, GEOS3016, GEOS3916, GEOS3017, GEOS3917	Semester 2
GEOS3009 **Coastal Environments & Processes**	6	**P** (6 credit points of Intermediate Geoscience* units) and (6 further credit points of Intermediate Geoscience or 6 credit points of Physics or Mathematics or Information Technology or Engineering units) or ((MARS2005 or MARS2905) and (MARS2006 or MARS2906)) **N** GEOS3909, MARS3003, MARS3105 ** Geoscience is the disciplines of Geography, Geology and Geophysics.*	Semester 1
GEOS3014 **GIS in Coastal Management**	6	**P** MARS(2005 or 2905) and MARS(2006 or 2906), or 12 credit points of Intermediate Geoscience* units, or (GEOS(2115 or 2915) and BIOL(2018 or 2918)) **N** GEOS3914, MARS3104. ** Geoscience is the disciplines of Geography, Geology and Geophysics.*	Semester 2
GEOS3018 **Rivers: Science, Policy and Management**	6	**P** (24 credit points of Intermediate units of study including 6 credit points of Intermediate Geography units of study) or ((MARS2005 or MARS2905) and (MARS2006 or MARS2906)) **N** GEOS3918	Semester 1
BIOL3906 **Ecological Methods (Advanced)**	6	**A** BIOL (2011 or 2911 or 2012 or 2912) or PLNT (2002 or 2902). **P** Distinction average in 12 credit points of Intermediate Biology; or 6 credit points of Intermediate BIOL and ENVI2111 or MARS2006; or 12 credit points of Intermediate MARS units, including MARS2006. These requirements may be varied and students with lower averages should consult the Unit Executive Officer. **N** BIOL3006, MARS3102	Semester 1
BIOL3907 **Ecology (Advanced)**	6	**A** Although not prerequisites, knowledge obtained from BIOL3006/3906, and BIOL3008/3908 and/or BIOL3009/3909, is strongly recommended. Students entering this unit of study should have achieved Distinction average. **P** Distinction average in 12 credit points of Intermediate Biology; or 6 credit points of Intermediate BIOL and ENVI2111 or MARS2006; or 12 credit points of Intermediate MARS units, including MARS2006. **N** BIOL3007, MARS3102	Semester 2
BIOL3908 **Marine Field Ecology (Advanced)**	6	**A** BIOL (3006 or 3906). Prior completion of one of these units is very strongly recommended. **P** Distinction average in 12 credit points of Intermediate Biology; or 6 credit points of Intermediate Biology and ENVI2111 or MARS2006; or 12 credit points of Intermediate MARS units, including MARS2006. **N** BIOL3008, MARS3102. *Dates: 2 - 9 July 2009. Plus four 1 hour tutorials during semester 2.*	S2 Intensive
BIOL3911 **Ecophysiology (Advanced)**	6	**A** BIOL (2012 or 2912 or 2016 or 2916) or PLNT (2003 or 2903) **P** Distinction average in 12 credit points of Intermediate Biology; or 6 credit points of Intermediate BIOL and ENVI2111 or MARS2006; or 12 credit points of Intermediate MARS units, including MARS2006. These requirements may be varied and students with lower averages should consult the Unit Executive Officer. **N** BIOL3011 *The completion of 6 credit points of MBLG units is highly recommended.*	Semester 1
BIOL3913 **Marine Biology (Advanced)**	6	**A** BIOL2018 or MARS2006 **P** Distinction average in 12 credit points of Intermediate Biology; or 6 credit points of Intermediate BIOL and ENVI2111 or MARS2006; or 12 credit points of Intermediate MARS units, including MARS2006. **N** BIOL3013 *The completion of 6 credit points of MBLG units is highly recommended.*	Semester 1

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
GEOS3803 **Environmental & Sedimentary Geology(Adv)**	6	**A** GEOS1003, GEOS2124 **P** Distinctions in GEOS(2114 or 2914) and GEOS(2124 or 2924); Students who have a credit average for all Geoscience units may enrol in this unit with permission of the Head of School **N** GEOS3103	Semester 2
GEOS3804 **Geophysical Methods (Advanced)**	6	**P** Distinction in GEOS2114 or GEOS2914 and GEOS2124 or GEOS2924; Students who have a credit average for all Geoscience units may enrol in this unit with the permission of the Head of School **N** GEOS3104, GEOS3003, GEOS3903, GEOS3006, GEOS3906, GEOS3016, GEOS3916, GEOS3017, GEOS3917	Semester 2
GEOS3909 **Coastal Environments and Processes (Adv)**	6	**P** Distinction average in ((6 credit points of Intermediate Geoscience* units) and (6 further credit points of Intermediate Geoscience or 6 credit points of Physics, Mathematics, Information Technology or Engineering units) or ((MARS2005 or MARS2905) and (MARS2006 or MARS2906))) **N** GEOS3009, MARS3003, MARS3105 *A distinction average in prior Geography or Geology units is normally required for admission. This requirement may be varied and students should consult the unit of study coordinator.*	Semester 1
GEOS3914 **GIS in Coastal Management (Advanced)**	6	**P** Distinction average in 12 credit points of intermediate geography or geology units or GEOS (2115 or 2915) and BIOL (2018 or 2918) Department permission required for enrolment. **N** GEOS3014, MARS3104 *Note: Department permission required for enrolment* *A distinction average in prior Geography, Geology or Marine Science units of study is normally required for admission. This requirement may be varied and students should consult the unit of study coordinator.*	Semester 2
GEOS3918 **Rivers: Science and Management (Adv)**	6	**P** Distinction average in (24 credit points of Intermediate units of study including 6 credit points of Intermediate Geography units of study) or ((MARS2005 or MARS2905) and (MARS2006 or MARS2906)) **N** GEOS3018	Semester 1

Mathematics

For a major in Mathematics, the minimum requirement is 24 credit points from senior units of study listed in this subject area.

Junior units of study

MATH1011 **Life Sciences Calculus**	3	**A** HSC Mathematics **N** MATH1111, MATH1001, MATH1901, MATH1906, BIOM1003	Semester 1 Summer Main
MATH1014 **Introduction to Linear Algebra**	3	**A** HSC Mathematics or MATH1111 **N** MATH1012, MATH1002, MATH1902	Semester 2
MATH1111 **Introduction to Calculus**	6	**A** At least Year 10 Mathematics **N** MATH1001, MATH1901, MATH1011, MATH1906 *Note: Department permission required for enrolment* *Students who have previously studied calculus at any level are prohibited from enrolling in this unit. In particular, students with HSC Mathematics/Extension 1/Extension 2 (or equivalent) are prohibited.*	Semester 1
MATH1013 **Differential and Difference Equations**	3	**A** HSC Mathematics or MATH1111 **N** MATH1003, MATH1903, MATH1907	Semester 2 Summer Main
MATH1015 **Biostatistics**	3	**A** HSC Mathematics **N** MATH1005, MATH1905, STAT1021, STAT1022, ECMT1010, BIOM1003	Semester 1
MATH1001 **Differential Calculus**	3	**A** HSC Mathematics Extension 1 **N** MATH1011, MATH1901, MATH1906, MATH1111	Semester 1 Summer Main
MATH1002 **Linear Algebra**	3	**A** HSC Mathematics Extension 1 **N** MATH1902, MATH1012, MATH1014	Semester 1 Summer Main
MATH1003 **Integral Calculus and Modelling**	3	**A** HSC Mathematics Extension 2 or MATH1001 or MATH1111 **N** MATH1013, MATH1903, MATH1907	Semester 2 Summer Main
MATH1004 **Discrete Mathematics**	3	**A** HSC Mathematics Extension 1 **N** MATH1904, MATH2011	Semester 2
MATH1005 **Statistics**	3	**A** HSC Mathematics **N** MATH1015, MATH1905, STAT1021, STAT1022, ECMT1010	Semester 2 Summer Main
MATH1901 **Differential Calculus (Advanced)**	3	**A** HSC Mathematics Extension 2 **P** HSC Mathematics Extension 2. This requirement may be varied. Students with an interest in mathematics, but without HSC mathematics Extension 2, should consult the unit of study coordinator. **N** MATH1111, MATH1011, MATH1001, MATH1906	Semester 1
MATH1902 **Linear Algebra (Advanced)**	3	**A** HSC Mathematics Extension 2 **P** HSC Mathematics Extension 2. This requirement may be varied. Students with an interest in mathematics, but without HSC mathematics Extension 2, should consult the unit of study coordinator. **N** MATH1002, MATH1012, MATH1014	Semester 1
MATH1903 **Integral Calculus and Modelling Advanced**	3	**A** HSC Mathematics Extension 2 or Credit or better in MATH1001 or MATH1901 **P** HSC Mathematics Extension 2. This requirement may be varied. Students with an interest in mathematics, but without HSC mathematics Extension 2, should consult the unit of study coordinator. **N** MATH1003, MATH1013, MATH1907	Semester 2
MATH1905 **Statistics (Advanced)**	3	**A** HSC Mathematics Extension 2 **P** HSC Mathematics Extension 2. This requirement may be varied. Students with an interest in mathematics, but without HSC mathematics Extension 2, should consult the unit of study coordinator. **N** MATH1015, MATH1005, STAT1021, STAT1022, ECMT1010	Semester 2
MATH1906 **Mathematics (Special Studies Program) A**	3	**P** UAI of at least 98.5 and result in Band E4 HSC Mathematics Extension 2; by invitation **N** MATH1111, MATH1001, MATH1011, MATH1901 *Note: Department permission required for enrolment*	Semester 1
MATH1907 **Mathematics (Special Studies Program) B**	3	**P** Distinction in MATH1906; by invitation **N** MATH1003, MATH1013, MATH1903 *Note: Department permission required for enrolment*	Semester 2

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
Intermediate units of study			
MATH2061 **Linear Mathematics and Vector Calculus**	6	**P** MATH (1111 or 1001 or 1901 or 1906) and MATH (1014 or 1002 or 1902) and MATH (1003 or 1903 or 1907) **N** MATH2001, MATH2901, MATH2002, MATH2902, MATH2961, MATH2067	Semester 1 Summer Main
MATH2063 **Math Computing and Nonlinear Systems**	6	**P** MATH (1001 or 1901 or 1906) and MATH (1002 or 1902) and MATH (1003 or 1903 or 1907) **N** MATH2003, MATH903, MATH2006, MATH2906, MATH2963	Semester 1
MATH2069 **Discrete Mathematics and Graph Theory**	6	**P** 6 credit points of Junior level Mathematics **N** MATH2011, MATH2009, MATH2969	Semester 1
MATH2961 **Linear Mathematics & Vector Calculus Adv**	6	**P** MATH (1901 or 1906 or Credit in 1001) and MATH (1902 or Credit in 1002) and MATH (1903 or 1907 or Credit in 1003) **N** MATH2001, MATH2901, MATH2002, MATH2902, MATH2061, MATH2067	Semester 1
MATH2962 **Real and Complex Analysis (Advanced)**	6	**P** MATH (1901 or 1906 or Credit in 1001) and MATH (1902 or Credit in 1002) and MATH (1903 or 1907 or Credit in 1003) **N** MATH2007, MATH2907	Semester 1
MATH2963 **Math Computing & Nonlinear Systems (Adv)**	6	**P** MATH (1901 or 1906 or Credit in 1001) and MATH (1902 or Credit in 1002) and MATH (1903 or 1907 or Credit in 1003) **N** MATH2003, MATH2903, MATH2006, MATH2906, MATH2063	Semester 1
MATH2969 **Discrete Mathematics & Graph Theory Adv**	6	**P** 9 credit points of Junior Mathematics (advanced level or Credit at the normal level) **N** MATH2011, MATH2009, MATH2069	Semester 1
MATH2916 **Working Seminar A (SSP)**	3	**P** By invitation, High Distinction average over 12 credit points of Advanced Junior Mathematics *Note: Department permission required for enrolment*	Semester 1
MATH2065 **Partial Differential Equations (Intro)**	6	**P** MATH (1001 or 1901 or 1906) and MATH (1002 or 1902) and MATH (1003 or 1903 or 1907) **N** MATH2005, MATH2905, MATH2965, MATH2067	Semester 2
MATH2068 **Number Theory and Cryptography**	6	**A** MATH (1014 or 1002 or 1902) **P** 6 credit points of Junior level Mathematics **N** MATH3024, MATH3009, MATH2988	Semester 2
MATH2988 **Number Theory and Cryptography Advanced)**	6	**P** At least 9cp from MATH (1901 or Credit in 1001), MATH (1902 or Credit in 1002), MATH (1903 or Credit in 1003), MATH (1904 or Credit in 1004), MATH (1905 or Credit in 1005), MATH1906, MATH1907, MATH (2961 or Credit in MATH2061), MATH2962 or MATH (2969 or Credit in MATH2069). **N** MATH2068	Semester 2
MATH2070 **Optimisation and Financial Mathematics**	6	**A** MATH (1003 or 1903 or 1907) **P** MATH (1001 or 1901 or 1906) and MATH (1002 or 1902) **N** MATH2010, MATH2033, MATH2933, MATH2970, ECMT3510 *Students may enrol in both MATH2070 and MATH3075 in the same semester*	Semester 2
MATH2965 **Partial Differential Equations Intro Adv**	6	**P** MATH (2961 or Credit in 2061) or {MATH (2901 or Credit in 2001) and MATH (2902 or Credit in 2002)} **N** MATH2005, MATH 2905, MATH2065, MATH2067	Semester 2
MATH2968 **Algebra (Advanced)**	6	**P** 9 credit points of Junior Mathematics (advanced level or Credit at normal level) including (MATH1902 or Credit in MATH1002) **N** MATH2908, MATH2918, MATH2008	Semester 2
MATH2970 **Optimisation & Financial Mathematics Adv**	6	**A** MATH (1903 or 1907) or Credit in MATH1003 **P** MATH (1901 or 1906 or Credit in 1001) and MATH (1902 or Credit in 1002) **N** MATH2010, MATH2033, MATH2933, MATH2070 *Students may enrol in both MATH2970 and MATH3975 in the same semester*	Semester 2
MATH2917 **Working Seminar B (SSP)**	3	**P** By invitation, High Distinction average over 12 credit points of Advanced Junior Mathematics *Note: Department permission required for enrolment*	Semester 2
Senior units of study			
MATH3063 **Differential Equations & Biomaths**	6	**A** MATH2061 **P** 12 credit points of Intermediate Mathematics **N** MATH3020, MATH3920, MATH3003, MATH3923, MATH3963	Semester 1
MATH3065 **Logic and Foundations**	6	**P** 6 credit points of Intermediate Mathematics **N** MATH3005	Semester 1
MATH3076 **Mathematical Computing**	6	**P** 12 credit points of Intermediate Mathematics and one of MATH(1001 or 1003 or 1901 or 1903 or 1906 or 1907) **N** MATH3976, MATH3016, MATH3916	Semester 1
MATH3961 **Metric Spaces (Advanced)**	6	**A** MATH2961 or MATH2962 **P** 12 credit points of Intermediate Mathematics units **N** MATH3901, MATH3001	Semester 1
MATH3962 **Rings, Fields and Galois Theory (Adv)**	6	**A** MATH2961 **P** 12 credit points of Intermediate Mathematics **N** MATH3062, MATH3902, MATH3002 *Students are advised to take MATH2968 before attempting this unit.*	Semester 1
MATH3963 **Differential Equations & Biomaths (Adv)**	6	**A** MATH2961 **P** 12 credit points of Intermediate Mathematics **N** MATH3020, MATH3920, MATH3003, MATH3923, MATH3063	Semester 1
MATH3974 **Fluid Dynamics (Advanced)**	6	**A** MATH2961, MATH2965 **P** 12 credit points of Intermediate Mathematics with average grade of at least Credit **N** MATH3914	Semester 2
MATH3976 **Mathematical Computing (Advanced)**	6	**P** 12 credit points of Intermediate Mathematics and one of MATH(1903 or 1907) or Credit in MATH1003 **N** MATH3076, MATH3016, MATH3916	Semester 1
MATH3061 **Geometry and Topology**	6	**P** 12 credit points of Intermediate Mathematics **N** MATH3001, MATH3006	Semester 2

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
MATH3062 **Algebra and Number Theory**	6	**P** 12 credit points of Intermediate Mathematics **N** MATH3962, MATH3902, MATH3002, MATH3009 *Students are advised to take MATH(2068 or 2968) before attempting this unit.*	Semester 1
MATH3067 **Information and Coding Theory** *This unit of study is not available in 2009*	6	**P** 12 credit points of Intermediate Mathematics **N** MATH3007, MATH3010	Semester 2
MATH3068 **Analysis**	6	**P** 12 credit points of Intermediate Mathematics **N** MATH3008, MATH2007, MATH2907, MATH2962	Semester 2
MATH3075 **Financial Mathematics**	6	**P** 12 credit points of Intermediate Mathematics **N** MATH3975, MATH 3015, MATH3933	Semester 2
MATH3078 **PDEs and Waves**	6	**A** MATH(2061/2961) and MATH(2065/2965) **P** 12 credit points of Intermediate Mathematics **N** MATH3978, MATH3018, MATH3921	Semester 2
MATH3964 **Complex Analysis with Applications (Adv)** *This unit of study is not available in 2009*	6	**A** MATH2962 **P** 12 credit points of Intermediate Mathematics **N** MATH3904, MATH3915	Semester 2
MATH3966 **Modules and Group Representations (Adv)**	6	**A** MATH3962 **P** 12 credit points of Intermediate Mathematics **N** MATH3906, MATH3907	Semester 2
MATH3968 **Differential Geometry (Advanced)**	6	**A** At least 6 credit points of Advanced Mathematics units of study at Intermediate or Senior level. **P** 12 credit points of Intermediate Mathematics, including MATH2961 **N** MATH3903	Semester 2
MATH3969 **Measure Theory & Fourier Analysis (Adv)**	6	**A** At least 6 credit points of Advanced Mathematics units of study at Intermediate or Senior level **P** 12 credit points Intermediate Mathematics **N** MATH3909	Semester 2
MATH3975 **Financial Mathematics (Advanced)**	6	**P** 12 credit points of Intermediate Mathematics with at least Credit average **N** MATH3933, MATH3015, MATH3075	Semester 2
MATH3977 **Lagrangian & Hamiltonian Dynamics (Adv)**	6	**P** 12 credit points of Intermediate Mathematics with at least Credit average **N** MATH2904, MATH2004, MATH3917	Semester 1
MATH3978 **PDEs and Waves (Advanced)**	6	**A** MATH(2061/2961) and MATH(2065/2965) **P** 12 credit points of Intermediate Mathematics with at least Credit average **N** MATH3078, MATH3018, MATH3921	Semester 2

Medicinal Chemistry

For a major in Medicinal chemistry, the minimum requirement is 24 credit points comprising:

(i) PCOL3011/3911 and PCOL3012/3912;and

(ii) 12 credit points from senior Chemistry units of study.

Note that there are intermediate prerquisites for the core senior units of study. Junior and intermediate units of study should be selected to permit progression to the required senior units of study.

Microbiology

For a major in Microbiology, the minimum requirement is 24 credit points from senior units of study listed in the subject area.

MICR2021 **Microbial Life**	6	**P** 6cp of Junior Biology and (6cp of MBLG (1001 or 1901) or MBLG2901 or PLNT2001 or PLNT2901) and 6cp of Junior Chemistry **N** MICR2921, MICR2024, MICR2001, MICR2901, MICR2003, MICR2007, MICR2011, MICR2909 *Students are very strongly recommended to complete MICR (2021 or 2921 or 2024) before enrolling in MICR2022 in Semester 2. For progression on to Senior Microbiology units, students must also complete MBLG (1001 or 1901) or PLNT (2001 or 2901).*	Semester 1
MICR2921 **Microbial Life (Advanced)**	6	**P** (6 credit points of Junior Biology) and (6 credit points of MBLG (1001 or 1901) or MBLG2901 or PLNT2001 or PLNT2911) and 6 credit points of Junior Chemistry. Distinction grade required in at least one of Junior Biology or MBLG1001 or MBLG1901 or PLNT2001 or PLNT2911. **N** MICR2021, MICR2024, MICR2001, MICR2901, MICR2003, MICR2007, MICR2011, MICR2909 *Students are very strongly advised to complete MICR (2021 or 2921 or 2024) before enrolling in MICR2022 or 2922 in Semester 2. For progression on to Senior Microbiology units, students must also complete MBLG (1001 or 1901) or PLNT(2001 or 2901).*	Semester 1
MICR2022 **Microbes in Society**	6	**A** MICR (2021 or 2921 or 2024 or 2026) **P** 6 of Junior Biology and (6 of MBLG (1001 or 1901) or PLNT2001 or PLNT2911) and 6 of Junior Chemistry **N** MICR2922, MICR2002, MICR2902, MICR2004, MICR2008, MICR2012, MICR2909 *Students are very strongly advised to complete MICR (2021 or 2921 or 2024) before enrolling in MICR2022 in Semester 2. For progression on to Senior Microbiology units, students must also complete MBLG (1001 or 1901) or PLNT (2001 or 2901).*	Semester 2
MICR2922 **Microbes in Society (Advanced)**	6	**A** MICR (2021 or 2921 or 2024 or 2026) **P** 6 credit points of Junior Biology and (6 credit points of MBLG1001 or MBLG1901 or PLNT2001 or PLNT2901) and 6 credit points of Junior Chemistry. Distinction grade required in at least one of Junior Biology or MBLG1001 or MBLG1901 or PLNT2001 or PLNT2911 **N** MICR2022, MICR2002, MICR2902, MICR2004, MICR2008, MICR2012, MICR2909 *Students are very strongly advised to complete MICR (2021 or 2921 or 2024) before enrolling in MICR2922 in Semester 2. For progression on to Senior Microbiology units, students must also complete MBLG (1001 or 1901) or PLNT (2001 or 2901).*	Semester 2

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
MICR2024 **Microbes in the Environment**	6	**P** 30 credit points of Junior Science or Faculty of Agriculture, Food and Natural Resource units including 6 credit points of Junior Biology. **N** MICR2021, MICR2921, MICR2001, MICR2901, MICR2003, MICR2007, MICR2011, MICR2909 *Students are very strongly recommended to complete MICR (2021 or 2921 or 2024) before enrolling in MICR2922 in Semester 2. For progression on to Senior Microbiology units, students must also complete MBLG(1001 or 1901) or PLNT (2001 or 2901).*	Semester 2
Senior units of study			
MICR3011 **Microbes in Infection**	6	**P** At least 6 credit points of MBLG units and MICR (2022 or 2922 or 2002 or 2902). For BMedSc students: 42 credit points of Intermediate BMED units including BMED (2807 and 2808). For BScAgr students: PLNT (2001 or 2901) and MICR (2022 or 2922). **N** MICR3911, MICR3001, MICR3901	Semester 1
MICR3911 **Microbes in Infection (Advanced)**	6	**P** At least 6 credit points of MBLG units and Distinction in MICR (2022 or 2922 or 2002 or 2902). For BMedSc students: 42 credit points of Intermediate BMED units including in BMED (2807 or 2808) with a Distinction in one of these two. For BScAgr students: PLNT (2001 or 2901) and MICR (2022 or 2922) including one Distinction. **N** MICR3011, MICR3001, MICR3901	Semester 1
VIRO3001 **Virology**	6	**A** MICR (2021 or 2921 or 2022 or 2922) **P** At least 6 credit points of MBLG units and at least 6 credit points in Intermediate MICR or BCHM or BIOL or IMMU or PCOL or PHSI or PLNT units. For BMedSc students: 42 credit points of Intermediate BMED units including BMED2802. For BScAgr students: PLNT (2001 or 2901) and MICR2024. **N** VIRO3901 *Students are very strongly advised to complete VIRO (3001 or 3901) before enrolling in VIRO3002 Medical and Applied Virology in Session 2.*	Semester 1
VIRO3901 **Virology (Advanced)**	6	**A** MICR (2021 or 2921 or 2022 or 2922) **P** At least 6 credit points of MBLG units and at least 6 credit points including one Distinction in Intermediate MICR or BCHM or BIOL or IMMU or PCOL or PHSI or PLNT units. For BMedSc students: 42 credit points of Intermediate BMED units including Distinction in BMED2802. For BScAgr students: PLNT (2001 or 2901) and MICR2024 including one Distinction. **N** VIRO3001 *Students are very strongly advised to complete VIRO (3001 or 3901) before enrolling in VIRO3002 Medical and Applied Virology in Session 2.*	Semester 1
MICR3012 **Molecular Biology of Pathogens**	6	**P** At least 6 credit points of MBLG units and MICR (2022 or 2922 or 2002 or 2902). For BMedSc students: 42 credit points of Intermediate BMED units including BMED (2802, 2807 and 2808). For BScAgr students: PLNT (2001 or 2901) and MICR2024. **N** MICR3912, MICR3002, MICR3902, MICR3003, MICR3903, MICR3004, MICR3904	Semester 2
MICR3912 **Molecular Biology of Pathogens (Adv)**	6	**P** At least 6 credit points of MBLG units and Distinction in MICR (2022 or 2922 or 2002 or 2902). For BMedSc students: 42 credit points of Intermediate BMED units including BMED (2802 or 2807 or 2808) with a Distinction in one of these three. For BScAgr students: PLNT (2001 or 2901) and MICR2024 including one Distinction. **N** MICR3012, MICR3002, MICR3902, MICR3003, MICR3903, MICR3004, MICR3904	Semester 2
MICR3022 **Microbial Biotechnology**	6	**P** At least 6 credit points of MBLG units and 6 credit points of Intermediate MICR units. For BMedSc students: 42 credit points of Intermediate BMED units including BMED (2802 and 2807). For BScAgr students: PLNT (2001 or 2901) and MICR2024. **N** MICR3922, MICR3002, MICR3902	Semester 2
MICR3922 **Microbial Biotechnology (Advanced)**	6	**P** At least 6 credit points of MBLG units and Distinction in 6 credit points of Intermediate MICR units. For BMedSc students: 42 credit points of Intermediate BMED units including BMED (2802 and 2807) with a Distinction in at least one of these two. For BScAgr students: PLNT (2001 or 2901) and MICR2024 including one Distinction. **N** MICR3022, MICR3002, MICR3902	Semester 2
VIRO3002 **Medical and Applied Virology**	6	**A** Intermediate microbiology, immunology, molecular biology and genetics. **P** 6 CP MBLG units and at least 6 CP from Intermediate MICR or BCHM or BIOL or IMMU or PCOL or PHSI units. For BMedSc Students: 42 credit points of Intermediate BMED units including BMED2807. *Students are very strongly recommended to complete VIRO(3001 or 3901) before enrolling in VIRO3002 Medical and Applied Virology in Semester 2.*	Semester 2

Molecular Biology and Genetics

It is not possible to obtain a major in Molecular Biology and Genetics. However, Molecular Biology and Genetics units of study are highly recommended to be studied in conjunction with all Life Science subject areas. They are particularly relevant to students intending to major in Biology, Biochemistry or Microbiology.

Junior unit of study			
MBLG1001 **Molecular Biology and Genetics (Intro)**	6	**A** 6 credit points of Junior Biology and 6 cp of Junior Chemistry **N** AGCH2001, BCHM2001, BCHM2101, BCHM2901, MBLG2101, MBLG2901, MBLG2001, MBLG2111, MBLG2771, MBLG2871, MBLG1901	Semester 2
MBLG1901 **Molecular Biology and Genetics (Adv)**	6	**A** HSC Chemistry and Biology OR 6 credit points of Junior Biology and 6 cp of Junior Chemistry **P** UAI of 95 or minimum Band 5 in HSC chemistry and biology or by invitation **N** AGCH2001, BCHM2001, BCHM2101, BCHM2901, MBLG2101, MBLG2901, MBLG2001, MBLG2111, MBLG2771, MBLG2871, MBLG1001	Semester 2
Intermediate units of study			
MBLG2071 **Molecular Biology and Genetics A**	6	**P** MBLG1001 or MBLG1901 and 12 CP of Junior Chemistry. **N** MBLG2971, MBLG2771, MBLG2871, MBLG2001, MBLG2101, MBLG2901, MBLG2111, PLNT2001, AGCH2001, BCHM2001, BCHM2101, BCHM2901 *Students enrolled in the combined BAppSc (Exercise and Sport Science)/BSc(Nutrition) must have completed all Junior units for this course prior to enrolling in this unit.*	Semester 1
MBLG2971 **Molecular Biology and Genetics A (Adv)**	6	**P** 12 credit points of Junior Chemistry and Distinction in MBLG (1001 or 1901) **N** MBLG2071, MBLG2771, MBLG2871, MBLG2001, MBLG2101, MBLG2901, MBLG2111, PLNT2001, AGCH2001, BCHM2001, BCHM2101, BCHM2901 *Students enrolled in the combined BAppSc (Exercise and Sport Science)/BSc(Nutrition) must have completed all Junior units for this course prior to enrolling in this unit.*	Semester 1

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
MBLG2072 **Molecular Biology and Genetics B**	6	**A** One of MBLG2071, MBLG2771, MBLG2001, MBLG2871, MBLG2971, MBLG2901 **P** BIOL (1001 or 1101 or 1901 or 1911) and MBLG (1001 or 1901) and 12 credit points of Junior Chemistry **N** MBLG2972, MBLG2102, MBLG2002, MBLG2902	Semester 2
MBLG2972 **Molecular Biology and Genetics B (Adv)**	6	**P** Distinction in one of MBLG2071, MBLG2771, MBLG2001, MBLG2871, MBLG2971, MBLG2901 **N** MBLG2072, MBLG2102, MBLG2002, MBLG2902	Semester 2

Nanoscience and Technology

A major in Nanoscience and Technology requires 24 credit points of study at senior level taken from the following:

- Materials Chemistry (CHEM3112 or CHEM3912)
- Membranes, Self-Assembly & Surfaces (CHEM3116 or 3916)
- Senior physics units containing the Nanoscience lecture module (PHYS3052/3952, PHYS3054/3954, 3055/3955 or 3057/3957)
- Quantum Mechanics, Condensed Matter and Physics Laboratory (PHYS3062/3962)
- Mechanics of Solids 2 (MECH3361)
- Materials (MECH3362)

CHEM3112 **Materials Chemistry**	6	**P** CHEM(2401 or 2911 or 2915) and CHEM(2402 or 2912 or 2916) **N** CHEM3912	Semester 1
CHEM3912 **Materials Chemistry (Adv)**	6	**P** WAM of 65 or greater and a Credit or better in: CHEM (2401 or 2911 or 2915) and CHEM (2402 or 2912 or 2916). **N** CHEM3112	Semester 1
CHEM3116 **Membranes, Self Assembly and Surfaces**	6	**P** CHEM(2401 or 2911 or 2915) and CHEM(2402 or 2912 or 2916) **N** CHEM3916	Semester 2
CHEM3916 **Membranes, Self Assembly & Surfaces(Adv)**	6	**P** WAM of 65 or greater and a Credit or better in: CHEM (2401 or 2911 or 2915) and CHEM (2402 or 2912 or 2916). **N** CHEM3116	Semester 2
PHYS3052 **Nanoscience/Thermodynamics & Lab**	6	**P** PHYS (2011 or 2911 or 2001 or 2901); PHYS (2012 or 2912 or 2002 or 2902) **N** PHYS3952, PHYS3050, PHYS3051, PHYS3053, PHYS3056, PHYS3950, PHYS3951, PHYS3953, PHYS3956, PHYS3013, PHYS3021, PHYS3913, PHYS3921, PHYS3057, PHYS3957, PHYS3058, PHYS3958	Semester 1
PHYS3952 **Nanoscience/Thermodynamics & Lab (Adv)**	6	**P** PHYS (2011 or 2911 or 2001 or 2901) with at least Credit; PHYS (2012 or 2912 or 2002 or 2902) with at least Credit **N** PHYS3052, PHYS3050, PHYS3051, PHYS3053, PHYS3056, PHYS3950, PHYS3951, PHYS3953, PHYS3956, PHYS3013, PHYS3021, PHYS3913, PHYS3921, PHYS3057, PHYS3957, PHYS3058, PHYS3958	Semester 1
PHYS3054 **Nanoscience/Plasma Physics & Physics Lab**	6	**A** Electromagnetism at Senior Physics level; MATH (2061 or 2961 or 2067) **P** PHYS (2011 or 2911 or 2001 or 2901); PHYS (2012 or 2912 or 2002 or 2902) **N** PHYS3954, PHYS3050, PHYS3950, PHYS3052, PHYS3952, PHYS3055, PHYS3955, PHYS3056, PHYS3956, PHYS3057, PHYS3957, PHYS3059, PHYS3959, PHYS3070, PHYS3970, PHYS3072, PHYS3972, PHYS3073, PHYS3973, PHYS3076, PHYS3976, PHYS3077, PHYS3977, PHYS3078, PHYS3978	Semester 1
PHYS3954 **Nanoscience/Plasma Physics & Lab (Adv)**	6	**A** Electromagnetism at Senior Physics level; MATH (2061 or 2961 or 2067) **P** PHYS (2011 or 2911 or 2001 or 2901) with at least Credit; PHYS (2012 or 2912 or 2002 or 2902) with at least Credit **N** PHYS3054, PHYS3050, PHYS3950, PHYS3052, PHYS3952, PHYS3055, PHYS3955, PHYS3056, PHYS3956, PHYS3057, PHYS3957, PHYS3059, PHYS3959, PHYS3070, PHYS3970, PHYS3072, PHYS3972, PHYS3073, PHYS3973, PHYS3076, PHYS3976, PHYS3077, PHYS3977, PHYS3078, PHYS3978	Semester 1
PHYS3055 **Nanoscience/Plasma/Thermodynamics**	6	**A** Electromagnetism at Senior Physics level; MATH (2061 or 2961 or 2067) **P** PHYS (2011 or 2911 or 2001 or 2901); PHYS (2012 or 2912 or 2002 or 2902) **N** PHYS3955, PHYS3050, PHYS3950, PHYS3051, PHYS3951, PHYS3052, PHYS3952, PHYS3053, PHYS3953, PHYS3054, PHYS3954, PHYS3056, PHYS3956, PHYS3057, PHYS3957, PHYS3058, PHYS3958, PHYS3059, PHYS3959, PHYS3070, PHYS3970, PHYS3072, PHYS3972, PHYS3073, PHYS3973, PHYS3076, PHYS3976, PHYS3077, PHYS3977, PHYS3078, PHYS3978	Semester 1
PHYS3955 **Nanoscience/Plasma/Thermodynamics (Adv)**	6	**A** Electromagnetism at Senior Physics level; MATH (2061 or 2961 or 2067) **P** PHYS (2011 or 2911 or 2001 or 2901) with at least Credit; PHYS (2012 or 2912 or 2002 or 2902) with at least Credit **N** PHYS3055, PHYS3050, PHYS3950, PHYS3051, PHYS3951, PHYS3052, PHYS3952, PHYS3053, PHYS3953, PHYS3054, PHYS3954, PHYS3056, PHYS3956, PHYS3057, PHYS3957, PHYS3058, PHYS3958, PHYS3059, PHYS3959, PHYS3070, PHYS3970, PHYS3072, PHYS3972, PHYS3073, PHYS3973, PHYS3076, PHYS3976, PHYS3077, PHYS3977, PHYS3078, PHYS3978	Semester 1
PHYS3057 **Nanoscience/Thermodynamic/Biol.Phys**	6	**P** PHYS (2011 or 2911 or 2001 or 2901); PHYS (2012 or 2912 or 2002 or 2902) **N** PHYS3957, PHYS3050, PHYS3950, PHYS3051, PHYS3951, PHYS3052, PHYS3952, PHYS3053, PHYS3953, PHYS3054, PHYS3954, PHYS3055, PHYS3955, PHYS3056, PHYS3956, PHYS3058, PHYS3958, PHYS3059, PHYS3959	Semester 1
PHYS3957 **Nanoscience/Thermodynamic/Biol.Phys(Adv)**	6	**P** PHYS (2011 or 2911 or 2001 or 2901) with at least Credit; PHYS (2012 or 2912 or 2002 or 2902) with at least Credit **N** PHYS3057, PHYS3050, PHYS3950, PHYS3051, PHYS3951, PHYS3052, PHYS3952, PHYS3053, PHYS3953, PHYS3054, PHYS3954, PHYS3055, PHYS3955, PHYS3056, PHYS3956, PHYS3058, PHYS3958, PHYS3059, PHYS3959	Semester 1
PHYS3062 **Quantum/Cond Matter Physics & Lab**	6	**P** PHYS2012 or PHYS2912 **N** PHYS3060, PHYS3960, PHYS3961, PHYS3962, PHYS3068, PHYS3968, PHYS3070, PHYS3970, PHYS3074, PHYS3974, PHYS3075, PHYS3975, PHYS3076, PHYS3976, PHYS3077, PHYS3977, PHYS3079, PHYS3979, PHYS3080, PHYS3980, PHYS3081, PHYS3981	Semester 2
PHYS3962 **Quantum/Cond Matter Physics & Lab (Adv)**	6	**P** PHYS2012 or PHYS2912 with result of credit or better **N** PHYS3060, PHYS3960, PHYS3961, PHYS3062, PHYS3068, PHYS3968, PHYS3070, PHYS3970, PHYS3074, PHYS3974, PHYS3075, PHYS3975, PHYS3076, PHYS3976, PHYS3077, PHYS3977, PHYS3079, PHYS3979, PHYS3080, PHYS3980, PHYS3081, PHYS3981	Semester 2

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
MECH3361 **Mechanics of Solids 2**	6	**P** AMME2301 or AERO2300 or MECH2300; MATH2061 or MATH2067 or MATH2005	Semester 1
MECH3362 **Materials 2**	6	**P** (AMME2302 or MECH2300) and (AMME2301 or AERO2300)	Semester 2
Neuroscience			
For a major in Neuroscience, students are required to complete at least 24 credit points of the senior elective units of study listed below. At least two subject areas must be chosen from NEUR, PSYC and PCOL.			
Intermediate elective units of study			
Intermediate units should be chosen from the following units of study: ANAT2010 is strongly recommended. ANAT2010, MBLG2071/2971 or MBLG2072/2972, PCOL2011, PCOL2012, PHSI2005/2905, PHSI2006/2906, PSYC2011, PSYC2013.			
ANAT2010 **Concepts of Neuroanatomy**	6	**A** Background in basic cell biology and basic mammalian biology. **P** BIOL (1003 or 1903) and one of: ANAT2008 or BIOL (1002 or 1902) or MBLG(1001 or 1901 or 2071 or 2971) or PSYC (1001 and 1002). Students must have a grade of credit in at least one of the prerequisite units. **N** ANAT2003	Semester 2
MBLG2071 **Molecular Biology and Genetics A**	6	**P** MBLG1001 or MBLG1901 and 12 CP of Junior Chemistry. **N** MBLG2971, MBLG2771, MBLG2871, MBLG2001, MBLG2101, MBLG2901, MBLG2111, PLNT2001, AGCH2001, BCHM2001, BCHM2101, BCHM2901 *Students enrolled in the combined BAppSc (Exercise and Sport Science)/BSc(Nutrition) must have completed all Junior units for this course prior to enrolling in this unit.*	Semester 1
MBLG2971 **Molecular Biology and Genetics A (Adv)**	6	**P** 12 credit points of Junior Chemistry and Distinction in MBLG (1001 or 1901) **N** MBLG2071, MBLG2771, MBLG2871, MBLG2001, MBLG2101, MBLG2901, MBLG2111, PLNT2001, AGCH2001, BCHM2001, BCHM2101, BCHM2901 *Students enrolled in the combined BAppSc (Exercise and Sport Science)/BSc(Nutrition) must have completed all Junior units for this course prior to enrolling in this unit.*	Semester 1
MBLG2072 **Molecular Biology and Genetics B**	6	**A** One of MBLG2071, MBLG2771, MBLG2001, MBLG2871, MBLG2971, MBLG2901 **P** BIOL (1001 or 1101 or 1901 or 1911) and MBLG (1001 or 1901) and 12 credit points of Junior Chemistry **N** MBLG2972, MBLG2102, MBLG2002, MBLG2902	Semester 2
MBLG2972 **Molecular Biology and Genetics B (Adv)**	6	**P** Distinction in one of MBLG2071, MBLG2771, MBLG2001, MBLG2871, MBLG2971, MBLG2901 **N** MBLG2072, MBLG2102, MBLG2002, MBLG2902	Semester 2
PCOL2011 **Pharmacology Fundamentals**	6	**P** (6 credit points of Junior Chemistry) and (6 credit points of Junior Biology or MBLG (1001 or 1901)). **N** PCOL2001	Semester 1
PCOL2012 **Pharmacology: Drugs and People**	6	**A** PCOL2011 **P** (6 credit points of Junior Chemistry) and (6 credit points of Junior Biology or MBLG (1001 or 1901)). **N** PCOL2002, PCOL2003	Semester 2
PHSI2005 **Integrated Physiology A**	6	**P** 6 credit points of Junior Chemistry plus 30 credit points from any Junior Chemistry, Physics, Mathematics, Biology, Psychology units of study **N** PHSI2905, PHSI2001, PHSI2101, PHSI2901 *The completion of 6 credit points of MBLG units of study is highly recommended for progression to Senior Physiology. Students taking combined degrees or with passes in units not listed should consult a coordinator if they do not meet the prerequisites.*	Semester 1
PHSI2905 **Integrated Physiology A (Advanced)**	6	**P** 6 credit points of Junior Chemistry plus 30 credit points from any Junior Chemistry, Physics, Mathematics, Biology, Psychology units of study, approval of Coordinator **N** PHSI2005, PHSI2901, PHSI2001, PHSI2101 *Note: Department permission required for enrolment* *Permission from the coordinators is required for entry into this course. It is available only to selected students who have achieved a WAM of 75 (or higher) in their Junior units of study. Students taking combined degrees or with passes in units not listed should consult a coordinator if they do not meet the prerequisites. The completion of 6 credit points of MBLG units of study is highly recommended for progression to Senior Physiology*	Semester 1
PSYC2011 **Brain and Behaviour**	6	**P** PSYC (1001 and 1002). **N** PSYC2111	Semester 1
PSYC2013 **Cognitive and Social Psychology**	6	**P** PSYC (1001 and 1002). **N** PSYC2113	Semester 2
Senior elective units of study			
For a major in Neuroscience, 24 credit points must be chosen from any of the following units: PCOL3022/3922, NEUR3001/3901, NEUR3002/3902, NEUR3003/3903, NEUR3004/3904, PSYC3011, PSYC3013, PSYC3014, PSYC3018			
At least two subject areas must be chosen from NEUR, PSYC and PCOL.			
PCOL3022 **Neuropharmacology**	6	**P** PCOL2011, PCOL2012 or 36 credit points from Intermediate BMED units of study **N** PCOL3002, PCOL3902, PCOL3922	Semester 2
PCOL3922 **Neuropharmacology (Advanced)**	6	**P** Distinction average in PCOL2011 and PCOL2012 or in 36 credit points from Intermediate BMED units of study **N** PCOL3002, PCOL3902, PCOL3022	Semester 2
NEUR3001 **Neuroscience: Special Senses**	6	**A** It is strongly recommended that students also take unit NEUR3002. PHSI2005 and ANAT2010 are assumed knowledge. **P** For BMedSc students: BMED(2801 or 2503) and BMED(2806 or 2505) For other students: (PHSI(2101 or 2001 or 2901 or 2005 or 2905) or ANAT(2003 or 2010)) and 6 credit points of MBLG. **N** PHSI3001, NEUR3901	Semester 1
NEUR3901 **Neuroscience: Special Senses (Advanced)**	6	**A** PHSI2005 and ANAT2010 **P** For BMedSc students: Credit average in BMED(2801 or 2503) and BMED(2806 or 2505) For other students: Credit average in (PHSI(2101 or 2001 or 2901 or 2005 or 2905) or ANAT(2003 or 2010)) and 6 credit points of MBLG. **N** NEUR3001, PHSI3001, PHSI3901 *Permission from the coordinators is required for entry into this course. It is strongly recommended that students also take unit NEUR3002 or NEUR3902.*	Semester 1

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
NEUR3002 **Neuroscience: Motor Systems & Behaviour**	6	**A** It is strongly recommended that students also take unit NEUR3001. ANAT2010 and PHSI2005 is assumed knowledge. **P** For BMedSc students: BMED(2801 or 2503) and BMED(2806 or 2505) For other students: (PHSI(2101 or 2001 or 2901 or 2005 or 2905) or ANAT(2003 or 2010)) and 6 credit points of MBLG. **N** PHSI3001, NEUR3902	Semester 1
NEUR3902 **Neuroscience: Motor Systems & Behav. Adv**	6	**A** ANAT2010 and PHSI2005 is assumed knowledge. **P** For BMedSc students: Credit average in BMED(2801 or 2503) and BMED(2806 or 2505) For other students: Credit average in (PHSI(2101 or 2001 or 2901 or 2005 or 2905) or ANAT(2003 or 2010)) and 6 credit points of MBLG. **N** NEUR3002, PHSI3001 *Permission from the coordinators is required for entry into this course. It is strongly recommended that students also take unit NEUR3001 or NEUR3901.*	Semester 1
NEUR3003 **Cellular and Developmental Neuroscience**	6	**A** Students should be familiar with the material in Bear, Connors & Paradiso Neuroscience: Exploring the Brain. **P** For BMedSci: 42 credit points of intermediate BMed units. For others: 18 credit points of Intermediate science units of study from Anatomy & Histology, Biochemistry, Biology, Chemistry, Computer Science, Mathematics, Microbiology, Molecular Biology and Genetics, Physiology, Psychology or Statisitics **N** NEUR3903, PHSI3002, PHSI3902 *Enrolment in NEUR3004 is HIGHLY RECOMMENDED. Courses are designed to be taken in conjunction with each other.*	Semester 2
NEUR3903 **Cellular & Developmental Neurosci. (Adv)**	6	**A** Students should be familiar with the material in Bear, Connors & Paradiso Neuroscience: Exploring the Brain. **P** For BMedSci: 42 credit points of intermediate BMed units. For others: 18 credit points of Intermediate science units of study from Anatomy & Histology, Biochemistry, Biology, Chemistry, Computer Science, Mathematics, Microbiology, Molecular Biology and Genetics, Physiology, Psychology or Statisitics. Plus, students must have a CREDIT (or better) in NEUR3001/3901 and NEUR3002/3902. **N** NEUR3003, PHSI3002, PHSI3902 *Note: Department permission required for enrolment* *Enrollment in NEUR3004/3904 is HIGHLY RECOMMENDED. Courses are designed to be taken in conjunction with each other. Students must receive permission from the coordinators for enrollment.*	Semester 2
NEUR3004 **Integrative Neuroscience**	6	**A** Students should be familiar with the material in Bear, Connors & Paradiso Neuroscience: Exploring the Brain. **P** For BMedSci: 42 credit points of intermediate BMed units. For others: 18 credit points of Intermediate science units of study from Anatomy & Histology, Biochemistry, Biology, Chemistry, Computer Science, Mathematics, Microbiology, Molecular Biology and Genetics, Physiology, Psychology or Statisitics. **N** NEUR3904, PHSI3002, PHSI3902 *Enrolment in NEUR3003 is HIGHLY RECOMMENDED. Courses are designed to be taken in conjunction with each other.*	Semester 2
NEUR3904 **Integrative Neuroscience (Advanced)**	6	**A** Students should be familiar with the material in Bear, Connors & Paradiso Neuroscience: Exploring the Brain. **P** For BMedSCI: 42 credit points of intermediate BMed units. For others: 18 credit points of Intermediate science units of study from Anatomy & Histology, Biochemistry, Biology, Chemistry, Computer Science, Mathematics, Microbiology, Molecular Biology and Genetics, Physiology, Psychology or Statisitics. Plus, students must have a CREDIT (or better) in NEUR3001/3901 and NEUR3002/3902. **N** NEUR3004, PHSI3002, PHSI3902 *Note: Department permission required for enrolment* *Enrolment in NEUR3003/3903 is HIGHLY RECOMMENDED. Courses are designed to be taken in conjunction with each other. Students must receive permission from the coordinators for enrolment.*	Semester 2
PSYC3011 **Learning and Behaviour**	6	**A** PSYC (2012 or 2112) **P** PSYC (2011 or 2111) and at least one other Intermediate Psychology Unit from PSYC (2012 or 2112), PSYC (2013 or 2113), PSYC (2014 or 2114). **N** PSYC3209	Semester 1
PSYC3012 **Cognition, Language and Thought**	6	**A** PSYC (2012 or 2112) **P** PSYC (2013 or 2113) and at least one other Intermediate Psychology unit from PSYC (2011 or 2111), PSYC (2012 or 2112), PSYC (2014 or 2114). **N** PSYC3205	Semester 1
PSYC3013 **Perceptual Systems**	6	**A** PSYC2012 **P** PSYC (2011 or 2111) and at least one other Intermediate Psychology Unit from PSYC (2012 or 2112), PSYC (2013 or 2113), PSYC (2014 or 2114) or ANAT2010 **N** PSYC3210	Semester 2
PSYC3014 **Behavioural and Cognitive Neuroscience**	6	**A** PSYC (2113 or 2013) **P** (PSYC (2011 or 2111) and at least one other Intermediate Psychology Unit from PSYC (2012 or 2112), PSYC (2013 or 2113), PSYC (2014 or 2114)) OR (ANAT2010 plus PCOL2011) **N** PSYC3204, PSYC3215	Semester 2
# Pharmacology			
For a major in Pharmacology, the minimum requirement is 24 credit points from senior units of study listed in this subject area.			
Intermediate units of study			
The completion of MBLG(1001 or 1901) is highly recommended.			
PCOL2011 **Pharmacology Fundamentals**	6	**P** (6 credit points of Junior Chemistry) and (6 credit points of Junior Biology or MBLG (1001 or 1901)). **N** PCOL2001	Semester 1
PCOL2012 **Pharmacology: Drugs and People**	6	**A** PCOL2011 **P** (6 credit points of Junior Chemistry) and (6 credit points of Junior Biology or MBLG (1001 or 1901)). **N** PCOL2002, PCOL2003	Semester 2

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
Senior units of study			
PCOL3011 **Toxicology**	6	**P** PCOL2001 or PCOL2011 and PCOL2012 or 36 credit points from Intermediate BMED units of study. **N** PCOL3001, PCOL3901, PCOL3911	Semester 1
PCOL3012 **Drug Design and Development**	6	**P** PCOL2001 or PCOL2011 and PCOL2012 or 36 credit points from Intermediate BMED units of study. **N** PCOL3001, PCOL3901, PCOL3912	Semester 1
PCOL3911 **Toxicology (Advanced)**	6	**P** Distinction average in PCOL2011 and PCOL2012 or Distinction average in 36 credit points from Intermediate BMED units of study. **N** PCOL3001, PCOL3901, PCOL3011	Semester 1
PCOL3912 **Drug Design and Development (Adv)**	6	**P** Distinction average in PCOL2011 and PCOL2012 or Distinction average in 36 credit points from Intermediate BMED units of study. **N** PCOL3001, PCOL3901, PCOL3012	Semester 1
PCOL3021 **Drug Therapy** *This unit of study is not Data Audit Committee Approved*	6	**P** PCOL2011 and PCOL2012 or 36 credit points from Intermediate BMED units of study **N** PCOL3002, PCOL3902, PCOL3921	Semester 2
PCOL3022 **Neuropharmacology**	6	**P** PCOL2011, PCOL2012 or 36 credit points from Intermediate BMED units of study **N** PCOL3002, PCOL3902, PCOL3922	Semester 2
PCOL3921 **Drug Therapy (Advanced)**	6	**P** Distinction average in PCOL2011 and PCOL2012 or in 36 credit points from Intermediate BMED units of study **N** PCOL3002, PCOL3902, PCOL3021	Semester 2
PCOL3922 **Neuropharmacology (Advanced)**	6	**P** Distinction average in PCOL2011 and PCOL2012 or in 36 credit points from Intermediate BMED units of study **N** PCOL3002, PCOL3902, PCOL3022	Semester 2
# Physics			
For a major in Physics, the minimum requirement is 24 credit points from senior units of study listed in this subject area which must include: (i) One semester 1 Core unit (PHYS3040, 3940 or 3941) (ii) One semester 2 Core unit (PHYS3060, 3960 or 3961) (iii) Two other non-over-lapping Options units (chosen from PHYS305x, 395x, 307x and 397x) Note that one Senior Computational Science unit (COSC3011/3911) may be included in a Physics major as one of the options.			
Junior units of study			
PHYS1001 **Physics 1 (Regular)**	6	**A** HSC Physics **C** Recommended concurrent Units of Study: MATH (1001/1901, 1002/1902) **N** PHYS1002 , PHYS1901	Semester 1
PHYS1002 **Physics 1 (Fundamentals)**	6	**A** No assumed knowledge of Physics **C** Recommended concurrent Units of Study: MATH (1001/1901, 1002/1902) **N** PHYS1001, PHYS1901	Semester 1
PHYS1901 **Physics 1A (Advanced)**	6	**P** UAI of at least 96, or HSC Physics result in Band 6, or PHYS1902, or Distinction or better in PHYS (1003 or 1004) or an equivalent unit. **C** Recommended concurrent Units of Study: MATH (1001/1901,1002/1902). **N** PHYS1001, PHYS1002	Semester 1
PHYS1003 **Physics 1 (Technological)**	6	**A** HSC Physics or PHYS (1001 or 1002 or 1901) or equivalent. **C** Recommended concurrent Units of Study: MATH (1003/1903), MATH (1005/1905). **N** PHYS1004, PHYS1902 *It is recommended that PHYS (1001 or 1002 or 1901) be completed before this unit*	Semester 2
PHYS1004 **Physics 1 (Environmental & Life Science)**	6	**A** HSC Physics or PHYS (1001 or 1002 or 1901) or equivalent. **C** Recommended concurrent Units of Study: MATH (1003/1903), MATH (1005/1905). **N** PHYS1003, PHYS1902 *It is recommended that PHYS (1001 or 1002 or 1901) be completed before this unit*	Semester 2
PHYS1902 **Physics 1B (Advanced)**	6	**P** UAI of at least 96, or HSC Physics result in Band 6, or PHYS1901, or Distinction or better in PHYS (1001 or 1002) or an equivalent unit. **C** Recommended concurrent unit of study: MATH (1003/1903), MATH (1005/1905). **N** PHYS1003, PHYS1004 *It is recommended that PHYS (1001 or 1002 or 1901) be completed before this unit*	Semester 2
PHYS1500 **Astronomy**	6	**A** No assumed knowledge of Physics.	Semester 2
Intermediate units of study			
PHYS2011 **Physics 2A**	6	**A** MATH (1001/1901 and 1002/1902 and 1003/1903). MATH (1005/1905) would also be useful **P** 12 credit points of Junior Physics (excluding PHYS1500) **N** PHYS2001, PHYS2901, PHYS2911, PHYS2101, PHYS2103, PHYS2213, PHYS2203	Semester 1
PHYS2911 **Physics 2A (Advanced)**	6	**A** MATH (1901/1001 and 1902/1002 and 1903/1003). MATH (1905/1005) would also be useful **P** Credit or better in PHYS (1901 or 1001 or 1002) and Credit or better in PHYS (1902 or 1003 or 1004). **N** PHYS2901, PHYS2001, PHYS2011, PHYS2101, PHYS2103, PHYS2213, PHYS2203	Semester 1
PHYS2012 **Physics 2B**	6	**A** MATH (1001/1901 and 1002/1902 and 1003/1903). MATH (1005/1905) would also be useful **P** PHYS (1003 or 1004 or 1902) and PHYS (1001 or 1002 or 1901 or 2001 or 2901 or 2011 or 2911) **N** PHYS2102, PHYS2104, PHYS2902, PHYS2002, PHYS2912, PHYS2213, PHYS2203	Semester 2
PHYS2013 **Astrophysics and Relativity**	6	**A** MATH (1001/1901 and 1002/1902 and 1003/1903). MATH 1005/1905 would also be useful **P** PHYS (1003 or 1004 or 1902) and PHYS (1001 or 1002 or 1901 or 2011 or 2911) **C** PHYS (2012 or 2912) **N** PHYS2001, PHYS2901, PHYS2913, PHYS2101, PHYS2103	Semester 2
PHYS2912 **Physics 2B (Advanced)**	6	**A** MATH (1001/1901 and 1002/1902 and 1003/1903). MATH 1005/1905 would also be useful **P** Credit or better in PHYS (1003 or 1004 or 1902) and Credit or better in PHYS (1001 or 1002 or 1901 or 2001 or 2901 or 2011 or 2911). **N** PHYS2102, PHYS2104, PHYS2902, PHYS2002, PHYS2012, PHYS2213, PHYS2203	Semester 2

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
PHYS2913 **Astrophysics and Relativity (Advanced)**	6	**A** MATH (1001/1901 and 1002/1902 and 1003/1903). MATH 1005/1905 would also be useful. **P** Credit or better in PHYS (1003 or 1004 or 1902) and Credit or better in PHYS (1001 or 1002 or 1901 or 2011 or 2911) **C** PHYS (2912 or 2012). **N** PHYS2001, PHYS2901, PHYS2013, PHYS2101, PHYS2103	Semester 2
Senior units of study			
PHYS3015 **Topics in Senior Physics A**	6	**A** 6 credit points of Intermediate Mathematics **P** 12 credit points of Intermediate Physics *Note: Department permission required for enrolment*	Semester 1
PHYS3025 **Topics in Senior Physics B**	6	**A** 6 credit points of Intermediate Mathematics **P** 12 credit points of Intermediate Physics *Note: Department permission required for enrolment*	Semester 2
PHYS3040 **Electromagnetism & Physics Lab**	6	**P** PHYS(2011 or 2911 or 2001 or 2901), PHYS(2012 or 2912 or 2002 or 2902), MATH(2061 or 2961 or 2067) **N** PHYS3940, PHYS3941, PHYS3011, PHYS3014, PHYS3016, PHYS3017, PHYS3911, PHYS3914, PHYS3916, PHYS3917	Semester 1
PHYS3051 **Thermodynamics/Biol. Physics & Lab**	6	**P** PHYS (2011 or 2911 or 2001 or 2901); PHYS (2012 or 2912 or 2002 or 2902) **N** PHYS3951, PHYS3052, PHYS3952, PHYS3053, PHYS3953, PHYS3055, PHYS3955, PHYS3056, PHYS3956, PHYS3057, PHYS3957, PHYS3058, PHYS3958, PHYS3059, PHYS3959	Semester 1
PHYS3052 **Nanoscience/Thermodynamics & Lab**	6	**P** PHYS (2011 or 2911 or 2001 or 2901); PHYS (2012 or 2912 or 2002 or 2902) **N** PHYS3952, PHYS3050, PHYS3051, PHYS3053, PHYS3056, PHYS3950, PHYS3951, PHYS3953, PHYS3956, PHYS3013, PHYS3021, PHYS3913, PHYS3921, PHYS3057, PHYS3957, PHYS3058, PHYS3958	Semester 1
PHYS3054 **Nanoscience/Plasma Physics & Physics Lab**	6	**A** Electromagnetism at Senior Physics level; MATH (2061 or 2961 or 2067) **P** PHYS (2011 or 2911 or 2001 or 2901); PHYS (2012 or 2912 or 2002 or 2902) **N** PHYS3954, PHYS3050, PHYS3950, PHYS3052, PHYS3952, PHYS3055, PHYS3955, PHYS3056, PHYS3956, PHYS3057, PHYS3957, PHYS3059, PHYS3959, PHYS3070, PHYS3970, PHYS3072, PHYS3972, PHYS3073, PHYS3973, PHYS3076, PHYS3976, PHYS3077, PHYS3977, PHYS3078, PHYS3978	Semester 1
PHYS3055 **Nanoscience/Plasma/Thermodynamics**	6	**A** Electromagnetism at Senior Physics level; MATH (2061 or 2961 or 2067) **P** PHYS (2011 or 2911 or 2001 or 2901); PHYS (2012 or 2912 or 2002 or 2902) **N** PHYS3955, PHYS3050, PHYS3950, PHYS3051, PHYS3951, PHYS3052, PHYS3952, PHYS3053, PHYS3953, PHYS3054, PHYS3954, PHYS3056, PHYS3956, PHYS3057, PHYS3957, PHYS3058, PHYS3958, PHYS3059, PHYS3959, PHYS3070, PHYS3970, PHYS3072, PHYS3972, PHYS3073, PHYS3973, PHYS3076, PHYS3976, PHYS3077, PHYS3977, PHYS3078, PHYS3978	Semester 1
PHYS3057 **Nanoscience/Thermodynamic/Biol.Phys**	6	**P** PHYS (2011 or 2911 or 2001 or 2901); PHYS (2012 or 2912 or 2002 or 2902) **N** PHYS3957, PHYS3050, PHYS3950, PHYS3051, PHYS3951, PHYS3052, PHYS3952, PHYS3053, PHYS3953, PHYS3054, PHYS3954, PHYS3055, PHYS3955, PHYS3056, PHYS3956, PHYS3058, PHYS3958, PHYS3059, PHYS3959	Semester 1
PHYS3059 **Plasma/Thermodynamics/Biol. Physics**	6	**A** Electromagnetism at Senior Physics level; MATH (2061 or 2961 or 2067) **P** PHYS (2011 or 2911 or 2001 or 2901); PHYS (2012 or 2912 or 2002 or 2902) **N** PHYS3959, PHYS3051, PHYS3951, PHYS3052, PHYS3952, PHYS3053, PHYS3953, PHYS3054, PHYS3954, PHYS3055, PHYS3955, PHYS3056, PHYS3956, PHYS3057, PHYS3957, PHYS3058, PHYS3958, PHYS3070, PHYS3970, PHYS3072, PHYS3972, PHYS3073, PHYS3973, PHYS3076, PHYS3976, PHYS3077, PHYS3977, PHYS3078, PHYS3978	Semester 1
PHYS3060 **Quantum Mechanics & Physics Lab**	6	**P** PHYS(2011 or 2911 or 2001 or 2901); PHYS(2012 or 2912 or 2002 or 2902); MATH(2061 or 2961 or 2067) **N** PHYS3960, PHYS3961, PHYS3011, PHYS3024, PHYS3026, PHYS3027, PHYS3911, PHYS3924, PHYS3926, PHYS3927	Semester 2
PHYS3062 **Quantum/Cond Matter Physics & Lab**	6	**P** PHYS2012 or PHYS2912 **N** PHYS3060, PHYS3960, PHYS3961, PHYS3962, PHYS3068, PHYS3968, PHYS3070, PHYS3970, PHYS3074, PHYS3974, PHYS3075, PHYS3975, PHYS3076, PHYS3976, PHYS3077, PHYS3977, PHYS3079, PHYS3979, PHYS3080, PHYS3980, PHYS3081, PHYS3981	Semester 2
PHYS3068 **Optics/Cond. Matter & Lab**	6	**A** Electromagnetism and Quantum Mechanics at Senior Physics level; MATH (2061 or 2961 or 2067) **P** PHYS (2011 or 2911 or 2001 or 2901); PHYS (2012 or 2912 or 2002 or 2902) **N** PHYS3968, PHYS3050, PHYS3950, PHYS3053, PHYS3953, PHYS3056, PHYS3956, PHYS3058, PHYS3958, PHYS3062, PHYS3962, PHYS3069, PHYS3969, PHYS3070, PHYS3970, PHYS3074, PHYS3974, PHYS3075, PHYS3975, PHYS3076, PHYS3976, PHYS3077, PHYS3977, PHYS3079, PHYS3979, PHYS3080, PHYS3980, PHYS3081, PHYS3981, PHYS3082, PHYS3982	Semester 2
PHYS3069 **Optics/High Energy Physics & Lab**	6	**A** Electromagnetism at Senior Physics level; MATH (2061 or 2961 or 2067) **P** PHYS (2011 or 2911 or 2001 or 2901); PHYS (2012 or 2912 or 2002 or 2902); PHYS (2013 or 2913 or 2001 or 2901) **N** PHYS3969, PHYS3050, PHYS3950, PHYS3053, PHYS3953, PHYS3056, PHYS3956, PHYS3058, PHYS3958, PHYS3068, PHYS3968, PHYS3071, PHYS3971, PHYS3073, PHYS3973, PHYS3074, PHYS3974, PHYS3076, PHYS3976, PHYS3078, PHYS3978, PHYS3079, PHYS3979, PHYS3080, PHYS3980, PHYS3081, PHYS3981, PHYS3082, PHYS3982	Semester 2
PHYS3071 **High Energy/Astrophysics & Lab**	6	**P** PHYS (2011 or 2911 or 2001 or 2901); PHYS (2012 or 2912 or 2002 or 2902); PHYS (2013 or 2913 or 2001 or 2901) **N** PHYS3971, PHYS3069, PHYS3969, PHYS3072, PHYS3972, PHYS3073, PHYS3973, PHYS3074, PHYS3974, PHYS3075, PHYS3975, PHYS3076, PHYS3976, PHYS3077, PHYS3977, PHYS3078, PHYS3978, PHYS3079, PHYS3979, PHYS3080, PHYS3980, PHYS3081, PHYS3981, PHYS3082, PHYS3982	Semester 2
PHYS3074 **High Energy/Cond. Matter Physics & Lab**	6	**A** Quantum Mechanics at Senior Physics level; MATH (2061 or 2961) **P** PHYS (2011 or 2911 or 2001 or 2901); PHYS (2012 or 2912 or 2002 or 2902); PHYS (2013 or 2913 or 2001 or 2901) **N** PHYS3974, PHYS3062, PHYS3962, PHYS3068, PHYS3968, PHYS3069, PHYS3969, PHYS3070, PHYS3970, PHYS3071, PHYS3971, PHYS3073, PHYS3973, PHYS3075, PHYS3975, PHYS3076, PHYS3976, PHYS3077, PHYS3977, PHYS3078, PHYS3978, PHYS3079, PHYS3979, PHYS3080, PHYS3980, PHYS3081, PHYS3981, PHYS3082, PHYS3982	Semester 2

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
PHYS3079 **Cond. Matter/High Energy/Astrophysics**	6	**A** Quantum Mechanics at Senior Physics level; MATH (2061 or 2961) **P** PHYS (2011 or 2911 or 2001 or 2901); PHYS (2012 or 2912 or 2002 or 2902); PHYS (2013 or 2913 or 2001 or 2901) **N** PHYS3979, PHYS3062, PHYS3962, PHYS3068, PHYS3968, PHYS3069, PHYS3969, PHYS3070, PHYS3970, PHYS3071, PHYS3971, PHYS3072, PHYS3972, PHYS3073, PHYS3973, PHYS3074, PHYS3974, PHYS3075, PHYS3975, PHYS3076, PHYS3976, PHYS3077, PHYS3977, PHYS3078, PHYS3978, PHYS3080, PHYS3980, PHYS3081, PHYS3981, PHYS3082, PHYS3982	Semester 2
PHYS3080 **Optics/Cond.Matter/High Energy Physics**	6	**A** Electromagnetism and Quantum Mechanics at Senior Physics level; MATH (2061 or 2961 or 2067) **P** PHYS (2011 or 2911 or 2001 or 2901); PHYS (2012 or 2912 or 2002 or 2902); PHYS (2013 or 2913 or 2001 or 2901) **N** PHYS3980, PHYS3050, PHYS3950, PHYS3053, PHYS3953, PHYS3056, PHYS3956, PHYS3058, PHYS3958, PHYS3062, PHYS3962, PHYS3068, PHYS3968, PHYS3069, PHYS3969, PHYS3070, PHYS3970, PHYS3071, PHYS3971, PHYS3073, PHYS3973, PHYS3074, PHYS3974, PHYS3075, PHYS3975, PHYS3076, PHYS3976, PHYS3077, PHYS3977, PHYS3078, PHYS3978, PHYS3079, PHYS3979, PHYS3081, PHYS3981, PHYS3082, PHYS3982	Semester 2
PHYS3081 **Optics/Cond. Matter/Astrophysics**	6	**A** Electromagnetism and Quantum Mechanics at Senior Physics level; MATH (2061 or 2961 or 2067) **P** PHYS (2012 or 2912 or 2002 or 2902); PHYS (2013 or 2913 or 2001 or 2901) **N** PHYS3981, PHYS3050, PHYS3950, PHYS3053, PHYS3953, PHYS3056, PHYS3956, PHYS3058, PHYS3958, PHYS3062, PHYS3962, PHYS3068, PHYS3968, PHYS3069, PHYS3969, PHYS3070, PHYS3970, PHYS3071, PHYS3971, PHYS3072, PHYS3972, PHYS3074, PHYS3974, PHYS3075, PHYS3975, PHYS3076, PHYS3976, PHYS3077, PHYS3977, PHYS3078, PHYS3978, PHYS3079, PHYS3979, PHYS3080, PHYS3980, PHYS3082, PHYS3982	Semester 2
PHYS3082 **Optics/High Energy/Astrophysics**	6	**A** Electromagnetism at Senior Physics level; MATH (2061 or 2961 or 2067) **P** PHYS (2011 or 2911 or 2001 or 2901); PHYS (2012 or 2912 or 2002 or 2902); PHYS (2013 or 2913 or 2001 or 2901) **N** PHYS3982, PHYS3050, PHYS3950, PHYS3053, PHYS3953, PHYS3056, PHYS3956, PHYS3058, PHYS3958, PHYS3068, PHYS3968, PHYS3069, PHYS3969, PHYS3071, PHYS3971, PHYS3072, PHYS3972, PHYS3073, PHYS3973, PHYS3074, PHYS3974, PHYS3075, PHYS3975, PHYS3076, PHYS3976, PHYS3077, PHYS3977, PHYS3078, PHYS3978, PHYS3079, PHYS3979, PHYS3080, PHYS3980, PHYS3081, PHYS3981	Semester 2
PHYS3915 **Topics in Senior Physics A (Advanced)**	6	**A** 6 credit points of Intermediate Mathematics **P** 12 credit points of Intermediate Physics. *Note: Department permission required for enrolment*	Semester 1
PHYS3925 **Topics in Senior Physics B (Advanced)**	6	**P** 12 credit points of Intermediate Physics with a Credit average and 6 credit points of Intermediate Mathematics. *Note: Department permission required for enrolment*	Semester 2
PHYS3940 **Electromagnetism & Physics Lab (Adv)**	6	**P** PHYS (2011 or 2911 or 2001 or 2901) with a grade of at least Credit; PHYS (2012 or 2912 or 2002 or 2902) with a grade of at least Credit; MATH (2061 or 2961 or 2067) **N** PHYS3040, PHYS3941, PHYS3011, PHYS3014, PHYS3016, PHYS3017, PHYS3911, PHYS3914, PHYS3916, PHYS3917	Semester 1
PHYS3941 **Electromagnetism & Special Project (Adv)**	6	**P** PHYS (2011 or 2911 or 2001 or 2901) with at least Credit; PHYS (2012 or 2912 or 2002 or 2902) with at least Credit; MATH (2061 or 2961 or 2067) **N** PHYS3040, PHYS3940, PHYS3961, PHYS3011, PHYS3911, PHYS3918, PHYS3928 *Note: Department permission required for enrolment* *Approval for this unit must be obtained from the School of Physics Senior Coordinator.*	Semester 1
PHYS3951 **Thermodynamics/Biol. Physics & Lab (Adv)**	6	**P** PHYS (2011 or 2911 or 2001 or 2901) with at least Credit; PHYS (2012 or 2912 or 2002 or 2902) with at least Credit **N** PHYS3951, PHYS3052, PHYS3952, PHYS3053, PHYS3953, PHYS3055, PHYS3955, PHYS3056, PHYS3956, PHYS3057, PHYS3957, PHYS3058, PHYS3958, PHYS3059, PHYS3959	Semester 1
PHYS3952 **Nanoscience/Thermodynamics & Lab (Adv)**	6	**P** PHYS (2011 or 2911 or 2001 or 2901) with at least Credit; PHYS (2012 or 2912 or 2002 or 2902) with at least Credit **N** PHYS3052, PHYS3050, PHYS3051, PHYS3053, PHYS3056, PHYS3950, PHYS3951, PHYS3953, PHYS3956, PHYS3013, PHYS3021, PHYS3913, PHYS3921, PHYS3057, PHYS3957, PHYS3058, PHYS3958	Semester 1
PHYS3954 **Nanoscience/Plasma Physics & Lab (Adv)**	6	**A** Electromagnetism at Senior Physics level; MATH (2061 or 2961 or 2067) **P** PHYS (2011 or 2911 or 2001 or 2901) with at least Credit; PHYS (2012 or 2912 or 2002 or 2902) with at least Credit **N** PHYS3054, PHYS3050, PHYS3950, PHYS3052, PHYS3952, PHYS3055, PHYS3955, PHYS3056, PHYS3956, PHYS3057, PHYS3957, PHYS3059, PHYS3959, PHYS3070, PHYS3970, PHYS3072, PHYS3972, PHYS3073, PHYS3973, PHYS3076, PHYS3976, PHYS3077, PHYS3977, PHYS3078, PHYS3978	Semester 1
PHYS3955 **Nanoscience/Plasma/Thermodynamics (Adv)**	6	**A** Electromagnetism at Senior Physics level; MATH (2061 or 2961 or 2067) **P** PHYS (2011 or 2911 or 2001 or 2901) with at least Credit; PHYS (2012 or 2912 or 2002 or 2902) with at least Credit **N** PHYS3055, PHYS3050, PHYS3950, PHYS3051, PHYS3951, PHYS3052, PHYS3952, PHYS3053, PHYS3953, PHYS3054, PHYS3954, PHYS3056, PHYS3956, PHYS3057, PHYS3957, PHYS3058, PHYS3958, PHYS3059, PHYS3959, PHYS3070, PHYS3970, PHYS3072, PHYS3972, PHYS3073, PHYS3973, PHYS3076, PHYS3976, PHYS3077, PHYS3977, PHYS3078, PHYS3978	Semester 1
PHYS3957 **Nanoscience/Thermodynamic/Biol.Phys(Adv)**	6	**P** PHYS (2011 or 2911 or 2001 or 2901) with at least Credit; PHYS (2012 or 2912 or 2002 or 2902) with at least Credit **N** PHYS3057, PHYS3050, PHYS3950, PHYS3051, PHYS3951, PHYS3052, PHYS3952, PHYS3053, PHYS3953, PHYS3054, PHYS3954, PHYS3055, PHYS3955, PHYS3056, PHYS3956, PHYS3058, PHYS3958, PHYS3059, PHYS3959	Semester 1
PHYS3959 **Plasma/Thermodynamics/Biol.Physics (Adv)**	6	**A** Electromagnetism at Senior Physics level; MATH (2061 or 2961 or 2067) **P** PHYS (2011 or 2911 or 2001 or 2901) with at least Credit; PHYS (2012 or 2912 or 2002 or 2902) with at least Credit **N** PHYS3059, PHYS3051, PHYS3951, PHYS3052, PHYS3952, PHYS3053, PHYS3953, PHYS3054, PHYS3954, PHYS3055, PHYS3955, PHYS3056, PHYS3956, PHYS3057, PHYS3957, PHYS3058, PHYS3958, PHYS3070, PHYS3970, PHYS3072, PHYS3972, PHYS3073, PHYS3973, PHYS3076, PHYS3976, PHYS3077, PHYS3977, PHYS3078, PHYS3978	Semester 1

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
PHYS3960 **Quantum Mechanics & Physics Lab (Adv)**	6	**P** PHYS (2011 or 2911 or 2001 or 2901) with at least Credit; PHYS (2012 or 2912 or 2002 or 2902) with at least Credit; MATH (2061 or 2961 or 2067) **N** PHYS3060, PHYS3961, PHYS3011, PHYS3024, PHYS3026, PHYS3027, PHYS3911, PHYS3924, PHYS3926, PHYS3927	Semester 2
PHYS3961 **Quantum Mechanics & Special Project(Adv)**	6	**P** PHYS (2011 or 2911 or 2001 or 2901) with at least Credit; PHYS (2012 or 2912 or 2002 or 2902) with at least Credit; MATH (2061 or 2961 or 2067) **N** PHYS3060, PHYS3960, PHYS3941, PHYS3011, PHYS3911, PHYS3918, PHYS3928 *Note: Department permission required for enrolment* *Approval for this unit must be obtained from the School of Physics Senior Coordinator*	Semester 2
PHYS3962 **Quantum/Cond Matter Physics & Lab (Adv)**	6	**P** PHYS2012 or PHYS2912 with result of credit or better **N** PHYS3060, PHYS3960, PHYS3961, PHYS3062, PHYS3068, PHYS3968, PHYS3070, PHYS3970, PHYS3074, PHYS3974, PHYS3075, PHYS3975, PHYS3076, PHYS3976, PHYS3077, PHYS3977, PHYS3079, PHYS3979, PHYS3080, PHYS3980, PHYS3081, PHYS3981	Semester 2
PHYS3968 **Optics/Cond. Matter & Lab (Adv)**	6	**A** Electromagnetism and Quantum Mechanics at Senior Physics level; MATH (2061 or 2961 or 2067) **P** PHYS (2011 or 2911 or 2001 or 2901) with at least Credit; PHYS (2012 or 2912 or 2002 or 2902) with at least Credit **N** PHYS3068, PHYS3050, PHYS3950, PHYS3053, PHYS3953, PHYS3056, PHYS3956, PHYS3058, PHYS3958, PHYS3062, PHYS3962, PHYS3069, PHYS3969, PHYS3070, PHYS3970, PHYS3074, PHYS3974, PHYS3075, PHYS3975, PHYS3076, PHYS3976, PHYS3077, PHYS3977, PHYS3079, PHYS3979, PHYS3080, PHYS3980, PHYS3081, PHYS3981, PHYS3082, PHYS3982	Semester 2
PHYS3969 **Optics/High Energy Physics & Lab (Adv)**	6	**A** Electromagnetism at Senior Physics level; MATH (2061 or 2961 or 2067) **P** PHYS (2011 or 2911 or 2001 or 2901) with at least Credit; PHYS (2012 or 2912 or 2002 or 2902) with at least Credit; PHYS (2013 or 2913 or 2001 or 2901) with at least Credit **N** PHYS3069, PHYS3050, PHYS3950, PHYS3053, PHYS3953, PHYS3056, PHYS3956, PHYS3058, PHYS3958, PHYS3068, PHYS3968, PHYS3071, PHYS3971, PHYS3073, PHYS3973, PHYS3074, PHYS3974, PHYS3076, PHYS3976, PHYS3078, PHYS3978, PHYS3079, PHYS3979, PHYS3080, PHYS3980, PHYS3081, PHYS3981, PHYS3082, PHYS3982	Semester 2
PHYS3971 **High Energy/Astrophysics & Lab (Adv)**	6	**P** PHYS (2011 or 2911 or 2001 or 2901) with at least Credit; PHYS (2012 or 2912 or 2002 or 2902) with at least Credit; PHYS (2013 or 2913 or 2001 or 2901) with at least Credit **N** PHYS3071, PHYS3069, PHYS3969, PHYS3072, PHYS3972, PHYS3073, PHYS3973, PHYS3074, PHYS3974, PHYS3075, PHYS3975, PHYS3076, PHYS3976, PHYS3077, PHYS3977, PHYS3078, PHYS3978, PHYS3079, PHYS3979, PHYS3080, PHYS3980, PHYS3081, PHYS3981, PHYS3082, PHYS3982	Semester 2
PHYS3974 **High Energy/Cond. Matter Phys.& Lab(Adv)**	6	**A** Quantum Mechanics at Senior Physics level; MATH (2061 or 2961) **P** PHYS (2011 or 2911 or 2001 or 2901) with at least Credit; PHYS (2012 or 2912 or 2002 or 2902) with at least Credit ; PHYS (2013 or 2913 or 2001 or 2901) with at least Credit **N** PHYS3074, PHYS3062, PHYS3962, PHYS3068, PHYS3968, PHYS3069, PHYS3969, PHYS3070, PHYS3970, PHYS3071, PHYS3971, PHYS3073, PHYS3973, PHYS3075, PHYS3975, PHYS3076, PHYS3976, PHYS3077, PHYS3977, PHYS3078, PHYS3978, PHYS3079, PHYS3979, PHYS3080, PHYS3980, PHYS3081, PHYS3981, PHYS3082, PHYS3982	Semester 2
PHYS3979 **Cond. Matter/High Energy/Astrophys (Adv)**	6	**A** Quantum Mechanics at Senior Physics level; MATH (2061 or 2961) **P** PHYS (2011 or 2911 or 2001 or 2901) with at least credit; PHYS (2012 or 2912 or 2002 or 2902) with at least Credit; PHYS (2013 or 2913 or 2001 or 2901) with at least Credit **N** PHYS3079, PHYS3062, PHYS3962, PHYS3068, PHYS3968, PHYS3069, PHYS3969, PHYS3070, PHYS3970, PHYS3071, PHYS3971, PHYS3072, PHYS3972, PHYS3073, PHYS3973, PHYS3074, PHYS3974, PHYS3075, PHYS3975, PHYS3076, PHYS3976, PHYS3077, PHYS3977, PHYS3078, PHYS3978, PHYS3080, PHYS3980, PHYS3081, PHYS3981, PHYS3082, PHYS3982	Semester 2
PHYS3980 **Optics/Cond.Matter/High Energy Phys(Adv)**	6	**A** Electromagnetism and Quantum Mechanics at Senior Physics level; MATH (2061 or 2961 or 2067) **P** PHYS (2011 or 2911 or 2001 or 2901) with at least Credit; PHYS (2012 or 2912 or 2002 or 2902) with at least Credit; PHYS (2013 or 2913 or 2001 or 2901) with at least Credit **N** PHYS3080, PHYS3050, PHYS3950, PHYS3053, PHYS3953, PHYS3056, PHYS3956, PHYS3058, PHYS3958, PHYS3062, PHYS3962, PHYS3068, PHYS3968, PHYS3069, PHYS3969, PHYS3070, PHYS3970, PHYS3071, PHYS3971, PHYS3073, PHYS3973, PHYS3074, PHYS3974, PHYS3075, PHYS3975, PHYS3076, PHYS3976, PHYS3077, PHYS3977, PHYS3078, PHYS3978, PHYS3079, PHYS3979, PHYS3081, PHYS3981, PHYS3082, PHYS3982	Semester 2
PHYS3981 **Optics/Cond. Matter/Astrophysics (Adv)**	6	**A** Electromagnetism and Quantum Mechanics at Senior Physics level; MATH (2061 or 2961 or 2067) **P** PHYS (2012 or 2912 or 2002 or 2902) with at least Credit; PHYS (2013 or 2913 or 2001 or 2901) with at least Credit **N** PHYS3081, PHYS3050, PHYS3950, PHYS3053, PHYS3953, PHYS3056, PHYS3956, PHYS3058, PHYS3958, PHYS3062, PHYS3962, PHYS3068, PHYS3968, PHYS3069, PHYS3969, PHYS3070, PHYS3970, PHYS3071, PHYS3971, PHYS3072, PHYS3972, PHYS3074, PHYS3974, PHYS3075, PHYS3975, PHYS3076, PHYS3976, PHYS3077, PHYS3977, PHYS3078, PHYS3978, PHYS3079, PHYS3979, PHYS3080, PHYS3980, PHYS3082, PHYS3982	Semester 2
PHYS3982 **Optics/High Energy/Astrophysics (Adv)**	6	**A** Electromagnetism at Senior Physics level; MATH (2061 or 2961 or 2067) **P** PHYS (2011 or 2911 or 2001 or 2901) with at least Credit; PHYS (2012 or 2912 or 2002 or 2902) with at least Credit; PHYS (2013 or 2913 or 2001 or 2901) with at least Credit **N** PHYS3082, PHYS3050, PHYS3950, PHYS3053, PHYS3953, PHYS3056, PHYS3956, PHYS3058, PHYS3958, PHYS3068, PHYS3968, PHYS3069, PHYS3969, PHYS3071, PHYS3971, PHYS3072, PHYS3972, PHYS3073, PHYS3973, PHYS3074, PHYS3974, PHYS3075, PHYS3975, PHYS3076, PHYS3976, PHYS3077, PHYS3977, PHYS3078, PHYS3978, PHYS3079, PHYS3979, PHYS3080, PHYS3980, PHYS3081, PHYS3981	Semester 2
COSC3011 **Scientific Computing**	6	**A** Programming experience in MATLAB **P** 12 credit points chosen from Junior Mathematics and Statistics, 12 credit points of Intermediate units in Science subject areas. **N** COSC3911, COSC3001, COSC3901, PHYS3301, PHYS3901	Semester 2
COSC3911 **Scientific Computing (Advanced)**	6	**A** Programming experience in MATLAB **P** 12 credit points chosen from Junior Mathematics and Statistics, 12 credit points of Intermediate units in Science subject areas with a credit average. **N** COSC3011, COSC3001, COSC3901, PHYS3301, PHYS3901	Semester 2

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
# Physiology			
for a major in Physiology, the minimum requirement is 24 credit points from senior units of study listed in this subject area.			
Intermediate units of study			
PHSI2005 **Integrated Physiology A**	6	**P** 6 credit points of Junior Chemistry plus 30 credit points from any Junior Chemistry, Physics, Mathematics, Biology, Psychology units of study **N** PHSI2905, PHSI2001, PHSI2101, PHSI2901 *The completion of 6 credit points of MBLG units of study is highly recommended for progression to Senior Physiology. Students taking combined degrees or with passes in units not listed should consult a coordinator if they do not meet the prerequisites.*	Semester 1
PHSI2905 **Integrated Physiology A (Advanced)**	6	**P** 6 credit points of Junior Chemistry plus 30 credit points from any Junior Chemistry, Physics, Mathematics, Biology, Psychology units of study, approval of Coordinator **N** PHSI2005, PHSI2901, PHSI2001, PHSI2101 *Note: Department permission required for enrolment* *Permission from the coordinators is required for entry into this course. It is available only to selected students who have achieved a WAM of 75 (or higher) in their Junior units of study. Students taking combined degrees or with passes in units not listed should consult a coordinator if they do not meet the prerequisites. The completion of 6 credit points of MBLG units of study is highly recommended for progression to Senior Physiology*	Semester 1
PHSI2006 **Integrated Physiology B**	6	**P** 6 credit points of Junior Chemistry plus 30 credit points from any Junior Chemistry, Physics, Mathematics, Biology, Psychology units of study **N** PHSI2906, PHSI2002, PHSI2102, PHSI2902 *The completion of Molecular Biology and Genetics A is highly recommended for progression to Senior Physiology. Students taking combined degrees or with passes in units not listed should consult a coordinator if they do not meet the prerequisites.*	Semester 2
PHSI2906 **Integrated Physiology B (Advanced)**	6	**P** 6 credit points of Junior Chemistry plus 30 credit points from any Junior Chemistry, Physics, Mathematics, Biology, Psychology units of study, approval of coordinator **N** PHSI2006, PHSI2902, PHSI2002, PHSI2102 *Note: Department permission required for enrolment* *Permission from the coordinators is required for entry into this course. It is available only to selected students who have achieved a WAM of 75 (or higher) in their Junior units of study. Students taking combined degrees or with passes in units not listed should consult a coordinator if they do not meet the prerequisite. The completion of Molecular Biology and Genetics A is highly recommended for progression to Senior Physiology.*	Semester 2
Senior units of study			
PHSI3005 **Human Cellular Physiology: Theory**	6	**A** 6 credit points of MBLG **P** Except for BMedSc students: PHSI(2005 or 2905) and PHSI(2006 or 2906) For BMedSc: BMED (2801 and 2802). **N** PHSI3905, PHSI3004, PHSI3904 *It is highly recommended that this unit of study be taken in conjunction with PHSI3006.*	Semester 1
PHSI3905 **Human Cellular Physiology (Adv): Theory**	6	**A** 6 credit points of MBLG **P** Credit average in PHSI(2005 or 2905) and PHSI(2006 or 2906) or in BMED (2801 and 2802). Students enrolling in this unit should have a WAM of at least 70. **N** PHSI3005, PHSI3004, PHSI3904 *Note: Department permission required for enrolment* *It is highly recommended that this unit of study be taken in combination with PHSI3906*	Semester 1
PHSI3006 **Human Cellular Physiology: Research**	6	**P** Except for BMedSc students: PHSI (2005 or 2905) and PHSI(2006 or 2906) For BMedSc: BMED (2801 and 2802). **C** PHSI3005 **N** PHSI3906, PHSI3004, PHSI3904	Semester 1
PHSI3906 **Human Cellular Physiology (Ad): Research**	6	**A** 6 credit points of MBLG **P** PHSI (2005 or 2905) and PHSI(2006 or 2906) or in BMED (2801 and 2802). Students enroling in this unit should have a WAM of at least 70. **C** PHSI3905 **N** PHSI3006, PHSI3004, PHSI3904 *Note: Department permission required for enrolment*	Semester 1
NEUR3001 **Neuroscience: Special Senses**	6	**A** It is strongly recommended that students also take unit NEUR3002. PHSI2005 and ANAT2010 are assumed knowledge. **P** For BMedSc students: BMED(2801 or 2503) and BMED(2806 or 2505) For other students: (PHSI(2101 or 2001 or 2901 or 2005 or 2905) or ANAT(2003 or 2010)) and 6 credit points of MBLG. **N** PHSI3001, NEUR3901	Semester 1
NEUR3901 **Neuroscience: Special Senses (Advanced)**	6	**A** PHSI2005 and ANAT2010 **P** For BMedSc students: Credit average in BMED(2801 or 2503) and BMED(2806 or 2505) For other students: Credit average in (PHSI(2101 or 2001 or 2901 or 2005 or 2905) or ANAT(2003 or 2010)) and 6 credit points of MBLG. **N** NEUR3001, PHSI3001, PHSI3901 *Permission from the coordinators is required for entry into this course. It is strongly recommended that students also take unit NEUR3002 or NEUR3902.*	Semester 1
NEUR3002 **Neuroscience: Motor Systems & Behaviour**	6	**A** It is strongly recommended that students also take unit NEUR3001. ANAT2010 and PHSI2005 is assumed knowledge. **P** For BMedSc students: BMED(2801 or 2503) and BMED(2806 or 2505) For other students: (PHSI(2101 or 2001 or 2901 or 2005 or 2905) or ANAT(2003 or 2010)) and 6 credit points of MBLG. **N** PHSI3001, NEUR3902	Semester 1
NEUR3902 **Neuroscience: Motor Systems & Behav. Adv**	6	**A** ANAT2010 and PHSI2005 is assumed knowledge. **P** For BMedSc students: Credit average in BMED(2801 or 2503) and BMED(2806 or 2505) For other students: Credit average in (PHSI(2101 or 2001 or 2901 or 2005 or 2905) or ANAT(2003 or 2010)) and 6 credit points of MBLG. **N** NEUR3002, PHSI3001 *Permission from the coordinators is required for entry into this course. It is strongly recommended that students also take unit NEUR3001 or NEUR3901.*	Semester 1

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
PHSI3007 **Heart and Circulation: Normal Function**	6	**A** 6 credit points of MBLG **P** Except for BMedSc students: PHSI(2005 or 2905) and PHSI(2006 or 2906) plus at least 12 credit points of intermediate Science Units of Study For BMedSc: BMED (2801 and 2803). **N** PHSI3907, PHSI3003, PHSI3903 *It is recommended that students take PHSI3007 ONLY in combination with PHSI3008.*	Semester 2
PHSI3907 **Heart & Circulation: Normal Function Adv**	6	**A** 6 credit points of MBLG **P** Except for BMedSc students: PHSI(2005 or 2905) and PHSI(2006 or 2906) plus at least 12 credit points of intermediate Science Units of Study For BMedSc: BMED (2801 and 2803). **N** PHSI3007, PHSI3003, PHSI3903 *Note: Department permission required for enrolment* *Available to selected students who have achieved an average of at least 75 in their prerequisite units of study. It is highly recommended that this unit of study be taken in combination with PHSI3908.*	Semester 2
PHSI3008 **Heart and Circulation: Dysfunction**	6	**A** 6 credit points of MBLG **P** Except for BMedSc students: PHSI(2005 or 2905) and PHSI(2006 or 2906) plus at least 12 credit points of intermediate Science Units of Study For BMedSc: BMED (2801 and 2803) **N** PHSI3908, PHSI3003, PHSI3903 *It is strongly recommended that students take PHSI3008 ONLY in combination with PHSI3007*	Semester 2
PHSI3908 **Heart & Circulation: Dysfunction Adv**	6	**A** 6 credit points of MBLG **P** Except for BMedSc students: PHSI(2005 or 2905) and PHSI(2006 or 2906) plus at least 12 credit points of intermediate Science Units of Study For BMedSc: BMED (2801 and 2803). **N** PHSI3008, PHSI3003, PHSI3903 *Note: Department permission required for enrolment* *Available to selected students who have achieved an average of at least 75 in their prerequisite units of study. It is highly recommended that this unit of study be taken ONLY in combination with PHSI3907 or PHSI3007.*	Semester 2
NEUR3003 **Cellular and Developmental Neuroscience**	6	**A** Students should be familiar with the material in Bear, Connors & Paradiso Neuroscience: Exploring the Brain. **P** For BMedSci: 42 credit points of intermediate BMed units. For others: 18 credit points of Intermediate science units of study from Anatomy & Histology, Biochemistry, Biology, Chemistry, Computer Science, Mathematics, Microbiology, Molecular Biology and Genetics, Physiology, Psychology or Statisitics **N** NEUR3903, PHSI3002, PHSI3902 *Enrolment in NEUR3004 is HIGHLY RECOMMENDED. Courses are designed to be taken in conjunction with each other.*	Semester 2
NEUR3903 **Cellular & Developmental Neurosci. (Adv)**	6	**A** Students should be familiar with the material in Bear, Connors & Paradiso Neuroscience: Exploring the Brain. **P** For BMedSci: 42 credit points of intermediate BMed units. For others: 18 credit points of Intermediate science units of study from Anatomy & Histology, Biochemistry, Biology, Chemistry, Computer Science, Mathematics, Microbiology, Molecular Biology and Genetics, Physiology, Psychology or Statisitics. Plus, students must have a CREDIT (or better) in NEUR3001/3901 and NEUR3002/3902. **N** NEUR3003, PHSI3002, PHSI3902 *Note: Department permission required for enrolment* *Enrollment in NEUR3004/3904 is HIGHLY RECOMMENDED. Courses are designed to be taken in conjunction with each other. Students must receive permission from the coordinators for enrollment.*	Semester 2
NEUR3004 **Integrative Neuroscience**	6	**A** Students should be familiar with the material in Bear, Connors & Paradiso Neuroscience: Exploring the Brain. **P** For BMedSci: 42 credit points of intermediate BMed units. For others: 18 credit points of Intermediate science units of study from Anatomy & Histology, Biochemistry, Biology, Chemistry, Computer Science, Mathematics, Microbiology, Molecular Biology and Genetics, Physiology, Psychology or Statisitics. **N** NEUR3904, PHSI3002, PHSI3902 *Enrolment in NEUR3003 is HIGHLY RECOMMENDED. Courses are designed to be taken in conjunction with each other.*	Semester 2
NEUR3904 **Integrative Neuroscience (Advanced)**	6	**A** Students should be familiar with the material in Bear, Connors & Paradiso Neuroscience: Exploring the Brain. **P** For BMedSCI: 42 credit points of intermediate BMed units. For others: 18 credit points of Intermediate science units of study from Anatomy & Histology, Biochemistry, Biology, Chemistry, Computer Science, Mathematics, Microbiology, Molecular Biology and Genetics, Physiology, Psychology or Statisitics. Plus, students must have a CREDIT (or better) in NEUR3001/3901 and NEUR3002/3902. **N** NEUR3004, PHSI3002, PHSI3902 *Note: Department permission required for enrolment* *Enrolment in NEUR3003/3903 is HIGHLY RECOMMENDED. Courses are designed to be taken in conjunction with each other. Students must receive permission from the coordinators for enrolment.*	Semester 2
# Plant Science			
for a major in Plant Science, the minimum requirement is 24 credit points from senior units of study listed in this subject area, including a minimum of 12 credit points of senior PLNT units.			
Intermediate units of study			
PLNT2001 **Plant Biochemistry and Molecular Biology**	6	**P** 12 credit points of Junior Chemistry and 12 credit points of Junior Biology (or with the Dean's permission BIOL1201 and BIOL1202) **N** PLNT2901, AGCH2001	Semester 1
PLNT2901 **Plant Biochem & Molecular Biology (Adv)**	6	**P** A Distinction average in 12 credit points of Junior Chemistry and 12 credit points of Junior Biology (or with the Dean's permission BIOL1201 and BIOL1202) **N** PLNT2001, AGCH2001	Semester 1
PLNT2002 **Aust Flora: Ecology and Conservation**	6	**P** 6 credit points of a Junior unit of study **N** PLNT2902	Semester 1
PLNT2902 **Aust Flora: Ecology & Conservation (Adv)**	6	**A** The contents of BIOL(1002 or 1902) is assumed knowledge. Students wishing to enroll in Intermediate Biology (BIOL) and Plant Science (PLNT) units of study using BIOL(1003 or 1903) will need to do some preparatory reading **P** Distinction average in 6 credit points of Junior units of study **N** PLNT2002	Semester 1

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
PLNT2003 **Plant Form and Function**	6	**A** 12 credit points of Junior Biology, or equivalent eg BIOL (1001 or 1101 or 1901 or 1911) and BIOL (1002 or 1902 or 1003 or 1903) **N** PLNT2903, BIOL2003, BIOL2903, CROP2001	Semester 2
PLNT2903 **Plant Form and Function (Advanced)**	6	**A** 12 credit points of Junior Biology, or equivalent eg BIOL (1001 or 1101 or 1901 or 1911) and BIOL (1002 or 1902 or 1003 or 1903) **N** PLNT2003, BIOL2003, BIOL2903, CROP2001	Semester 2
Senior units of study			
PLNT3001 **Plant, Cell and Environment**	6	**P** 12 credit points of Intermediate Biology, Plant Science, Molecular Biology and Genetics or equivalent **N** PLNT3901	Semester 2
PLNT3901 **Plant, Cell and Environment (Advanced)**	6	**P** 12 credit points of Intermediate Biology, Plant Science, Molecular Biology and Genetics or equivalent with average grade of distinction **N** PLNT3001 *Note: Department permission required for enrolment*	Semester 2
PLNT3002 **Plant Growth and Development**	6	**P** 12 credit points of intermediate PLNT, BIOL, AGCH or CROP units of study including at least one of PLNT2001, PLNT2901, PLNT2003, PLNT2903, BIOL2016, BIOL2916, BIOL2003, BIOL2903, BIOL2006, BIOL2906, CROP2001, AGCH2002 or equivalent **N** PLNT3902, BIOL3021, BIOL3931	Semester 2
PLNT3902 **Plant Growth and Development (Advanced)**	6	**P** 12 credit points of intermediate PLNT, BIOL, AGCH or CROP units of study including at least one of PLNT2001, PLNT2901, PLNT2003, PLNT2903, BIOL2016, BIOL2916, BIOL2003, BIOL2903, BIOL2006, BIOL2906, CROP2001, AGCH2002 or equivalent. These requirements may be varied and students with lower averages should consult the unit Executive Officer. **N** PLNT3002, BIOL3021, BIOL3931	Semester 2
PLNT3003 **Systematics and Evolution of Plants**	6	**P** 6 credit points of any Intermediate unit of study from BIOL, PLNT, LWSC, HORT, GEOS, GEOG, ENVI, SOIL. **N** PLNT3903, BIOL3015/3915.	Semester 1
PLNT3903 **Systematics and Evolution of Plants Adv**	6	**P** Distinction average in 6 credit points of any Intermediate unit of study from BIOL, PLNT, LWSC, HORT, GEOS, GEOG, ENVI, SOIL. These requirements may be varied and students with lower averages should consult the Unit Executive Officer. **N** PLNT3003, BIOL3015/3915.	Semester 1
BIOL3009 **Terrestrial Field Ecology**	6	**A** BIOL (3006 or 3906). Prior completion of one of these units is very strongly recommended. **P** 12 credit points of Intermediate Biology or ANSC2004 and BIOM2001. **N** BIOL3909 *One 6 day field trip held in the pre-semester break (19 - 24 July 2009) and 4 practical classes during weeks 1-4 in Semester 2.*	S2 Intensive
BIOL3909 **Terrestrial Field Ecology (Advanced)**	6	**A** BIOL (3006 or 3906). Prior completion of one of these units is very strongly recommended. **P** Distinction average in 12 credit points of Intermediate Biology or ANSC2004 and BIOM2001 **N** BIOL3009. *One 6 day field trip held in the pre-semester break (19 - 24 July 2009) and 4 practical classes during weeks 1-4 in Semester 2.*	S2 Intensive
BIOL3017 **Fungi in the Environment**	6	**P** 12 credit points of Intermediate Biology, or 6 credit points of Intermediate Biology and 6 Intermediate credit points of either Microbiology or Geography. **N** BIOL3917 *Dates: 16-27 February 2009. The completion of 6 credit points of MBLG units is highly recommended.*	S1 Intensive
BIOL3917 **Fungi in the Environment (Advanced)**	6	**P** Distinction average in 12 credit points of Intermediate Biology, or 6 credit points of Intermediate Biology and 6 Intermediate credit points of either Microbiology or Geography. **N** BIOL3017 *The completion of 6 credit points of MBLG units is highly recommended.*	S1 Intensive
PPAT3003 **Plant Disease**	6	**P** MICR2024	Semester 1
PPAT4004 **Advanced Mycology and Plant Pathology**	6	**P** PPAT3003	Semester 1
PPAT4005 **Soil Biology**	6	**P** MICR2024 or 6cp intermediate microbiology	Semester 1
HORT3005 **Production Horticulture**	6	**A** ((AFNR1001 and AFNR1002) or (HORT1001 and HORT1002)) and HORT2002. **P** Two of PLNT2001, PLNT2901, PLNT2002, PLNT2902, PLNT2003, PLNT2903.	Semester 1
AGRO3002 **Agronomy 3** *This unit of study is not available in 2009*	6	**A** CROP1001 or HORT1001 or LWSC1001 **P** PLNT2003 or PLNT2903 *Note: Department permission required for enrolment*	Semester 1

Psychology

For a major in Psychology, the minimum requirement is 48 credit points across intermediate and senior psychology* units of study including PSYC (2111 or 2011), PSYC (2112 or 2012), PSYC (2113 or 2013) and PSYC (2114 or 2014). No other intermediate psychology units can be counted towards the major. You must complete at least 24 (30 for BPsych) credit points of Senior Psychology for a major. The senior units must include at least one of PSYC3011, 3012, 3013 and 3014. Students who want to be eligible for entry to the Honours program must also include PSYC3010.

*Note: HPSC3023 Psychology & Psychiatry: History & Phil is available for senior Psychology students and will count towards a major in Psychology. Successful completion of this unit of study is essential for students intending to take the Theoretical Thesis option in Psychology Honours.

Junior units of study			
PSYC1001 **Psychology 1001**	6		Semester 1 Summer Main
PSYC1002 **Psychology 1002**	6		Semester 2 Summer Main
Intermediate units of study			
PSYC2011 **Brain and Behaviour**	6	**P** PSYC (1001 and 1002). **N** PSYC2111	Semester 1

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
PSYC2012 **Statistics & Research Methods for Psych**	6	**A** Recommended: HSC Mathematics, any level **P** PSYC (1001 and 1002). **N** PSYC2112	Semester 1
PSYC2013 **Cognitive and Social Psychology**	6	**P** PSYC (1001 and 1002). **N** PSYC2113	Semester 2
PSYC2014 **Personality and Differential Psychology**	6	**P** PSYC (1001 and 1002) **N** PSYC2114	Semester 2
Senior units of study			
PSYC3011 **Learning and Behaviour**	6	**A** PSYC (2012 or 2112) **P** PSYC (2011 or 2111) and at least one other Intermediate Psychology Unit from PSYC (2012 or 2112), PSYC (2013 or 2113), PSYC (2014 or 2114). **N** PSYC3209	Semester 1
PSYC3012 **Cognition, Language and Thought**	6	**A** PSYC (2012 or 2112) **P** PSYC (2013 or 2113) and at least one other Intermediate Psychology unit from PSYC (2011 or 2111), PSYC (2012 or 2112), PSYC (2014 or 2114). **N** PSYC3205	Semester 1
PSYC3015 **Intelligence and Differential Psychology**	6	**A** PSYC(2012 or 2112); PSYC(2013 or 2113) **P** PSYC(2014 or 2114) and PSYC(2011 or 2111 or 2012 or 2112 or 2013 or 2113)	Semester 1
PSYC3016 **Developmental Psychology**	6	**P** PSYC (2013 or 2113) and at least one other Intermediate Psychology unit from PSYC (2011 or 2111), PSYC (2012 or 2112), PSYC (2014 or 2114). **N** PSYC3206	Semester 1
PSYC3017 **Social Psychology**	6	**A** PSYC (2012 or 2112). **P** PSYC (2013 or 2113) and at least one other Intermediate Psychology Unit of Study from PSYC (2011 or 2111), PSYC (2012 or 2112), PSYC (2014 or 2114). **N** PSYC3212	Semester 1
HPSC3023 **Psychology & Psychiatry: History & Phil**	6	**A** Basic knowledge about the history of modern science as taught in HPSC2100 AND the principles of philosophy of science as taught in HPSC2101 OR knowledge of the various sub-disciplines within Psychology. **P** (at least 12 credit points of intermediate HPSC Units of study) OR (a CR or above in one HPSC intermediate Unit of Study) OR (12 intermediate credit points in psychology). **N** PSYC3202	Semester 1
PSYC3010 **Advanced Statistics for Psychology**	6	**P** PSYC (2012 or 2112) plus at least one other Intermediate Psychology Unit of Study from PSYC (2011 or 2111), PSYC (2013 or 2113), PSYC (2014 or 2114). **N** PSYC3201	Semester 2
PSYC3013 **Perceptual Systems**	6	**A** PSYC2012 **P** PSYC (2011 or 2111) and at least one other Intermediate Psychology Unit from PSYC (2012 or 2112), PSYC (2013 or 2113), PSYC (2014 or 2114) or ANAT2010 **N** PSYC3210	Semester 2
PSYC3014 **Behavioural and Cognitive Neuroscience**	6	**A** PSYC (2113 or 2013) **P** (PSYC (2011 or 2111) and at least one other Intermediate Psychology Unit from PSYC (2012 or 2112), PSYC (2013 or 2113), PSYC (2014 or 2114)) OR (ANAT2010 plus PCOL2011) **N** PSYC3204, PSYC3215	Semester 2
PSYC3018 **Abnormal Psychology**	6	**A** PSYC2012 **P** PSYC (2014 or 2114) and at least one other Intermediate Psychology unit of study from PSYC (2011 or 2111), PSYC (2012 or 2112), PSYC (2013 or 2113). **N** PSYC3203	Semester 2
PSYC3020 **Applications of Psychological Science**	6	**P** 12 credit points of junior psychology and 12 credit points in Intermediate Psychology **N** PSYC3019	Semester 2
# Soil Science			
For a major in soil science, the minimum requirement is completion of SOIL3008, SOIL3009, SOIL3010 and one of (AGCH3032 or LWSC3006 or PPAT4005)			
Intermediate units of study			
SOIL2003 **Soil Properties and Processes**	6		Semester 1
SOIL2004 **The Soil Resource**	6		Semester 2
Senior units of study			
Compulsory units for a major in Soil Science			
SOIL3008 **Rural Spatial Information Systems** *This unit of study is not available in 2009*	6		Semester 1
SOIL3009 **Contemporary Field and Lab Soil Science**	6	**P** SOIL2003	Semester 1
SOIL3010 **The Soil at Work**	6	**P** SOIL2003 or SOIL2004	Semester 2
At least one of these units must be taken for a major in Soil Science:			
AGCH3032 **Land and Water Ecochemistry**	6	**P** AGCH2003 or AGCH2004 or PLNT2001 or CHEM24XX or BCHM2XXX or ENVI2001 **N** AGCH3030, AGCH3031	Semester 2
LWSC3006 **Landscape Hydrology and Management**	6	**P** LWSC2002 or GEOG2321 **C** LWSC3004	Semester 1
PPAT4005 **Soil Biology**	6	**P** MICR2024 or 6cp intermediate microbiology	Semester 1

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
Statistics			
For a major in Statistics, the minimum requirement is 24 credit points from senior units of study listed below.			
Intermediate units of study			
STAT2011 **Statistical Models**	6	**P** MATH (1001 or 1901 or 1906 or 1011) and [MATH (1005 or 1905 or 1015) or STAT1021] **N** STAT2901, STAT2001, STAT2911	Semester 1
STAT2012 **Statistical Tests**	6	**P** MATH (1005 or 1905 or 1015) **N** STAT2004, STAT2912	Semester 2
STAT2911 **Probability and Statistical Models (Adv)**	6	**P** MATH (1903 or 1907 or Credit in 1003) and MATH (1905 or 1904 or Credit in 1005) **N** STAT2001, STAT2011, STAT2901	Semester 1
STAT2912 **Statistical Tests (Advanced)**	6	**A** STAT (2911 or 2901) **P** MATH1905 or Credit in MATH1005 **N** STAT2004, STAT2012	Semester 2
Senior units of study			
STAT3011 **Stochastic Processes and Time Series**	6	**P** STAT (2011 or 2911 or 2001 or 2901) and MATH (1003 or 1903 or 1907). **N** STAT3911, STAT3003, STAT3903, STAT3005, STAT3905	Semester 1
STAT3012 **Applied Linear Methods**	6	**P** STAT(2012 or 2912 or 2004) and MATH(1002 or 1014 or 1902). **N** STAT3912, STAT3002, STAT3902, STAT3004, STAT3904	Semester 1
STAT3013 **Statistical Inference**	6	**P** STAT(2012 or 2912 or 2003 or 2903) and STAT (2011 or 2911) **N** STAT3913, STAT3001, STAT3901	Semester 2
STAT3014 **Applied Statistics**	6	**A** STAT(3012 or 3912). **P** STAT(2012 or 2912 or 2004). **N** STAT3914, STAT3002, STAT3902, STAT3006	Semester 2
STAT3911 **Stochastic Processes and Time Series Adv**	6	**P** (STAT2911 or credit in STAT2011) and MATH(1003 or 1903 or 1907). **N** STAT3011, STAT3003, STAT3903, STAT3005, STAT3905	Semester 1
STAT3912 **Applied Linear Methods Advanced**	6	**P** (STAT2912 or Credit in STAT2004 or Credit in STAT2012) and MATH(2061 or 2961 or 1902). **N** STAT3012, STAT3002, STAT3902, STAT3004, STAT3904	Semester 1
STAT3913 **Statistical Inference Advanced**	6	**P** STAT(2911 or 2903). **N** STAT3013, STAT3001, STAT3901	Semester 2
STAT3914 **Applied Statistics Advanced**	6	**A** STAT3912 **P** STAT2912 or credit or better in (STAT2004 or STAT2012). **N** STAT3014, STAT3002, STAT3902, STAT3006, STAT3907	Semester 2
BIOM3006 **Statistics for the Natural Sciences**	6	**P** BIOM2001 or STAT3012	Semester 2
Study in other Faculties			
A total of 48 credit points of units of study from non-Science discipline areas may be counted towards the Bachelor of Science degree. Students should consult the Handbooks from other faculties to determine any prerequisites, corequisites or other requirements relating to enrolment in units of study offered by departments in these faculties. Students may not enrol in Concepts and Issues in Physical Science (PHYS1600) or General Statistical Methods 1 (STAT1021) or Econometrics first year units, ot any other unit of study deemed mutually exclusive with units of study listed in this Table. Students enrolled in the combined BSc/BCom program may enrol in Econometrics 1A (ECMT1010). Students may not enrol in LAWS units of study, unless enrolled in the combined BSc/Llb degree.			

4. Bachelor of Science specialist degree programs

This chapter is intended to give enrolment advice to undergraduate students in the Faculty of Science enrolling in specialist Bachelor of Science degrees. You will find answers to frequently asked questions covering all students. Following this are specific summaries of the requirements for each degree including examples of how unit of study choices can be made over the duration of the degree. With some degrees there is information on recommended combinations of units of study, especially in first year, to help guide you to your goals.

It should be stressed that the information in this chapter is intended to be a rough guide only. All students will have to decide for themselves how to plan their degree to suit their own particular interests and situation.

All students are expected to read the degree resolutions for their course before they commence their studies, and from time to time during their studies. Undergraduate degree resolutions appear in chapter 2. The tables of undergraduate units of study available for each degree and unit descriptions appear in this chapter, and Table 1 of the Bachelor of Science degree in chapter 3.

Students enrolled in units of study offered by the Faculty of Science are required to familiarise themselves with the following key policies:

Special Arrangements
Students who are experiencing difficulty in meeting their assessment requirements due to competing essential community commitments may apply for Special Arrangements for examination and assessment.

Special Consideration
Students who have a serious illness or who have experienced misadventure which may affect their academic performance in a course or unit of study may request that they be given Special Consideration in relation to the determination of their results.

At Risk
To progress through a degree course, students are required to:

1. achieve the minimum Progression Rate specified by the Faculty; in the Faculty of Science, students must pass more than 50 per cent of the units attempted in each semester
2. pass any field or clinical work, practicum, or other unit of study mandated by the faculty (listed in your degree requirements).

If you do not meet the progress requirements, you will be identified as a student at risk. The At Risk policy is read in addition to specific degree progression requirements.

Code of Conduct for Students
The University has clear expectations of students in respect of academic matters and personal behaviour.

Student Plagiarism: Coursework Policy and Procedure
The University of Sydney expects high standards of academic honesty in all student work. In particular, the University is opposed to and will not tolerate plagiarism.

Details on Special Arrangements, Special Consideration, Code of Conduct for Students, and Student Plagiarism Policy are provided elsewhere in this handbook.

Inside the back cover of this handbook is a planner to help you map out your degree. It is recommended that you plan your studies carefully with an eye to your final years, so that you take the correct prerequisites in the preceding years. It will be useful to revisit this planner during your studies as your interests take more detailed shape.

Enrolment day FAQs

What is a 'major'?

Some degrees in the Faculty of Science require you to complete a major. A major is a specialisation in the senior year of your degree. Specialist Bachelor of Science degrees have been designed to develop your knowledge and skills in a particular area. Students enrolling in specialist degree programs do not have majors, but do have a specialisation.

How many credit points should I take per semester?

You should take 24 credit points each semester if you are a full-time student. There is an upper limit of 30 credit points per semester. If you take fewer than 18 credit points in each semester you will automatically become part-time.

To finish your degree in the recommended minimum time you will have to take 48 credit points per year, or 24 per semester. If you enrol part time you can take as few credit points as you like. You must keep in mind however that you have a 10 year limit to finish your degree. Students wishing to accelerate their degree programs may consider undertaking units offered at Summer School or undertaking up to 30 credit points each semester. The degree summaries and sample programs in this chapter assume you will enrol full-time.

Do I need to be full-time?

International students must enrol full-time in a minimum of 24 credit points per semester unless there are exceptional circumstances. Failure to enrol in 24 credit points per semester may have serious ramifications for your visa.

Australian citizens and permanent residents are considered full-time if they are enrolled in 18 or more credit points per semester.

If you receive any financial support, whether from a University scholarship or from the government, you may well need to enrol as a full-time student. You should carefully check the terms and conditions of that support before going part-time. Australian citizens and permanent residents who wish to receive a transport concession card must be full-time students.

Can I take units of study from other faculties?

Students in specialist degrees may have room for some electives. In some instances, these electives may be taken from other faculties. Consult your degree resolutions and sample degree table.

Can I receive credit for previous tertiary study?

Yes. The amount of credit you receive depends on your individual circumstances, but in general the total amount of credit granted may not be greater than 96 credit points and may not include more than 48 credit points from degrees that have been completed.

On the day that you enrol you must lodge an application for credit from previous study. Because of the large numbers of applications received at enrolment there can be a considerable delay in processing your application, but all credit offers will be sent to students well in advance of the last day to add a unit of study for the semester in which they enrol.

The faculty must sight originals of your academic transcripts, as well as detailed descriptions of prior units of study completed, as at the time of completion of the units. Descriptions will normally be an extract from a handbook or a unit of study syllabus/outline, and should include the credit point value, learning outcomes, assessment details, texts

and references, and contact details for each unit of study. You must bring this information with you on the day that you enrol. On enrolment day you will have to make unit of study choices as if you have had no previous university study. Alternatively, you may be able to obtain special permission to enrol in intermediate or senior units of study by taking a copy of your transcript and unit of study descriptions to academic advisers for each individual unit of study. Unit of study academic advisers are listed under unit of study descriptions in this handbook.

Information on the current application process for credit, including the application form, is available from the Faculty of Science website.

Are any bridging courses available?

There are bridging courses in Biology, Chemistry, Mathematics and Physics, designed to cover the assumed knowledge that students would normally cover in the HSC. They run in February each year after enrolment and are recommended for students who either didn't take a subject at the HSC or feel they need some revision.

Who can enrol in advanced units of study?

Advanced units of study are available to those students enrolled in any program in the Faculty of Science who have performed at a high level in science subjects in the HSC or who perform well in their studies at the University.

Consult a departmental adviser about your eligibility to enrol in advanced-level subjects in the first year of study. You must obtain special permission to enrol in any advanced unit of study except Software. For advanced Software units of study, you must meet the criteria listed on the permission form for advanced units of study. The departmental advisers have copies of the permission form.

You should consult the unit of study tables for assumed and prerequisite marks in the HSC required to enrol in Advanced units of study.

For students in an Advanced degree it is recommended that you enrol in no more than 24 credit points of Advanced units of study in a year. Advanced units of study are very demanding and students are required to perform at a higher standard than in the normal units of study.

What is the Talented Student Program?

The Talented Student Program (TSP) is unique to the University of Sydney. It is tailored to meet students' individual needs and is restricted to the very top students.

Students may be able to bypass some first year study and enrol directly in a second year course. If you have outstanding results in any of your HSC science subjects you may wish to negotiate a special program of study with one of the departments in the Faculty of Science.

The Talented Student Program is available in most areas of Science. Students receive special supervision by academic staff and often engage in studies on an individual basis with small numbers of fellow students, all of whom have a special interest in the same subject.

Am I eligible for the Talented Student Program?

Entry to the TSP is by invitation from the Dean which you should have received by the time you enrol. The following guidelines apply generally, although departments may have additional (and sometimes more stringent) requirements for entry into the program.

To get into the program in your first year, you should normally have a UAI (or equivalent) of at least 99.00 and a result in band 6 in at least one HSC Science subject area and/or a mark of 95 or better in HSC Mathematics Extension 2.

For entry into the program in your second and third years, you should normally have a weighted average mark of 85 or over and a high distinction grade in the relevant subject area.

Bachelor of Science (Bioinformatics)

Degree code: LH019

Note: this degree is not available to new students from 2007. A new major in Bioinformatics is available to students enrolling in the BSc.

Summary of requirements
The requirements for the degree are set out in Table IA: Bachelor of Science (Bioinformatics) (see chapter 3) and the Senate and Faculty Resolutions (see chapter 2) which should be read by all intending candidates. In particular it is important to ensure that any proposed course of study will comply with the basic requirements for the degree.

Enrolment guide
In your junior year you should complete:

- 12 credit points from the science subject areas of Mathematics and Statistics
- 6 credit points of junior units of study in the science subject area of Biology
- 6 credit points of junior units of study in the science subject area of Molecular Biology and Genetics (ie, MBLG1001 or MBLG1901)
- 12 credit points of junior units of study in the science subject area of Chemistry, and
- 12 credit points of junior units of study in the science subject area Computer Science (ie, SOFT1001/1901 and SOFT1002/1902).

To complete your degree you must gain credit for at least 144 credit points as specified in Table IA: Bachelor of Science (Bioinformatics).

Plans of study
It is very important when choosing units of study at any stage of your university career that you consider your overall degree program. There is a sample degree program below including information. See the Bachelor of Science entry for information about majors and recommended first year combinations of units of study. There is also a degree planner inside the back cover.

Units of study
The Science units of study available for this degree are set out in Table IA: Bachelor of Science (Bioinformatics) and in Table I: Bachelor of Science in chapter 3. Unit of study descriptions follow the tables.

Honours
There are Honours courses in science subject areas suitable for Bioinformatics students. Please refer to 'Honours in the Faculty of Science' in this chapter, and Table VI: Honours units of study in chapter 10.

Discontinuation
If you wish to discontinue a unit of study it is important to talk to staff in the Faculty Office. In some circumstances, discontinuation can affect your access to units of study, prizes and scholarships. Deadlines for withdrawal and discontinuation can be found on the second page of this handbook.

Special permission
You should note that the faculty can, in certain circumstances, permit exceptions to the normal requirements for a degree. Applications should be made in writing to the Associate Dean (Undergraduate) after discussion with staff in the Faculty Office.

Transferring into the BSc (Bioinformatics)
Students are not permitted to transfer into this degree.

Degree resolutions
See chapter 2.

Sample Bachelor of Science (Bioinformatics)

	Sem	Unit of study 1 & credit points	Unit of study 2 & credit points	Unit of study 3 & credit points	Unit of study 4 & credit points	Unit of study 5 & credit points	Unit of study 6 & credit points	Total
Year 1	1	MATH1XXX	MATH1XXX	MBLG1X01	CHEM1XXX	INFO1X03		
		3	3	6	6	6		24
	2	MATH1XXX	MATH1XXX	BIOL1XXX	CHEM1XXX	INFO1X03		
		3	3	6	6	6		24
Year 2	1	INFO2X10	MBLG2XXX	Life Science elective	MATH/SOFT elective			
		6	6	6	6			24
	2	SOFT2X30	MBLG2XXX	Life Science elective	MATH/SOFT elective			
		6	6	6	6			24
Year 3	1	SOFT3XXX	Life Science elective	Life Science elective	SOFT/MATH/PHYS elective			
		6	6	6	6			24
	2	BINF3101	Life Science elective	Life Science elective	SOFT/MATH/PHYS elective			
		6	6	6	6			24
							Total credit points:	144
Require: 144cp total, and units of study as per Table IA.								

Table 1A: Bachelor of Science (Bioinformatics)

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
A. Junior units of study			
Candidates are required to enrol in and complete:			
(i) 12 credit points from Junior units of study in the Science Subject Area of Mathematics (MATH1011, 1013, 1014 and 1015 or equivalents);			
(ii) 6 credit points from Junior units of study in the Science Subject Areas of Biology (BIOL1001/1101/1901/1911);			
(iii) 6 credit points from Junior units of study in the Science Subject Area of Molecular Biology and Genetics (MBLG1001 or 1901);			
(iv) 12 credit points from Junior units of study in the Science Subject Area of Chemistry; and			
(v) 12 credit points from Junior units of study in the Science Subject Area of Computer Science (INFO1003/1103/1903).			
B. Intermediate units of study			
Candidates are required to enrol in and complete:			
(i) INFO(2110 or 2810) and SOFT(2130 or 2830);			
(ii) MBLG(2071 or 2971) and MBLG(2072 or 2972);			
(iii) at least 12 credit points from other Intermediate units of study in the Science Subject Areas of Biochemistry, Biology, Microbiology or Pharmacology and/or Plant Science (may include further Junior units of study in Biology); and			
(iv) a further 12 credit points of additional units of study at the Intermediate level chosen from the Science Subject Areas of Computer Science, Information Systems, Computational Science, Statistics, or from the following Mathematics units of study: MATH(2061 or 2961), MATH(2063 or 2963), MATH(2069 or 2969), MATH(2070 or 2970).			
C. Senior units of study			
Candidates are required to enrol in and complete:			
(i) BINF3101 Bioinformatics Project and at least 6 credit points of Senior units of study in the Science Subject Area of Computer Science;			
(ii) 24 credit points of Senior units of study in the Science Subject Areas of Biology, Biochemistry, Microbiology, Pharmacology and/or Plant Science; and			
(iii) a further 12 credit points of additional units of study at the Senior level chosen from the Science Subject Areas of Computer Science, Information Systems, Computational Science, Statistics or from the following Mathematics and Physics units of study: MATH3067, MATH3076/3976, MATH3063/3963, COSC(3011 or 3911), COSC(3012 or 3912).			
BINF3101 **Bioinformatics Project**	6	**A** INFO2110 and (INFO1103 or INFO1903) **P** INFO3402 and 12 credit points from Intermediate Biology, Molecular Biology and Genetics, Biochemistry, Microbiology, Pharmacology **N** COMP3206, BINF3001, INFO3600, SOFT3300, SOFT3600, SOFT3200, SOFT3700	Semester 2

Bachelor of Science (Environmental)

Degree code: LH017

Note: this degree is not available to new students from 2007. A new major in Environmental Studies is available to students enrolling in the Bachelor of Science degree.

Summary of requirements
The requirements for the degree are set out in Table IB: Bachelor of Science (Environmental) (see below) and the Senate and Faculty Resolutions (see chapter 2) which should be read by all intending candidates. In particular it is important to ensure that any proposed course of study will comply with the basic requirements for the degree.

Enrolment guide
In your junior year you should complete:

- ENVI1002 and GEOL 1002
- 12 credit points from the science subject areas of Mathematics and Statistics
- 12 credit points of junior units of study in the science subject area of Biology
- 12 credit points of junior units of study in the science subject area of Chemistry.

The study of some Biology, Chemistry or Mathematics at the Advanced level is recommended but not compulsory.

To complete your degree you must gain credit for at least 144 credit points as specified in Table IB: Bachelor of Science (Environmental). The 144 credit points required for the degree must include:

- the intermediate Environmental Science units of study, ENVI2111 and ENVI2112
- the senior Environmental Science units of study, ENVI3111, ENVI3112, and ENVI3114.

Plans of study
It is important when choosing units of study at any stage of your university career that you consider your overall degree program. There is a sample degree program below. See the Bachelor of Science entry for additional information. There is also a degree planner inside the back cover.

See the Environmental Science website (www.usyd.edu.au/envsci) for further information.

Units of study
The Science units of study available for this degree are set out in Table IB: Bachelor of Science (Environmental) and in Table I: Bachelor of Science in chapter 10. Unit descriptions follow the tables.

Honours
There are Honours courses in Science subject areas suitable for Environmental Science students. Please refer to 'Honours in the Faculty of Science' in this chapter, and Table VI: Honours units of study in chapter 10.

Discontinuation
If you wish to discontinue a unit of study it is important to talk to staff in the Faculty Office. In some circumstances, discontinuation can affect your access to units of study, prizes and scholarships. Deadlines for withdrawal and discontinuation can be found on the second page of this handbook.

Special permission
You should note that the faculty can, in certain circumstances, permit exceptions to the normal requirements for a degree. Applications should be made in writing to the Associate Dean (Undergraduate) after discussion with staff in the Faculty Office.

Transferring into the BSc (Environmental)
This degree is not available for transfer into from 2007.

Degree resolutions
See chapter 2.

Sample Bachelor of Science (Environmental)

	Sem	Unit of study 1 & credit points	Unit of study 2 & credit points	Unit of study 3 & credit points	Unit of study 4 & credit points	Unit of study 5 & credit points	Unit of study 6 & credit points	Total
Year 1	1	MATH1XXX	MATH1XXX	ENVI1002	BIOL1X01/1911	CHEM1X01		
		3	3	6	6	6		24
	2	MATH1XXX	MATH1XXX	GEOL1002	BIOL1X02	CHEM1X02		
		3	3	6	6	6		24
Year 2	1	ENVI2X11	SOIL/CHEM elective	Science elective	Science elective			
		6	6	6	6			24
	2	ENVI2112	GEOS elective	BIOL/MICR/PLNT elective	Science Elective			
		6	6	6	6			24
Year 3	1	ENVI3111	ENVI3113	Table 1B elective	Table 1B elective			
		6	6	6	6			24
	2	ENVI3112	ENVI3114	Table 1B elective	Table 1B elective			
		6	6	6	6			24
							Total credit points:	144
Require: 144cp total, and units of study as per Table IB.								

Table 1B: Bachelor of Science (Environmental)

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
A. Junior units of study			
Candidates are required to enrol in and complete:			
(i) ENVI1002 and GEOL1002;			
(ii) 12 credit points of Junior units of study from the Science Subject Area of Biology;			
(iii) 12 credit points of Junior units of study from the Science Subject Area of Chemistry; and			
(iv) 12 credit points of Junior units of study from the Science Subject Area of Mathematics.			
ENVI1002 **Geomorphic Environments** *This unit of study is not available in 2009*	6	*This unit of study is available to students in the Bachelor of Science (Environmental) and the Bachelor of Land & Water Science only.*	Semester 1
Some study of BIOL, CHEM, MATHS at the Advanced level is recommended but not compulsory.			
B. Intermediate units of study			
Candidates are required to enrol in and complete:			
(i) ENVI2111/2911 and ENVI2112;			
(ii) at least 6 credit points from SOIL2003 or CHEM2404;			
(iii) at least 6 credit points from GEOG2321 or GEOS2121;			
(iv) at least 6 credit points from MICR2024, BIOL2017, PLNT(2003 or 2903), BIOL(2012 or 2912); and			
(v) up to 18 credit points of Junior or Intermediate units of study from the Science Subject Areas of Agricultural Chemistry, Biology, Chemistry, Geography, Geology and Geophysics, Marine Science, Microbiology, Physics and Soil Science. Units of study in History and Philosophy of Science may be taken on approval of the Chair of the Program Committee for Environmental Science.			
ENVI2111 **Conservation Biology and Applied Ecology**	6	**P** 24 credit points of Junior Science units, including 12 credit points of Junior Biology (BIOL/MBLG/EDUH). **N** ENVI2911, ENVI2001.	Semester 1
ENVI2911 **Conservation Biology (Advanced)**	6	**P** Distinction average in BIOL (1001 or 1911 or 1101 or 1901) and 6 additional credit points of Junior Biology (BIOL/MBLG/EDUH). 12 credit points of Junior Chemistry (or for BSc (Marine Science) students 6 credit points of Junior Chemistry and 6 credit points of Junior Physics). These requirements may be varied and students with lower averages should consult the Unit Executive Officer. **N** ENVI2111, ENVI2001.	Semester 1
ENVI2112 **Atmospheric Processes and Climate**	6	**P** 24 credit points of Junior Science units, including 12 credit points of Junior Chemistry or Physics **N** ENVI2002	Semester 2
C. Senior units of study			
Candidates are required to enrol in and complete:			
(i) ENVI3111 and ENVI3112 and ENVI3114; and			
(ii) at least 24 credit points of Intermediate or Senior units of study from the Science Subject Areas of Agricultural Chemistry, Biology, Chemistry, Geography, Geology and Geophysics, Marine Science, Microbiology, Physics and Soil Science. Units of study in History and Philosophy of Science may be taken on approval of the Director for Environmental Science.			
NB: enrolment in at least 6 credit points of the following units of study is highly recommended:- AGCH3030 Rural Environmental Chemistry A, AGCH3031 Rural Environmental Chemistry B, BIOL3006 Ecological Methods, GEOS3014 GIS in Coastal Management.			
ENVI3111 **Environmental Law and Ethics**	6	**A** Intermediate Environmental Science. **P** 12 credit points of Intermediate Science or Agriculture units. **N** ENVI3001, ENVI3003.	Semester 1
ENVI3112 **Environmental Assessment**	6	**A** Intermediate Environmental Science. **P** 12 credit points of Intermediate Science or Agriculture units. **N** ENVI3002, ENVI3004.	Semester 2
ENVI3114 **Energy and the Environment**	6	**A** Junior Physics or Intermediate Environmental Science. **P** 12 credit points of Intermediate Science or Agriculture units. **N** ENVI3001, PHYS3600.	Semester 2
GEOS3513 **Regional Development and Environment**	6	**P** 24 credit points of intermediate and/or senior units of study including 6 credit points of Intermediate units of study in Geography. **N** ENVI3113, GEOS3511, GEOS3911, GEOS3913	Semester 1
GEOS3913 **Regional Development & Environment (Adv)**	6	**P** 24 credit points of intermediate and/or senior units of study including 6 credit points of intermediate units of study in Geography with a grade of Credit or better **N** ENVI3113, GEOS3513, GEOS3911	Semester 1

Bachelor of Science (Marine Science)

Degree code: LH021

Note: this award course is not available to new students in 2009.

Summary of requirements
The requirements for the degree are set out in Table IC: Bachelor of Science (Marine Science) (see this chapter) and the Senate and Faculty Resolutions (see chapter 2) which should be read by all intending candidates. In particular it is important to ensure that any proposed course of study will comply with the basic requirements for the degree.

Enrolment guide
In your junior year you should complete:

- 12 credit points from the science subject areas of Mathematics and Statistics
- 12 credit points of junior units of study in the science subject area of Biology
- 12 credit points of junior units of study in the science subject areas of Geosciences
- PHYS1001 or 1002 or 1901, and
- CHEM1001 or 1101 or 1901.

Some study at the Advanced level is recommended but not compulsory.

To complete your degree you must gain credit for at least 144 credit points as specified in Table IC: Bachelor of Science (Marine Science). The 144 credit points required for the degree must include:

- 6 credit points from GEOS2115 or GEOS2915
- 6 credit points from BIOL2018 or 2918
- 36 credit points from senior Marine Science units of study, and
- no more than 48 credit points from junior units of study.

Plans of study
It is important when choosing units of study at any stage of your university career that you consider your overall degree program. There is a sample degree program below. See the Bachelor of Science entry for additional information. There is also a degree planner inside the back cover.

See the Marine Science website (www.usyd.edu/marine) for further information.

Units of study
The Science units of study available for this degree are set out in Table IC: Bachelor of Science (Marine Science), Table IB: Bachelor of Science (Environmental) and in Table I: Bachelor of Science in chapter 3.

Honours
There is an honours course in Marine Science. Please refer to 'Honours in the Faculty of Science' in this chapter, and Table VI: Honours units of study in chapter 10.

Discontinuation
If you wish to discontinue a unit of study it is important to talk to staff in the Faculty Office. In some circumstances, discontinuation can affect your access to units of study, prizes and scholarships. Deadlines for withdrawal and discontinuation can be found on the second page of this handbook.

Special permission
You should note that the faculty can, in certain circumstances, permit exceptions to the normal requirements for a degree. Applications should be made in writing to the Associate Dean (Undergraduate) after discussion with staff in the Faculty Office.

Transferring to the BSc (Marine Science)
Students may be permitted to transfer from other courses offered by the Faculty of Science or any of its streams into the BSc (Marine Science). Internal transfers are competitive based on merit.

Universities Admissions Index (UAI)
The minimum UAI for admission into the course varies from year to year.

Degree resolutions
See chapter 2.

Sample Bachelor of Science (Marine Science)

	Sem	Unit of study 1 & credit points	Unit of study 2 & credit points	Unit of study 3 & credit points	Unit of study 4 & credit points	Unit of study 5 & credit points	Unit of study 6 & credit points	Total
Year 1	1	MATH1XXX	MATH1XXX	PHYS1XXX	BIOL1X01/1911	GEOS1XXX		
		3	3	6	6	6		24
	2	MATH1XXX	MATH1XXX	CHEM1X01	BIOL 1XXX	GEOS1XXX		
		3	3	6	6	6		24
Year 2	1	GEOS2X15	GEOS2XXX	BIOL2XXX	Science elective			
		6	6	6	6			24
	2	BIOL2X18	GEOS2XXX	BIOL2XXX	Science elective			
		6	6	6	6			24
Year 3	1	Table 1C elective	Table 1C elective	Table 1C elective	Science elective			
		6	6	6	6			24
	2	Table 1C elective	Table 1C elective	Table 1C elective	Science elective			
		6	6	6	6			24
							Total credit points:	144
Require: 144cp total, and units of study as per Table IC.								

Table 1C: Bachelor of Science (Marine Science)

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
A. Junior units of study			
Candidates are required to enrol in and complete:			
(i) 12 credit points of Junior units of study from the Science Subject Area of Biology;			
(ii) 12 credit points of Junior units of study from the Science Subject Areas of Geography and/or Geology;			
(iii) 12 credit points of Junior units of study from the Science Subject Area of Mathematics;			
(iv) PHYS1001 or 1002; and			
(v) CHEM1001 or 1101.			
Some study of Biology, Chemistry, Mathematics or Physics at the Advanced level is recommended but not compulsory.			
B. Intermediate units of study			
Candidates are required to enrol in and complete:			
(i) GEOS2115 or 2915 and BIOL2018 or 2918; or, for students who completed the intermediate year prior to 2008, MARS2005 or 2905 and MARS2006 or 2906 and MARS2007 or 2907;			
(ii) 12 credit points of Intermediate units of study from the Science Subject Area of Biology (students in this course may take any Intermediate Biology unit of study which requires 12 credit points of Junior Chemistry as a prerequisite, provided they have passed at least 6 credit points of Junior Chemistry and at least 6 credit points of Junior Physics); and			
(iii) 18 credit points of Intermediate units of study from Science Subject Areas and/or Civil Engineering units of study CIVL3401 and CIVL3402.			
GEOS2115 **Oceans, Coasts and Climate Change**	6	**A** At least one of (GEOG1001, GEOL1001, GEOL1002, GEOS1003, GEOS1903, ENVI1002, GEOL1902, GEOL1501) **P** 48 credit points from Junior Units of Study **N** GEOS2915, MARS2006	Semester 1
GEOS2915 **Oceans, Coasts and Climate Change (Adv)**	6	**A** (GEOG1001, GEOL1001, GEOL1002, GEOS1003, GEOS1903, ENVI1002, GEOL1902, GEOL1501) **P** Distinction average in 48 credit points from Junior units of study **N** GEOS2115, MARS2006	Semester 1
BIOL2018 **Introduction to Marine Biology**	6	**A** 12 credit points of Junior Biology; MARS2005. **P** BIOL (1001 or 1911 or 1101 or 1901) and 6 additional credit points of Junior Biology (BIOL/MBLG/EDUH). 12 credit points of Junior Chemistry (or for BSc (Marine Science) students 6 credit points of Junior Chemistry and either an additional 6 credit points of Junior Chemistry or 6 credit points of Junior Physics). **N** BIOL2918, MARS (2006 or 2906 or 2007 or 2907).	Semester 2
BIOL2918 **Introduction to Marine Biology (Adv)**	6	**A** 12 credit points of Junior Biology; MARS2005. **P** Distinction average in BIOL (1001 or 1911 or 1101 or 1901) and 6 additional credit points of Junior Biology (BIOL/MBLG/EDUH). 12 credit points of Junior Chemistry (or for BSc (Marine Science) students 6 credit points of Junior Chemistry and either an additional 6 credit points of Junior Chemistry or 6 credit points of Junior Physics. These requirements may be varied and students with lower averages should consult the Unit Executive Officer. **N** BIOL2018, MARS (2006 or 2906 or 2007 or 2907). *Entry is restricted and selection is made from applicants on the basis of previous performance.*	Semester 2
C. Senior units of study			
Candidates are required to enrol in and complete:			
(i) at least 36 credit points of Senior units of study from GEOS and/or BIOL units from this table, which must include at least one BIOL and one GEOS unit;			
(ii) at least 12 credit points of Intermediate or Senior units of study from the Science subject areas of Biology, Environmental Science, Geography, Geology, Geophysics, Marine Science units.			
BIOL3006 **Ecological Methods**	6	**A** BIOL (2011 or 2911 or 2012 or 2912) or PLNT (2002 or 2902). **P** 12 credit points of Intermediate Biology; or 6 credit points of Intermediate BIOL units and ENVI2111 or MARS2006; or 12 credit points of Intermediate MARS units, including MARS2006. **N** BIOL3906, MARS3102	Semester 1
BIOL3906 **Ecological Methods (Advanced)**	6	**A** BIOL (2011 or 2911 or 2012 or 2912) or PLNT (2002 or 2902). **P** Distinction average in 12 credit points of Intermediate Biology; or 6 credit points of Intermediate BIOL and ENVI2111 or MARS2006; or 12 credit points of Intermediate MARS units, including MARS2006. These requirements may be varied and students with lower averages should consult the Unit Executive Officer. **N** BIOL3006, MARS3102	Semester 1
BIOL3007 **Ecology**	6	**A** Although not prerequisites, knowledge obtained from BIOL3006/3906, and BIOL3008/3908 and/or BIOL3009/3909, is strongly recommended. **P** 12 credit points of Intermediate Biology; or 6 credit points of Intermediate BIOL, and ENVI2111 or MARS2006 ; or 12 credit points of MARS units, including MARS2006 **N** BIOL3907, MARS3102	Semester 2
BIOL3907 **Ecology (Advanced)**	6	**A** Although not prerequisites, knowledge obtained from BIOL3006/3906, and BIOL3008/3908 and/or BIOL3009/3909, is strongly recommended. Students entering this unit of study should have achieved Distinction average. **P** Distinction average in 12 credit points of Intermediate Biology; or 6 credit points of Intermediate BIOL and ENVI2111 or MARS2006; or 12 credit points of Intermediate MARS units, including MARS2006. **N** BIOL3007, MARS3102	Semester 2
BIOL3008 **Marine Field Ecology**	6	**A** BIOL (3006 or 3906). Prior completion of one of these units is very strongly recommended. **P** 12 credit points of Intermediate Biology; or 6 credit points of Intermediate BIOL and ENVI2111 or MARS2006; or 12 credit points of Intermediate MARS units, including MARS2006. **N** BIOL3908, MARS3102. *Dates: 2 - 9 July 2009.*	S2 Intensive

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
BIOL3908 **Marine Field Ecology (Advanced)**	6	**A** BIOL (3006 or 3906). Prior completion of one of these units is very strongly recommended. **P** Distinction average in 12 credit points of Intermediate Biology; or 6 credit points of Intermediate Biology and ENVI2111 or MARS2006; or 12 credit points of Intermediate MARS units, including MARS2006. **N** BIOL3008, MARS3102. *Dates: 2 - 9 July 2009. Plus four 1 hour tutorials during semester 2.*	S2 Intensive
BIOL3011 **Ecophysiology**	6	**A** BIOL (2012 or 2912 or 2016 or 2916) or PLNT (2003 or 2903). **P** 12 credit points of Intermediate Biology; or 6 credit points of Intermediate BIOL and ENVI2111 or MARS2006; or 12 credit points of Intermediate MARS units, including MARS2006. **N** BIOL3911 *The completion of 6 credit points of MBLG units is highly recommended.*	Semester 1
BIOL3911 **Ecophysiology (Advanced)**	6	**A** BIOL (2012 or 2912 or 2016 or 2916) or PLNT (2003 or 2903) **P** Distinction average in 12 credit points of Intermediate Biology; or 6 credit points of Intermediate BIOL and ENVI2111 or MARS2006; or 12 credit points of Intermediate MARS units, including MARS2006. These requirements may be varied and students with lower averages should consult the Unit Executive Officer. **N** BIOL3011 *The completion of 6 credit points of MBLG units is highly recommended.*	Semester 1
BIOL3013 **Marine Biology**	6	**A** BIOL 2018 or MARS2006 **P** 12 credit points of Intermediate Biology, or 6 credit points of Intermediate BIOL and ENVI2111 or MARS2006; or 12 credit points of Intermediate MARS units, including MARS2006. **N** BIOL3913 *The completion of 6 credit points of MBLG units is highly recommended.*	Semester 1
BIOL3913 **Marine Biology (Advanced)**	6	**A** BIOL2018 or MARS2006 **P** Distinction average in 12 credit points of Intermediate Biology; or 6 credit points of Intermediate BIOL and ENVI2111 or MARS2006; or 12 credit points of Intermediate MARS units, including MARS2006. **N** BIOL3013 *The completion of 6 credit points of MBLG units is highly recommended.*	Semester 1
GEOS3009 **Coastal Environments & Processes**	6	**P** (6 credit points of Intermediate Geoscience* units) and (6 further credit points of Intermediate Geoscience or 6 credit points of Physics or Mathematics or Information Technology or Engineering units) or ((MARS2005 or MARS2905) and (MARS2006 or MARS2906)) **N** GEOS3909, MARS3003, MARS3105 ** Geoscience is the disciplines of Geography, Geology and Geophysics.*	Semester 1
GEOS3909 **Coastal Environments and Processes (Adv)**	6	**P** Distinction average in ((6 credit points of Intermediate Geoscience* units) and (6 further credit points of Intermediate Geoscience or 6 credit points of Physics, Mathematics, Information Technology or Engineering units) or ((MARS2005 or MARS2905) and (MARS2006 or MARS2906))) **N** GEOS3009, MARS3003, MARS3105 *A distinction average in prior Geography or Geology units is normally required for admission. This requirement may be varied and students should consult the unit of study coordinator.*	Semester 1
GEOS3014 **GIS in Coastal Management**	6	**P** MARS(2005 or 2905) and MARS(2006 or 2906), or 12 credit points of Intermediate Geoscience* units, or (GEOS(2115 or 2915) and BIOL(2018 or 2918)) **N** GEOS3914, MARS3104. ** Geoscience is the disciplines of Geography, Geology and Geophysics.*	Semester 2
GEOS3914 **GIS in Coastal Management (Advanced)**	6	**P** Distinction average in 12 credit points of intermediate geography or geology units or GEOS (2115 or 2915) and BIOL (2018 or 2918) Department permission required for enrolment. **N** GEOS3014, MARS3104 *Note: Department permission required for enrolment* *A distinction average in prior Geography, Geology or Marine Science units of study is normally required for admission. This requirement may be varied and students should consult the unit of study coordinator.*	Semester 2
GEOS3018 **Rivers: Science, Policy and Management**	6	**P** (24 credit points of Intermediate units of study including 6 credit points of Intermediate Geography units of study) or ((MARS2005 or MARS2905) and (MARS2006 or MARS2906)) **N** GEOS3918	Semester 1
GEOS3918 **Rivers: Science and Management (Adv)**	6	**P** Distinction average in (24 credit points of Intermediate units of study including 6 credit points of Intermediate Geography units of study) or ((MARS2005 or MARS2905) and (MARS2006 or MARS2906)) **N** GEOS3018	Semester 1
GEOS3103 **Environmental & Sedimentary Geology**	6	**A** GEOS1003, GEOS2124 **P** GEOS(2124 or 2924) and GEOS(2111 or 2911 or 2114 or 2914 or 2113 or 2913); or GEOS(1003 or 1903) and 24 credit points of intermediate Science units of study with permission of the Head of School **N** GEOS3803	Semester 2
GEOS3803 **Environmental & Sedimentary Geology(Adv)**	6	**A** GEOS1003, GEOS2124 **P** Distinctions in GEOS(2114 or 2914) and GEOS(2124 or 2924); Students who have a credit average for all Geoscience units may enrol in this unit with permission of the Head of School **N** GEOS3103	Semester 2
GEOS3104 **Geophysical Methods**	6	**A** GEOS2114 and GEOS2124 **P** 24 credit points of intermediate Science units of study or (GEOS(2114, 2914) and GEOS(2124, 2924)) **N** GEOS3804, GEOS3003, GEOS 3903, GEOS3006, GEOS3906, GEOS3016, GEOS3916, GEOS3017, GEOS3917	Semester 2
GEOS3804 **Geophysical Methods (Advanced)**	6	**P** Distinction in GEOS2114 or GEOS2914 and GEOS2124 or GEOS2924; Students who have a credit average for all Geoscience units may enrol in this unit with the permission of the Head of School **N** GEOS3104, GEOS3003, GEOS3903, GEOS3006, GEOS3906, GEOS3016, GEOS3916, GEOS3017, GEOS3917	Semester 2
NTMP3001 **Coral Reef Ecosystems**	6	**A** General concepts in Biology **P** MARS(2005 or 2905), plus 12 credit points from Intermediate Science units of study which must include at least 6 credit points of Biology. *Note: Department permission required for enrolment*	S2 Intensive
NTMP3003 **Fisheries Biology and Management** *This unit of study is not available in 2009*	6	**A** General concepts in Biology. **P** MARS(2005 or 2905), plus 12 credit points from Intermediate Science units of study which must include at least 6 credit points of Biology. *Note: Department permission required for enrolment*	S2 Intensive

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
NTMP3004 **Aquaculture**	6	**A** General concepts in Biology. **P** 12 credit points from Intermediate Science units of study which must include at least 6 credit points of Biology. *Note: Department permission required for enrolment*	S2 Intensive
NTMP3005 **Coastal Management**	6	**A** General concepts in Biology. **P** 12 credit points from Intermediate Science units of study which must include at least 6 credit points of Biology. *Note: Department permission required for enrolment* *These units are only available to BSc (Marine Science) students. Department permission required for enrolment*	S2 Intensive

Bachelor of Science (Molecular Biology and Genetics)

Degree code: LH018

Summary of requirements
The requirements for the degree are set out in Table ID: Bachelor of Science (Molecular Biology and Genetics) (see below) and the Senate and Faculty Resolutions (see chapter 2) which should be read by all intending candidates. In particular it is important to ensure that any proposed course of study will comply with the basic requirements for the degree.

Enrolment guide
In your Junior year you should complete:

- 12 credit points from the science subject areas of Mathematics and Statistics (it is recommended that students take units that assume completion of HSC Mathematics Extension 1 or 2 and include some statistics)
- 12 credit points of any junior BIOL units of study (BIOL1911 and BIOL1902 is the preferred option)
- 12 credit points of junior units of study in the science subject area of Chemistry (CHEM1108 and 1109 is the preferred option)
- MBLG1001 or 1901, and
- 6 credit points of elective junior science units of study (Physics or Computer Science are recommended).

To complete your degree you must gain credit for at least 144 credit points as specified in Table ID: Bachelor of Science (Molecular Biology and Genetics). All students in the Bachelor of Science (Molecular Biology and Genetics) must complete:

- at least 48 credit points of intermediate units of study, and
- at least 48 credit points of senior units of study of which at least 24 credit points are in a single science subject area.

Progression requirements
You should note that you must maintain in units of study in Science subject areas an average mark of 65 or greater in each year of enrolment, or be transferred to the BSc.

Plans of study
It is important when choosing units of study at any stage of your university career that you consider your overall degree program. There is a sample degree program below. See the Bachelor of Science entry for additional information. There is also a degree planner inside the back cover.

Units of study
The Science units of study available for this degree are set out in Table ID: Bachelor of Science (Molecular Biology and Genetics) and in Table I: Bachelor of Science in chapter 9. Unit descriptions follow the tables.

Honours
There are Honours courses in Science subject areas suitable for Molecular Biology and Genetics students. Please refer to 'Honours in the Faculty of Science' in this chapter, and Table VI: Honours units of study in chapter 10.

Discontinuation
If you wish to discontinue a unit of study it is important to talk to staff in the Faculty Office. In some circumstances, discontinuation can affect your access to units of study, prizes and scholarships. Deadlines for withdrawal and discontinuation can be found on the second page of this handbook.

Special permission
You should note that the faculty can, in certain circumstances, permit exceptions to the normal requirements for a degree. Applications should be made in writing to the Associate Dean (Undergraduate) after discussion with staff in the Faculty Office.

Transferring into the BSc (Molecular Biology and Genetics)
Students who have completed at least 48 credit points may, with the permission of the Dean, be permitted to transfer to the BSc (Molecular Biology and Genetics) from the BSc or any of its streams if their mark averaged over all attempted units of study is 75 or greater.

Universities Admissions Index (UAI)
The minimum UAI for admission into the course varies every year.

Degree resolutions
See chapter 2.

Sample Bachelor of Science (Molecular Biology and Genetics)

Sample Bachelor of Science (Molecular Biology and Genetics)								
	Sem	Unit of study 1 & credit points	Unit of study 2 & credit points	Unit of study 3 & credit points	Unit of study 4 & credit points	Unit of study 5 & credit points	Unit of study 6 & credit points	Total
Year 1	1	MATH1XXX	MATH1XXX	BIOL1XXX	CHEM1108	Science elective		
		3	3	6	6	6		24
	2	MATH1XXX	MATH1XXX	BIOL1XXX	CHEM1109	MBLG1901		
		3	3	6	6	6		24
Year 2	1	MBLG2X71	BCHM2X71	MICR2X21	Science elective			
		6	6	6	6			24
	2	MBLG2X72	BCHM2X72	CHEM2403	Science elective			
		6	6	6	6			24
Year 3	1	BCHM3X71	BCHM3X81	BIOL3X18	BIOL3X27			
		6	6	6				24
	2	Table ID elective	Table ID elective	Table ID elective	Table 1D elective	MBLG3999		
		6	6	6	6	0		24
							Total credit points:	144
Require: 144cp total, and units of study as per Table ID.								

Table 1D: Bachelor of Science (Molecular Biology and Genetics)

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
A. Junior units of study			
Candidates are required to enrol in and complete:			
(i) 12 credit points of any Junior BIOL units of study (BIOL1911 and BIOL1902 is the preferred option); and			
(ii) CHEM(1101 or 1901 or 1903 or 1108) and CHEM(1102 or 1902 or 1904 or 1109) (The combination of CHEM 1108 and 1109 is the preferred option. The combination of CHEM 1001 and 1002 is available with special permission.);			
(iii) MBLG1901 (MBLG1001 and MBLG1999 for students who commenced prior to 2008);			
(iv) 12 credit points of Junior units of study from the Science Subject Area of Mathematics (it is recommended that students take units requiring HSC Mathematics Extension 1 or 2 and include some statistics in their choice of Mathematics units of study); and			
(v) 6 credit points of other Junior units of study from BSc units of study (Table I). It is recommended that the extra 6 credit points be selected from Junior units of study in Physics or in Computer Science.			
MBLG1901 **Molecular Biology and Genetics (Adv)**	6	**A** HSC Chemistry and Biology OR 6 credit points of Junior Biology and 6 cp of Junior Chemistry **P** UAI of 95 or minimum Band 5 in HSC chemistry and biology or by invitation **N** AGCH2001, BCHM2001, BCHM2101, BCHM2901, MBLG2101, MBLG2901, MBLG2001, MBLG2111, MBLG2771, MBLG2871, MBLG1001	Semester 2
MBLG1999 **Molecular Biology & Genetics Seminar A**		**C** MBLG1001 or MBLG1901 *Only available in the BSc(MBG) and MBLG1901*	Semester 2
B. Intermediate units of study			
In order to proceed to the Intermediate year, candidates for the BSc (Molecular Biology and Genetics) must achieve a Credit average in Junior units of study. Candidates who fail to maintain the required Credit average will be transferred to candidature for the Bachelor of Science degree in their next year of enrolment with full credit for the units of study completed as Bachelor of Science (Molecular Biology and Genetics) candidates. Candidates who fail to achieve the required average across all units of study attempted in the year in which they have otherwise completed the requirements for the degree will be awarded the Bachelor of Science.			
In the Intermediate year candidates are required to enrol in and complete:			
(i) MBLG(2071 or 2971) and(2072 or 2972);			
(ii) CHEM(2403 or 2913);			
(iii) BCHM(2071 or 2971) and BCHM(2072 or 2972);			
(iv) MICR(2021 or 2921); and			
(v) 12 Credit points of Intermediate Science units of study. (In 1st Semester, CHEM2401/2911/2915 or BIOL(2016/2916) and in 2nd Semester, MICR(2022 or 2922) and CHEM2402/2912/2916, are strongly recommended as the Science options.)			
Note: Students wishing to proceed to the Senior units of Chemistry or Microbiology must complete 12 credit points of Intermediate units in the appropriate discipline area.			
C. Senior units of study			
In order to proceed to the Senior year, candidates for the BSc (Molecular Biology and Genetics) must achieve a Credit average in Intermediate units of study. Candidates who fail to maintain the required Credit average will be transferred to candidature for the Bachelor of Science degree in their next year of enrolment with full credit for the units of study completed as Bachelor of Science (Molecular Biology and Genetics) candidates. Candidates who fail to achieve the required average across all units of study attempted in the year in which they have otherwise completed the requirements for the degree will be awarded the Bachelor of Science.			
In the Senior year candidates are required to enrol in and complete:			
(i) MBLG3999; and			
(ii) BCHM(3071 or 3971) and BCHM(3081 or 3981); and			
(iii) BIOL(3018 or 3918) and (3027 or 3927); and			
(iv) Semester 2 elective units of study: Select 24 credit points from BCHM(3072 or 3972), BCHM(3082 or 3982), BCHM(3092 or 3992), BIOL(3025 or 3925), BIOL(3026 or 3926), CHEM(3114 or 3914), CHEM(3115 or 3915), CHEM(3116 or 3916), CHEM(3117 or 3917), MICR(3012 or 3912), MICR(3022 or 3922).			
NOTE: The July semester enrolment must include a unit of study which incorporates the seminar and discussion program.			
Other suitable options incorporating molecular biology and genetics would be considered by the Program Committee.			
MBLG3999 **Molecular Biology & Genetics Seminar B**		*Only available to students enrolled in the BSc(MBG) degree or the BCHM3972 course*	Semester 2
Honours units of study			
Candidates for the Honours degree in Molecular Biology and Genetics shall complete an Honours program incorporating research in molecular biology and genetics in a Department or School in the Faculty of Science.			

Bachelor of Science (Molecular Biotechnology)

Degree code: LH022

Summary of requirements
This degree program is taught mainly by departments in the Faculty of Science and includes industry participation.

The requirements for the degree are set out in Table IE: Bachelor of Science (Molecular Biotechnology) (see this chapter) and the Senate and Faculty Resolutions (see chapter 2) which should be read by all intending candidates. In particular it is important to ensure that any proposed course of study will comply with the basic requirements for the degree.

Enrolment guide
In your junior year you should complete:

- 12 credit points from the science subject areas of Mathematics and Statistics
- 12 credit points of junior units of study in the science subject area of Biology
- 12 credit points of junior units of study in the science subject area of Chemistry (preferred combination is CHEM1108 and CHEM1109)
- MBLG1001 or 1901, and
- 6 credit points of elective units of study from Science, Agriculture, Arts, Economics and Business, Engineering and Information Technologies or other faculties.

To complete your degree you must gain credit for at least 144 credit points as specified in Table IE: Bachelor of Science (Molecular Biotechnology).

Plans of study
It is important when choosing units of study at any stage of your university career that you consider your overall degree program. There is a sample degree program below. See the Bachelor of Science entry for additional information. There is also a degree planner inside the back cover.

Units of study
The Science units of study available for this degree are set out in Table IE: Bachelor of Science (Molecular Biotechnology) and in Table I: Bachelor of Science in chapter 10. Unit descriptions follow the tables.

Honours
Please refer to 'Honours in the Faculty of Science' in this chapter, and Table VI: Honours units of study in chapter 10. Candidates for the Honours degree in Molecular Biotechnology shall complete an Honours program incorporating research in molecular biotechnology and related areas through one of the Departments or Schools within the Faculty of Science. Under some circumstances co-supervision may be provided by suitably qualified staff based in relevant industrial settings.

Discontinuation
If you wish to discontinue a unit of study it is important to talk to staff in the Faculty Office. In some circumstances, discontinuation can affect your access to units of study, prizes and scholarships. Deadlines for withdrawal and discontinuation can be found on the second page of this handbook.

Special permission
You should note that the faculty can, in certain circumstances, permit exceptions to the normal requirements for a degree. Applications should be made in writing to the Associate Dean (Undergraduate) after discussion with staff in the Faculty Office.

Transferring into the BSc (Molecular Biotechnology)
Students may transfer from other courses offered by the Faculty of Science or any of its streams into the BSc (Molecular Biotechnology). Internal transfers are competitive on the basis of academic merit.

Universities Admissions Index (UAI)
The minimum UAI for admission into the course varies every year.

Degree resolutions
See chapter 2

Sample Bachelor of Science (Molecular Biotechnology)

	Sem	Unit of study 1 & credit points	Unit of study 2 & credit points	Unit of study 3 & credit points	Unit of study 4 & credit points	Unit of study 5 & credit points	Unit of study 6 & credit points	Total
Year 1	1	MATH1XXX	MATH1XXX	BIOL1X01/1911	CHEM1XXX	Elective		
		3	3	6	6	6		24
	2	MATH1XXX	MATH1XXX	BIOL1XXX	CHEM1XXX	MBLG1X01		
		3	3	6	6	6		24
Year 2	1	BCHM2X71	MBLG2X71	CHEM2401/2911/2915	Table IE elective 2XXX			
		6	6	6	6			24
	2	MOBT2102	MBLG2X72	CHEM2402/2912/2916	Table IE elective 2XXX			
		6	6	6	6			24
Year 3	1	MOBT3101	BIOL3X27	Table 1E Elective 3XXX	Table IE elective 3XXX			
		6	6	6	6			24
	2	MOBT3202	CHEM3XXX	BCHM/MICR 3XXX	Table IE elective 3XXX			
		6	6	6	6			24
							Total credit points:	144
Require: 144cp total, and units of study as per Table IE.								

Table 1E: Bachelor of Science (Molecular Biotechnology)

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
A. Junior units of study			
Candidates are required to enrol in and complete:			
(i) at least 12 credit points of Junior units of study from the Science Subject Area of Biology;			
(ii) CHEM1108 and CHEM1109 or at least 12 credit points of Junior units of study from the Science Subject Area of Chemistry (with special permission);			
(iii) at least 12 credit points of Junior units of study from the Science Subject Area of Mathematics;			
(iv) MBLG1001 or 1901; and			
(v) at least 6 credit points of elective units of study.			
CHEM1108 **Chemistry 1A Life Sciences**	6	**A** HSC Chemistry and Mathematics **C** Recommended concurrent units of study: 6 credit points of Junior Mathematics **N** CHEM1002, CHEM1102, CHEM1902, CHEM1904 *This unit of study is available to students enrolled in the Bachelor of Medical Science, the Bachelor of Science (Molecular Biology and Genetics), the Bachelor of Science (Nutrition) and the Bachelor of Science (Molecular Biotechnology) only.*	Semester 1
CHEM1109 **Chemistry 1B Life Sciences**	6	**P** CHEM1108 **C** Recommended concurrent units of study: 6 credit points of Junior Mathematics **N** CHEM1001, CHEM1101, CHEM1901, CHEM1903 *This unit of study is available to students enrolled in the Bachelor of Medical Science, the Bachelor of Science (Molecular Biology and Genetics), the Bachelor of Science (Nutrition) and the Bachelor of Science (Molecular Biotechnology) only.*	Semester 2
B. Intermediate units of study			
Candidates are required to enrol in and complete 48 credit points of Intermediate units of study including:			
(i) MOBT2102;			
(ii) MBLG(2071 or 2971) and MBLG(2072 or 2972);			
(iii) CHEM(2401/2911/2915) and CHEM(2402/2912/2916);			
(iv) BCHM(2071 or 2971); and			
(v) at least 12 credit points chosen from Intermediate units of study in the Subject Areas of Animal Science, Biochemistry, Biological Sciences, Chemical Engineering, Chemistry, Computational Science, Computer Science and Information Systems, Immunology, Mathematics and Statistics, Microbiology, Pharmacology and Plant Science.			
MOBT2102 **Molecular Biotechnology 2**	6	**P** 12 credit points of Junior Biology and 12 credit points of Junior Chemistry **N** MOBT2001 *This unit of study is only available to students in enrolled the BSc (Molecular Biotechnology) degree.*	Semester 2
C. Senior units of study			
Candidates are required to enrol in and complete 48 credit points of Senior units of study including:			
(i)MOBT3101 and MOBT3202;			
(ii) BIOL3027/3927;			
(iii) 6 credit points of CHEM from CHEM3111/3911 or CHEM3110/3910 or CHEM3114/3914 or CHEM3115/3915 or CHEM3116/3916			
(iv) 6 credit points of BCHM or MICRO (Highly recommended: BCHM3092/3982 or MICR3022 /3922 or BCHM3081/3981)			
(v) at least 18 credit points from Senior units of study in the Subject Areas of: Agricultural Chemistry, Animal Science, Biochemistry, Biological Sciences, Chemical Engineering, Chemistry, Computational Science, Computer Science and Information Systems, Immunology, Mathematics and Statistics, Microbiology, Pharmacology and Plant Sciences.			
MOBT3101 **Molecular Biotechnology 3A**	6	**A** MBLG (2072 or 2972). **P** MOBT2102 **N** MOBT2002 *NB:This unit of study is only available to students enrolled in the BSc (Molecular Biotechnology) degree.*	Semester 1
MOBT3202 **Molecular Biotechnology 3B Project**	6	**P** MOBT2002 or MOBT3101 **N** MOBT3002, MOBT3102 *This unit of study is only available to students enrolled in the BSc (Molecular Biotechnology) degree.*	Semester 2

Bachelor of Science (Nutrition)

Degree code: LH020

Summary of requirements
The requirements for the degree are set out in Table IF: Bachelor of Science (Nutrition) (see this chapter) and the Senate and Faculty Resolutions (see chapter 2) which should be read by all intending candidates. In particular it is important to ensure that any proposed course of study will comply with the basic requirements for the degree.

Enrolment guide
In your junior year you should complete:

- 12 credit points in the science areas of Maths and Statistics
- 12 credit points in the science subject area of Biology
- 12 credit points in the science subject area of Chemistry (CHEM1108 and CHEM1109 preferred option)
- 6 credit points in the science subject areas of Computer Science, Physics or Psychology, and
- MBLG1001.

To complete your degree you must gain credit for at least 192 credit points in total as specified in Table IF: Bachelor of Science (Nutrition).

Plans of study
It is important when choosing units of study at any stage of your university career that you consider your overall degree program. There is a sample degree program below.

Units of study
Units of study for this degree appear in Table IF: Bachelor of Science (Nutrition) and in Table I: Bachelor of Science in chapter 9.

Progression requirements
A minimum requirement for progression in the BSc (Nutrition) will be set annually and will be based on WAM.

Students must achieve a WAM of 60 in their junior year and a WAM of 65 in intermediate and senior years, or be transferred to the BSc.

Honours
Please refer to 'Honours in the Faculty of Science' in this chapter. Candidates for the honours degree in Nutrition shall complete an honours program in either (1) clinical strand or (2) by research. Students who enrol in the BSc (Nutrition) in order to achieve accreditation as a dietitian will need to complete the clinical strand.

Discontinuation
If you wish to discontinue a unit of study it is important to talk to staff in the Faculty Office. In some cases, discontinuation can affect your access to units of study, prizes and scholarships. Deadlines for withdrawal/discontinuation are shown on page i of this handbook.

Special permission
You should note that the faculty can, in certain circumstances, permit exceptions to the normal requirements for a degree. Applications should be made in writing to the Associate Dean (Undergraduate) after discussion with staff in the Faculty Office.

Transferring into the BSc (Nutrition)
Students may apply for internal transfer from the Bachelor of Science or any of its steams into the BSc(Nutrition). Internal transfers are competitive on the basis of academic merit.

Universities Admissions Index (UAI)
The minimum UAI for admission into the course varies every year.

Degree resolutions
See chapter 2.

Sample Bachelor of Science (Nutrition)

	Sem	Unit of study 1 & credit points	Unit of study 2 & credit points	Unit of study 3 & credit points	Unit of study 4 & credit points	Unit of study 5 & credit points	Unit of study 6 & credit points	Total
Year 1	1	MATH1XXX	MATH1XXX	BIOL 1X01/1911	CHEM1XXX	BIOL1X03 or SOFT/INFO/ PHYS/ PSYC elective		
		3	3	6	6	6		24
	2	MATH1XXX	MATH1XXX	BIOL1X02 or SOFT/INFO/ PHYS/ PSYC elective	CHEM1XXX	MBLG1X01		
		3	3	6	6	6		24
Year 2	1	NUTR2911	MBLG2X71	PHSI2005	MICR2021/CHEM/ PCOL elective			
		6	6	6	6			24
	2	NUTR2912	BCHM2X72	PHSI2006	MICR 2022/ CHEM/ PCOL elective			
		6	6	6	6			24
Year 3	1	NUTR3911	NUTR 3921	AGCH3025/Table 1F Senior elective	AGCH3026/Table 1F Senior elective			
		6	6	6	6			24
	2	NUTR3912	NUTR3922	BCHM3X72	BCHM3X82			
		6	6	6	6			24
Year 4 (Clinical*)	1	NUTR4001						
		24						24
	2	NUTR4002						
		24						24
Year 4 (Research*)	1	NUTR4101	NUTR4102					
		12	12					24
	2	NUTR4103	NUTR4014					
		12	12					24
							Total credit points:	192

Require: 192cp total, and units of study as per Table IF * *Students complete honours in either a clinical or a research strand.*

Honours (clinical strand)				
Year 5	1	NUTR4001		
		24		24
	2	NUTR4002		
		24		24
BAppSc (Ex & Sports Sc) & BSc (Nutr)Honours			Total credit points:	240
Require: 240cp total, min. 138cp Science, min. 12cp Maths, min. 102cp Exercise and Sport Science, 48cp Honours units in Nutrition.				

Honours (research strand)					
Year 5	1	NUTR4101	NUTR4102		
		12	12		24
	2	NUTR4103	NUTR4104		
		12	12		24
BAppSc (Ex & Sports Sc) & BSc (Nutr) Honours				Total	240
Require: 240cp total, min. 138cp Science, min. 36cp Junior Science incl. 12cp Mathematics, min. 102cp Exercise and Sport Science, 48cp Honours units in Nutrition.					

Table 1F: Bachelor of Science (Nutrition)

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
The Bachelor of Science (Nutrition) is a 4 year degree. To complete the degree, a candidate must gain Credit for at least 192 credit points including the Honours course in either the clinical or research strand.			
A. Junior units of study			
Candidates are required to enrol in and complete:			
(i) BIOL(1001 or 1101 or 1901 or 1911) and BIOL(1002 or 1902 or 1003 or 1903);			
(ii) 12 credit points of Junior Chemistry;			
(iii) 12 credit points of Junior units of study from the Science Subject Area of Mathematics;			
(iv) 6 credit points of other Junior units of study from the Science Subject Areas of Computer Science, Physics or Psychology; and			
(v) MBLG1001 or 1901			
B. Intermediate units of study			
In order to proceed to the Intermediate year, candidates for the BSc (Nutrition) must achieve a WAM of 60 in their Junior year. Candidates who fail to maintain the required average will be transferred to candidature for the Bachelor of Science degree in their next year of enrolment with full credit for the units of study completed as Bachelor of Science (Nutrition) candidates. Candidates who fail to achieve the required average across all units of study attempted in the year in which they have otherwise completed the requirements for the degree will be awarded the Bachelor of Science.			
In the Intermediate year candidates are required to enrol in and complete:			
(i) NUTR2911 and NUTR2912;			
(ii) MBLG 2071 or 2971);			
(iii) BCHM(2072 or 2972);			
(iv) PHSI2005 and PHSI2006; and			
(v) Either (MICR2021 and MICR2022) or (at least 12 credit points of Intermediate units of study - 6 credit points each semester - from the Science Subject Areas of Chemistry or Pharmacology).			
NUTR2911 **Food Science Introductory (Advanced)**	6	**P** MBLG(1001 or 1901) and CHEM (1001 or 1101 or 1901 or 1903 or 1108) and CHEM (1002 or 1102 or 1902 or 1904 or 1109) and BIOL (1001 or 1911) and BIOL (1002 or 1003 or 1902 or 1903). For Combined BAppSc (Exercise and Sport Science)/BSc(Nutrition) degree completion of all Junior units in the table of units for this course. **N** NUTR2901	Semester 1
NUTR2912 **Nutritional Science Introductory (Adv)**	6	**A** NUTR2911 **P** MBLG(1001 or 1901) and CHEM (1001 or 1101 or 1901 or 1903 or 1108) and CHEM (1002 or 1102 or 1902 or 1904 or 1109) and BIOL (1001 or 1911) and BIOL (1002 or 1003 or 1902 or 1903). For Combined BAppSc (Exercise and Sport Science)/BSc(Nutrition) degree completion of all Junior units in the table of units for this course. **N** NUTR2902	Semester 2
C. Senior units of study			
In order to proceed to the Senior year, candidates for the BSc (Nutrition) must achieve a WAM of 65 in their Intermediate year. Candidates who fail to maintain the required Credit average will be transferred to candidature for the Bachelor of Science degree in their next year of enrolment with full credit for the units of study completed as Bachelor of Science (Nutrition) candidates.			
In the Senior year candidates are required to enrol in and complete:			
(i) NUTR3911, 3921, 3912 and 3922;			
(ii) BCHM(3082 or 3982) and BCHM(3072 or 3972); and			
(iii) AGCH(3025 and 3026) or 12 credit points from the following Senior units of study: BCHM(3071 or 3971), BCHM(3081 or 3981), MICR(3011 or 3911), VIRO(3001 or 3901), NEUR(3001 or 3901), NEUR(3002 or 3902).			
NUTR3911 **Nutritional Assessment Methods**	6	**P** Credit average in NUTR2911 and NUTR2912 **N** NUTR3901	Semester 1
NUTR3921 **Methods in Nutrition Practice**	6	**P** Credit average in NUTR2911 and NUTR2912 **N** NUTR3901	Semester 1

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
NUTR3912 **Community and Public Health Nutrition**	6	**P** Credit average in NUTR2911 and NUTR2912 **N** NUTR3902	Semester 2
NUTR3922 **Nutrition and Chronic Disease**	6	**P** Credit average in NUTR2911 and NUTR2912 **N** NUTR3902	Semester 2
D. Honours units of study			
In order to proceed to the Honours year, candidates must achieve a SCIWAM of at least Credit (65), and results of at least Credit (65) in all of NUTR 3911, 3921, 3912 and 3922.			
Candidates who fail to achieve the required results across the Senior units of study will be transferred to candidature for the Bachelor of Science degree, and if they have otherwise completed the requirements for the BSc Pass degree, will be awarded the Bachelor of Science with a major in Nutrition.			
Candidates enrol in and complete either:			
(i) Bachelor of Science (Nutrition) Honours (clinical strand): NUTR4001 and NUTR4002 and NUTR4999; OR			
(ii) Bachelor of Science (Nutrition) Honours (research strand): NUTR4101, NUTR4102, NUTR4103 and NUTR4104.			
E. Combined degree program: Bachelor of Applied Science (Exercise and Sport Science) and Bachelor of Science (Nutrition)			
Candidates must complete over 10 semesters the following units of study. In order to proceed from Year 1 to Year 2 of the program candidates must achieve a year WAM of at least 60. In order to proceed to the following years of the program a candidate must achieve at least 65 in each of NUTR 2911, NUTR 2912, NUTR 3911, NUTR 3921, NUTR 3912 and NUTR 3922, and a year WAM of at least 65 in Years 2 - 4. Candidates who fail to maintain these results in any year will be transferred to either the BSc(LH000), the BAppSc(ExSpSc)(SH088) or the BAppSc(ExSpSc&Nutr)(SH115).			
For information on units from the BAppSc (ExSpSc), please refer to the Handbook of the Faculty of Health Sciences.			
Year 1			
Candidates are required to enrol in and complete in their first year:			
(i) 12 credit points of Junior Chemistry;			
(ii) BACH1161;			
(ii) BIOS1159, 1133 and 1160;			
(iii) EXSS1018 and 1033; and			
(v) MBLG1001.			
Year 2			
Candidates are required to enrol in and complete in their second year:			
(i) BCHM2072 andBIOS 2098;			
(ii) EXSS2019, 1029 and 2022;			
(iii) MATH1015 and MBLG2071; and			
(iv) NUTR2911 and NUTR2912.			
Year 3			
Candidates are required to enrol in and complete in their third year:			
(i) EXSS(2016, 2018, 3023, 3024, 2025, 2026 and 3027);			
(ii) MATH1011 and STAT2012.			
MATH1011 **Life Sciences Calculus**	3	**A** HSC Mathematics **N** MATH1111, MATH1001, MATH1901, MATH1906, BIOM1003	Semester 1 Summer Main
STAT2012 **Statistical Tests**	6	**P** MATH (1005 or 1905 or 1015) **N** STAT2004, STAT2912	Semester 2
Year 4			
Candidates are required to enrol in and complete in their fourth year:			
(i) NUTR3911, NUTR3921, NUTR3912 and NUTR3922;			
(ii) EXSS3037 and EXSS3042;			
(iii) BCHM3082 and BCHM3072.			
Students can exit here with BAppSc(Exercise, Sports Science and Nutrition).			
Year 5			
Honours units of study			
In order to proceed to the Honours year, candidates must achieve a SCIWAM of at least Credit (65), and results of at least Credit (65) in all of NUTR 3911, 3921, 3912 and 3922.			
Candidates intending to graduate with Honours in the Clinical Strand are required to enrol in and complete in their fifth year:			
(i)NUTR4001 and NUTR4002 and NUTR4999			
Candidates intending to graduate with Honours in Research Strand are required to enrol in and complete in their fifth year:			
(i) NUTR4101 and NUTR4102 and NUTR4103 and NUTR4104.			

Exercise and Sports Science combined degree from 2009

Students who enrolled in the combined degree prior to 2009 should consult the Faculty of Health Sciences for any concerns they may have regarding unit of study choice in 2009.

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
E. Combined degree program: Bachelor of Applied Science (Exercise and Sport Science)/Bachelor of Science (Nutrition)			
Candidates must complete over 10 semesters the following units of study. In order to proceed from Year 1 to Year 2 of the program candidates must achieve a year weighted average mark of at least 60. In order to proceed to the following years of the program a candidate must achieve an average of at least 65 in (NUTR 2911 and NUTR 2912), and achieve an average of at least 65 in (NUTR 3911, NUTR 3921, NUTR 3912 and NUTR 3922) and a year weighted average mark of at least 65 in Years 2 - 4. Candidates who fail to maintain these results in any year will be transferred to either the BSc(LH000), the BAppSc(ExSpSc)(SH088) or the BAppSc(ExSpSc&Nutr)(SH115).			
For information on units from the BAppSc (ExSpSc), please refer to the Handbook of the Faculty of Health Sciences.			
Year 1			
Candidates are required to enrol in and complete in their first year:			
Semester 1			
(i) 6 credit points of Junior Chemistry;			
(ii) BACH1161 Introductory Behavioural Health Sciences;			
(iii) BIOSXXXX Functional Musculoskeletal Anatomy A;			
(iv) EXSS1018 Biomechanics of Human Movement			
Semester 2			
(i) 6 credit points of Junior Chemistry;			
(ii) BIOSXXXX Functional Musculoskeletal Anatomy B;			
(iii) BIOSXXXX Body System: Structure, Function & Dysfunction			
(iv) MBLG1001			
Year 2			
Candidates are required to enrol in and complete in their second year:			
Semester 1			
(i) BIOSXXXX Neuroscience			
(ii) MBLG2071 Molecular Biology & Genetics A			
(iii) NUTR2911 Food Science Introductory (Advanced)			
(iv) EXSS2019 Exercise Physiology - Acute Responses			
Semester 2			
(i) EXSS1029 Muscle Mechanics & Training			
(ii) EXSS2022 Exercise Physiology Training Adaptations			
(iii) BCHM2072 Human Biochemistry			
(iv) NUTR2912 Nutritional Science Introductory (Advanced)			
Year 3			
Candidates are required to enrol in and complete in their third year:			
Semester 1			
(i) EXSS3024 Exercise, Health & Disease			
(ii) EXSS3023 Exercise Testing & Prescription			
(iii) EXSS2018 Biomechanical Analysis of Human Movement			
(iv) MATH1015 Biostatistics and; MATH1011 Life Sciences Calculus			
Semester 2			
(i) EXSS3027 Exercise & Rehabilitation			
(ii) EXSS2026 Growth, Development & Ageing			
(iii) EXSS2025 Motor Control & Learning			
(iv) STAT2012 Statistical Tests			
Year 4			
Candidates are required to enrol in and complete in their fourth year:			
Semester 1			
(i) NUTR3911 Nutritional Assessment Methods			
(ii) NUTR3921 Methods in Nutrition Practice			
(iii) EXSSXXXX Nutrition for Health Exercise & Sport unit			
(iv) EXSS3037 Exercise Pharmacology & Immunology			
Semester 2			
(i) NUTR3912 Community and Public Health			
(ii) NUTR3922 Nutrition and Chronic Disease			
(iii) BCHM3072 Human Molecular Cell Biology			

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
(iv) BCHM3082 Medical and Metabolic Biochemistry			
Students can exit here with BAppSc(Exercise, Sports Science and Nutrition).			
Year 5			
Honours units of study			
In order to proceed to the Honours year, candidates must achieve a SCIWAM of at least Credit (65), and results of at least Credit average (65) in (NUTR 3911, 3921, 3912 and 3922).			
Candidates intending to graduate with Honours in Nutrition and Dietetics are required to enrol in and complete in their fifth year:			
(i) NUTR4001 and NUTR4002 and NUTR4999			
Candidates intending to graduate with Honours in Nutrition are required to enrol in and complete in their fifth year:			
(i) NUTR4101 and NUTR4102 and NUTR4103 and NUTR4104			

5. Bachelor of Medical Science and BMedSc/MBBS

This chapter is intended to give enrolment advice to undergraduate Bachelor of Medical Science students in the Faculty of Science. You will find answers to frequently asked questions covering all students.

Following this are specific summaries of the requirements for each degree including examples of how unit of study choices can be made over the duration of the degree. With some degrees there is information on recommended combinations of units of study, especially in first year, to help guide you to your goals.

It is stressed that the information in this chapter is intended to be a rough guide only. All students will have to decide for themselves how to plan their degree to suit their own particular interests and situation.

All students are expected to read the degree resolutions for their course before they commence their studies, and from time to time during their studies. Undergraduate degree resolutions appear in chapter 2. The tables of undergraduate units of study available for each degree appear towards the end of this chapter. Unit of study descriptions may be found in Chapter 10.

Students enrolled in units of study offered by the Faculty of Science are required to familiarise themselves with the following key policies:

Special Arrangements
Students who are experiencing difficulty in meeting their assessment requirements due to competing essential community commitments may apply for Special Arrangements for examination and assessment.

Special Consideration
Students who have a serious illness or who have experienced misadventure which may affect their academic performance in a course or unit of study may request that they be given Special Consideration in relation to the determination of their results.

At Risk
To progress through a degree course, students are required to:

1. achieve the minimum Progression Rate specified by the faculty; in the Faculty of Science students must pass more than 50 per cent of the units attempted in each semester
2. pass any field or clinical work, practicum, or other unit of study mandated by the faculty (listed in your degree requirements).

If you do not meet the progress requirements, you will be identified as a student at risk.

Code of Conduct for Students
The University has clear expectations of students in respect of academic matters and personal behaviour.

Student Plagiarism: Coursework Policy and Procedure
The University of Sydney expects high standards of academic honesty in all student work. In particular, the University is opposed to and will not tolerate plagiarism.

Details on Special Arrangements, Special Consideration, Code of Conduct for Students, and Student Plagiarism Policy are provided in Chapter 1 of this handbook.

Inside the back cover of this handbook you will find a planner to help you map out your degree. It is recommended that you plan your studies carefully with an eye to your final years, so that you take the correct prerequisites in the preceding years. It will be useful to revisit this planner during your studies as your interests take more detailed shape.

Enrolment day FAQs

What is a 'major'?

Some degrees in the Faculty of Science require you to complete a major. A major is a specialisation in the senior year of your degree. A major is usually defined as 24 credit points of study at the senior level in a single science Area.

The Bachelor of Medical Science does not have majors.

How many credit points should I take per semester?

You should take 24 credit points each semester if you are a full-time student. There is an upper limit of 30 credit points per semester. If you take fewer than 18 credit points in each semester you will automatically become part-time.

To finish your degree in the recommended minimum time you will have to take 48 credit points per year, or 24 per semester. If you enrol part time you can take as few credit points as you like. You must keep in mind however that you have a 10 year limit to finish your degree. Students wishing to accelerate their degree programs may consider undertaking units offered at Summer School or undertaking up to 30 credit points each semester. The degree summary and sample program in this chapter assume you will enrol full-time.

Do I need to be full-time?

International students must enrol full-time in a minimum of 24 credit points per semester unless there are exceptional circumstances. Failure to enrol in 24 credit points per semester may have serious ramifications for your visa.

Australian citizens and permanent residents are considered full-time if they are enrolled in 18 or more credit points per semester.
Australian citizens and permanent residents who wish to receive a transport concession card must be full-time students.

If you receive any financial support, whether from a University scholarship or from the government, you may well need to enrol as a full-time student. You should carefully check the terms and conditions of that support before going part-time.

Can I take units of study from other faculties?

Yes. Students may take up to 12 credit points of non-Medical Science electives in the third year of the degree. You may take any unit in the faculties of Arts or Economics and Business for which you have the prerequisites. Each faculty website has links to departmental and unit of study information.

Also available are undergraduate units from any other faculty at the University. The onus is on you to get written permission from the relevant department and bring it to the Faculty of Science.

There are limits, and exclusions. You should refer to the degree summary sections of this chapter for specific information about your particular degree.

I have an offer for the Bachelor of Medical Science (first year entry) – can I apply for credit for previous tertiary study?

Yes. However, students enrolling as new students into the Bachelor of Medical Science award course are advised that credit will not enable you to proceed directly into core Intermediate BMED units of study. Prerequisites for Intermediate BMED units of study are such that anything less than 42 credit points of junior units of study specified in the resolutions for the degree will not enable students to undertake these units on entry to the award course. Only students admitted into

second year entry for the Bachelor of Medical Science (UAC code: 512081/522081) will be able to proceed directly into second-year units of study.

No more than 48 credit points of credit can be offered towards the Bachelor of Medical Science. Credit will only be offered at junior level.

On the day that you enrol you must lodge an application for credit for previous study. Because of the large numbers of applications received at enrolment there can be a considerable delay in processing your application, but all credit offers will be sent to students well in advance of the last day to add a unit of study for the semester in which they enrol.

The faculty must sight originals of your academic transcripts, as well as detailed descriptions of prior units of study completed, as at the time of completion of the units. Descriptions will normally be an extract from a Handbook or a unit of study syllabus or outline, and should include the credit point value, learning outcomes, assessment details, texts and references, and contact details for each unit of study. You must bring this information with you on the day that you enrol.

On enrolment day you will have to make unit of study choices as if you have had no previous university study. Alternatively, you may be able to obtain special permission to enrol in intermediate or senior units of study by taking a copy of your transcript and unit of study descriptions to academic advisers for each individual unit of study. Unit of study Academic advisers are listed under unit of study descriptions in this Handbook.

Information on the application process for credit, including the application form, is available from the Faculty of Science website.

I have an offer for Bachelor of Medical Science (second year entry) – do I need to apply for credit?

No, credit will be granted upon enrolment. You will enrol in second year units of study on the day of enrolment.

Are there any bridging courses available?

There are bridging courses in Biology, Chemistry, Mathematics and Physics, designed to cover the assumed knowledge that students would normally cover in the HSC. They run in February each year after enrolment and are recommended for students who either didn't take a subject at the HSC or feel they need some revision.

Who can enrol in Advanced units of study?

Advanced units of study are available to those students enrolled in any program in the Faculty of Science who have performed at a high level in science subjects in the HSC or who perform well in their studies at the University.

Consult a departmental adviser about your eligibility to enrol in advanced level subjects in the first year of study.

Students should also consult the unit of study Tables for assumed and prerequisite marks in the HSC required to enrol in Advanced units of study.

It is recommended that you enrol in no more than 24 credit points of Advanced units of study in a year. Advanced units of study are very demanding and students are required to perform at a higher standard than in the normal units of study.

What is the Talented Student Program?

The Talented Student Program (TSP) is unique to the University of Sydney. It is tailored to meet students' individual needs and is restricted to the very top students.

Students may be able to bypass some first year study and enrol directly in a second year course. If you have outstanding results in any of your HSC science subjects you may wish to negotiate a special program of study with one of the departments in the Faculty of Science.

The Talented Student Program is available in most areas of Science. Students receive special supervision by academic staff and often engage in studies on an individual basis with small numbers of fellow students, all of whom have a special interest in the same subject.

Am I eligible for the Talented Student Program?

Entry to the TSP is by invitation from the Dean, which you should have received by the time you enrol. The following guidelines apply generally, although departments may have additional (and sometimes more stringent) requirements for entry into the program. To get into the program in your first year, you should normally have a UAI (or equivalent) of at least 99.00 and a result in band 6 in at least one HSC Science subject area and/or a mark of 95 or better in HSC Mathematics Extension 2. For entry into the program in your second and third years, you should normally have a weighted average mark of 85 or over and a high distinction grade in the relevant subject area.

Bachelor of Medical Science (BMedSc)

Degree code: LH010

Summary of requirements

The requirements for the degree are set out in the Senate and Faculty Resolutions (see chapter 2) which should be read by all intending candidates. In particular it is important to ensure that any proposed course of study will comply with the basic requirements for the degree. Important aspects of the Resolutions are summarised below. The Resolutions should be consulted for any clarification of the summary points.

Enrolment guide

To complete your degree you must gain credit for at least 144 credit points. The 144 credit points required for the degree must include:

- at least 48 credit points from jnior units of study, comprising MBLG1001 and 12 credit points each from Chemistry, Mathematics and Physics (other than PHYS 1500) or Computational Science and 6 credit points from Biology
- no more than 60 credit points from jnior units of study
- 48 credit points of intermediate core units of study listed in Table IV
- at least 36 credit points of Senior units of study taken from the subject areas of Anatomy/Histology, Biology (Genetics), Biochemistry, Cell Pathology, Immunology, Infectious Diseases, Microbiology, Pharmacology and Physiology
- no more than 12 credit points from units of study other than core units of study.

Students are required to have completed at least 42 credit points of the core intermediate units of study prior to enrolment in any senior units of study. It is possible for students to 'carry' up to 6 credit points of core or elective units from the intermediate year into the senior year, provided that these units of study are not prerequisites for electives they may wish to undertake in the senior year.

You should also note the following:

- you cannot count any unit of study with the grade Pass (Concessional) toward the degree
- units of study completed at the University of Sydney Summer School which correspond to units of study in the table of undergraduate units of study may be credited towards the course requirements

- a standard full time enrolment is 24 credit points per semester; less than 18 credit points per semester is considered to be part time
- you may not enrol in more than 30 credit points in any one semester without permission
- in order to enrol in a unit of study, you have to meet any prerequisites and corequisites for that unit of study
- advanced units of study are indicated by a 9 (or 8) as the second digit of the unit of study code. Entry to these units of study is limited (details can be obtained from departments)
- once the award course requirements of 144 credit points have been satisfied a student may not enrol in additional units of study without first obtaining permission from the Dean
- if a student fails or discontinues enrolment in one unit of study twice, a warning will be issued that if the unit is failed a third time, the student may be asked to show good cause why he or she should be allowed to re-enrol in that unit of study.

The combination MATH1003 and 1004 or 1903 and 1904 is not recommended in this degree. Students wishing to study Statistics/Calculus are advised to select from MATH1003, 1005, 1903, 1905, 1013, 1015.

Plans of study
It is important when choosing units of study at any stage of your university career that you consider your overall degree program. There is a sample degree program below and a degree planner inside the back cover. Consultation with a faculty adviser is always recommended.

Units of study
The Science units of study available for this degree are set out in Table IV: Bachelor of Medical Science and in Table I: Bachelor of Science in chapter 3. Unit descriptions follow the tables.

Honours
There will be honours courses in Anatomy, Biochemistry, Biology (Genetics), Cell Pathology, Histology and Embryology, Immunology, Infectious Diseases, Microbiology, Pharmacology and Physiology. Please refer to 'Honours in the Faculty of Science' in this chapter, and Table VI: Honours units of study in chapter 3.

Discontinuation
If you wish to discontinue a unit of study it is important to talk to staff in the Faculty Office. In some cases discontinuation can affect your access to units of study, prizes and scholarships. Deadlines for withdrawal and discontinuation can be found on the second page of this handbook.

Special permission
You should note that the faculty can, in certain circumstances, permit exceptions to the normal requirements for a degree. Applications should be made in writing to the Associate Dean (Undergraduate) after discussion with staff in the Faculty Office.

Transferring into the BMedSc degree program
A limited number of students may be permitted to transfer into the BMedSc course at the beginning of the Intermediate year from other degrees offered by the faculty, from other degrees offered by The University of Sydney or from other institutions. In order to transfer, students must achieve a Pass or better in all of the qualifying units of study, or units of study deemed equivalent by the faculty. Selection is based solely on performance in the first year subjects. Applicants should anticipate a WAM of about 75 as being necessary to gain admission. Students who wish to transfer must apply for admission to the BMedSc course through the Universities Admission Centre (domestic students) or the International Office (international students).

Universities Admissions Index (UAI)
The minimum UAI for admission to the course varies every year.

BMedSc degree resolutions
See chapter 2.

Sample Bachelor of Medical Science

	Sem	Unit of study 1 & credit points	Unit of study 2 & credit points	Unit of study 3 & credit points	Unit of study 4 & credit points	Unit of study 5 & credit points	Unit of study 6 & credit points	Total
Year 1	1	MATH1XXX	MATH1XXX	CHEM1XXX	PHYS1XXX	BIOL1XXX		
		3	3	6	6	6		24
	2	MATH1XXX	MATH1XXX	CHEM1XXX	PHYS1XXX	MBLG1X01		
		3	3	6	6	6		24
Year 2	1	BMED2801	BMED2802	BMED2803	BMED2806			
		6	6	6	6			24
	2	BMED2804	BMED2805	BMED2807	BMED2808			
		6	6	6	6			24
Year 3	1	Senior core 3XXX	Senior core 3XXX	Senior core 3XXX	Senior core 3XXX or elective			
		6	6	6	6			24
	2	Senior core 3XXX	Senior core 3XXX	Senior core 3XXX	Senior core 3XXX or elective			
		6	6	6	6			24
							Total credit points:	144
Require: 144cp total, min 48cp Junior, min 48cp Intermediate core, min 36cp Senior core, no more than 12cp from units of study outside Table IV.								

Combined BMedSc/MBBS degree

Degree codes: LH033/LH034

Summary of requirements
The requirements for the degree are set out in the Senate and Faculty Resolutions (see chapter 2) which should be read by all intending candidates.

A student may proceed through the degree of Bachelor of Science (Advanced) or the Bachelor of Medical Science to the degrees of Bachelor of Medicine and Bachelor of Surgery.

Enrolment guide
To qualify for the award of the degrees a student shall complete units of study to a total value of at least 336 credit points, and

- satisfactorily complete three SMTP units in the first three years of the program
- meet the requirements of the BSc (Adv) or BMedSc degree outlined above, and
- complete 192 credit points towards the MBBS degree as required by the Resolutions of the Faculty of Medicine.

Progression requirements
Students are required to maintain a minimum AAM of 65 or above and to satisfactorily complete three SMTP units of study in the first three years of the program. Students who fail to satisfy these requirements will be transferred to the BSc (Adv) or BMedSc.

Plans of study
It is important when choosing units of study at any stage of your university career that you consider your overall degree program. See the Bachelor of Science (Advanced) or Bachelor of Medical Science entry for information about recommended first year combinations of units of study and the sample degree program. There is a degree planner inside the back cover. Consultation with a Faculty adviser is always recommended.

Units of study
The Science units of study available for this degree are set out in Table I: Bachelor of Science in chapter 3 and Table IV: Bachelor of Medical Science in this chapter. Unit descriptions appear in chapter 10. The Medicine units of study available for this degree are set out in the Faculty of Medicine handbook.

Honours
Students who qualify to undertake Honours in the BSc (Adv) or BMedSc degree may elect to do so by either suspending their candidature from the MBBS degree for one year, or after completion of the combined course. Please refer to 'Honours in the Faculty of Science' in this chapter, and to Table VI: Honours units of study in chapter 12.

Abandoning and discontinuing
Students may abandon the combined degree course and elect to complete the BSc (Adv) or BMedSc degree.

If you wish to discontinue a unit of study it is important to talk to staff in the Faculty Office. In some circumstances, discontinuation can affect your access to units of study, prizes and scholarships. Deadlines for withdrawal and discontinuation can be found on the second page of this handbook.

Special permission
You should note that the faculty can, in certain circumstances, permit exceptions to the normal requirements for a degree. Applications should be made in writing to the Associate Dean (Undergraduate) after discussion with staff in the Faculty Office.

Supervision
Students will be under the general supervision of the Faculty of Science until the end of the semester in which they complete the requirements for the BSc (Adv) or BMedSc degree. After that they will be under the general supervision of the Faculty of Medicine.

Universities Admissions Index (UAI)
The minimum UAI for admission into the course varies every year.

Degree resolutions
See chapter 2.

Honours in the BSc (Including all streams and combined degrees), BCST, BMedSc, BST
Admission
To qualify to enrol in an honours course, students shall:

1. (a) have qualified for the award of a relevant pass degree from the Faculty of Science, or
   (b) be a pass graduate of the Faculty of Science, or
   (c) be a pass graduate holding an equivalent qualification from another institution
2. have completed a minimum of 24 credit points of senior units of study relating to the intended honours course (or equivalent at another institution)
3. have achieved either
   (a) a credit average in the relevant Senior units of study, or
   (b) a SCIWAM of at least 65 (or equivalent at another institution)
4. satisfy any additional criteria set by the relevant Head of Department.

You should also note the following:

- Students shall complete the requirements for the honours course full-time over two consecutive semesters. If the faculty is satisfied that a student is unable to attempt the honours course on a full-time basis and if the Head of Department concerned so recommends, permission may be granted to undertake honours half-time over four consecutive semesters.
- Not all departments offer students part time enrolment in honours, or honours enrolment commencing in the July semester. Students considering these types of honours enrolment are urged to contact the Department concerned.
- A student may not re-attempt an honours course in a single subject area. A student who is qualified to enrol in two honours courses may either complete the honours courses in the two subject areas separately and in succession, or complete a joint honours course, equivalent to an honours course in a single subject area, in the two subject areas. A joint honours course shall comprise such parts of the two honours courses as may be decided by the Dean.
- An interdisciplinary honours course shall comprise such parts as determined by the Coordinating Committee for the interdisciplinary course.

Table IV – Bachelor of Medical Science

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
A. Junior units of study			
Candidates are required to enrol in and complete:			
(i) MBLG1X01;			
(ii) 12 credit points of Junior units of study from the Science Subject Area of Chemistry;			
(iii) 12 credit points of Junior units of study from the Science Subject Area of Mathematics;			
(iv) 12 credit points of Junior units of study from the Science Subject Area of Physics (excluding PHYS1500) or Computational Science;and			
(v) 6 credit points of Junior units of study from the Science Subject Area of Biology.			
B. Intermediate units of study			
Candidates are required to complete 48 credit points of Intermediate core units of study.			
BMED2801 **Cell Structure and Function**	6	**P** 42 credit points of Junior Bachelor of Medical Science units of study **N** All Intermediate level units offered by the Schools of Molecular and Microbial Biosciences, Medical Sciences and BIOL(2006/2906) and BIOL(2016/2916)	Semester 1
BMED2802 **Molecular Basis of Medical Sciences**	6	**P** 42 credit points of Junior Bachelor of Medical Science units of study **N** All Intermediate level units offered by the Schools of Molecular and Microbial Biosciences, Medical Sciences and BIOL(2006/2906) and BIOL(2016/2916)	Semester 1
BMED2803 **Cardiac, Respiratory and Renal Function**	6	**P** 42 credit points of Junior Bachelor of Medical Science units of study **N** All Intermediate level units offered by the Schools of Molecular and Microbial Biosciences, Medical Sciences and BIOL(2006/2906) and BIOL(2016/2916)	Semester 1
BMED2804 **Digestion, Absorption and Metabolism**	6	**P** 42 credit points of Junior Bachelor of Medical Science units of study **N** All Intermediate level units offered by the Schools of Molecular and Microbial Biosciences, Medical Sciences and BIOL(2006/2906) and BIOL(2016/2916)	Semester 2
BMED2805 **Hormones, Reproduction and Development**	6	**P** 42 credit points of Junior Bachelor of Medical Science units of study **N** All Intermediate level units offered by the Schools of Molecular and Microbial Biosciences, Medical Sciences and BIOL(2006/2906) and BIOL(2016/2916)	Semester 2
BMED2806 **Sensory and Motor Functions**	6	**P** 42 credit points of Junior Bachelor of Medical Science units of study **N** All Intermediate level units offered by the Schools of Molecular and Microbial Biosciences, Medical Sciences and BIOL(2006/2906) and BIOL(2016/2916)	Semester 1
BMED2807 **Microbes and Body Defences**	6	**P** 42 credit points of Junior Bachelor of Medical Science units of study **N** All Intermediate level units offered by the Schools of Molecular and Microbial Biosciences, Medical Sciences and BIOL(2006/2906) and BIOL(2016/2916)	Semester 2
BMED2808 **Disease in Society**	6	**P** 42 credit points of Junior Bachelor of Medical Science units of study **N** All Intermediate level units offered by the Schools of Molecular and Microbial Biosciences, Medical Sciences and BIOL(2006/2906) and BIOL(2016/2916)	Semester 2
C. Senior units of study			
Students may complete their Senior year by taking 48 credit points of Senior core units from the subject areas of Anatomy and Histology, Biology (Genetics) (ie. BIOL3018/3918, 3025/3925, 3026/3926, 3027/3927), Biochemistry, Cell Pathology, Immunology, Infectious Diseases, Microbiology, Pharmacology and Physiology. The unit listed in the table below is available only to students enrolled in the Bachelor of Medical Science. Details of the other units available are listed in Table I. Candidates may elect to take 36 credit points of Senior core units and 12 credit points of elective units. The electives may be chosen from any units of study available in the university, and in which the candidate is permitted to enrol by the relevant Faculty or School.			
INFD3012 **Infectious Diseases**	6	**A** Intermediate microbiology, immunology, molecular biology and genetics. **P** 42 cedit points of intermediate BMED units including BMED2807. *The completion of MICR3011 is strongly recommended prior to undertaking this course.*	Semester 2
D. Honours units of study			
Where honours units of study are designated A, B, C, D the units should be taken in that order, whether a student enrols full-time, part-time or mid-year.			
Anatomy			
ANAT4011 **Anatomy Honours A**	12	*Note: Department permission required for enrolment*	Semester 1 Semester 2
ANAT4012 **Anatomy Honours B**	12	**C** ANAT4011	Semester 1 Semester 2
ANAT4013 **Anatomy Honours C**	12	**C** ANAT4012	Semester 1 Semester 2
ANAT4014 **Anatomy Honours D**	12	**C** ANAT4013	Semester 1 Semester 2
Biochemistry			
BCHM4011 **Biochemistry Honours A**	12	*Note: Department permission required for enrolment* *Entry into the School Honours program normally requires a credit average in a major relevant to the chosen project or relevant 24 credit points of senior study. The School will consider entry to students who do not have this requirement if their overall academic performance indicates an equivalent performance in other subject areas or if their SCIWAM exceeds 65.*	Semester 1 Semester 2
BCHM4012 **Biochemistry Honours B**	12	**C** BCHM4011 *Entry into the School Honours program normally requires a credit average in a major relevant to the chosen project or relevant 24 credit points of senior study. The School will consider entry to students who do not have this requirement if their overall academic performance indicates an equivalent performance in other subject areas or if their SCIWAM exceeds 65.*	Semester 1 Semester 2
BCHM4013 **Biochemistry Honours C**	12	**C** BCHM4012 *Entry into the School Honours program normally requires a credit average in a major relevant to the chosen project or relevant 24 credit points of senior study. The School will consider entry to students who do not have this requirement if their overall academic performance indicates an equivalent performance in other subject areas or if their SCIWAM exceeds 65.*	Semester 1 Semester 2

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
BCHM4014 **Biochemistry Honours D**	12	**C** BCHM4013 *Entry into the School Honours program normally requires a credit average in a major relevant to the chosen project or relevant 24 credit points of senior study. The School will consider entry to students who do not have this requirement if their overall academic performance indicates an equivalent performance in other subject areas or if their SCIWAM exceeds 65.*	Semester 1 Semester 2
Biology (Genetics)			
BIOL4015 **Scientific Research in Biology**	6	**P** Pass degree in an area of Life Sciences or Equivalent **C** BIOL4016 **N** BIOL4009, BIOL4010 *Note: Department permission required for enrolment*	Semester 1 Semester 2
BIOL4016 **Biology Honours A**	6	**C** BIOL4015 **N** BIOL4011 *Note: Department permission required for enrolment*	Semester 1 Semester 2
BIOL4012 **Biology Honours B**	12	**C** BIOL4011 or (BIOL4015 and BIOL4016)	Semester 1 Semester 2
BIOL4013 **Biology Honours C**	12	**C** BIOL4012	Semester 1 Semester 2
BIOL4014 **Biology Honours D**	12	**C** BIOL4013 *Note: Department permission required for enrolment*	Semester 1 Semester 2
Cell Pathology			
CPAT4011 **Cell Pathology Honours A**	12	*Note: Department permission required for enrolment*	Semester 1 Semester 2
CPAT4012 **Cell Pathology Honours B**	12	**C** CPAT4011	Semester 1 Semester 2
CPAT4013 **Cell Pathology Honours C**	12	**C** CPAT4012	Semester 1 Semester 2
CPAT4014 **Cell Pathology Honours D**	12	**C** CPAT4013	Semester 1 Semester 2
Histology and Embryology			
Students should enrol in Anatomy Honours			
Immunology			
IMMU4011 **Immunology Honours A**	12	**N** BMED4011 *Note: Department permission required for enrolment*	Semester 1 Semester 2
IMMU4012 **Immunology Honours B**	12	**C** IMMU4011 **N** BMED4012	Semester 1 Semester 2
IMMU4013 **Immunology Honours C**	12	**C** IMMU4012 **N** BMED4013	Semester 1 Semester 2
IMMU4014 **Immunology Honours D**	12	**C** IMMU4013 **N** BMED4014	Semester 1 Semester 2
Infectious Diseases			
INFD4011 **Infectious Diseases Honours A**	12	**N** BMED4021 *Note: Department permission required for enrolment*	Semester 1
INFD4012 **Infectious Diseases Honours B**	12	**C** INFD4011 **N** BMED4022	Semester 1
INFD4013 **Infectious Diseases Honours C**	12	**C** INFD4012 **N** BMED4023	Semester 2
INFD4014 **Infectious Diseases Honours D**	12	**C** INFD4013 **N** BMED4024	Semester 2
Microbiology			
MICR4011 **Microbiology Honours A**	12	*Note: Department permission required for enrolment* *Entry into the School Honours program normally requires a credit average in a major relevant to the chosen project or relevant 24 credit points of senior study. The School will consider entry to students who do not have this requirement if their overall academic performance indicates an equivalent performance in other subject areas or if their SCIWAM exceeds 65.*	Semester 1 Semester 2
MICR4012 **Microbiology Honours B**	12	**P** Department permission required for enrolment **C** MICR4011 *Entry into the School Honours program normally requires a credit average in a major relevant to the chosen project or relevant 24 credit points of senior study. The School will consider entry to students who do not have this requirement if their overall academic performance indicates an equivalent performance in other subject areas or if their SCIWAM exceeds 65.*	Semester 1 Semester 2
MICR4013 **Microbiology Honours C**	12	**C** MICR4012 *Entry into the School Honours program normally requires a credit average in a major relevant to the chosen project or relevant 24 credit points of senior study. The School will consider entry to students who do not have this requirement if their overall academic performance indicates an equivalent performance in other subject areas or if their SCIWAM exceeds 65.*	Semester 1 Semester 2
MICR4014 **Microbiology Honours D**	12	**C** MICR4013 *Entry into the School Honours program normally requires a credit average in a major relevant to the chosen project or relevant 24 credit points of senior study. The School will consider entry to students who do not have this requirement if their overall academic performance indicates an equivalent performance in other subject areas or if their SCIWAM exceeds 65.*	Semester 1 Semester 2
Pharmacology			
PCOL4011 **Pharmacology Honours A**	12	*Note: Department permission required for enrolment*	Semester 1 Semester 2

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
PCOL4012 **Pharmacology Honours B**	12	**C** PCOL4011	Semester 1 Semester 2
PCOL4013 **Pharmacology Honours C**	12	**C** PCOL4012	Semester 1 Semester 2
PCOL4014 **Pharmacology Honours D**	12	**C** PCOL4013	Semester 1 Semester 2
Physiology			
PHSI4011 **Physiology Honours A**	12	*Note: Department permission required for enrolment*	Semester 1 Semester 2
PHSI4012 **Physiology Honours B**	12	**C** PHSI4011	Semester 1 Semester 2
PHSI4013 **Physiology Honours C**	12	**C** PHSI4012	Semester 1 Semester 2
PHSI4014 **Physiology Honours D**	12	**C** PHSI4013	Semester 1 Semester 2

6. Bachelor of Psychology

This chapter is intended to give enrolment advice to undergraduate students in the Bachelor of Psychology. You will find answers to frequently asked questions covering all students. Following this is a specific summary of the requirements for the Bachelor of Psychology, including examples of how unit of study choices can be made over the duration of the degree. There is information on recommended combinations of units of study, especially in first year, to help guide you to your goals.

It should be stressed that the information in this chapter is intended to be a rough guide only. All students will have to decide for themselves how to plan their degree to suit their own particular interests and situation.

All students are expected to read the degree resolutions for their course before they commence their studies, and from time to time during their studies. Undergraduate degree resolutions appear in chapter 2. The undergraduate units of study available for the Bachelor of Psychology degree are listed in Table 1, in Chapter 3. They are the same as those offered in the Bachelor of Science degree.

Students enrolled in units of study offered by the faculty of Science are required to familiarise themselves with the following key policies:

Special Arrangements
Students who are experiencing difficulty in meeting their assessment requirements due to competing essential community commitments may apply for Special Arrangements for examination and assessment.

Special Consideration
Students who have a serious illness or who have experienced misadventure which may affect their academic performance in a course or unit of study may request that they be given Special Consideration in relation to the determination of their results.

At Risk
To progress through a degree course, students are required to:

1. achieve the minimum Progression Rate specified by the faculty; in the Faculty of Science, students must pass more than 50 per cent of the units attempted in each semester
2. pass any field or clinical work, practicum, or other unit of study mandated by the faculty (listed in your degree requirements).

If you do not meet the progress requirements, you will be identified as a student at risk.

Code of Conduct for Students
The University has clear expectations of students in respect of academic matters and personal behaviour.

Student Plagiarism: Coursework Policy and Procedure
The University of Sydney expects high standards of academic honesty in all student work. In particular, the University is opposed to and will not tolerate plagiarism.

Details on Special Arrangements, Special Consideration, Code of Conduct for Students, and Student Plagiarism Policy are provided elsewhere in this handbook.

Inside the back cover of this handbook you will find a planner to help you map out your degree. It is recommended that you plan your studies carefully with an eye to your final years, so that you take the correct prerequisites in the preceding years. It will be useful to revisit this planner during your studies as your interests take more detailed shape.

Enrolment day FAQs

What is a 'major'?

Some degrees in the Faculty of Science require you to complete a major. A major is a specialisation in the senior year of your degree. Students enrolled in the Bachelor of Psychology will complete a major in Psychology, and an honours year in Psychology.

How many credit points should I take per semester?

You should take 24 credit points each semester if you are a full-time student. There is an upper limit of 30 credit points per semester. If you take fewer than 18 credit points in each semester you will automatically become part-time.

To finish your degree in the recommended minimum time you will have to take 48 credit points per year, or 24 per semester. If you enrol part time you can take as few credit points as you like. You must keep in mind however that you have a 10 year limit to finish your degree.

Students wishing to accelerate their degree programs may consider undertaking units offered at Summer School or undertaking up to 30 credit points each semester.

The degree summaries and sample programs in this chapter assume you will enrol full-time.

Do I need to be full-time?

International students must enrol full-time in a minimum of 24 credit points per semester unless there are exceptional circumstances. Failure to enrol in 24 credit points per semester may have serious ramifications for your visa.

Australian citizens and permanent residents are considered full-time if they are enrolled in 18 or more credit points per semester. Australian citizens and permanent residents who wish to receive a transport concession card must be full-time students.

If you receive any financial support, whether from a University scholarship or from the government, you may well need to enrol as a full-time student. You should carefully check the terms and conditions of that support before going part-time.

Can I take units of study from other faculties?

Yes. Generally you can take any unit of study offered by the Faculty of Arts and the Faculty of Economics and Business, up to 48 credit points in accordance with your degree resolutions. Lists of available units of study will be available on enrolment day, or in each faculty's handbook. Each faculty website has links to departmental and unit of study information.

Also available are undergraduate units from any other faculty at the University. The onus is on you to get written permission from the relevant department and bring it to the Faculty of Science.

There are limits, and exclusions. You should refer to the degree summary sections of this chapter for specific information about your particular degree.

Can I receive credit for previous tertiary study?

Yes. The amount of credit you may receive depends on your individual circumstances, but in general the total amount of credit granted may not be greater than 96 credit points and may not include more than 48 credit points from degrees that have been completed.

On the day that you enrol you must lodge an application for credit from previous study. Because of the large numbers of applications received at enrolment there can be a considerable delay in processing your application, but all credit offers will be sent to students well in advance of the last day to add a unit of study for the semester in which they enrol.

The faculty must sight originals of your academic transcripts, as well as detailed descriptions of prior units of study completed, as at the time of completion of the units. Descriptions will normally be an extract from a handbook or a unit of study syllabus or outline, and should include the credit point value, learning outcomes, assessment details, texts and references, and contact details for each unit of study. You must bring this information with you on the day that you enrol.

On enrolment day you will have to make unit of study choices as if you have had no previous university study. Alternatively, you may be able to obtain special permission to enrol in intermediate or senior units of study by taking a copy of your transcript and unit of study descriptions to academic advisers for each individual unit of study. Unit of study academic advisers are listed under unit of study descriptions in this handbook.

Information on the current application process for credit, including the application form, is available from the Faculty of Science website.

Are there any bridging courses available?

There are bridging courses in Biology, Chemistry, Mathematics and Physics, designed to cover the assumed knowledge that students would normally cover in the HSC. They run in February each year after enrolment and are recommended for students who either didn't take a subject at the HSC or feel they need some revision.

Who can enrol in advanced units of study?

Advanced units of study are available to those students enrolled in any program in the Faculty of Science who have performed at a high level in science subjects in the HSC or who perform well in their studies at the University.

Consult a departmental adviser about your eligibility to enrol in advanced level subjects in the first year of study. Students should also consult the unit of study tables for assumed and prerequisite marks in the HSC required to enrol in advanced units of study.

For students in an advanced degree it is recommended that you enrol in no more than 24 credit points of advanced units of study in a year. Advanced units of study are very demanding and students are required to perform at a higher standard than in the normal units of study.

What is the Talented Student Program?

The Talented Student Program (TSP) is unique to the University of Sydney. It is tailored to meet students' individual needs and is restricted to the very top students.

Students may be able to bypass some first year study and enrol directly in a second year course. If you have outstanding results in any of your HSC science subjects you may wish to negotiate a special program of study with one of the departments in the Faculty of Science.

The Talented Student Program is available in most areas of Science. Students receive special supervision by academic staff and often engage in studies on an individual basis with small numbers of fellow students, all of whom have a special interest in the same subject.

Am I eligible for the Talented Student Program?

Entry to the TSP is by invitation from the Dean, which you should have received by the time you enrol. The following guidelines apply generally, although departments may have additional (and sometimes more stringent) requirements for entry into the program.

To get into the program in your first year, you should normally have a UAI (or equivalent) of at least 99.00 and a result in band 6 in at least one HSC Science subject area and/or a mark of 95 or better in HSC Mathematics Extension 2. For entry into the program in your second and third years, you should normally have a weighted average mark of 85 or over and a high distinction grade in the relevant subject area.

Bachelor of Psychology (BPsych)

Degree code: LH013

Summary of requirements

The requirements for the degree are set out in the Senate and Faculty Resolutions (see chapter 2) which should be read by all candidates. In particular it is important to ensure that any proposed course of study complies with the basic requirements for the degree. Important aspects of the Resolutions are summarised below. The Resolutions should be consulted for any clarification of the summary points.

Enrolment guide

To complete your degree you must gain credit for at least 192 credit points including completing the honours course in Psychology and maintaining the required average grade in each year of study in the Science Subject Area of Psychology. The 192 credit points required for the degree must include:

- PSYC1001 and PSYC1002 at an average of Credit or better
- at least 12 credit points of units of study in the science subject areas of Mathematics and Statistics
- at least 12 credit points are junior units of study from science subject areas other than Psychology and Mathematics and Statistics
- PSYC2011, 2012, 2013 and 2014 at an average grade of Distinction of better.
- At least 30 credit points from senior units of study in the science subject area of Psychology with an average grade of Distinction or better. The senior units must include PSYC3010 and at least one of PSYC3011, 3012, 3013 and 3014. HPSC3023 may be included as a senior unit in the 24 senior credit points and is required by students who wish to complete the theoretical thesis option in Psychology honours.
- at least 96 credit points from science subject areas
- 48 credit points of honours Psychology units of study with a grade of honours (H3 or better).

You should also note the following:

- a maximum of 48 credit points may be counted towards the degree requirements from units of study offered by faculties other than the Faculty of Science.
- units of study completed at The University of Sydney Summer School which correspond to units of study in the table of undergraduate units of study may be credited towards the course requirements.
- a standard full time enrolment is 24 credit points per semester; less than 18 credit points per semester is considered to be part time
- you may not enrol in more than 30 credit points in any one semester without permission.
- you may not enrol in more than 60 credit points of junior units of study
- before being admitted to enrol in a unit of study, you have to meet any prerequisites and corequisites for that unit of study
- once the award course requirements of 192 credit points have been satisfied a student may not enrol in additional units of study without first obtaining permission from the Dean.
- if a student fails or discontinues enrolment in one unit of study twice, a warning will be issued that if the unit is failed a third time, the student may be asked to show good cause why he or she should be allowed to re-enrol in that unit of study.

Progression requirements
A minimum requirement for progression in the BPsych is as follows:

- Credit average in junior Psychology units of study
- Distinction average in intermediate and senior Psychology units of study.

A student who fails to meet progression requirements will be transferred to the BSc.

A student may not enrol in Psychology honours until they have completed 144 credit points of units of study and have satisfied all requirements for the BPsych except those related to honours.

Plans of study
It is important when choosing units of study at any stage of your university career that you consider your overall degree program. There is a sample degree program below and a degree planner inside the back cover. Consultation with a faculty or school adviser is always recommended.

Units of study
Units of study for the BPsych are listed in Table I: Bachelor of Science.

Honours
Students shall complete the requirements for the honours course full-time over two consecutive semesters. If the faculty is satisfied that a student is unable to attempt the honours course on a full-time basis and if the Head of Department concerned so recommends, permission may be granted to undertake honours half–time over four consecutive semesters.

A student may not re-attempt the Psychology honours course. Please refer to 'Honours in the Faculty of Science' in this chapter, and Table VI: Honours units of study in chapter 10.

Discontinuation
If you wish to discontinue a unit of study it is important to talk to staff in the Faculty Office. In some cases, discontinuation can affect your access to units of study, prizes and scholarships. Deadlines for withdrawal and discontinuation can be found on the second page of this handbook.

Special permission
You should note that the faculty can, in certain circumstances, permit exceptions to the normal requirements for a degree. Applications should be made in writing to the Associate Dean (Undergraduate) after discussion with staff in the Faculty Office.

Transferring into the BPsych
Students may transfer from any degree into the BPsych. applications are competitive on the basis of academic merit. Applications should be made through UAC (Domestic Students) or the International Office (International Students).

Universities Admission Index (UAI)
The minimum UAI for admission to the course varies from year to year.

Degree Resolutions
See chapter 2.

Sample Bachelor of Psychology

	Sem	Unit of study 1 & credit points	Unit of study 2 & credit points	Unit of study 3 & credit points	Unit of study 4 & credit points	Unit of study 5 & credit points	Unit of study 6 & credit points	Total
Year 1	1	PSYC1001	MATH1XXX	MATH1XXX	Science elective 1XXX	Elective		
		6	3	3	6	6		24
	2	PSYC1002	MATH1XXX	MATH1XXX	Science elective 1XXX	Elective		
		6	3	3	6	6		24
Year 2	1	PSYC2011	PSYC2012	Science elective	Elective			
		6	6	6	6			24
	2	PSYC2013	PSYC2014	Science elective	Elective			
		6	6	6	6			24
Year 3	1	PSYC3XXX	PSYC3XXX	PSYC3XXX	PSYC3XXX or elective			
		6	6	6	6			24
	2	PSYC3010	PSYC3XXX	PSYC3XXX or elective	PSYC3XXX or elective			
		6	6	6	6			24
Year 4	1	PSYC4011	PSYC4012					
		12	12					24
	2	PSYC4013	PSYC4014					
		12	12					24
							Total credit points:	192
Require: 192cp total, min. 12 cp Junior Psychology, min. 24cp Intermediate Psychology, min. 30cp Senior Psychology (incl. PSYC3010 and at least one of PSYC 3011, 3012, 3013, 3014), min. 48cp Honours Psychology, min. 12cp Maths, max 60cp Junior.								

7. Bachelor of Science and Technology

This chapter is intended to give enrolment advice to undergraduate students in the Faculty of Science. You will find answers to frequently asked questions covering all students.

Following this are specific summaries of the requirements for each degree including examples of how unit of study choices can be made over the duration of the degree. With some degrees there is information on recommended combinations of units of study, especially in first year, to help guide you to your goals.

It is stressed that the information in this chapter is intended to be a rough guide only. All students will have to decide for themselves how to plan their degree to suit their own particular interests and situation.

All students are expected to read the degree resolutions for their course before they commence their studies, and from time to time during their studies. Undergraduate degree resolutions appear in chapter 2. The unit descriptions appear in chapter 9.

Students enrolled in units of study offered by the Faculty of Science are required to familiarise themselves with the following key policies:

Special Arrangements
Students who are experiencing difficulty in meeting their assessment requirements due to competing essential community commitments may apply for Special Arrangements for examination and assessment.

Special Consideration
Students who have a serious illness or who have experienced misadventure which may affect their academic performance in a course or unit of study may request that they be given Special Consideration in relation to the determination of their results.

At Risk
To progress through a degree course, students are required to:

1. achieve the minimum Progression Rate specified by the faculty; in the Faculty of Science, students must pass more than 50 per cent of the units attempted in each semester
2. pass any field or clinical work, practicum, or other unit of study mandated by the faculty (listed in your degree requirements)..

If you do not meet the progress requirements, you will be identified as a student at risk.

Code of Conduct for Students
The University has clear expectations of students in respect of academic matters and personal behaviour.

Student Plagiarism: Coursework Policy and Procedure
The University of Sydney expects high standards of academic honesty in all student work. In particular, the University is opposed to and will not tolerate plagiarism.

Details on Special Arrangements, Special Consideration, Code of Conduct for Students, and Student Plagiarism Policy are provided elsewhere in this handbook.

Inside the back cover of this handbook you will find a planner to help you map out your degree. It is recommended you plan your studies carefully with an eye to your final years, so that you take the correct prerequisites in the preceding years. It will be useful to revisit this planner during your studies as your interests take more detailed shape

Enrolment day FAQs

What is a 'major'?

Some degrees in the Faculty of Science require you to complete a major. A major is a specialisation in the senior year of your degree. It is useful to have an idea of what major, or group of majors, interest you now, so that you can plan your junior and intermediate years properly.

The Bachelor of Science majors Neuroscience, and Nanoscience and Technology require earlier planning than most others. If you are interested in these then read Table I (Bachelor of Science: Chapter 3) carefully and/or seek advice.

A major is usually defined as 24 credit points of study at the senior level in a single science Area. Neuroscience and Psychology both have additional requirements. Depending on the majors chosen, it is possible to complete more than one major in your degree.

Degrees where you choose a major are the Bachelor of Science (including the Advanced stream of the BSc), Bachelor of Computer Science and Technology (including the Advanced stream of the BCST), Bachelor of Information Technology and the Bachelor of Liberal Studies (including both the Advanced and International streams of the BLibStud).

How many credit points should I take per semester?

You should take 24 credit points each semester if you are a full-time student. There is an upper limit of 30 credit points per semester. If you take fewer than 18 credit points in each semester you will automatically become part-time.

To finish your degree in the recommended minimum time you will have to take 48 credit points per year, or 24 per semester. If you enrol part time you can take as few credit points as you like. You must keep in mind however that you have a 10 year limit to finish your degree. Students wishing to accelerate their degree programs may consider undertaking units offered at Summer School or undertaking up to 30 credit points each semester. The degree summaries and sample programs in this chapter assume you will enrol full-time.

Do I need to be full-time?

International students must enrol full-time in a minimum of 24 credit points per semester unless there are exceptional circumstances. Failure to enrol in 24 credit points per semester may have serious ramifications for your visa.

Australian citizens and permanent residents are considered full-time if they are enrolled in 18 or more credit points per semester. Australian citizens and permanent residents who wish to receive a transport concession card must be full-time students.

If you receive any financial support, whether from a University scholarship or from the government, you may well need to enrol as a full-time student. You should carefully check the terms and conditions of that support before going part-time.

Can I take units of study from other faculties?

Yes. Generally you can take any unit of study offered by the Faculty of Arts and the Faculty of Economics and Business. Lists of available units of study will be available on enrolment day, or in each faculty's

handbook. Each faculty website has links to departmental and unit of study information.

Also available are undergraduate units from any other faculty at the University. The onus is on you to get written permission from the relevant department and bring it to the Faculty of Science.

There are limits, and exclusions. You should refer to the degree summary sections of this chapter for specific information about your particular degree.

Can I receive credit for previous tertiary study?

Yes. The amount of credit you may receive depends on your individual circumstances, but in general the total amount of credit granted may not be greater than 96 credit points and may not include more than 48 credit points from degrees that have been completed.

On the day that you enrol you must lodge an application for credit from previous study. Because of the large numbers of applications received at enrolment there can be a considerable delay in processing your application, but all credit offers will be sent to students well in advance of the last day to add a unit of study for the semester in which they enrol.

The faculty must sight originals of your academic transcripts, as well as detailed descriptions of prior units of study completed, as at the time of completion of the units. Descriptions will normally be an extract from a Handbook or a unit of study syllabus or outline, and should include the credit point value, learning outcomes, assessment details, texts and references, and contact details for each unit of study. You must bring this information with you on the day that you enrol.

On enrolment day you will have to make unit of study choices as if you have had no previous university of study. Alternatively, you may be able to obtain special permission to enrol in intermediate or senior units of study by taking a copy of your transcript and unit of study descriptions to academic advisers for each individual unit of study. Unit of study academic advisers are listed under unit of study descriptions in this Handbook.

Information on the current application process for credit, including the application form, is available from the Faculty of Science website.

Are there any bridging courses available?

There are bridging courses in Biology, Chemistry, Mathematics and Physics, designed to cover the assumed knowledge that students would normally cover in the HSC. They run in February each year after enrolment and are recommended for students who either didn't take a subject at the HSC or feel they need some revision.

Who can enrol in advanced units of study?

Advanced units of study are available to those students enrolled in any program in the Faculty of Science who have performed at a high level in science subjects in the HSC or who perform well in their studies at the University.

Consult a departmental adviser about your eligibility to enrol in advanced level subjects in the first year of study. You must obtain special permission to enrol in any advanced unit of study except Software. For Software advanced units of study, you must meet the criteria listed on the permission form for advanced units of study. The departmental advisers have copies of the permission form for advanced units of study.

Students should also consult the unit of study tables for assumed and prerequisite marks in the HSC required to enrol in advanced units of study.

For students in an advanced degree it is recommended that you enrol in no more than 24 credit points of advanced units of study in a year. Advanced units of study are very demanding and students are required to perform at a higher standard than in the normal units of study.

What is the Talented Student Program?

The Talented Student Program (TSP) is unique to the University of Sydney. It is tailored to meet students' individual needs and is restricted to the very top students.

Students may be able to bypass some first year study and enrol directly in a second year course. If you have outstanding results in any of your HSC science subjects you may wish to negotiate a special program of study with one of the departments in the Faculty of Science.

The Talented Student Program is available in most areas of Science. Students receive special supervision by academic staff and often engage in studies on an individual basis with small numbers of fellow students, all of whom have a special interest in the same subject.

Am I eligible for the Talented Student Program?

Entry to the TSP is by invitation from the Dean, which you should have received by the time you enrol. The following guidelines apply generally, although departments may have additional (and sometimes more stringent) requirements for entry into the program.

To get into the program in your first year, you should normally have a UAI (or equivalent) of at least 99.00 and a result in band 6 in at least one HSC Science subject area and/or a mark of 95 or better in HSC Mathematics Extension 2. For entry into the program in your second and third years, you should normally have a weighted average mark of 85 or over and a high distinction grade in the relevant subject area.

Bachelor of Science and Technology (BST)

Degree code: LH035

Summary of requirements

The requirements for the degree are set out in the Senate and Faculty Resolutions (see Chapter 2) which should be read by all intending candidates. It is important to ensure that any proposed course of study will comply with the basic requirements for the degree. Important aspects of the Resolutions are summarised below. The Resolutions should be consulted for any clarification of the summary points.

Enrolment guide

In your junior year, you should complete:

- 12 credit points from the science subject areas of Mathematics and Statistics
- 12 credit points of junior units of study from the subject areas of Experimental Science (from Table VIIb)
- 12 credit points of junior units of study from Science/Technology associated with Humanities and Social Sciences units of study (from Table VIIc)
- 12 credit points of junior units of study from Science, Engineering and Information Technologies or Architecture, Design and Planning (from Table VIId)

To complete your degree you must gain credit for at least 144 credit points, comprising:

- a minimum of 12 credit points in the subject area of Mathematics and Statistics
- a minimum of 12 credit points in Experimental Science units of study from those specified in Table VIIb
- a minimum of 12 credit points in Science/Technology associated Humanities and Social Sciences units of study from those specified in Table VIIc

- a minimum of 12 credit points in Technology/Applied Science units of study from those specified in Table VIId
- a minimum of 72 credit points in senior or intermediate units of study, or in units of study normally taken at second or third year level or higher
- a major, as specified in Table I of the Bachelor of Science, or as listed in Table VIIe. A major in the BST requires a minimum of 36 credit points at intermediate (2000) and senior (3000) levels, including a minimum of 12 credit points at senior level, except in the case of a major in a science subject area, which normally requires the completion of 24 credit points of senior-level units of study, in addition to any other units of study specified in the table as compulsory for that major.

Plans of study
It is important when choosing units of study at any stage of your university career that you consider your overall degree program. There is a sample degree program in this section. See the Bachelor of Science entry for information about majors.

Units of study
The Science units of study available for this degree are set out in Table VII: Bachelor of Science and Technology, and in Table 1: Bachelor of Science, in chapter 3. Unit of study descriptions can be found in chapter 9.

Honours
There are honours courses in the following subject areas:

Agricultural Chemistry
Anatomy and Histology
Biochemistry
Biology
Cell Pathology
Chemistry
Computational Science
Computer Science
Environmental Studies
Geography
Geology and Geophysics
History and Philosophy of Science
Immunobiology
Information Systems
Marine Science
Mathematics
Medicinal Chemistry
Microbiology
Nanoscience and Technology
Neuroscience
Pharmacology
Physics
Physiology
Psychology
Soil Science
Statistics

Students should note that honours is not available in the following subject areas: Design Technology, Electronic Engineering, General Engineering, and Information Technology. Please refer to 'Honours in the Faculty of Science' in this chapter, and Table VI: Honours units of study in chapter 10.

Discontinuation
If you wish to discontinue a unit of study it is important to talk to staff in the Faculty Office. In some cases discontinuation can affect your access to units of study, prizes and scholarships. Deadlines for withdrawal and discontinuation can be found on the second page of this handbook.

Special permission
You should note that the faculty can, in certain circumstances, permit exceptions to the normal requirements for a degree. Applications should be made in writing to the Associate Dean (Undergraduate) after discussion with staff in the Faculty Office.

Universities Admissions Index (UAI)
The minimum UAI for admission into the course varies from year to year.

Degree resolutions
See chapter 2.

Sample Bachelor of Science and Technology

	Sem	Unit of Study 1 & credit points	Unit of Study 2 & credit points	Unit of Study 3 & credit points	Unit of Study 4 & credit points	Unit of Study 5 & credit points	Total
Year 1	1	MATH1XXX (3cp) or MATH	MATH1XXX (3cp) 1111 (6cp)	Tech/Appl Sci (Table VIId) (6cp)	Expmtl Sci (Table VIIb) (6cp)	Elective* (6cp)	24
	2	MATH1XXX (3cp)	MATH1XXX (3cp)	Tech/Appl Sci (Table VIId) (6cp)	Expmtl Sci (Table VIIb) (6cp)	Elective* (6cp)	24
Year 2	1	Major 1 (Table VIIb) (6cp)	Major 1 or 2, or elective (6cp)	Major 1 or 2, or elective (6cp)	Humanities UoS (Table VIIc) (6cp)		24
	2	Major 1 (Table VIIb) (6cp)	Major 1 or 2, or elective (6cp)	Major 1 or 2, or elective (6cp)	Humanities UoS (Table VIIc) (6cp)		24
Year 3	1	Major 1 (6cp)	Major 2 (6cp)	Major 2 (6cp)	Elective (6cp)		24
	2	Major 1 (6cp)	Major 2 (6cp)	Major 2 (6cp)	Elective (6cp)		24
						Total	144

* Students intending to major in a Science subject area should enrol in the appropriate junior level of units of study. For more information, refer to the Faculty of Science Handbook, Chapter 3: Enrolment Guide by Major for the Bachelor of Science degree. Students may take their Humanities Table VIIc requirements instead of an elective in their junior year.

Enrolment guide by major

The following is a list of recommended combinations of junior units of study if you are intending to complete a major in a non-science subject area.

Majors in science subject areas
12 credit points of junior units of study in Mathematics + 12 credit points Applied Technology from Table VIId + at least 12 credit points of Experimental Science from Table I + 12 credit points of other science units of study as required to progress to major(s) of choice. Students should also consult the 'Enrolment Guide by Major' for the Bachelor of Science in chapter 3 of this handbook for the recommended combinations of junior units of study for a major in a science subject area. Consultation with an academic adviser is also recommended.

Design Technology
12 credit points of junior units of study in Mathematics (Table VIIa) + 12 credit points INFO1003 and INFO(1103 or 1903)(Table VIId) + 12 credit points of Experimental Science from Table I (except Mathematics and Statistics, Computer Science, Computational Science, History and Philosophy of Science and Information Systems - Table VIIb) + 12 credit points Science/Technology Humanities (Table VIIc). Instead of 12 credit points INFO1003 and INFO1103 (Table VIId) + 12 credit points Science/Technology Humanities (Table VIIc), students may choose 24 credit points DECO1100 from Table VIId and enrol in 12 credit points of Table VIIc Science/Technology Humanities in their second year. Note: students who wish to undertake a sequence of units of study in 3D Animation should take DECO1012 and DECO1008 in place of INFO1003 and INFO1103 in their first year of studies.

Electronic Engineering
12 credit points of junior units of study in Mathematics + 12 credit points of ELEC1601 and ELEC1103 + 12 credit points of Experimental Science from Table I (except Mathematics and Statistics, Computer Science, Computational Science, History and Philosophy of Science and Information Systems) + 12 credit points Applied Technology electives of your choice from units of study offered by the Faculties of Science, Architecture, Design and Planning, Engineering and Information Technologies and Agriculture, Food and Natural Resources.

General Engineering
12 credit points of junior units of study in Mathematics + 12 credit points of ENGG1800 and ENGG1803 + 12 credit points of Experimental Science from Table I (except Mathematics and Statistics, Computer Science, Computational Science, History and Philosophy of Science and Information Systems) + 12 credit points of Applied Technology electives of your choice from units of study offered by the Faculties of Science, Architecture, Design and Planning, Engineering and Information Technologies and Agriculture, Food and Natural Resources.

Information Technology
12 credit points of junior units of study in Mathematics + 12 credit points of INFO1103 and INFO1105 + 12 credit points of Experimental Science from Table I (except Mathematics and Statistics, Computer Science, Computational Science, History and Philosophy of Science and Information Systems) + 12 credit points of Applied Technology electives of your choice from Table 1 or Table VII.

Table VII - Bachelor of Science and Technology

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
(a) Mathematics and Statistics			
Candidates are required to enrol in and complete a minimum of 12 credit points from the science subject areas of Mathematics and Statistics.			
(b) Experimental Science units of study			
Candidates are required to enrol in and complete at least 12 credit points from those units of study listed in Table I not including units in the following subject areas: Computational Science, Computer Science, History and Philosophy of Science, Information Systems, and Mathematics and Statistics.			
(c) Science/Technology associated with Humanities and Social Sciences units of study			
Candidates are required to enrol in and complete at least 12 credit points from the units of study listed below:			
NOTE: Any 6 credit points from the subject area of English may be taken instead of ENGL1000.			
ACCT1003 **Financial Accounting Concepts**	6	**N** ACCT1001, ACCT1002 *Terminating unit.*	Semester 1
ACCT1004 **Management Accounting Concepts**	6	**N** ACCT1001, ACCT1002 *Terminating unit.*	Semester 2
DECO1006 **Understanding Design & Cognition**	6	**N** DECO1004	Semester 1
EDUF1018 **Education, Teachers and Teaching**	6	**N** EDUF1011	Semester 1
EDUF1019 **Human Development and Education**	6	**N** EDUF1012	Semester 2
ENGL1000 **Academic Writing** *This unit of study is not available in 2009*	6	**P** This unit is available to all enrolled students and will count for credit across all faculties. There are no specific pre-requisites, co-requisites or prohibitions, but students are expected to have native or near native competence in written English. Students not meeting this requirement should enrol in appropriate remedial English courses before undertaking ENGL1000. From 2008, ENGL1000 can be counted towards the junior credit points required to enrol in senior units of English.	Semester 1 Semester 2 Summer Main Winter Main
HPSC1000 **Bioethics**	6	**N** HPSC1900 *This Junior unit of study is highly recommended to Intermediate and Senior Life Sciences students.*	Semester 1
PHIL1013 **Society, Knowledge and Self**	6	**N** PHIL1010	Semester 2
SLSS1001 **Introduction to Socio-Legal Studies**	6	*Available to Bachelor of Arts and Sciences and Bachelor of Socio-Legal Studies only*	Semester 1
CIVL3010 **Engineering and Society**	6	**A** ENGG1803 Professional Engineering	Semester 1

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
ENGG3005 **Engineering & Industrial Management Fund**	6	**N** ELEC3702, MECH3661	Semester 2
HPSC3024 **Science and Ethics**	6	**P** At least 24 credit points of Intermediate or Senior units of study **N** HPSC3007 *This unit will not be offered every year.*	Semester 2
ENGG4061 **Innovation/Technology Commercialisation**	6		Semester 1

(d) Technology/Applied Science units of study

Candidates are required to enrol in and complete at least 12 credit points from the units of study listed below:

For a major in Design Technology:

(i) INFO1003 and INFO(1103 or 1903) or

(ii) DECO1012 and DECO1008; or

(iii) DECO1100

DECO1008 **3D Modelling**	6	**N** DECO2103 *This unit is for BDesComp and BST students only. Others may enrol in DECO2103.*	Semester 2
DECO1100 **Digital Design Studio**	12	**N** DECO1011 *Core unit for Bachelor of Design Computing. BST students by permission. Enrolment is limited by teaching resources.*	Semester 1
INFO1003 **Foundations of Information Technology**	6	**N** INFO (1903 or 1000) or INFS1000	Semester 1 Semester 2
INFO1103 **Introduction to Programming**	6	**A** HSC Mathematics **N** INFO1903 or SOFT (1001 or 1901) or COMP (1001 or 1901) or DECO2011	Semester 1 Semester 2
INFO1903 **Informatics (Advanced)**	6	**A** HSC Mathematics **P** UAI sufficient to enter BCST(Adv), BIT or BSc(Adv), or portfolio of work suitable for entry **N** INFO1003, INFO1103 *Note: Department permission required for enrolment*	Semester 1

For a major in Electronic Engineering

(iv) ELEC1103 and ELEC1601

ELEC1103 **Fundamentals of Elec and Electronic Eng**	6	**A** HSC Physics, HSC Mathematics extension 1. **N** ELEC1102 Foundations of Electronic Circuits.	Semester 1
ELEC1601 **Foundations of Computer Systems**	6	**A** HSC Mathematics extension 1 **N** NETS2008 Computer System Organisation, NETS2908 Computer System Organisation (Adv), COMP2001 Computer Systems, COMP2901 Computer Systems (Adv).	Semester 2

For a major in General Engineering

(v) ENGG1803 and ENGG1800

ENGG1800 **Engineering Disciplines (Intro) Stream A**	6		Semester 1
ENGG1803 **Professional Engineering 1**	6		Semester 1 Semester 2

For a major in Information Technology

(vi) INFO1103 and INFO1105

INFO1103 **Introduction to Programming**	6	**A** HSC Mathematics **N** INFO1903 or SOFT (1001 or 1901) or COMP (1001 or 1901) or DECO2011	Semester 1 Semester 2
INFO1105 **Data Structures**	6	**A** Programming, as for INFO1103 **N** INFO1905 or SOFT (1002 or 1902) or COMP (1002 or 1902 or 2160 or 2860 or 2111 or 2811 or 2002 or 2902)	Semester 2

Progression to Years 2 and 3

In order to proceed to Year 2 and 3 of the degree, candidates for the Bachelor of Sciences and Technology must either have completed 12 credit points of Technology/Applied Science units of study in a single group designated in TableVII(d) or have completed Science units of study that are prerequisite for a chosen 2000 or 3000-level Science subject areas. Candidates who have completed the 12 credit points of Engineering units of study designated in Table VII(d)(iii) or Table VII(d)(iv) and who wish to complete a major in either General Engineering or Electronic Engineering are in addition required to complete 12 credit points of Junior Mathematics including MATH1003 before proceeding to Year 2.

(e) Requirements for a Major

Science major

Candidates are required to complete a major in a Science subject area (Table I) or one of the following majors in Technology/Applied Science.

(i) Design Technology Major

For a major in Design Technology the minimum requirement is the completion of at least 36 credit points from units of study shown in the following Table, including:

(i) a minimum of 12 credit points of DECO units at 3000-level from the Table.

DECO2010 **Collaborative Virtual Environments**	6	**P** DECO (1100 and 1200) or (2101 and 2102) or INFO (1000 or 1003) **N** DECO2005 *Enrolment numbers limited by teaching resources. If your attempt to enrol online is unsuccessful, please seek permission from the Faculty of Architecture, Design and Planning Student Administration Centre. First preference to Bachelor of Design Computing students.*	Semester 1

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
DECO1012 **Design Programming**	6	**N** DECO2011, SOFT1001	Semester 1
DECO2013 **Generative Design Systems**	6	**P** DECO2011 or SOFT1001 **N** DECO2601, DECO2602, DECO2603 *Note: Department permission required for enrolment* *This unit will not run beyond 2009. Bachelor of Design Computing students only.*	Semester 2
DECO2101 **Digital Image Design & Representation**	6	**N** DECO1001, DECO1100 *Places in this unit are limited by teaching resources. If your attempt to enrol online is unsuccessful, please seek permission from the Faculty of Architecture, Design and Planning Student Administration Centre. Bachelor of Design Architecture students will receive preference. Not available in the Bachelor of Design Computing.*	Semester 1
DECO2102 **Interactive Multimedia Design**	6	**P** DECO2101 **N** DECO1002, DECO2002, DECO1200 *Places in this unit are limited by teaching resources. If your attempt to enrol online is unsuccessful, please seek permission from the Faculty of Architecture, Design and Planning Student Administration Centre. Bachelor of Design Architecture students will receive preference. Not available in the Bachelor of Design Computing.*	Semester 2
DECO2204 **Principles of AutoCAD**	6	*Places in this unit are limited by teaching resources. If your attempt to enrol online is unsuccessful, please seek permission from the Faculty of Architecture, Design and Planning Student Administration Centre. Bachelor of Design Architecture students will receive preference.*	Semester 2
DECO2205 **Principles of ArchiCAD**	6	*Places in this unit are limited by teaching resources. If your attempt to enrol online is unsuccessful, please seek permission from the Faculty of Architecture, Design and Planning Student Administration Centre. Bachelor of Design Architecture students will receive preference.*	Semester 1
DECO2606 **Real Time Multimedia**	6	**P** DECO (1008 or 2103) and (SOFT1001 or DECO2011) *Enrolment numbers limited by teaching resources. If your attempt to enrol online is unsuccessful, please seek permission from the Faculty of Architecture, Design and Planning Student Administration Centre. First preference to Bachelor of Design Computing students.*	Semester 2
DECO3003 **Design Computing Research Opportunity**	6	**A** Computer programming. **P** 96 credit points and minimum WAM of 65. *Note: Department permission required for enrolment* *Students from other faculties may apply directly to the Faculty of Architecture, Design and Planning.*	Semester 2
DECO3005 **Advanced Interactive Multimedia Design**	6	**P** DECO (1200 or 2102 or 2002) **N** DESC9142 *Enrolment numbers limited by teaching resources. If your attempt to enrol online is unsuccessful, please seek permission from the Faculty of Architecture, Design and Planning Student Administration Centre. First preference to Bachelor of Design Computing students.*	Semester 1
DECO3006 **Principles of Animation**	6	**P** DECO (1003 or 1008 or 2103) **N** DESC9019, DESC9141 *Enrolment numbers limited by teaching resources. If your attempt to enrol online is unsuccessful, please seek permission from the Faculty of Architecture, Design and Planning Student Administration Centre. First preference to Bachelor of Design Computing students.*	Semester 1
DECO3100 **Information Visualisation Design Studio**	12	**P** DECO (1100 and 1200) or DECO (2101 and 2102) or DECO (2012 and 2013) **N** DECO3001 *Core unit for Bachelor of Design Computing. BST students by permission. Enrolment is limited by teaching resources.*	Semester 1
DECO3200 **Human-Computer Experience Des Stdo**	12	**P** DECO3100 or DECO (2101 and 2102 and (DECO2011 or SOFT1001)) **N** DECO3002 *Core unit for Bachelor of Design Computing. BST students by permission. Enrolment is limited by teaching resources.*	Semester 2
(ii) General Engineering Major			
For a major in General Engineering the minimum requirement is the completion of at least 36 credit points from units of study shown in the following Table, including:			
(i) MATH2061; and			
(ii) a minimum of 12 credit points at the 3000-level.			
MATH2061 **Linear Mathematics and Vector Calculus**	6	**P** MATH (1111 or 1001 or 1901 or 1906) and MATH (1014 or 1002 or 1902) and MATH (1003 or 1903 or 1907) **N** MATH2001, MATH2901, MATH2002, MATH2902, MATH2961, MATH2067	Semester 1 Summer Main
AMME2200 **Thermodynamics and Fluids**	6	**A** MATH1001; MATH1002; MATH1003.	Semester 2
AMME2301 **Mechanics of Solids**	6	**P** (MATH1001 or MATH1901 or MATH1906), (MATH1002 or MATH1902), (MATH1003 or MATH1903 or MATH1907), (ENGG1802 or PHYS1001 or PHYS1901)	Semester 1
AMME2302 **Materials 1**	6	**N** CIVL2110	Semester 2
AMME2500 **Engineering Dynamics**	6	**P** (MATH1001 or MATH1901 or MATH1906), (MATH1002 or MATH1902), (AMME1550 or PHYS1001 or PHYS1901 or ENGG1802 prior to 2008)	Semester 1
CHNG2801 **Conservation and Transport Processes** *This unit of study is not available in 2009*	6	**A** Calculus Computations (Matlab, Excel) Mass and Energy Balances **P** All core 1st year engineering units of study.	Semester 1
CHNG2802 **Applied Maths for Chemical Engineers**	6	**A** Enrolment in this unit of study assumes that all core science and engineering UoS in first-year have been successfully completed. **P** All core 1st year engineering units of study. **C** CHNG 2803 (Analysis Practice 1) CHNG 2801 (Conservation and Transport Processes) CHEM 2404 (Forensic and Environmental Chemistry)	Semester 1
CHNG2804 **Chemical & Biological Systems Behaviour**	6	**A** Ability to conduct mass and energy balances, and the integration of these concepts to solve real chemical engineering problems Ability to understand basic principles of physical chemistry, physics and mechanics Ability to use mathematics of calculus (including vector calculus) and linear algebra, and carry out computations with MATLAB and MS EXCEL. **P** All core 1st year engineering units of study. **C** CHNG 2805 (Industrial Systems and Sustainability) CHNG 2806 (Analysis Practice 2 - Treatment, Purification and Recovery Systems) CHEM 2403 (Chemistry of Biological Molecules)	Semester 2

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
CHNG2805 **Industrial Systems and Sustainability**	6	**A** Ability to conduct mass and energy balances, and the integration of these concepts to solve real chemical engineering problems Ability to understand basic principles of physical chemistry, physics and mechanics Ability to use mathematics of calculus (including vector calculus) and linear algebra, and carry out computations with MATLAB and MS EXCEL. Ability to read widely outside of the technical literature, and to synthesise arguments based on such literature Ability to write coherent reports and essays based on qualitative information **P** All core 1st year engineering units of study. **C** CHNG 2804 (Chemical and Biological Systems Behaviour) CHNG 2806 (Analysis Practice 2 - Treatment, Purification & Recovery Systems) CHEM 2403 (Chemistry of Biological Molecules)	Semester 2
CIVL2110 **Materials**	6		Semester 1
CIVL2201 **Structural Mechanics**	6	**P** ENGG1802 Engineering Mechanics	Semester 1
CIVL2230 **Intro to Structural Concepts and Design**	6	**A** ENGG1802 Engineering Mechanics, CIVL2110 Materials CIVL2201 Structural Mechanics	Semester 2
CIVL2410 **Soil Mechanics**	6	**A** CIVL2201 Structural Mechanics	Semester 2
CIVL2611 **Fluid Mechanics: Inviscid Flow**	6	**A** MATH1001 Differential Calculus, ENGG1802 Engineering Mechanics, CIVL2201 Structural Mechanics	Semester 2
CIVL2810 **Engineering Construction and Surveying**	6	**A** MATH1001, MATH1002, MATH1003, MATH1005	Semester 1
MECH2400 **Mechanical Design 1**	6	**A** ENGG1802, AMME2301	Semester 2
AMME3500 **System Dynamics and Control**	6	**A** AMME2500, MATH2061 **P** AMME2500 or MECH2500; MATH2061 or MATH2961 or MATH2067 or (MATH2001 or MATH2901 and MATH2005 or MATH2905)	Semester 1
CHNG3801 **Process Design**	6	**A** Enrolment in this unit of study assumes that all (six) core chemical engineering UoS in second year have been successfully completed. **P** 12 credit points of junior Mathematics; 12 credit points of junior chemistry; ENGG1800; CHNG1103; CHNG2801; CHNG2802; CHNG2803; CHNG2804; CHNG2805; CHNG2806 **C** CHNG3803 (Design Practice 1 - Chemical & Biological Processes) CHNG3802 (Operation, Analysis and Improvement of Industrial Systems) *This UoS is part of an integrated third-year program in chemical engineering. Completion of this body of work is required before a student will be permitted to move into the final-year with its emphasis on detailed design work, thesis based research and advanced engineering options.*	Semester 1
CHNG3802 **Operating/Improving Industrial Systems**	6	**A** Enrolment in this unit of study assumes that all (six) core chemical engineering UoS in second year have been successfully completed. **P** 12 credit points of junior Mathematics; 12 credit points of junior Chemistry; CHNG1103; ENGG1800; CHNG2801; CHNG2802; CHNG2803; CHNG2804; CHNG2805; CHNG2806 **C** CHNG3801 (Process Design) CHNG3803 (Design Practice 1 - Chemical & Biological Processes) *This UoS is part of an integrated third-year program in chemical engineering. Completion of this body of work is required before a student will be permitted to move into the final-year with its emphasis on detailed design work, thesis based research and advanced engineering options.*	Semester 1
CHNG3805 **Product Formulation and Design**	6	**A** Mass and Energy Balances Conservation and Transport Phenomena Applied Mathematics (for Chemical Engineering) Process Design Concepts Process Control and Optimisation Concepts **P** 12 credit points of junior Mathematics; 12 credit points of junior Chemistry; CHNG1103; ENGG1800; CHNG2801; CHNG2802; CHNG2803; CHNG2804; CHNG2805; CHNG2806 **C** CHNG3806 (Management of Industrial Systems) CHNG3807 (Design Practice 2 - Products and Value Chains) *This UoS is part of an integrated third-year program in chemical engineering. Completion of this body of work is required before a student will be permitted to move into the final-year with its emphasis on detailed design work, thesis based research and advanced engineering options.*	Semester 2
CHNG3806 **Management of Industrial Systems**	6	**A** Ability to conduct mass and energy balances, and the integration of these concepts to solve real chemical engineering problems Ability to understand basic principles of physical chemistry, physics and mechanics Ability to use mathematics of calculus (including vector calculus) and linear algebra, and carry out computations with MATLAB and MS EXCEL. Ability to read widely outside of the technical literature, and to synthesise arguments based on such literature Ability to write coherent reports and essays based on qualitative information **P** 12 credit points of junior Mathematics; 12 credit points of junior Chemistry; CHNG1103; ENGG1800; CHNG2801; CHNG2802; CHNG2803; CHNG2804; CHNG2805; CHNG2806 **C** CHNG3805 (Product Formulation and Design) CHNG3807 (Design Practice 2 - Products and Value Chains) *This UoS is part of an integrated third-year program in chemical engineering. Completion of this body of work is required before a student will be permitted to move into the fourth year.*	Semester 2
CIVL3205 **Concrete Structures 1**	6	**A** CIVL2110 Materials, CIVL2201 Structural Mechanics, CIVL2230 Intro to Structural Concepts and Design	Semester 1
CIVL3411 **Foundation Engineering**	6	**A** CIVL2410 Soil Mechanics	Semester 2
CIVL3612 **Environmental & Fluids Eng: Viscous Flow**	6	**A** ENGG1802 Engineering Mechanics, MATH2061 - Linear Mathematics and Vector Calculus, CIVL2201 - Structural Mechanics, CIVL2611 - Fluid Mechanics: Inviscid Flow	Semester 1
CIVL3812 **Project Appraisal**	6	**A** MATH1005 - Statistics, CIVL3805 Project Scope, Time and Cost Management **N** CIVL4803 Engineering Management	Semester 1
MECH3260 **Thermal Engineering**	6	**A** Fundamentals of thermodynamics are needed to begin this more advanced course. **P** AMME2200 or MECH2200 or MECH2201	Semester 2
MECH3261 **Fluid Mechanics**	6	**P** (AMME2200 or AERO2201 or MECH2202) and (MATH2061 or MATH2067 or (MATH2001 and MATH2005)	Semester 1
MECH3361 **Mechanics of Solids 2**	6	**P** AMME2301 or AERO2300 or MECH2300; MATH2061 or MATH2067 or MATH2005	Semester 1

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
MECH3460 **Mechanical Design 2**	6	**A** (ENGG1802 or PHYS1001 or PHYS1901) and AMME2301 and AMME2500 **P** MECH2400	Semester 2
(iii) Electronic Engineering Major			
For a major in General Engineering the minimum requirement is the completion of at least 36 credit points from units of study shown in the following Table, including:			
(i) MATH2061; and			
(ii) a minimum of 12 credit points at the 3000-level.			
MATH2061 **Linear Mathematics and Vector Calculus**	6	**P** MATH (1111 or 1001 or 1901 or 1906) and MATH (1014 or 1002 or 1902) and MATH (1003 or 1903 or 1907) **N** MATH2001, MATH2901, MATH2002, MATH2902, MATH2961, MATH2067	Semester 1 Summer Main
ELEC2103 **Simulation & Numerical Solutions in Eng**	6	**A** 36 credit points including ELEC1102 Foundations of Electronic Engineering or ELEC1103 Professional Electronic Engineering. **N** ELEC2102 Engineering Computing, COSC1001 Computational Science in Matlab, COSC1901 Computational Science in Matlab (Advanced).	Semester 2
ELEC2104 **Electronic Devices and Circuits**	6	**A** ELEC1102 Foundations of Electronic Circuits or ELEC1103 Professional Electronic Engineering. **N** ELEC2401 Introductory Electronics.	Semester 2
ELEC2302 **Signals and Systems**	6	**A** MATH1001 Differential Calculus and MATH1002 Linear Algebra and MATH1003 Integral Calculus and Modelling. **N** ELEC2301 Signals & Systems, MATH3019 Signal Processing, MATH3919 Signal Processing (Adv).	Semester 2
ELEC2602 **Digital System Design**	6	**A** ELEC1101 Foundations of Computer Systems or ELEC1601 Professional Computer Engineering. **N** ELEC3601 Digital Systems Design, ELEC3608 Digital Systems Design.	Semester 1
ELEC3204 **Power Electronics and Applications**	6	**A** ELEC2401 Introductory Electronics or ELEC2104 Electronic devices and basic circuits or ELEC2001 Electrical and Electronic Engineering or ELEC2003 Electrical and Electronic Engineering A. **N** ELEC3202 Power Electronics and Drives.	Semester 1
ELEC3304 **Control**	6	**A** ELEC2301 Signals and Systems or ELEC2302 Signals and Systems. **N** ELEC3302 Fundamentals of Feedback Control, MECH3800 Systems Control, AMME3500 System Dynamics and Control, CHNG3302 Process Control.	Semester 2
ELEC3305 **Digital Signal Processing**	6	**A** ELEC2301 Signals & Systems or ELEC2302 Signals & Systems. **N** ELEC3303 Digital Signal Processing.	Semester 1
ELEC3404 **Electronic Circuit Design**	6	**N** ELEC3401 Electronic Devices and Circuits.	Semester 1
ELEC3405 **Communications Electronics and Photonics**	6	**A** ELEC2401 Introductory Electronics or ELEC2104 Electronic Devices and Basic Circuits. **N** ELEC3402 Communications Electronics.	Semester 2
ELEC3505 **Communications**	6	**N** ELEC3503 Introduction to Digital Communications.	Semester 1
ELEC3607 **Embedded Computing**	6	**A** ELEC1101 Foundations of Computer Systems, or ELEC1601 Professional Computer Engineering or ELEC2602 Digital System Design. **N** ELEC2601 Microcomputer Systems.	Semester 2
ELEC3802 **Fundamentals of Biomedical Engineering**	6	**A** ELEC2104 Electronic Devices and Basic Circuits or ELEC2401 Introductory Electronics or ELEC2001 Electrical and Electronic Engineering or ELEC2003 Electrical and Electronic Engineering A or ELEC2004 Electrical Service Unit. **N** ELEC3801 Fundamentals of Biomedical Engineering.	Semester 1
(iv) Information Technology Major			
For a major in Information Technology, the minimum requirement is the completion of at least 36 credit points at 2000 level and above from the Bachelor of Information Technology degree (table to be found in Faculty of Engineering and Information Technologies Handbook) - excluding any units which are not available in the BST degree, which must contain:-			
(i) INFO2110 and INFO2120/2820 and			
(ii) INFO3402 and (INFO3400 or COMP3615)			

8. Combined degrees

This chapter is intended to give enrolment advice to undergraduate students in the Faculty of Science enrolling in combined degrees. You will find answers to frequently asked questions covering all students.

Following this are specific summaries of the requirements for each degree including examples of how unit of study choices can be made over the duration of the degree. With some degrees there is information on recommended combinations of units of study, especially in first year, to help guide you to your goals.

It should be stressed that the information in this chapter is intended to be a rough guide only. All students will have to decide for themselves how to plan their degree to suit their own particular interests and situation.

All students are expected to read the degree resolutions for their course before they commence their studies, and from time to time during their studies. Undergraduate degree resolutions appear in chapter 2. The tables of undergraduate units of study available for each degree and unit descriptions appear in chapter 9.

Students enrolled in units of study offered by the Faculty of Science are required to familiarise themselves with the following key policies:

Special Arrangements
Students who are experiencing difficulty in meeting their assessment requirements due to competing essential community commitments may apply for Special Arrangements for examination and assessment.

Special Consideration
Students who have a serious illness or who have experienced misadventure which may affect their academic performance in a course or unit of study may request that they be given Special Consideration in relation to the determination of their results.

At Risk
To progress through a degree course, students are required to:

1. achieve the minimum Progression Rate specified by the faculty; in the Faculty of Science, students must pass more than 50 per cent of the units attempted in each semester
2. pass any field or clinical work, practicum, or other unit of study mandated by the faculty (listed in your degree requirements).

If you do not meet the progress requirements, you will be identified as a student at risk.

Code of Conduct for Students
The University has clear expectations of students in respect of academic matters and personal behaviour.

Student Plagiarism: Coursework Policy and Procedure
the University of Sydney expects high standards of academic honesty in all student work. In particular, the University is opposed to and will not tolerate plagiarism.

Details on Special Arrangements, Special Consideration, Code of Conduct for Students, and Student Plagiarism Policy are provided elsewhere in this handbook.

Inside the back cover of this handbook you will find a planner to help you map out your degree. It is recommended you plan your studies carefully with an eye to your final years, so that you take the correct prerequisites in the preceding years. It will be useful to revisit this planner during your studies as your interests take more detailed shape.

Enrolment day FAQs

What is a 'major'?

Some degrees in the Faculty of Science require you to complete a major. A major is a specialisation in the senior year of your degree. It is useful to have an idea of what major, or group of majors, interest you now, so that you can plan your junior and intermediate years properly.

The Bachelor of Science majors Neuroscience, and Nanoscience and Technology require earlier planning than most others. If you are interested in these then read Table I (Bachelor of Science: chapter 3) carefully and/or seek advice.

A major is usually defined as 24 credit points of study at the senior level in a single science area. Neuroscience and Psychology both have additional requirements. Depending on the majors chosen, it is possible to complete more than one major in your degree.

Degrees where you choose a major are the Bachelor of Science (including the advanced stream of the BSc), Bachelor of Science and Technologies (BST) and the Bachelor of Liberal Studies (including both the advanced and international streams of the BLibStud).

How many credit points should I take per semester?

You should take 24 credit points each semester if you are a full-time student. There is an upper limit of 30 credit points per semester. If you take fewer than 18 credit points in each semester you will automatically become part-time.

To finish your degree in the recommended minimum time you will have to take 48 credit points per year, or 24 per semester. If you enrol part time you can take as few credit points as you like. You must keep in mind however that you have a 10 year limit to finish your degree. Students wishing to accelerate their degree programs may consider undertaking units offered at Summer School or undertaking up to 30 credit points each semester. The degree summaries and sample programs in this chapter assume you will enrol full-time.

Do I need to be full-time?

International students must enrol full-time in a minimum of 24 credit points per semester unless there are exceptional circumstances. Failure to enrol in 24 credit points per semester may have serious ramifications for your visa.

Australian citizens and permanent residents are considered full-time if they are enrolled in 18 or more credit points per semester. Australian citizens and permanent residents who wish to receive a transport concession card must be full-time students.

If you receive any financial support, whether from a University scholarship or from the government, you may well need to enrol as a full-time student. You should carefully check the terms and conditions of that support before going part-time.

Can I take units of study from other faculties?

It is possible in some combined degrees. There are limits, and exclusions. You should refer to the degree summary sections of this chapter for specific information about your particular degree.

Can I receive credit for previous tertiary study?

Yes. The amount of credit you may receive depends on your individual circumstances, but in general the total amount of credit granted may not be greater than 96 credit points and may not include more than 48 credit points from degrees that have been completed.

On the day that you enrol you must lodge an application for credit from previous study. Because of the large numbers of applications received at enrolment there can be a considerable delay in processing your application, but all credit offers will be sent to students well in advance of the last day to add a unit of study for the semester in which they enrol.

The faculty must sight originals of your academic transcripts, as well as detailed descriptions of prior units of study completed, as at the time of completion of the units. Descriptions will normally be an extract from a Handbook or a unit of study syllabus or outline, and should include the credit point value, learning outcomes, assessment details, texts and references, and contact details for each unit of study. You must bring this information with you on the day that you enrol.

On enrolment day you will have to make unit of study choices as if you have had no previous university study. Alternatively, you may be able to obtain special permission to enrol in intermediate or senior units of study by taking a copy of your transcript and unit of study descriptions to academic advisers for each individual unit of study. Unit of study academic advisers are listed under unit of study descriptions in this Handbook.

Information on the current application process for credit, including the application form, is available from the Faculty of Science website.

Are there any bridging courses available?

There are bridging courses in Biology, Chemistry, Mathematics and Physics, designed to cover the assumed knowledge that students would normally cover in the HSC. They run in February each year after enrolment and are recommended for students who either didn't take a subject at the HSC or feel they need some revision.

Who can enrol in advanced units of study?

Advanced units of study are available to those students enrolled in any program in the Faculty of Science who have performed at a high level in science subjects in the HSC or who perform well in their studies at the University. Consult a departmental adviser about your eligibility to enrol in Advanced level subjects in the first year of study.

For students in an advanced degree it is recommended that you enrol in no more than 24 credit points of advanced units of study in a year. Advanced units of study are very demanding and students are required to perform at a higher standard than in the normal units of study.

What is the Talented Student Program?

The Talented Student Program (TSP) is tailored to meet students' individual needs and is restricted to the very top students.

Students may be able to bypass some first year study and enrol directly in a second year course. If you have outstanding results in any of your HSC science subjects you may wish to negotiate a special program of study with one of the departments in the Faculty of Science.

The Talented Student Program is available in most areas of Science. Students receive special supervision by academic staff and often engage in studies on an individual basis with small numbers of fellow students, all of whom have a special interest in the same subject.

Am I eligible for the Talented Student Program?

Entry to the TSP is by invitation from the Dean, which you should have received by the time you enrol. The following guidelines apply generally, although departments may have additional (and sometimes more stringent) requirements for entry into the program.

To get into the program in your first year, you should normally have a UAI (or equivalent) of at least 99.00 and a result in band 6 in at least one HSC Science subject area and/or a mark of 95 or better in HSC Mathematics Extension 2. For entry into the program in your second and third years, you should normally have a weighted average mark of 85 or over and a high distinction grade in the relevant subject area.

Combined BAppSc (Exercise and Sport Science)/BSc (Nutrition) degrees

Degree code: SH115

See also BSc (Nutrition) entry and the Health Sciences Handbook.

Summary of requirements
The requirements for the degrees are set out in the Senate and Faculty Resolutions (see Faculty of Health Sciences 2007 handbook) which should be read by all intending candidates. A student may proceed concurrently to the degrees of Bachelor of Applied Science (Exercise and Sport Science) and Bachelor of Science (Nutrition).

Enrolment guide
To qualify for the award of the degrees a student shall complete at least 240 credit points as specified in Table IF Part E, including:

- at least 138 credit points from science subject areas including at least 12 credit points from Mathematics and Statistics
- at least 102 credit points of units of study in Exercise and Sport Science, and
- an honours year (48 credit points) in Nutrition or Nutrition and Dietetics.

Units of study
Units of study are listed in Table IF; unit prerequisites are listed in Table I and Table IF, and in Table 9.2 of Faculty Resolutions for the degree of BAppSc (Exercise and Sport Science), Faculty of Health Sciences. Unit descriptions are found in chapter 10.

Progression requirements
A minimum requirement for progression is set annually based on WAM and performance in Nutrition units. Students must achieve a WAM of at least 60 in their first year and a WAM of least 65 in subsequent years and at least a Credit (65) in all intermediate and senior NUTR units or be transferred from the combined program to one of the related degrees.

Abandoning and discontinuing
A student may abandon the combined degree course and elect to complete either a BSc, a BSc (Nutrition), a BAppSc (Exercise and Sport Science) or a BAppSc (Exercise, Sport Science and Nutrition) in accordance with the resolutions governing those degrees. A student who does not qualify to undertake an honours course in Nutrition or Nutrition and Dietetics or who chooses to exit after completing year 4 of the program may graduate with the degree of Bachelor of Applied Science (Exercise Sport Science and Nutrition) in accordance with the resolutions of the Faculty of Health Sciences.

Alternative Honours in BAppSc
In the fifth year a student may elect to undertake an honours course in Exercise and Sports Science and graduate with the degree of Bachelor of Applied Science (Exercise Sport Science and Nutrition) Honours in accordance with the resolutions of the Faculty of Health Sciences.

Supervision
Students in years 1–4 of the program will be under the general supervision of the Faculty of Health Sciences; students in the honours year will be under the supervision of the faculty in which the honours course is being undertaken.

Universities Admission Index (UAI)
The minimum UAI for admission into the course varies every year.

Degree resolutions
See chapter 2.

Sample Bachelor of Applied Science (Exercise and Sports Science)/ Bachelor of Science (Nutrition)

	Sem	Unit of study 1 & credit points	Unit of study 2 & credit points	Unit of study 3 & credit points	Unit of study 4 & credit points	Unit of study 5 & credit points	Unit of study 6 & credit points	Total
Year 1	1	CHEM1101/1108	BACH1161	BIOS1159	EXSS1018			
		6	6	6	6			24
	2	CHEM1102/1109	MBLG1001	BIOS1133	BIOS1160	EXSS1033		
		6	6	3	6	3		24
Year 2	1	MBLG2071	NUTR2911	BIOS2098	EXSS2019	MATH1015		
		6	6	3	6	3		24
	2	BCHM2072	NUTR2912	EXSS1029	EXSS2022			
		6	6	6	6			24
Year 3	1	MATH1011	EXSS2016	EXSS2018	EXSS3023	EXSS3024		
		3	3	6	6	6		24
	2	STAT2012	EXSS2025	EXSS2026	EXSS3027			
		6	6	6	6			24
Year 4	1	NUTR3911	NUTR3921	EXSS3037	EXSS3042			
		6	6	6	6			24
	2	NUTR3912	NUTR3922	BCHM3072	BCHM3082			
		6	6	6	6			24
Require: 192cp total, min. 90cp Science, min. 102cp Exercise and Sport Science								

Table 1F: Bachelor of Science (Nutrition)

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
The Bachelor of Science (Nutrition) is a 4 year degree. To complete the degree, a candidate must gain Credit for at least 192 credit points including the Honours course in either the clinical or research strand.			
A. Junior units of study			
Candidates are required to enrol in and complete:			
(i) BIOL(1001 or 1101 or 1901 or 1911) and BIOL(1002 or 1902 or 1003 or 1903);			
(ii) 12 credit points of Junior Chemistry;			
(iii) 12 credit points of Junior units of study from the Science Subject Area of Mathematics;			
(iv) 6 credit points of other Junior units of study from the Science Subject Areas of Computer Science, Physics or Psychology; and			
(v) MBLG1001 or 1901			
B. Intermediate units of study			
In order to proceed to the Intermediate year, candidates for the BSc (Nutrition) must achieve a WAM of 60 in their Junior year. Candidates who fail to maintain the required average will be transferred to candidature for the Bachelor of Science degree in their next year of enrolment with full credit for the units of study completed as Bachelor of Science (Nutrition) candidates. Candidates who fail to achieve the required average across all units of study attempted in the year in which they have otherwise completed the requirements for the degree will be awarded the Bachelor of Science.			
In the Intermediate year candidates are required to enrol in and complete:			
(i) NUTR2911 and NUTR2912;			
(ii) MBLG 2071 or 2971);			
(iii) BCHM(2072 or 2972);			
(iv) PHSI2005 and PHSI2006; and			
(v) Either (MICR2021 and MICR2022) or (at least 12 credit points of Intermediate units of study - 6 credit points each semester - from the Science Subject Areas of Chemistry or Pharmacology).			
NUTR2911 **Food Science Introductory (Advanced)**	6	**P** MBLG(1001 or 1901) and CHEM (1001 or 1101 or 1901 or 1903 or 1108) and CHEM (1002 or 1102 or 1902 or 1904 or 1109) and BIOL (1001 or 1911) and BIOL (1002 or 1003 or 1902 or 1903). For Combined BAppSc (Exercise and Sport Science)/BSc(Nutrition) degree completion of all Junior units in the table of units for this course. **N** NUTR2901	Semester 1
NUTR2912 **Nutritional Science Introductory (Adv)**	6	**A** NUTR2911 **P** MBLG(1001 or 1901) and CHEM (1001 or 1101 or 1901 or 1903 or 1108) and CHEM (1002 or 1102 or 1902 or 1904 or 1109) and BIOL (1001 or 1911) and BIOL (1002 or 1003 or 1902 or 1903). For Combined BAppSc (Exercise and Sport Science)/BSc(Nutrition) degree completion of all Junior units in the table of units for this course. **N** NUTR2902	Semester 2
C. Senior units of study			
In order to proceed to the Senior year, candidates for the BSc (Nutrition) must achieve a WAM of 65 in their Intermediate year. Candidates who fail to maintain the required Credit average will be transferred to candidature for the Bachelor of Science degree in their next year of enrolment with full credit for the units of study completed as Bachelor of Science (Nutrition) candidates.			
In the Senior year candidates are required to enrol in and complete:			
(i) NUTR3911, 3921, 3912 and 3922;			
(ii) BCHM(3082 or 3982) and BCHM(3072 or 3972); and			
(iii) AGCH(3025 and 3026) or 12 credit points from the following Senior units of study: BCHM(3071 or 3971), BCHM(3081 or 3981), MICR(3011 or 3911), VIRO(3001 or 3901), NEUR(3001 or 3901), NEUR(3002 or 3902).			

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
NUTR3911 **Nutritional Assessment Methods**	6	**P** Credit average in NUTR2911 and NUTR2912 **N** NUTR3901	Semester 1
NUTR3921 **Methods in Nutrition Practice**	6	**P** Credit average in NUTR2911 and NUTR2912 **N** NUTR3901	Semester 1
NUTR3912 **Community and Public Health Nutrition**	6	**P** Credit average in NUTR2911 and NUTR2912 **N** NUTR3902	Semester 2
NUTR3922 **Nutrition and Chronic Disease**	6	**P** Credit average in NUTR2911 and NUTR2912 **N** NUTR3902	Semester 2

D. Honours units of study

In order to proceed to the Honours year, candidates must achieve a SCIWAM of at least Credit (65), and results of at least Credit (65) in all of NUTR 3911, 3921, 3912 and 3922.

Candidates who fail to achieve the required results across the Senior units of study will be transferred to candidature for the Bachelor of Science degree, and if they have otherwise completed the requirements for the BSc Pass degree, will be awarded the Bachelor of Science with a major in Nutrition.

Candidates enrol in and complete either:

(i) Bachelor of Science (Nutrition) Honours (clinical strand): NUTR4001 and NUTR4002 and NUTR4999; OR

(ii) Bachelor of Science (Nutrition) Honours (research strand): NUTR4101, NUTR4102, NUTR4103 and NUTR4104.

E. Combined degree program: Bachelor of Applied Science (Exercise and Sport Science) and Bachelor of Science (Nutrition)

Candidates must complete over 10 semesters the following units of study. In order to proceed from Year 1 to Year 2 of the program candidates must achieve a year WAM of at least 60. In order to proceed to the following years of the program a candidate must achieve at least 65 in each of NUTR 2911, NUTR 2912, NUTR 3911, NUTR 3921, NUTR 3912 and NUTR 3922, and a year WAM of at least 65 in Years 2 - 4. Candidates who fail to maintain these results in any year will be transferred to either the BSc(LH000), the BAppSc(ExSpSc)(SH088) or the BAppSc(ExSpSc&Nutr)(SH115).

For information on units from the BAppSc (ExSpSc), please refer to the Handbook of the Faculty of Health Sciences.

Year 1

Candidates are required to enrol in and complete in their first year:

(i) 12 credit points of Junior Chemistry;

(ii) BACH1161;

(ii) BIOS1159, 1133 and 1160;

(iii) EXSS1018 and 1033; and

(v) MBLG1001.

Year 2

Candidates are required to enrol in and complete in their second year:

(i) BCHM2072 andBIOS 2098;

(ii) EXSS2019, 1029 and 2022;

(iii) MATH1015 and MBLG2071; and

(iv) NUTR2911 and NUTR2912.

Year 3

Candidates are required to enrol in and complete in their third year:

(i) EXSS(2016, 2018, 3023, 3024, 2025, 2026 and 3027);

(ii) MATH1011 and STAT2012.

MATH1011 **Life Sciences Calculus**	3	**A** HSC Mathematics **N** MATH1111, MATH1001, MATH1901, MATH1906, BIOM1003	Semester 1 Summer Main
STAT2012 **Statistical Tests**	6	**P** MATH (1005 or 1905 or 1015) **N** STAT2004, STAT2912	Semester 2

Year 4

Candidates are required to enrol in and complete in their fourth year:

(i) NUTR3911, NUTR3921, NUTR3912 and NUTR3922;

(ii) EXSS3037 and EXSS3042;

(iii) BCHM3082 and BCHM3072.

Students can exit here with BAppSc(Exercise, Sports Science and Nutrition).

Year 5

Honours units of study

In order to proceed to the Honours year, candidates must achieve a SCIWAM of at least Credit (65), and results of at least Credit (65) in all of NUTR 3911, 3921, 3912 and 3922.

Candidates intending to graduate with Honours in the Clinical Strand are required to enrol in and complete in their fifth year:

(i)NUTR4001 and NUTR4002 and NUTR4999

Candidates intending to graduate with Honours in Research Strand are required to enrol in and complete in their fifth year:

(i) NUTR4101 and NUTR4102 and NUTR4103 and NUTR4104.

Combined Science/Law degrees (BSc/LLB)

Degree code: LH006

Summary of requirements
The requirements for the degree are set out in the Senate and Faculty Resolutions (see chapter 2) which should be read by all intending candidates. In particular it is important to ensure that any proposed course of study will comply with the basic requirements for the degree. Important aspects of the Resolutions are summarised below. The Resolutions should be consulted for any clarification of the summary points.

A student may proceed concurrently to the degrees of Bachelor of Laws and Bachelor of Science, Bachelor of Science (Advanced) or Bachelor of Science (Advanced Mathematics).

Enrolment guide
In your junior year you should complete:

- 12 credit points from the science subject areas of Mathematics and Statistics
- 24 credit points of junior units of study from at least two science subject areas other than Mathematics and Statistics
- LAWS1006, LAWS1012 and LAWS1013.

To qualify for the award of the BSc degree a student must complete 96 credit points from Science units of study set out in Table I: Bachelor of Science, and 48 credit points from units set out in Table II: Law units of study, including:

- at least 12 credit points from the science subject areas of Mathematics and Statistics
- 24 credit points of junior units of study from at least two science subject areas other than Mathematics or Statistics
- 60 credit points of intermediate/senior units of study in science subject areas
- a major in a science area.

The order in which Law units of study are taken is specified in the Resolutions of the Senate and Faculty for the Bachelor of Laws.

For commencing **2009** students, Law units of study are taken in the following sequence:

- in the first year of attendance the student will take LAWS1006, LAWS1013 and LAWS1012
- in the second year of attendance the student will take LAWS1014, LAWS1015 and LAWS1016
- in the third year of attendance the student will take LAWS1017, LAWS1018, LAWS1021 and LAWS1019.

Full details of the units of study to be completed during this time are contained in the Faculty of Law handbook. General enquiries about the combined Science/Law course can be directed to staff in the Faculty of Science Office.

Advanced streams
To qualify for the award of the BSc degree in an advanced stream, a student shall complete the requirements for the BSc degree outlined above and in addition (except with the permission of the Dean):

- include at least 12 credit points of intermediate science units of study at either the advanced level or as TSP units (for BSc (Advanced Mathematics) at least 12 credit points from the science subject areas of Mathematics and Statistics at either the advanced level or as TSP units)
- include at least 24 credit points of senior science units of study at the advanced level or as TSP units in a single science subject area (for the BSc (Advanced)) or 24 credit points of senior units of study at the advanced level or as TSP units in the science subject areas of Mathematics and Statistics (for the BSc (Advanced Mathematics)).

You should note that you must maintain in intermediate and senior units of study in science subject areas an average mark of 65 or greater in each year of enrolment, or be transferred to the BSc.

Plans of study
When choosing units of study at any stage of your University career, please consider your overall degree program. See the sample degree program below and the Bachelor of Science entry for information about each major and recommended first year combinations of units of study. A degree planner is inside the back cover.

Units of study
The Science units of study available for this degree are set out in Table I: Bachelor of Science, and Table II: Laws units of study in chapter 3. Unit descriptions follow the tables. You may also wish to refer to the Faculty of Law handbook for higher year law options.

Honours
For students interested in graduating with honours:

1. Students in the combined Law course who wish to take an honours program in Science may elect to spend an additional year in Science after the 3rd year of the combined course. The Faculty of Law generally permits only 1 year of suspension of candidature from the Bachelor of Laws degree (including the combined degree). It may be possible for students to defer an honours year in Science until after the completion of the entire combined course.
2. There is no separate honours year for the degree of Bachelor of Laws. Graduation with honours in Law is based on the Weighted Average Mark (including failures) and requires a high standard of performance in all units of study for the LLB degree, including units of study taken during the first three years of the combined course while the student is completing the Science component of the course.

Discontinuation
To discontinue a unit of study it is important to talk to staff in the Faculty Office. In some cases, discontinuation can affect your access to units of study, prizes and scholarships. Deadlines for withdrawal and discontinuation are on the second page of this handbook.

Special permission
You should note that the faculty can, in certain circumstances, permit exceptions to the normal requirements for a degree. Applications should be made in writing to the Associate Dean (Undergraduate) after discussion with staff in the Faculty Office.

Universities Admissions Index (UAI)
The minimum UAI for course admission varies every year.

Degree resolutions: See chapter 2.

Sample Bachelor of Science/Bachelor of Laws (Years 1 to 3)

	Sem	Unit of study 1 & credit points	Unit of study 2 & credit points	Unit of study 3 & credit points	Unit of study 4 & credit points	Unit of study 5 & credit points	Unit of study 6 & credit points	Total
Year 1	1	MATH 1XXX	MATH 1XXX	Science elective A 1XXX	Science elective B 1XXX	LAWS1006	LAWS1013	
		3	3	6	6	6	0	24
	2	MATH 1XXX	MATH 1XXX	Science elective A 1XXX	Science elective B 1XXX	LAWS1012		
		3	3	6	6	6		24
Year 2	1	Major Intermediate 2XXX	Intermediate Science elective	LAWS1014	LAWS1015			
		6	6	6	6			24
	2	Major Intermediate 2XXX	Intermediate Science elective	Science elective	LAWS1016			
		6	6	6	6			24
Year 3	1	Major 3XXX	Major 3XXX	Science elective	LAWS1018			
		6	6	6	6			24
	2	Major 3XXX	Major 3XXX	LAWS1017	LAWS1019	LAWS1021		
		6	6	6	0	6		24
							Total credit points:	144

Table II: Law units of study

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
LAWS1006 **Foundations of Law**	6	**N** LAWS1000	Semester 1
LAWS1012 **Torts**	6	**P** LAWS1006 **N** LAWS1005, LAWS1010, LAWS3001 *Available to candidates proceeding under the new LLB resolutions.*	Semester 1 Semester 2
LAWS1013 **Legal Research I**		**C** LAWS1006 **N** LAWS1008 *Available to candidates proceeding under the new LLB resolutions. Semester 1 classes are for Combined Law candidates in the faculties of Arts, Engineering and Science. Semester 2 classes are for Combined Law candidates in the Faculty of Economics & Business.*	Semester 1 Semester 2
LAWS1014 **Civil and Criminal Procedure**	6	**P** LAWS1006 **N** LAWS1001, LAWS1007, LAWS3002, LAWS3004 *Available to candidates proceeding under the new LLB resolutions.*	Semester 1 Semester 1b
LAWS1015 **Contracts**	6	**P** LAWS1006 **N** LAWS1002, LAWS2008 *Available to candidates proceeding under the new LLB resolutions.*	Semester 1 Semester 1b Summer Late
LAWS1016 **Criminal Law**	6	**P** LAWS1006, LAWS1014 **N** LAWS1003, LAWS3001, LAWS2009 *Available to candidates proceeding under the new LLB resolutions.*	Semester 2
LAWS1017 **Torts and Contracts II**	6	**P** (LAWS1010 or LAWS1012) and LAWS1015 *Available to candidates proceeding under the new LLB resolutions.*	Semester 2 Semester 2b
LAWS1018 **International Law**	6	**P** LAWS1006 **N** LAWS2005 *Available to candidates proceeding under the new LLB resolutions.*	Semester 1 Semester 2
LAWS1019 **Legal Research II**		**P** LAWS1013 **N** LAWS1008, LAWS1022 *Available to candidates proceeding under the new LLB resolutions. Semester 1 classes are for Combined Law candidates in the faculties of Arts, Engineering and Science. Semester 2 classes are for Combined Law candidates in the Faculty of Economics & Business.*	Semester 1 Semester 2
LAWS1021 **Public Law**	6	**P** LAWS1006 *Available to candidates proceeding under the new LLB resolutions.*	S2 Late IntB Semester 2 Summer Late
LAWS2008 **Contracts**	6	**P** LAWS1006 **N** LAWS1002, LAWS1015 *Note: Department permission required for enrolment* *Available to Combined Law candidates proceeding under the old LLB resolutions.*	Semester 1
LAWS2009 **Criminal Law**	6	**P** LAWS1006 **N** LAWS1003, LAWS1016 *Note: Department permission required for enrolment* *Available to Combined Law candidates proceeding under the old LLB resolutions.*	Semester 2
LAWS3003 **Federal Constitutional Law**	12	**P** LAWS1006 **N** LAWS1004, LAWS2011, LAWS3000 *Note: Department permission required for enrolment* *Available to Combined Law candidates proceeding under the old LLB resolutions. Students will attend classes for LAWS2011.*	Semester 1
LAWS3004 **Law, Lawyers and Justice**	12	**P** LAWS1006 **N** LAWS1001, LAWS1007, LAWS2013, LAWS3002 *Note: Department permission required for enrolment* *Available to Combined Law candidates proceeding under the old LLB resolutions. Students attend classes for LAWS2013 The Legal Profession.*	Semester 2

Combined Science/Arts degree

Degree code: LH011 Science/Arts

See also Summary of Requirements of the BSc.

Summary of requirements
Note that from 2006 students will be admitted to the Bachelor of Science/Arts course only.

Students who enrolled in DH018 Bachelor of Arts/Science should be aware that the degree is now administered by the Faculty of Science.

The requirements for the degree are set out in the Senate and Faculty Resolutions (see chapter 2) which should be read by all intending candidates. In particular it is important to ensure that any proposed course of study will comply with the basic requirements for the degree. Important aspects of the Resolutions are summarised below. The Resolutions should be consulted for any clarification of the summary points.

A student may proceed concurrently to the degrees of Bachelor of Arts and Bachelor of Science, Bachelor of Science (Advanced) or Bachelor of Science (Advanced Mathematics) within the BSc/BA course.

Enrolment guide
To qualify for the award of the pass degrees in the BSc/BA course a student shall complete units of study to a total value of at least 240 credit points including:

- at least 96 credit points from science subject areas
- at least 12 credit points from the science subject areas of Mathematics and Statistics
- at least 24 credit points of junior units of study from at least two science subject areas other than Mathematics or Statistics;
- no more than 96 credit points from junior units of study
- a major in a science area, and
- at least 72 credit points of senior units of study in Arts subject areas, including a major from Part A of the table of undergraduate units of study in the Faculty of Arts.

Advanced streams
To qualify for the award of the pass degree in the BSc (Advanced) stream, a student shall complete the requirements for the BSc and in addition:

- at least 12 credit points of intermediate science units of study at either the advanced level or as TSP units
- at least 24 credit points of senior units of study at the advanced level or as TSP units in a single science subject area
- maintain in intermediate and senior units of study in science subject areas an average mark of 65 or greater in each year of enrolment, or be transferred to the non-advanced stream.

To qualify for the award of the pass degree in the BSc (Advanced Mathematics) stream, a student shall complete the requirements for the BSc degree as outlined above and in addition:

- include at least 12 credit points of intermediate units of study at either the advanced level or as TSP units in the science subject areas of Mathematics and Statistics, and
- include at least 24 credit points of senior units of study at the advanced level or as TSP units in the science subject areas of Mathematics and Statistics.

You should note that you must maintain in intermediate and senior units of study in science subject areas an average mark of 65 or greater in each year of enrolment, or be transferred to the non-advanced stream.

Plans of study
It is important when choosing units of study at any stage of your university career that you consider your overall degree program. There is a sample degree program below. See the Bachelor of Science entry for information about each major and recommended first year combinations of units of study. There is also a degree planner inside the back cover.

Units of study
The science units of study available for this degree are set out in Table I: Bachelor of Science in chapter 3. Unit descriptions follow the tables. The Arts units of study available for this degree are set out in Part A of the table of undergraduate units of study in the Faculty of Arts handbook.

Honours
Students who are qualified to do so may undertake honours courses in either or both degrees or a joint honours course at the completion of the combined degrees. Please refer to 'Honours in the Faculty of Science' in this chapter, and to Table VI: Honours units of study in chapter 10.

Abandoning and discontinuing
Students may abandon the combined degree course and elect to complete either a BSc or a BA in accordance with the Resolutions governing those degrees.

If you wish to discontinue a unit of study it is important to talk to staff in the Faculty Office. In some cases, discontinuation can affect your access to units of study, prizes and scholarships. Deadlines for withdrawal and discontinuation can be found on the second page of this handbook.

Special permission
You should note that the faculty can, in certain circumstances, permit exceptions to the normal requirements for a degree. Applications should be made in writing to the Associate Dean (Undergraduate) after discussion with staff in the Faculty Office.

Supervision
Supervision of all students in the combined degrees will be the responsibility of the Faculty of Science and the Faculty of Arts.

Universities Admissions Index (UAI)
The minimum UAI for admission into the course varies every year.

Degree resolutions
See chapter 2.

Sample Bachelor of Science/Bachelor of Arts

	Sem	Unit of study 1 & credit points	Unit of study 2 & credit points	Unit of study 3 & credit points	Unit of study 4 & credit points	Unit of study 5 & credit points	Unit of study 6 & credit points	Total
Year 1	1	MATH1XXX	MATH1XXX	Science elective A 1XXX	Science elective B 1XXX	Arts elective 1XXX		
		3	3	6	6	6		24
	2	MATH1XXX	MATH1XXX	Science elective A 1XXX	Science elective B 1XXX	Arts elective 1XXX		
		3	3	6	6	6		24
Year 2	1	Science major Intermediate 2XXX	Intermediate Science elective 2XXX	Intermediate Science elective 2XXX	Arts elective 1XXX			
		6	6	6	6			24
	2	Science major Intermediate 2XXX	Intermediate Science elective 2XXX	Intermediate Science elective 2XXX	Arts elective 1XXX			
		6	6	6	6			24
Year 3	1	Science major 3XXX	Science major 3XXX	Elective	Arts elective 1XXX			
		6	6	6	6			24
	2	Science major 3XXX	Science major 3XXX	Elective	Arts elective 1XXX			
		6	6	6	6			24
Year 4	1	Elective	Arts Senior elective	Arts Senior elective	Arts major Senior elective			
		6	6	6	6			24
	2	Int/Senior elective	Arts Senior elective	Arts Senior elective	Arts major Senior elective			
		6	6	6	6			24
Year 5	1	Arts Senior elective	Arts Senior elective	Arts major Senior elective	Arts major Senior elective			
		6	6	6	6			24
	2	Elective	Arts Senior elective	Arts major Senior elective	Arts major Senior elective			
		6	6	6	6			24
							Total credit points:	240
Require: 240cp total, max 96cp Junior, min. 96cp Science, min 36cp Junior Science incl. 12cp Maths, one Science major, min 72cp Senior Arts including one Arts major.								

Combined Engineering/Science degrees

Degree code: HH015

See also Summary of Requirements of the BSc.

Summary of requirements
The requirements for the degree are set out in the Senate and Faculty Resolutions (see chapter 2) which should be read by all intending candidates. In particular it is important to ensure that any proposed course of study will comply with the basic requirements for the degree. Important aspects of the Resolutions are summarised below. The Resolutions should be consulted for any clarification of the summary points.

A student may proceed concurrently to the degrees of Bachelor of Science, Bachelor of Science (Advanced) or Bachelor of Science (Advanced Mathematics) and any stream of the Bachelor of Engineering.

Enrolment guide
To qualify for the award of the pass degrees a student shall complete units of study to a total value of at least 240 credit points including:

- 96 credit points from science subject areas
- units of study as prescribed in the BE Specialisation Requirement tables for the specialisation that the student is pursuing, and
- a major in a science area.

Advanced streams
To qualify for the award of the pass degree in the advanced or advanced Mathematics stream of the BSc a student must:

- complete at least 54 credit points of intermediate/senior science units of study of which at least 36 credit points shall be completed at the advanced level or as TSP units, and
- complete at least 24 credit points of senior science units of study at the advanced level or as TSP units in a single science subject area (for the BSc (Advanced)) or 24 credit points of senior units of study at the advanced level or as TSP units in the science subject areas of Mathematics and Statistics (for the BSc (Advanced Mathematics)).

You should note that you must maintain in intermediate and senior units of study in science subject areas an average mark of 65 or greater in each year of enrolment, or be awarded the Bachelor of Science.

Plans of study
It is important when choosing units of study at any stage of your university career that you consider your overall degree program. See the Bachelor of Science entry for information about each major and recommended first year combinations of units of study. There is a degree planner inside the back cover.

Units of study
The Science units of study available for this degree are set out in Table I: Bachelor of Science in chapter 3. Unit descriptions appear in chapter 10. The Engineering units of study available for this degree are set out in tables in the Faculty of Engineering and Information Technologies handbook.

Honours
Students who are so qualified may be awarded honours in the BE degree or undertake an honours course in the BSc degree. Please refer to 'Honours in the Faculty of Science' in this chapter, and to Table VI: Honours units of study in chapter 3.

Abandoning and discontinuing
Students may abandon the combined degree course and elect to complete either a BSc or a BE in accordance with the Resolutions governing those degrees.

If you wish to discontinue a unit of study it is important to talk to staff in the Faculty Office. In some cases, discontinuation can affect your access to units of study, prizes and scholarships. Deadlines for withdrawal and discontinuation can be found on the second page of this handbook.

Special permission
You should note that the faculty can, in certain circumstances, permit exceptions to the normal requirements for a degree. Applications should be made in writing to the Associate Dean (Undergraduate) after discussion with staff in the Faculty Office.

Supervision
Students will be under the general supervision of the Faculty of Engineering and Information Technologies. However, students may refer to the Faculty of Science Office for additional information.

Universities Admissions Index (UAI)
The minimum UAI for admission into the course varies every year.

Degree resolutions
See chapter 2.

Double degree in Science/Engineering

Degree code: LH000

Admission requirements
A student enrolled for a Bachelor of Engineering degree may be permitted to transfer to a BSc degree if:

- at least 96 credit points from units of study in Engineering have been completed with the grade of Pass or better, and
- the student is qualified to enrol in a major in a science area.

For admission to the advanced and advanced Mathematics streams a student must have completed at least 48 credit points of units of study from the BSc with a mark averaged over all attempted units of study of 75 or greater and have met the prerequisites to be able to enrol in the required number of advanced level units or TSP units.

Enrolment guide

To qualify for the award of the pass degree a student shall complete units of study to a value of at least 48 credit points including:

- 42 credit points of intermediate/senior units of study in science subject areas, and
- a major in a science area.

Advanced streams
To qualify for the award of the pass degree in the advanced or advanced Mathematics stream of the BSc a student shall, in addition:

- include at least 72 credit points of intermediate/senior science units of study, and
- include at least 24 credit points of senior science units of study at the advanced level or as TSP units in a single science subject area (for the BSc (Advanced)) or 24 credit points of senior units of study at the advanced level or as TSP units in the science subject areas of Mathematics and Statistics (for the BSc (Advanced Mathematics))

You should note that you must maintain in intermediate and senior units of study in science subject areas an average mark of 65 or greater in each year of enrolment, or be transferred to the Bachelor of Science.

Plans of study
It is important when choosing units of study at any stage of your university career that you consider your overall degree program. See the Bachelor of Science entry for information about each major and recommended first year combinations of units of study. There is a degree planner inside the back cover.

Units of study
The Science units of study available for this degree are set out in Table I: Bachelor of Science in chapter 3. Unit descriptions follow the tables. The Engineering units of study available for this degree are set out in tables in the Faculty of Engineering and Information Technologies handbook.

Method of candidature
The requirements outlined above must be completed in one year of full-time study or two years of part-time study. Students who complete at least 42 but less than 48 credit points in the prescribed time limits may in the following year of enrolment in the BE complete the remaining units to satisfy the requirements of the BSc. Students who complete less than 42 credit points may apply to be readmitted to the degree, subject to Resolutions relating to credit transfer.

Applications
Bachelor of Engineering students should apply to the Faculty of Science before 15 November in the year prior to candidature.

Honours
Students who are qualified may be awarded honours in the BE degree or undertake an honours course in the BSc. Please refer to 'Honours in the Faculty of Science' in this chapter, and to Table VI: Honours units of study in chapter 3.

Discontinuing
If you wish to discontinue a unit of study it is important to talk to staff in the Faculty Office. In some circumstances, discontinuation can affect your access to units of study, prizes and scholarships. Deadlines for withdrawal and discontinuation can be found on the second page of this handbook.

Special permission
You should note that the Faculty can, in certain circumstances, permit exceptions to the normal requirements for a degree. Applications should be made in writing to the Associate Dean (Undergraduate) after discussion with staff in the Faculty Office.

Degree resolutions
See chapter 2.

Combined Science/Commerce degrees

Course code: FH034

See also Summary of Requirements of the BSc.

Note that from 2006, students will be admitted to the Bachelor of Commerce/Bachelor of Science course only, which is administered by the Faculty of Economics and Business. Please consult that faculty's handbook for information on that degree.

The following summary is relevant to students who first enrolled in the Bachelor of Science/Bachelor of Commerce course prior to 2006.

Summary of requirements
The requirements for the degree are set out in the Senate and Faculty Resolutions (see chapter 5) which should be read by all candidates. In particular it is important to ensure that any proposed course of study will comply with the basic requirements for the degree. Important aspects of the Resolutions are summarised below. Consult the Resolutions for clarification of the summary points.

A student may proceed concurrently to the degrees of Bachelor of Commerce and Bachelor of Science, Bachelor of Science (Advanced) or Bachelor of Science (Advanced Mathematics).

Enrolment guide
In your junior year you should complete:

- 12 credit points from the science subject areas of Mathematics and Statistics
- 24 credit points of junior units of study from at least two science subject areas other than Mathematics and Statistics, and
- 12 credit points of junior units of study from either Economics, Accounting or the combination ECMT 1010 and INFS 1000.

To qualify for the pass degree a student must complete successfully units of study amounting to a total of 240 credit points, comprising:

1. In the first six semesters of enrolment, at a grade of Pass or better:

(a) 12 credit points of units of study from the science subject areas of Mathematics and Statistics listed in Table I: Bachelor of Science
(b) at least 24 credit points of junior units of study from at least two science subject areas other than Mathematics or Statistics
(c) 12 credit points in junior units of study from each of Accounting and Economics
(d) ECMT 1010, except that a student shall complete an alternative junior Economics and Business unit of study other than those in (c) and (e) if MATH1015/1005/1905 has been completed
(e) INFS 1000, and
(f) a minimum of 60 credit points from intermediate and senior units of study from science subject areas.

2. No more than 100 credit points from junior units of study.

3. At least 96 credit points of units of study taught by the Faculty of Economics and Business.

4. No more than 48 credit points of junior units of study taught by the Faculty of Economics and Business.

5. A major in a science area, and a major or double major in Economics and Business from the list of approved majors for the Bachelor of Commerce.

Advanced streams
To qualify for the award of the pass degree in the BSc (Advanced) stream, a student shall complete the requirements for the BSc and in addition:

- include at least 12 credit points of intermediate science units of study at either the advanced level or as TSP units, and
- include at least 24 credit points of senior units of study at either the advanced level or as TSP units in a single science area.

You should note that you must maintain in intermediate and senior units of study in science subject areas an average mark of 65 or greater in each year of enrolment, or be transferred to the non-advanced stream.

To qualify for the award of the pass degree in the BSc (Advanced Mathematics) stream, a student shall complete the requirements for the BSc degree and in addition:

- include at least 12 credit points of intermediate units of study at either the advanced level or as TSP units in the science subject areas of Mathematics and Statistics, and
- include at least 24 credit points of senior units of study at either the advanced level or as TSP units in the science subject areas of Mathematics and Statistics.

You should note that you must maintain in intermediate and senior units of study in science subject areas an average mark of 65 or greater in each year of enrolment, or be transferred to the non-advanced stream.

Plans of study
It is important when choosing units of study at any stage of your university career that you consider your overall degree program. There is a sample degree program below. See the Bachelor of Science entry for information about each major and recommended first year combinations of units of study. There is also a degree planner inside the back cover.

Units of study
The Science units of study available for this degree are set out in Table I: Bachelor of Science in chapter 3. Unit descriptions follow the tables. The Commerce units of study available for this degree are set out in the Faculty of Economics and Business handbook. You may also wish to refer to the handbooks of other faculties as the degree resolutions allow.

Honours
Students who are qualified to do so may undertake honours courses in either or both degrees or a joint honours course on completion of the combined degree. Please refer to 'Honours in the Faculty of Science' in this chapter, and to Table VI: Honours units of study in chapter 3.

Abandoning and discontinuing
Students may abandon the combined degree course and elect to complete either a BSc or a BCom in accordance with the Resolutions governing those degrees.

If you wish to discontinue a unit of study it is important to talk to staff in the Faculty Office. In some cases discontinuation can affect your access to units of study, prizes and scholarships. Deadlines for withdrawal and discontinuation can be found on the second page of this handbook.

Special permission
You should note that the faculty can, in certain circumstances, permit exceptions to the normal requirements for a degree. Applications should be made in writing to the Associate Dean (Undergraduate) after discussion with staff in the Faculty Office.

Supervision
The Faculty of Science is the Supervising Faculty for the Bachelor of Science/Commerce. However, for student matters related to the Bachelor of Commerce component (eg, credit, graduation and progression advice) students should refer to the Faculty of Economics and Business Student Information Office.

Universities Admissions Index (UAI)
The minimum UAI for admission into the course varies every year.

Degree resolutions
See chapter 2.

Sample Bachelor of Science/Bachelor of Commerce

	Sem	Unit of study 1 & credit points	Unit of study 2 & credit points	Unit of study 3 & credit points	Unit of study 4 & credit points	Unit of study 5 & credit points	Unit of study 6 & credit points	Total
Year 1	1	MATH 1XXX	MATH 1XXX	Science elective A 1XXX	Science elective B 1XXX	Commerce Junior core 1XXX		
		3	3	6	6	6		24
	2	MATH 1XXX	MATH 1XXX	Science elective A 1XXX	Science elective B 1XXX	Commerce Junior core 1XXX		
		3	3	6	6	6		24
Year 2	1	Science major Intermediate 2XXX	Intermediate Science elective 2XXX	Intermediate Science elective 2XXX	Commerce Junior core 1XXX			
		6	6	6	6			24
	2	Science major Intermediate 2XXX	Intermediate Science elective 2XXX	Intermediate Science elective 2XXX	Commerce Junior core 1XXX			
		6	6	6	6			24
Year 3	1	Science major 3XXX	Science major 3XXX	Commerce/ Science elective	Commerce Junior core 1XXX			
		6	6	6	6			24
	2	Science major 3XXX	Science major 3XXX	Commerce/ Science elective	Commerce Junior core 1XXX			
		6	6	6	6			24
Year 4	1	Elective	Commerce Senior elective	Commerce Senior elective	Commerce major Senior elective			
		6	6	6	6			24
	2	Elective	Commerce Senior elective	Commerce Senior elective	Commerce major Senior elective			
		6	6	6	6			24
Year 5	1	Int/Senior elective	Commerce Senior elective	Commerce major Senior elective	Commerce major Senior elective			
		6	6	6	6			24
	2	Int/Senior elective	Commerce Senior elective	Commerce major Senior elective	Commerce major Senior elective			
		6	6	6	6			24
							Total credit points:	240
Require: 240cp total, max. 100cp Junior, min. 96cp Science, min. 36cp Junior Science incl. 12cp Maths, one Science major, min. 96cp Commerce, max. 48cp Junior Commerce units, either a Commerce major (32cp) or a Commerce double major (48cp).								

Combined Nursing/Science degrees

Degree code: GN010

See also Summary of Requirements of the BSc.

Summary of requirements
The requirements for the degree are set out in the Senate and Faculty Resolutions.

Degree resolutions
See the 2006 Faculty of Science Handbook.

Combined Education/Science degrees

See also Summary of Requirements of the BSc.

Summary of requirements
The requirements for the degree are set out in the Senate and Faculty Resolutions (see chapter 2) which should be read by all intending candidates. In particular it is important to ensure that any proposed course of study will comply with the basic requirements for the degree. Important aspects of the Resolutions are summarised below. The Resolutions should be consulted for any clarification of the summary points.

Please note that there is no new intake in the BEd/BSc(Psychology) degree from 2006.

Enrolment guide
BEd (Secondary: Science)/BSc
To qualify for the award of the pass degrees a student shall complete units of study to a total value of at least 240 credit points including:

- at least 96 credit points from science subject areas and 132 credit points from prescribed Education units of study
- at least 12 credit points from the science subject areas of Mathematics and Statistics
- at least 24 credit points of junior units of study from at least two science subject areas other than Mathematics or Statistics
- a major in a science area
- a major in Education, and
- at least 84 credit points of units of study in Curriculum and Professional Studies in Secondary Education.

BEd (Secondary: Mathematics)/BSc
To qualify for the award of the pass degrees a student shall complete units of study to a total value of at least 240 credit points including:

- at least 96 credit points from science subject areas and 132 credit points from prescribed Education units of study
- at least 12 credit points from the science subject areas of Mathematics and Statistics
- at least 24 credit points of junior units of study from at least two science subject areas other than Mathematics or Statistics
- a major in the science subject area of Mathematics or Statistics
- a major in Education, and
- at least 84 credit points of units of study in Curriculum and Professional Studies in Secondary Education.

Advanced streams
To qualify for the award of the pass degree in the BSc (Advanced) stream, a student shall complete the requirements for the BSc and in addition:

- include at least 12 credit points of intermediate science units of study at either the advanced level or as TSP units, and
- include at least 24 credit points of senior units of study at either the advanced level or as TSP units in a single science subject area.

You should note that you must maintain in intermediate and senior units of study in science subject areas an average mark of 65 or greater in each year of enrolment, or be transferred to the Bachelor of Science.

To qualify for the award of the pass degree in the BSc (Advanced Mathematics) stream, a student shall complete the requirements for the BSc degree and in addition:

- include at least 12 credit points of intermediate units of study at either the advanced level or as TSP units in the science subject areas of Mathematics and Statistics, and
- include at least 24 credit points of senior units of study at either the advanced level or as TSP units in the science subject areas of Mathematics and Statistics.

You should note that you must maintain in intermediate and senior units of study in science subject areas an average mark of 65 or greater in each year of enrolment, or be transferred to the Bachelor of Science.

BEd (Secondary)/BSc (Psychology)
There is no new intake for this degree in 2007.

To qualify for the award of the pass degrees a student shall complete units of study to a total value of at least 244 credit points including:

Year I

- junior units of study in Education, as specified in the table of units of study, total of 12 credit points,and
- specified junior units of study in Psychology, 12 credit points, and
- junior units of study in science, 24 credit points, of which 12 credit points must be in Mathematics and 12 in Chemistry.

Year II

- units of study in Education, as specified in the table of units of study, total of 18 credit points, and
- specified intermediate level units of study in Psychology, 18 credit points, and
- intermediate level units of study selected from Science Table 1, 12 credit points, which must be in the selected science teaching subject.

Year III

- units of study in Education, as specified in the table of units of study, total of 18 credit points, and
- specified senior units of study in Psychology, 30 credit points.

Year IV

- units of study in Education, as specified in the table of units of study, including professional experience, 24 credit points, and
- specified units of study in Psychology, 24 credit points.

Year V

- units of study in Education, as specified in the table of units of study, including professional experience, 16 credit points, and
- specified units of study in Psychology, 20 credit points, and
- senior units of study selected from Science Table 1, 12 credit points, to complete study in the science teaching subject.

The Bachelor of Science (Psychology) is not available at an advanced level.

Plans of study
It is important when choosing units of study at any stage of your university career that you consider your overall degree program. See the Bachelor of Science entry for information about each major and recommended first year combinations of units of study. There is a degree planner inside the back cover.

Units of study
The Science units of study available for this degree are set out in Table I: Bachelor of Science in chapter 3. Unit descriptions appear in chapter 10. The Education units of study available for this degree are set out in the Faculty of Education handbook.

Honours
Students who are qualified to do so may undertake honours courses in either degree or both degrees or a joint honours course on completion of the combined degree. Please refer to 'Honours in the Faculty of Science' in this chapter, and to Table VI: Honours units of study in chapter 3.

Abandoning and discontinuing
Students may abandon the combined degree course and elect to complete either a BSc or a BEd in accordance with the Resolutions governing those degrees.

If you wish to discontinue a unit of study it is important to talk to staff in the Faculty Office. In some cases discontinuation can affect your access to units of study, prizes and scholarships. Deadlines for withdrawal and discontinuation can be found on the second page of this handbook.

Special permission
You should note that the faculty can, in certain circumstances, permit exceptions to the normal requirements for a degree. Applications should be made in writing to the Associate Dean (Undergraduate) after discussion with staff in the Faculty Office.

Supervision
Students will be under the general supervision of the Faculty of Education.

Universities Admissions Index (UAI)
The minimum UAI for admission into the course varies every year.

Degree resolutions
See chapter 2.

Bachelor of Liberal Studies (BLibStud)

Degree code: AH010

Note that this degree is administered by the Faculty of Arts.

Summary of requirements
In the Bachelor of Liberal Studies students will undertake a broad liberal education which emphasises communication and problem-solving skills. The degree is available in two streams – the Bachelor of Liberal Studies and the Bachelor of Liberal Studies (International).

The requirements for the degree are set out in the Senate and Faculty Resolutions (see chapter 2) which should be read by all intending candidates. In particular it is important to ensure that any proposed course of study will comply with the basic requirements for the degree. Important aspects of the Resolutions are summarised below. The Resolutions should be consulted for any clarification of the summary points.

Enrolment guide
B Liberal Studies
To qualify for the award of the degree a student shall complete units of study having a total value of at least 192 credit points, including:

- at least 120 intermediate or senior credit points
- at least one Arts major and one Science major
- at least 30 credit points, including 18 intermediate or senior credit points, from units of study in one language subject area other than English from Part A of the tables of units of study for the degree of Bachelor of Arts
- a 6 credit point unit of study in communication and analytical skills or in other academic skills as may be prescribed from time to time (currently ENGL1000, ENGL1007 and LNGS1001), and
- a minimum of 6 credit points from units of study in Mathematics and Statistics.

Bachelor of Liberal Studies (International)

Degree code: AH030

Summary of requirements
The requirements for this stream of the degree are the same as those for the BLibStud except that a minimum of 24 credit points (one semester equivalent) of study must be completed at an overseas university while enrolled as an exchange student as part of the University of Sydney Exchange Program. The Exchange Program is usually undertaken in the second or third year of enrolment, and students will comply with the rules of, and be under the administration of, the Exchange Program during the period of exchange.

To qualify for participation in the Exchange Program a student must have completed at least 48 credit points towards the BLibStud and have an average mark of 75 or greater over all units of study completed.

During the period of their exchange program a student must be enrolled as a full-time student in the Bachelor of Liberal Studies (International) at the University of Sydney and take classes at the overseas university that will qualify for a minimum of 24 credit points per semester towards the Bachelor of Liberal Studies (International) degree.

Under the Exchange program a student's academic fees are covered by normal HECS arrangements based on their enrolment at the University of Sydney. However, students are responsible for their own travel and living expenses during the Exchange Program. The Faculties of Arts and Science will provide a number of travel grants each year on a competitive basis, which assist towards students' travel costs, and students are also eligible to apply for the scholarships and bursaries provided by the University as part of the Exchange Program.

Candidates who fail to maintain the required credit average will be transferred to candidature for the Bachelor of Liberal Studies degree in their next year of enrolment with full credit for the units of study completed as Bachelor of Liberal Studies (Advanced) candidates.

Candidates who fail to achieve a credit average across all units of study attempted in the year in which they have otherwise completed the requirements for the degree will be awarded the Bachelor of Liberal Studies.

Plans of study
It is important when choosing units of study at any stage of your university career that you consider your overall degree program. See the Bachelor of Science entry for information about each Science major and recommended first year combinations of units of study. There is a sample degree program below and a degree planner inside the back cover. The Faculty of Arts has a Degree Director for Liberal Studies. The Faculty of Science has an Associate Dean responsible for Liberal Studies.

Units of study
The Science units of study available for this degree are set out in Table I: Bachelor of Science in chapter 3. Unit descriptions are contained in chapter 10. The Arts units of study available for this degree are set out in Part A of the table of undergraduate units of study in the Faculty of Arts handbook. You may also wish to refer to the handbooks of other faculties as the degree resolutions allow.

Honours
There will be honours courses in most Arts and Science subject areas. To qualify for the award of an honours degree, students shall complete 48 credit points of honours units of study in Part A of the table of undergraduate units of study for the Bachelor of Arts or in Table VI: Honours units of study. You may also wish to refer to 'Honours in the Faculty of Science' in this chapter, and Table VI: Honours units of study in chapter 12.

Transfer to the Bachelor of Arts or the Bachelor of Science
Students who at the end of at least four semesters of candidature have completed at least 96 credit points in total, and who intend to satisfy the requirements for entry to a Fourth Year Honours unit of study or joint honours unit of study for the Bachelor's degrees in Arts or Science, may apply to transfer to candidature for one of these degrees.

Students who at the end of at least six semesters of candidature have completed units of study which correspond to the entry requirements for fourth-year honours for the bachelor's degrees in Arts or Science may apply to transfer to candidature for one of these degrees.

Students for the degree may, with the permission of the faculty concerned, transfer to candidature for the pass degrees of Bachelor of Arts or Bachelor of Science no later than the end of the fourth semester of candidature.

If a student has completed the normal requirements for the pass degree of Bachelor of Arts, Bachelor of Arts (Asian Studies) or Bachelor of Science, he or she may apply to take one of these degrees

provided that candidature for the Bachelor of Liberal Studies is abandoned.

Transfer between the BLibStud and the BLibStud (International)
Students who have completed at least 48 credit points may be permitted with the permission of the Deans of Arts and Science to transfer from the Bachelor of Liberal Studies to the Bachelor of Liberal Studies (International) stream if:

1. their marks averaged over all attempted units of study is 75 or greater, and
2. they are able to qualify for participation in the Exchange Program.

Students enrolled in the Bachelor of Liberal Studies (International) stream who do not qualify for, or are unable or unwilling to participate in an Exchange Program may, with the permission of the Deans of Arts and Science, transfer to the Bachelor of Liberal Studies.

Discontinuation
If you wish to discontinue a unit of study it is important to talk to staff in the Faculty of Arts Office. In some circumstances, discontinuation can affect your access to units of study, prizes and scholarships. Deadlines for withdrawal and discontinuation can be found on the second page of this handbook.

Special permission
You should note that the Faculty can, in certain circumstances, permit exceptions to the normal requirements for a degree. Applications should be made in writing to the Associate Dean (Undergraduate) after discussion with staff in the Faculty of Arts Office.

Supervision
From 2005, this degree will be supervised by the Faculty of Arts only.

Universities Admissions Index (UAI)
The minimum UAI for admission to the course varies every year.

Degree resolutions
See chapter 2.

Sample Bachelor of Liberal Studies

	Sem	Unit of study 1 & credit points	Unit of study 2 & credit points	Unit of study 3 & credit points	Unit of study 4 & credit points	Unit of study 5 & credit points	Unit of study 6 & credit points	Total
Year 1	1	Science Junior elective A	Arts/Science Junior elective B	Language Junior elective	Maths or ENGL1000/1007 or LNGS1001			
		6	6	6	6			24
	2	Science Junior elective A	Arts/Science Junior elective B	Language Junior elective	Maths or ENGL1000/1007 or LNGS1001			
		6	6	6	6			24
Year 2	1	Science major Intermediate elective	Arts/Science Junior elective	Language Intermediate elective	Intermediate/Senior elective			
		6	6	6	6			24
	2	Science major Intermediate elective	Arts/Science Junior elective	Language Intermediate elective	Language Intermediate/Senior elective			
		6	6	6	6			24
Year 3	1	Science major Senior elective	Science major Senior elective	Arts major Senior elective	Intermediate/Senior elective			
		6	6	6	6			24
	2	Science major Senior elective	Science major Senior elective	Arts major Senior elective	Intermediate/Senior elective			
		6	6	6	6			24
Year 4	1	Arts/Science Intermediate/Senior elective	Intermediate/Senior elective	Arts major Senior elective	Arts major Senior elective			
		6	6	6	6			24
	2	Arts/Science Intermediate/Senior elective	Intermediate/Senior elective	Arts major Senior elective	Arts major Senior elective			
		6	6	6	6			24
							Total credit points:	192
Require: 192cp total, min. 120cp Intermediate and/or Senior, one Arts major and one Science major, min. 30cp non-English language incl. min. 18cp Intermediate and/or Senior, min. 6cp Mathematics and Statistics, 6cp communication skills.								

Combined Engineering/Medical Science degrees

Degree code: HH021

Summary of requirements
The requirements for the degree are set out in the Senate and Faculty Resolutions (see chapter 2) which should be read by all intending candidates.

A student may proceed concurrently to the degrees of Bachelor of Engineering (in any specialisation except Civil Engineering) and Bachelor of Medical Science.

Enrolment guide
To qualify for the award of the pass degrees a student shall complete units of study to a total value of at least 240 credit points including:

- at least 160 credit points from prescribed Engineering units of study (this total to include the 12 credit points from the Interdisciplinary Thesis)
- 48 credit points of intermediate core units of study listed in Table IV: Bachelor of Medical Science
- at least 24 credit points of senior units of study from the subject areas listed in Table IV: Bachelor of Medical Science
- 12 credit points from the Interdisciplinary Thesis.

Students who are so qualified may be awarded honours in the BE degree or undertake an honours course in the BMedSc degree.

Plans of study
It is important when choosing units of study at any stage of your university career that you consider your overall degree program. See the Bachelor of Medical Science entry for information about recommended first year combinations of units of study and the sample degree program. There is a degree planner inside the back cover.

Units of study
The Science units of study available for this degree are set out in Table IV: Bachelor of Medical Science in chapter 3. Unit descriptions follow the tables. The Engineering units of study available for this degree are set out in the Faculty of Engineering and Information Technologies handbook.

Abandoning and discontinuing
Students may abandon the combined degree course and elect to complete either a BMedSc or a BE in accordance with the Resolutions governing those degrees.

If you wish to discontinue a unit of study it is important to talk to staff in the Faculty Office. In some cases discontinuation can affect your access to units of study, prizes and scholarships. Deadlines for withdrawal and discontinuation can be found on the second page of this handbook.

Special permission
You should note that the faculty can, in certain circumstances, permit exceptions to the normal requirements for a degree. Applications should be made in writing to the Associate Dean (Undergraduate) after discussion with staff in the Faculty Office.

Supervision
Students will be under the general supervision of the Faculty of Engineering and Information Technologies.

Universities Admissions Index (UAI)
The minimum UAI for admission into the course varies every year.

Degree resolutions
See chapter 2.

9. Undergraduate Units of Study

This chapter provides information on each of the undergraduate units of study offered by the Faculty of Science, as well as additional information on each of the teaching Schools and Departments and interdisciplinary subject areas.

Organisation of unit of study information

The units of study are generally organised alphabetically by School or Departments. EMHU and HSTO units can be found under the entry for Anatomy and Histology. NEUR can be found in the Anatomy or Physiology entries, depending on the principle teaching department for the individual unit. COMP, INFO, ISYS, NETS, MULT AND SOFT can be found under the Information Technologies entry. Further information on Information Technology units can be found in the Faculty of Engineering and Information Technologies Handbook and website. NTMP can be found under the Marine Science entry. STAT can be found under the Mathematics and Statistics entry. VIRO can be found under the Microbiology entry.

Aerospace, Mechanical and Mechatronic Engineering

The School of Aerospace, Mechanical and Mechatronic Engineering is part of the Faculty of Engineering and Information Technologies. In addition to providing professional training in aerospace, mechanical, biomedical and mechatronic engineering, units of study in the School are available to students in the Faculty of Science who meet any prerequisite requirements for a particular unit.

Registration

Timetable information on alternative lecture/tutorial/laboratory/practical classes is available in the General Office of the School.

Tutorials and laboratories

All students are required to undertake the tutorial and laboratory work associated with the chosen units of study, details of which are provided in the timetables. The experimental and tutorial work, an integral part of the unit of study, complements the lecture material.

Double degree

Science graduates may obtain up to two years advanced standing towards a Bachelor of Engineering degree in Aerospace, Mechanical, Mechatronic or Biomedical Engineering. Students wishing to undertake this option must apply through UAC and compete on the basis of academic merit. Information about application procedures is available from the Engineering Faculty Office in the Engineering and Information Technologies Building.

Agricultural Chemistry and Soil Science

Study in the discipline of Agricultural Chemistry is offered by the Faculty of Agriculture, Food and Natural Resources. Units of study in Agricultural Chemistry for Science students cover aspects of chemistry and biochemistry which are relevant in basic and applied biological sciences including agriculture, the environment and food science. The unit of study, Introductory Rural Environmental Chemistry (AGCH2003) introduces students to basic analytical and environmental chemistry. Senior units of study include Chemistry and Biochemistry of Foods A and B (AGCH3025 and AGCH3026) and Land and Water Ecochemistry (AGCH3032). These senior units of study introduce students to the applied aspects of food chemistry science or to applied environmental chemistry. Emphasis is placed on the chemistry of both naturally occurring molecules of biological, agricultural and environmental significance (eg in foods and natural fibres), and chemically synthesised (eg insecticides and herbicides). Agricultural Chemistry Honours is available to students who wish to further their studies in food chemistry or environmental chemistry.

AGCH2003
Rural Environmental Chemistry

Credit points: 6 **Teacher/Coordinator:** Dr Robert Caldwell **Session:** Semester 1 **Classes:** 3 lec/week and 30 hours of lab/semester **Prerequisites:** 12 credit points of Junior Chemistry **Prohibitions:** AGCH2001, AGCH2002 and CHEM2404 **Assessment:** One 2 hr exam, laboratory reports, theory of prac test, lecture quiz.

This introductory unit of study consists of aspects of chemistry relevant in studies of basic and applied biological sciences including agriculture, food and the rural environment. Lecture topics include an introduction to quantitative aspects of biophysical, environmental and aquatic chemistry with particular reference to protocols for specimen sampling and maintenance of specimen quality; the principles of basic analytical methods such as spectroscopy, chromatography and electrochemistry; environmental aspects of water such as thermal properties and its behaviour as a solvent of hydrophobic solutes, surfactants, neutral hydrophilic solutes, salts and other electrolytes, and gases. The lectures will also include environmental nutrient cycling (C, N, S, O, P, micronutrients) with reference to pesticides, herbicides, organic and inorganic pollutants affecting agricultural produce and the environment, and gases of environmental concern. Ten laboratory sessions will demonstrate aspects of analytical chemistry including: elemental analysis of foods and natural waters, spectrophotometry, chromatographic techniques, preparation of buffers, fundamentals of pH and conductance measurement, water as a solvent including the effect of surfactants and electrolytes. Students will analyze natural water samples using the skills acquired in earlier laboratory sessions and write an environmental assessment from their findings. An on-line tutorial on safety procedures in a chemistry laboratory is a pre-requisite for commencement of laboratory experiments.

AGCH3025
Chemistry and Biochemistry of Foods

Credit points: 6 **Teacher/Coordinator:** Dr Meredith Wilkes, Dr Robert Caldwell, Prof Les Copeland, A/Prof Neil Howes **Session:** Semester 1 **Classes:** 3 lec/wk; 21 hrs laboratory **Prerequisites:** 6 credit points of Intermediate units in either Agricultural Chemistry or Chemistry or PLNT2001 or PLNT2901 or BCHM2071 or BCHM2072 **Prohibitions:** AFNR5102 **Assumed knowledge:** 12 credit points of Junior chemistry **Assessment:** One 2 hr theory exam, one 1 hr theory of prac exam, practical reports, lecture quizzes.

This unit of study aims to give students an understanding of the properties, relationship between form and function and fitness for purpose (quality) of food components, and the interactions between these components during storage, processing and digestion.

The unit will develop an understanding of the role of agricultural products as foods. Students will gain an appreciation of the biochemical systems we know as foods and will build upon knowledge gained in intermediate levels of biochemistry.

Students will explore the relationship between chemical composition and structure of macro- and micro-constituents and their function in foods. Students will also develop an analytical approach in understanding of the biochemistry of food formulations, processing and storage stability.

At the completion of this unit, students will be able to describe the chemistry, biochemistry and processing behaviour of major food constituents such as carbohydrates, proteins, lipids, natural fibres and gel-forming polymers. They will also be able to demonstrate an

understanding of the functionality of these constituents and gain experience in laboratory techniques used in industry for the analysis of some of these compounds in actual food products.

Students will gain research and inquiry skills by mastering the key theories and concepts presented in lecture material and practical classes. Students will also gain information literacy and communication skills by using various sources of information for the synthesis of material required for practical reports. At the end of the unit students should also have an enhanced understanding of the role of agriculture in Australian and International food production systems.

Textbooks

There is no recommended textbook. Laboratory notes will be available for purchase from the Copy Centre in the first week of semester and lecture notes will be made available through WebCT.

AGCH3026
Food Biotechnology

Credit points: 6 **Teacher/Coordinator:** Dr Meredith Wilkes, Dr Robert Caldwell, Prof Les Copeland, A/Prof Neil Howes **Session:** Semester 1 **Classes:** 3 lec/wk and 21 hrs laboratory **Prerequisites:** 6 credit points of Intermediate Agricultural Chemistry or PLNT2001 or PLNT2901 or BCHM2071 or BCHM2072 **Corequisites:** AGCH3025 **Prohibitions:** AFNR5103 **Assumed knowledge:** 12 units of Junior chemistry **Assessment:** One 2 hr exam, practical reports, theory of practical exam, oral and written presentation on a case study.

This unit aims to give students an understanding of the biochemistry of processing of raw products used in food manufacture, with special emphasis placed on current issues faced by the food industry.

The unit is designed to build upon intermediate levels of chemistry and biochemistry by developing a deeper understanding of how biochemical molecules contained in raw products affect the processing, manufacture and quality of foods. It complements AGCH3025 by applying the knowledge gained in that unit in food processing procedures.

The teaching covers the use of enzymes in food processing and diagnostic analysis, the types of raw products used in foods and their processing, the chemistry of raw products with special attention given to proteins, doughs and baking technologies, the reactions that occur during processing and the evaluation of foods. Students will gain exposure to a wide range of food related issues through the presentation of lectures by invited speakers with industry experience.

At the end of this unit students will understand the chemistry of doughs and the changes that occur in baked goods, the role of enzymes in the food industry and the processing of raw ingredients and the products produced. Students will also have an enhanced understanding of issues that face Australian and international agricultural practices and current issues presented by an increasingly global food processing industry.

Students will gain research and inquiry skills by mastering the key theories and concepts presented in lecture material and practical classes. Students will also gain information literacy and communication skills by using various sources of information for the synthesis of material required for practical reports and an oral presentation. At the end of the unit students should also have an enhanced understanding of the role of agriculture in Australian and international food production systems.

Textbooks

No recommended text. Laboratory notes will be available for purchase from the Copy Centre in the first week of semester and lecture notes will be available through the unit WebCT site.

AGCH3032
Land and Water Ecochemistry

Credit points: 6 **Teacher/Coordinator:** Professor Ivan Kennedy, Dr Robert Caldwell **Session:** Semester 2 **Classes:** 5-day field trip in AVCC common break; 20 hr lectures/tutorials, 25 hr laboratory classes and project during semester **Prerequisites:** AGCH2003 or AGCH2004 or PLNT2001 or CHEM24XX or BCHM2XXX or ENVI2001 **Prohibitions:** AGCH3030, AGCH3031 **Assessment:** One 2 hr exam, field trip report and presentation, prac and project reports.

This field-oriented unit will develop professional expertise in rural ecochemistry, measuring impacts on sustainability and seeking solutions to chemical problems at the catchment scale. AGCH3032 is an elective unit suitable for the BSc, BScAgr, BLWSc, BHortSc, BResEc and BAnVetBioSc degrees, building on intermediate units in chemistry or biochemistry. It will promote knowledge and professional skills related to key chemical processes in ecosystems causing risks to soil and water resources, the quality of agricultural produce and to ecological biodiversity. These will be examined by quantitative risk analysis, targeted monitoring and remediation, seeking innovative solutions (e.g. IPM and genetic modification).

A field trip in the AVCC break and professional report on a chosen topic will investigate relevant case studies at selected centres in eastern Australian doing innovative research on global warming and climate change, soil and water quality and environmental protection. Lectures will provide knowledge in the environmental C, N and S cycles important for sustaining action in ecosystems, the nature of greenhouse gases and mitigation of their production including C sequestration, risks to biota (soil, water, plants, animals) from acidification and innovative means of remediation, environmental risk from pesticides and other pollutants, monitoring and their remediation. In laboratory exercises, students will gain skills in relevant analyses using GC, LC, mass spectrometry and ELISA. The assessment procedures are designed to provide students with skills in definition of research problems and risk assessment, quality in analyses, risk management and remediation, and effective communication of outputs.

Agricultural Chemistry Honours

Honours in Agricultural Chemistry aims to provide students with problem-solving and communication skills required by professional chemists in enterprises concerned with agricultural production and processing, foods and beverages, and environmental science; enable students to learn to work independently in a laboratory environment; familiarise students with the research literature and methodology of biological chemistry; and provide a basis for students who wish to proceed to postgraduate research.Candidates should consult the department as soon as possible after results in senior units of study are obtained. The unit of study consists of a research project and four 6 credit point units of study. The research project component includes oral as well as written forms of assessment. Projects are usually available in one of the following areas of current research interest in the department: carbohydrate and nitrogen metabolism in plants, biological nitrogen fixation and biofertilisers, greenhouse gas production, the biochemistry and environmental chemistry of pesticides and herbicides, environmental risk assessment, acidification of ecosystems, residue analysis in foods, aspects of food science including oil seed and cereal chemistry and biochemistry.

Soil Science

The Soil Science units of study aim primarily at giving students an introduction to the three major branches of soil science, namely soil physics, soil chemistry, and pedology, and at providing the basis for a professional career in each of these divisions for students wishing to specialise.The introductory unit of study is particularly relevant for students interested in the environmental and geological sciences and in land-use management.For a major in Soil Science, the minimum requirement is completion of SOIL3008, 3009 and 3010 and one of (AGCH3032 or LWSC3006 or PPAT4005).

SOIL2003
Soil Properties and Processes

Credit points: 6 **Teacher/Coordinator:** A/Prof Balwant Singh (Coordinator), Prof Alex McBratney, Dr Stephen Cattle **Session:** Semester 1 **Classes:** (3 lec & 3hr prac)/wk **Assessment:** Prac book and fieldtrip report (15%), 3 Quizzes (15%), essay (5%), practical exam (25%), written exam (40%).

This unit of study is designed to introduce students to the fundamental concepts within pedology, soil physics and soil chemistry. These concepts are part of the grounding principles that underpin crop and animal production, nutrient and water cycling, and environmental sustainability taught by other units of study in the Faculty. Students will participate in a two-day field excursion in the first week of semester to examine some common soils of the Sydney Basin, they will also learn to describe soil, and measure soil chemical and physical

properties in the field. Referring to common soil profiles of the Sydney Basin, students will concentrate on factors affecting soil formation, the rudiments of soil description, and analysis of soil properties that are used in soil classification. Students will also develop knowledge of the physics of water and gas movement, soil strength, soil chemical properties, inorganic and organic components, nutrient cycles and soil acidity in an agricultural context. At the end of this unit students will become familiar with the factors that determine a soil's composition and behaviour, and will have an understanding of the most important soil physical and chemical properties. Students will develop communication skills through essay, report and practical exercises. The final report and laboratory exercise questions are designed to develop team work and collaborative efforts.

Textbooks

Campbell, K.O. & Bowyer, J.W. (eds) (1988). The Scientific Basis of Modern Agriculture. Sydney University Press.
White, R.E. (2006). Principles and Practice of Soil Science: the Soil as a Natural Resource. 4th ed., Blackwell Science, Oxford.
Charman, P.E.V. & Murphy, B.W. (2000). Soils: Their properties and management. 2nd ed. Oxford University Press, Melbourne.

SOIL2004
The Soil Resource

Credit points: 6 **Teacher/Coordinator:** Dr Stephen Cattle (Coordinator), Prof Alex McBratney, A/Prof Balwant Singh **Session:** Semester 2 **Classes:** (2 lec, 2 pracs)/wk, 24 hr (5 days) field work out of semester time **Assessment:** Literature review exercise (10%), soil description and mapping report (20%), laboratory report (15%), 2 hr exam (50%), field excursion participation (5%)

This unit will familiarize students with the description and mapping of soil types in the Australian landscape, with common analytical methods for soil and with the various forms of degradation that may alter the quality and function of soil. It is an applied soil science unit which builds on the fundamental soil science concepts learned in the SOIL2003 unit. The first practical component of the unit, a five-day soil survey, will give students experience in soil description and classification in the field, and soil samples collected during this survey will be subsequently analysed for a variety of attributes by the students in laboratory practicals. In the lecture series, topics including soil type distribution, soil quality, soil function, soil fertility and soil degradation will be discussed and linked to practical sessions. By the end of this unit, students will be able to construct maps of soil properties and soil type distribution, describe primary soil functions, soil attributes and types of soil degradation in an agricultural context, and be able to recognize and communicate the ability of a soil profile to sustain plant growth. Students will gain research and inquiry skills by collecting, analyzing and interpreting soil survey data. They will improve their information literacy skills by carrying out a literature review exercise, and will gain communication skills by having to prepare and present a poster.

Textbooks

Brady NC & Weil RR. (2002) The Nature and Properties of Soils. 13th ed. (or any later edition) Prentice Hall, New Jersey.
Isbell RF McDonald WS & Ashton LJ. (1997) Concepts and Rationale of the Australian Soil Classification. Australian Collaborative Land Evaluation Program, CSIRO Publishing, Canberra.
White RE (2006) Principles and Practice of Soil Science: the Soil as a Natural Resource.4th ed., Blackwell Science, Oxford.
McKenzie N, Jacquier D, Isbell, R & Brown K. (2004) Australian Soils and Landscapes: An Illustrated Compendium. CSIRO publishing, Melbourne.

SOIL3008
Rural Spatial Information Systems

This unit of study is not available in 2009

Credit points: 6 **Teacher/Coordinator:** Dr I Odeh **Session:** Semester 1 **Classes:** (2 lec, 2hr prac)/wk, four-day field trip **Assessment:** One 15 min presentation (10%), 3500w prac report (35%), 1500w report on field excur (15%), one 2 hr exam (40 %)

This unit is designed to impart knowledge and skills in spatial analysis and geographical information science (GISc) for decision-making in rural context. The unit of study is intended to introduce students to modern geospatial analysis and GISc technologies. It is offered as a core unit for BLWSc students and as an elective for BScAgr, BHortSc, BSc and BResEc students. The lecture material will present several themes: principles of GISc, fundamentals of remote sensing and geo-image analysis, geospatial data sources and acquisition methods, processing of geospatial data and spatial statistics. Practical exercises will focus on learning geographical information systems (GIS) and how to apply them to land resource assessment, including digital terrain modelling, land-cover assessment, sub-catchment modelling, and soil quality assessment for decisions regarding sustainable land use and management. A 4 day field excursion during the mid-semester break will involve a day GPS fieldwork at Arthursleigh University farm and three days in Canberra visiting various government agencies which research and maintain GIS coverages of major rural environments. By the end of this UoS, students should be able to: differentiate between spatial data and spatial information; source geospatial data from government and private agencies; apply conceptual models of spatial phenomena for practical decision-making in rural context; apply critical analysis of situations to apply the concepts of spatial analysis to solving environmental and land resource problems; communicate effectively results of GIS and remote sensing investigations through various means- oral, written and essay formats; and use a major GIS software package such as ArcGIS

Textbooks

Burrough, P.A. and McDonnell, R.A. 1998. Principles of Geographic Information Systems. Oxford University Press: Oxford.
Clarke, K. C. 2003. Getting Started With Geographic Information Systems. 4th Edition. Prentice Hall: Upper Saddle River, New Jersey.
Jensen, J. R. 2000. Remote Sensing of the Environment: An Earth Resources Perspective. Prentice Hall: Upper Saddle River, New Jersey.
Lillesand, T. M. Kiefer, R. W. Chipman J. W. 2004. Remote Sensing and Image Interpretation. 5rd ed. Wiley International: New York

SOIL3009
Contemporary Field and Lab Soil Science

Credit points: 6 **Teacher/Coordinator:** Prof Alex McBratney (coordinator), A/Prof Balwant Singh, Dr Stephen Cattle, Dr Budiman Minasny **Session:** Semester 1 **Classes:** (2 lec, 2 prac)/wk, 6-day field excursion **Prerequisites:** SOIL2003 **Assessment:** One 2hr exam; pedology, soil physics and soil chemistry written assessments; group presentation, synthesis paper

This is a theoretical and empirical unit providing specialised training in three important areas of contemporary soil science, namely pedology, soil chemistry and soil physics. The key concepts of these sub-disciplines will be outlined and strengthened by hands-on training in essential field and laboratory techniques. All of this is synthesized by placing it in the context of soil distribution and use in North-Western New South Wales. The unit is motivated by the teaching team's research in this locale. It builds on students existing soil science knowledge gained in SOIL2003. After completion of the unit, students should be able to articulate the advantages and disadvantages of current field & laboratory techniques for gathering necessary soil information, and simultaneously recognise key concepts and principles that guide contemporary thought in soil science. Students will be able to synthesise soil information from a multiplicity of sources and have an appreciation of the cutting edge areas of soil research. By investigating the contemporary nature of key concepts, students will develop their skills in research and inquiry. Students will develop their communication skills through report writing and oral presentations and will also articulate an openness to new ways of thinking which augments intellectual autonomy. Teamwork and collaborative efforts are encouraged in this unit.

Textbooks

D. Hillel. 2004. Introduction to Environmental Soil Physics. Elsevier Science, San Diego, CA, USA
R. Schaetzl and S. Anderson 2005. Soils: Genesis and Geomorphology. Cambridge University Press, New York, NY, USA
D.L. Sparks 2003 Environmental Soil Chemistry (2nd edn). Academic Press, San Diego, CA, USA

SOIL3010
The Soil at Work

Credit points: 6 **Teacher/Coordinator:** Prof Alex McBratney (coordinator) A/Prof Balwant Singh, Dr Stephen Cattle (facilitators) plus research-only academics **Session:** Semester 2 **Classes:** Problem-based unit: each student completes 2 problems; 4 x 3 hr workshops per problem (each student attends 8 workshops in total) **Prerequisites:** SOIL2003 or SOIL2004 **Assessment:** For each of two scenarios: Statement of the problem report (12.5%) - shared info, but two team reports; How to tackle problem seminar (12.5%) - team

seminars, before fieldwork, analyses done; Results seminar (12.5%) - team seminars; Final report (12.5%) - individual work.

This is a problem-based applied soil science unit. It is designed to allow students to identify soil-related problems in the real-world and by working in a group and with an end-user to suggest short and long-term solutions to such problems. This is a core unit for students majoring or specializing in soil science and an elective unit for those wishing to gain an understanding of environmental problem-solving. It utilises and reinforces soil-science knowledge gained in SOIL2003 and/or SOIL2004 and problem-solving skills gained during the degree program. This unit will address real-world scenarios which involve soil-related problems such as carbon management, structural decline, acidification, salinisation and contamination. Students will gain some understanding of the concept of sustainability, and will be able to identify the causes of problems by reference to the literature, discussion with landusers and by the design and execution of key experiments and surveys. They will gain a focused knowledge of the key soil drivers to environmental problems and will have some understanding on the constraints surrounding potential solutions. By designing and administering strategies to tackle real-world soil issues students will develop their research and inquiry skills and enhance their intellectual autonomy. By producing reports and seminars that enables understanding by an end-user students will improve the breadth of their communication skills.

Textbooks

I.W.Heathcote 1997. Environmental Problem Solving: A Case Study Approach. McGraw-Hill, New York, NY, USA.

AGCH3032

Land and Water Ecochemistry

Credit points: 6 **Teacher/Coordinator:** Professor Ivan Kennedy, Dr Robert Caldwell **Session:** Semester 2 **Classes:** 5-day field trip in AVCC common break; 20 hr lectures/tutorials, 25 hr laboratory classes and project during semester **Prerequisites:** AGCH2003 or AGCH2004 or PLNT2001 or CHEM24XX or BCHM2XXX or ENVI2001 **Prohibitions:** AGCH3030, AGCH3031 **Assessment:** One 2 hr exam, field trip report and presentation, prac and project reports.

This field-oriented unit will develop professional expertise in rural ecochemistry, measuring impacts on sustainability and seeking solutions to chemical problems at the catchment scale. AGCH3032 is an elective unit suitable for the BSc, BScAgr, BLWSc, BHortSc, BResEc and BAnVetBioSc degrees, building on intermediate units in chemistry or biochemistry. It will promote knowledge and professional skills related to key chemical processes in ecosystems causing risks to soil and water resources, the quality of agricultural produce and to ecological biodiversity. These will be examined by quantitative risk analysis, targeted monitoring and remediation, seeking innovative solutions (e.g. IPM and genetic modification).

A field trip in the AVCC break and professional report on a chosen topic will investigate relevant case studies at selected centres in eastern Australian doing innovative research on global warming and climate change, soil and water quality and environmental protection. Lectures will provide knowledge in the environmental C, N and S cycles important for sustaining action in ecosystems, the nature of greenhouse gases and mitigation of their production including C sequestration, risks to biota (soil, water, plants, animals) from acidification and innovative means of remediation, environmental risk from pesticides and other pollutants, monitoring and their remediation. In laboratory exercises, students will gain skills in relevant analyses using GC, LC, mass spectrometry and ELISA. The assessment procedures are designed to provide students with skills in definition of research problems and risk assessment, quality in analyses, risk management and remediation, and effective communication of outputs.

LWSC3006

Landscape Hydrology and Management

Credit points: 6 **Teacher/Coordinator:** Dr Willem Vervoort **Session:** Semester 1 **Classes:** (2 lec, 0.6 on-line 2.4 prac)hr/wk **Prerequisites:** LWSC2002 or GEOG2321 **Corequisites:** LWSC3004 **Assessment:** On-line activities 10%; oral presentation 10%; practical reports 50%; 2 hr exam 30%.

This unit of study is designed to allow students to examine catchment-scale hydrological modeling, groundwater hydrogeochemistry as an investigative tool for water quality and policy making at the catchment level.

It is a core unit for students in BLWSc and builds on the theoretical knowledge gained in LWSC3004, GEOG2321 and LWSC2002. In the first part, students will investigate several ways to simulate catchment hydrological processes and review the possibilities and impossibilities of using simulation models for catchment management. In the second part students will apply hydrogeochemical techniques to investigate groundwater quality and review recent developments in catchment-based management strategies to control salinity and pollution. At the end of this unit, students will be able to articulate advantages and disadvantages of using simulation models for catchment management, justify the choice of a simulation model for a particular catchment management problem, identify issues in relation to uncertainty, apply hydrogeochemical investigation techniques for groundwater and describe innovative strategies for salinity and pollution control. The students will gain research and inquiry skills through research based group projects, information literacy and communication skills through on-line discussion postings, laboratory reports and a presentation and personal and intellectual autonomy through working in groups.

PPAT4005

Soil Biology

Credit points: 6 **Teacher/Coordinator:** Prof David Guest **Session:** Semester 1 **Classes:** (2 tut, 3 hrs prac)/wk **Prerequisites:** MICR2024 or 6cp intermediate microbiology **Assessment:** Tutorial papers (30%), project proposal (10%), project report (50%), peer review (10%).

This unit investigates the diversity of organisms living in the soil, their biology, interactions and ecology, and their roles in maintaining and improving soil function. The unit is an elective for BScAgr, BHortSc and BSc students. It builds on the material introduced in MICR2024, PPAT3003 and BIOL3017. Undertaking this unit will develop skills in monitoring soil microbes, designing, conducting and analysing experiments. At the completion of this unit, students will be able to exercise problem-solving skills (developed through practical experiments, projects and tutorial discussions), think critically, and organise knowledge (from consideration of the lecture material and preparation of project reports), and expand from theoretical principles to practical explanations (through observing and reporting on project work). Students will consolidate their teamworking skills, develop self-directed study skills and plan effective work schedules, use statistical analysis in research, keep appropriate records of laboratory research, work safely in a research laboratory and operate a range of scientific equipment. Students will gain research and inquiry skills through group research projects, information literacy and communication skills through assessment tasks and personal and intellectual autonomy through working in groups.

Textbooks

Sylvia et al. 2005. Principles and Applications of Soil Microbiology 2nd ed. Pearson.

Schjonning PJ. 2001. Managing Soil Quality. CAB International.

Soil Science Honours

The honours program consists of several parts:(i) supplementary lectures and seminars;(ii) topics of study selected from Agricultural Chemistry, Biometry, Botany, Geology, Physical Chemistry, Mathematics, Soil Mechanics, Soil Microbiology, etc;(iii) a small amount of field work performed under direction; and(iv) a project in one branch of soil science.

Anatomy and Histology

The Discipline of Anatomy and Histology teaches topographical and neuroanatomy, histology and cell biology, developmental biology and physical anthropology to students in the Faculties of Science, Medicine and Dentistry.

Location

The office is in the Anderson Stuart Building. The Discipline Office is on the first floor, Room S463.

Noticeboards

The noticeboards are situated near Room S463. Students are advised to consult the noticeboard regularly. Timetables for lectures and practical classes will be posted, where possible, in the week before the beginning of each semester.

Advice on units of study and enrolment

Students wishing to enrol in units of study in Anatomy and Histology must consult the Discipline advisers in the Enrolment Centre during re-enrolment week prior to enrolling in the units of study. Information will be available at this time on the units of study offered by the Discipline and on the advisability of various combinations of subjects.

Registration

All students should register with the Discipline. Please consult the Discipline's noticeboards for details.

Vaccinations

All students studying gross anatomy or neurosciences who may also be exposed to human tissues or fluids should contact the University Health Service regarding vaccinations.

Protective clothing

All students studying gross anatomy or neurosciences must wear a laboratory coat or gown in tutorial rooms and a gown in dissection rooms and must wear gloves when handling cadaveric material. Closed footwear must be worn in both tutorial rooms and dissection rooms.

Website

The Department's website is www.anatomy.usyd.edu.au.

ANAT2008
Principles of Histology

Credit points: 6 **Teacher/Coordinator:** Dr Laura Lindsay **Session:** Semester 1 **Classes:** Two 1 hour lectures and one 2 hour practical per week; online and museum exercises (6 hours per week total) **Prerequisites:** 12 credit points of Junior Biology or Junior Psychology **Prohibitions:** ANAT2001 **Assumed knowledge:** General concepts in human biology **Assessment:** One 1 hour theory exam, one 1 hour practical exam, four quizzes

This unit of study covers the principles of cell biology and study of the structure of cells, tissues and organ systems at the light and electron microscopic levels. The focus is on human systems. Extension exercises introduce students to the connection between histology and anatomy. Modern practical applications of histological techniques and analysis for research are also presented.

Textbooks

Ross, MH and Paulina W. Histology-A Text and Atlas. 5th Edition, Lippincott Williams and Wilkins, New York. 2006

ANAT2009
Comparative Primate Anatomy

Credit points: 6 **Teacher/Coordinator:** Dr Denise Donlon **Session:** Semester 2 **Classes:** Two 1 hour lectures and one 2 hour practical per week; museum project. **Prerequisites:** 12 credit points of Junior Biology or Junior Psychology or Junior Archaeology. **Prohibitions:** ANAT2002 **Assumed knowledge:** Knowledge of basic vertebrate biology **Assessment:** One 1 hour theory exam, one 30 min prac exam, two quizzes, one 2000 word essay

This unit of student covers the musculo-skeletal anatomy of the human body with particular emphasis on human evolution and comparisons with apes and fossil hominids. The topics covered include the versatility of the human hand, in manipulation and locomotion, bipedalism, climbing and brachiation in apes, and the change in pelvic anatomy associated with bipedalism and obstetric consequences.

Textbooks

Kapit, W and Elson, LM The Anatomy Coloring Book. Addison-Wesley. 2001
Reference books:

Aiello, L and Dean, C. An Introduction to Human Evolutionary Anatomy. Academic Press 1990.
Zilman, AL. The Human Evolution Coloring Book. Barnes and Noble, Sydney. 1982

ANAT2010
Concepts of Neuroanatomy

Credit points: 6 **Teacher/Coordinator:** Dr Karen Cullen **Session:** Semester 2 **Classes:** Two 1 hour lectures and one 2 hour practical per week. **Prerequisites:** BIOL (1003 or 1903) and one of: ANAT2008 or BIOL (1002 or 1902) or MBLG(1001 or 1901 or 2071 or 2971) or PSYC (1001 and 1002). Students must have a grade of credit in at least one of the prerequisite units. **Prohibitions:** ANAT2003 **Assumed knowledge:** Background in basic cell biology and basic mammalian biology. **Assessment:** One 1.5 hour theory exam, one 1 hour practical exam, 2000 word essay, practical reports

Students are introduced to the structure and organisation of the central and peripheral nervous system. The course begins with an exploration into the make-up of the individual cells, followed by an examination of the different regions of the nervous system. A final theme of the course touches on the organisation of various systems (sensory and motor), together with aspects of higher-order function (memory). In essence, the course covers general concepts of organisation, structure and function of the brain and its different areas. The practicals offer students the unique opportunity to examine specimens in the Anatomy labs and museum. This course will be of considerable interest to students studying science and related disciplines, as well as those wishing to pursue further study in Neuroscience at senior levels.

Textbooks

Bear, MF, Connors, BW and Paradiso, MA. Neuroscience: Exploring the Brain. Third edition. Williams and Wilkins. 2006.

ANAT3004
Cranial and Cervical Anatomy

Credit points: 6 **Teacher/Coordinator:** Dr Robin Arnold **Session:** Semester 2 **Classes:** One 1 hour lecture and two 2 hour tutorials per week. **Prerequisites:** ANAT2009 or ANAT2010 or BMED2803 or BMED2804 or BMED2805 or BMED2806 **Prohibitions:** ANAT3904 **Assumed knowledge:** General knowledge of biology. **Assessment:** Theory exam, prac exam, continuous assessment

Note: The completion of 6 credit points of MBLG is highly recommended.

This unit of study covers skull, muscles of facial expression, muscles of jaw and neck, ear, eye, nose, oral cavity and larynx and pharynx as well as peripheral distribution of cranial nerves in the head and neck. The functional components of the cranial nerves and their relationship to the special senses and special motor functions such as facial gesture and speech are also studied. Tutorials are designed to encourage students to develop their own approach to the understanding and organisation of subject material. Communication of key concepts and presentation of subject material in an academic context are encouraged and assessed in a major assignment.

Textbooks

Rohan, Yokochi and Lutjen-drecoll, Color Atlas of Human Anatomy.

ANAT3904
Cranial & Cervical Anatomy (Advanced)

Credit points: 6 **Teacher/Coordinator:** Dr Robin Arnold and Dr Laura Lindsay **Session:** Semester 2 **Classes:** Two lectures per week, one 1 hour tutorial per week **Prerequisites:** For Medical Science: Credit in BMED(2803 or 2804 or 2805 or 2806). For BSc and other students Credit in ANAT(3007 or 2010 or 2009). **Prohibitions:** ANAT3004 **Assessment:** Theory exam, practical spot test, participation in dissection practicals and production of detailed weekly reports of the dissection carried out that week **Practical field work:** One 3 hour dissection per week

Note: Department permission required for enrolment. Note: Students must receive permission from the coordinators for enrolment. Course is subject to availability of donor material for dissection.

This unit of study is an alternative to ANAT3004 Cranial & Cervical for talented students with a special interest in and need for dissection experience. The lecture/tutorial component of the course is run in conjunction with ANAT3004. Students in the advanced course will study the anatomy of the skull, muscles of face, jaw and neck, eye, ear, nose oral cavity, larynx and pharynx as well as the peripheral distribution of cranial nerves in the neck. Dissection will allow students to find these structures in donated human cadavers for themselves

and to study and to understand at least some of the many anomalies and variations which characerise human cranial and cervical anatomy.

Textbooks
An Anatomy atlas such as Rohan, Yokochi, Lutjen-Drecoll, Colour Atlas of Human Anatomy

ANAT3006
Forensic Osteology

Credit points: 6 **Teacher/Coordinator:** Dr Denise Donlon **Session:** Semester 1 **Classes:** Two 1 hour lectures, one 2 hour tutorial and one 1 hour practical per week. **Prerequisites:** Credit in ANAT2009 or Credit in ANAT2002 (for students who completed Intermediate study before 2005) **Assumed knowledge:** An understanding of basic human musculoskeletal anatomy. **Assessment:** One 1.5 hour theory exam, one 30 min. prac exam, continuous assessment, case study

Note: The completion of 6 credit points of MBLG is highly recommended.

This unit of study aims to introduce students to the area of forensic osteology, which is the study of human skeletal remains within the legal context. Thus the unit of study aims to help students learn about human morphology and variation through the investigation and identification of human bones. It will also help students gain skills in observation and rigorous record taking and in analysis and interpretation. Production of case reports and practice in acting as 'expert witness' will improve students written and oral skills. An additional objective will be to assist students in learning to deal with legal and ethical issues.

Textbooks
Bass, W. 2005 Human osteology: a laboratory and field manual 5th ed. Missouri Archaeological Society Columbia, Mo.

ANAT3007
Visceral Anatomy

Credit points: 6 **Teacher/Coordinator:** Dr Robin Arnold **Session:** Semester 1 **Classes:** Two 1 hour lectures and two 2 hour practicals per week. **Prerequisites:** ANAT2009 or ANAT2010 **Assumed knowledge:** General knowledge of biology. **Assessment:** Theory exam, prac exam, continuous assessment

This unit of study aims to provide an understanding of the anatomy of the viscera of the thorax, abdomen and pelvis. Structures covered include the heart and associated great vessels, lungs, mediastinum and the abdominal viscera, the alimentary organs and the genitourinary system. The structure of anterior thoracic and abdominal walls and pelvis along with the nerve supply to the viscera and relevant endocrine structures is also covered. Emphasis is placed on the relationship of structure to function especially with respect to the important functions of breathing, digestion, excretion and reproduction. Students will also be encouraged to relate their understanding of the structures studied to current research into these structures in related fields such as molecular biology and physiology.

Textbooks
Rohan, Yokochi and Lutjen-drecoll. Color Atlas of Human Anatomy.

ANAT3008
Musculoskeletal Anatomy

Credit points: 6 **Teacher/Coordinator:** Dr Richard Ward **Session:** Semester 2 **Classes:** Two 1 hour lectures, two 2 hour tutorials/practicals per week. **Prerequisites:** ANAT2009 or ANAT2002 (for students who completed Intermediate study before 2005) or BMED2803 or BMED2804 or BMED2805 or BMED2806 **Prohibitions:** ANAT3005 **Assumed knowledge:** Some knowledge of basic mammalian biology **Assessment:** One assignment, one 1 hour prac exam, one 1.5 hour theory exam.

The unit provides an opportunity for students to study the topographical and systems anatomy of the upper limb, lower limb and the back regions. Emphasis is placed upon the identification and description of structures and the correlation of structure with function. This includes for the upper limb, its role in manipulation, for the lower limb standing and walking and for the back flexible support and protection. Emphasis is also given to the innervation of the limbs. The unit also aims to develop the general skills of observation, description, drawing, writing and discussion as applying to biological structure.

EMHU3001
Electron Microscopy and Imaging/Theory

Credit points: 6 **Teacher/Coordinator:** Dr Anne Swan and Dr Alan Jones **Session:** Semester 2 **Classes:** Four 1 hour lectures and one 1 hour tutorial per week. **Prerequisites:** At least 12 cp of Intermediate Science units from any of the following: Anatomy & Histology, Biochemistry, Biology, Chemistry, Mathematics, Microbiology, Molecular Biology & Genetics, Pharmacology, Physics, Physiology or Statistics. For BMedSc students: either 36 cp of Intermediate units including BMed (2501, 2503 & 2505) or 42 cp of BMed Intermediate units including (2801, 2802, 2803 & 2806) **Assumed knowledge:** General concepts in Biology, and in Biochemistry or in Chemistry. **Assessment:** Two 1 hour exams, theoretical research assignment as a PowerPoint (TM) submission and protocol.

The course is run conjointly by the Department of Anatomy and Histology and the Electron Microscope Unit. The course will focus on the theoretical aspects of transmission and scanning electron microscopy, the preparation of biological samples for electron microscopy, digital imaging, and freeze-fracture. Immunological and other techniques required in modern research and hospital electron microscope laboratories will also be covered. Students will also receive theoretical training in laser scanning confocal microscopy including the use of fluorescent probes to visualize cellular organelles and cellular processes. Students will undertake a theoretical research project of their choice which is of relevance to the course.

Textbooks
Bozzola JJ and Russell LD. Electron Microscopy. 2nd Edn. Jones and Bartlett, Publishers. 1999.
Reference book: John C. Russ. The Image Processing Handbook. 3rd Edn, CRC Press, 1998.

EMHU3002
Electron Microscopy and Imaging/Prac

Credit points: 6 **Teacher/Coordinator:** Dr Anne Swan and Dr Alan Jones **Session:** Semester 2 **Classes:** Two 2 hour practicals and one 1 hour tutorial per week. **Prerequisites:** 12 cp as follows: 6 cp from ANAT2008 OR 4 cp from ANAT2001 plus at least 6 cp OR 8 cp respectively of Intermediate Science units of study. For BMedSci: Either 36 credit points of intermediate units including BMed (2501, 2503 & 2505) or 42 credit points of BMed Intermediate units including BMed (2801, 2802, 2803 & 2806) **Corequisites:** EMHU3001 **Assumed knowledge:** General concepts in Biology, Histology and in Biochemistry or in Chemistry. **Assessment:** Two 1 hour exams, practical reports, practical project assignment by PowerPoint (TM) submission and presentation (10 min).

The course is run conjointly by the Department of Anatomy & Histology and the Electron Microscope Unit. The course will provide hands-on training in the operation of transmission and scanning electron microscopes, processing biological samples for electron microscopy, ultrathin sectioning, cryo-ultramicrotomy, freeze-fracture, electron diffraction, digital imaging, immunological and other techniques required in modern research and hospital electron microscope laboratories. Students will also learn the operation of laser scanning confocal microscopes, including the use of fluorescent probes to visualise cellular organelles and cellular processes. Students will apply their knowledge to complete a project of their choice on electron microscopy of a biological sample, from fixation of the sample to interpretation of the resulting electron micrographs.

Textbooks
Bozzola JJ and Russell LD. Electron Microscopy. 2nd Edn. Jones and Bartlett, Publishers. 1999.

HSTO3001
Microscopy & Histochemistry Theory

Credit points: 6 **Teacher/Coordinator:** Robin Arnold, Prof. Chris Murphy **Session:** Semester 1 **Classes:** Usually four 1 hour lectures per week plus some tutorials **Prerequisites:** (ANAT2008 or ANAT2001) or (BMED 2803 or 2804 or 2805 or 2806) **Corequisites:** HSTO3002 **Assumed knowledge:** Basic understanding of biology. **Assessment:** One 2 hour theory exam.

The aims of this unit of study are to provide a theoretical understanding of why biological tissues need to be specifically prepared for microscopic examination, how differing methods yield different types of morphological information; to allow students to study the theory of different types & modalities of microscopes, how they function & the differing information they provide; to develop an understanding of the theory of why biological material needs to be stained for microscopic

examination; to allow students to understand how biological material becomes stained; to develop an understanding of the chemical information provided by biological staining - dyes, enzymes & antibodies.

Textbooks
Keirnan, J.A. Histological & Histochemical Methods 4th Edition, 2008, Scion.

HSTO3002
Microscopy & Histochemistry Practical

Credit points: 6 **Teacher/Coordinator:** Robin Arnold, Prof. Chris Murphy **Session:** Semester 1 **Classes:** Usually 5.5 hours practical per week **Prerequisites:** (ANAT2008 or ANAT2001) or (BMED 2803 or 2804 or 2805 or 2806) **Corequisites:** HSTO3001 **Assumed knowledge:** Basic understanding of biology. **Assessment:** One 1.5 hour practical exam, 1 practical report, essay.

The aims of this unit of study are to provide an practical understanding of why biological tissues need to be specifically prepared for microscopic examination, to apply different methods to gain different types of morphological information; to allow students to learn to use the different types & modalities of microscopes: to gain first hand experience of how they function & see for themselves the differing information they provide; to learn to stain biological material for microscopic examination; applying their theoretical knowledge & to allow students to develop practical skills in diverse histochemical staining procedures - dyes, enzymes & antibodies.

Textbooks
Keirnan, JA. Histological & Histochemical Methods 4th Edition. Scion. 2008.

HSTO3003
Cells and Development: Theory

Credit points: 6 **Teacher/Coordinator:** A/Prof Frank Lovicu **Session:** Semester 2 **Classes:** Four 1 hour theory lectures and one 1 hour tutorial per week. **Prerequisites:** For BSc students: ANAT2008 For BMedSc students: 42 credit points of Intermediate BMED units, including: BMED2801, 2802, 2805. **Prohibitions:** EMHU3001, EMHU3002 **Assumed knowledge:** (i) An understanding of the basic structure of vertebrates; (ii) An understanding of elementary biochemistry and genetics. **Assessment:** One 2 hour exam, tutorial research papers.

Note: The completion of 6 credit points of MBLG is highly recommended.

The main emphasis of this unit of study concerns the mechanisms that control animal development. Fertilisation, cleavage, gastrulation and the formation of the primary germ layers are described in a range of animals, mainly vertebrates. Much of the emphasis will be placed on the parts played by inductive cell and tissue interactions in cell and tissue differentiation, morphogenesis and pattern formation. This will be studied at both cellular and molecular levels.

Textbooks
Gilbert SF Developmental Biology. 8th edn. Sinauer Associates Inc: Sunderland, Mass. 2006.

HSTO3004
Cells and Development: Practical (Adv)

Credit points: 6 **Teacher/Coordinator:** A/Prof Frank Lovicu **Session:** Semester 2 **Classes:** One 1 hour tutorial and two 2 hour practicals per week. **Prerequisites:** Note: This advanced unit of study is only available to select students who have achieved a mark of 65 or above in the following prerequisite units of study. For BSc students: ANAT2008. For BMedSc students: 42 credit points of Intermediate BMED units, including: BMED2801, 2802, 2805. **Corequisites:** HSTO3003 **Prohibitions:** EMHU3001, EMHU3002 **Assessment:** One 1 hour exam, Practical class reports.

Note: The completion of 6 credit points of MBLG is highly recommended.

This advanced unit of study complements HSTO3003 (Cells and Development:Theory) and is catered to provide students with laboratory research experience leading to Honours and higher degrees. It will primarily cover the design and application of experimental procedures involved in cell and developmental biology, using appropriate molecular and cellular techniques to answer developmental questions raised in HSTO3003. This unit of study will promote hands on experience with different animal models, allowing students to observe and examine developing and differentiating tissues at the macroscopic and microscopic level. The main emphasis of this unit of study will concentrate on practical approaches to understanding the mechanisms that control animal development. Fertilization, cleavage, gastrulation and the formation of the primary germ layers are covered. The parts played by inductive cell and tissue interactions in differentiation, morphogenesis and pattern formation are examined at cellular and molecular levels. Note that for some weeks of the course, specialised practical classes will be carried out at the Westmead campus.

Textbooks
Gilbert SF. Developmental Biology. 8th edn. Sinauer Associates Inc: Sunderland, Mass. 2006.

NEUR3002
Neuroscience: Motor Systems & Behaviour

Credit points: 6 **Teacher/Coordinator:** Dr Vladimir Balcar **Session:** Semester 1 **Classes:** Two 1 hour lectures per week, one 3 hour practical per fortnight and one 3 hour tutorial per fortnight. **Prerequisites:** For BMedSc students: BMED(2801 or 2503) and BMED(2806 or 2505) For other students: (PHSI(2101 or 2001 or 2901 or 2005 or 2905) or ANAT(2003 or 2010)) and 6 credit points of MBLG. **Prohibitions:** PHSI3001, NEUR3902 **Assumed knowledge:** It is strongly recommended that students also take unit NEUR3001. ANAT2010 and PHSI2005 is assumed knowledge. **Assessment:** Two 1 hour exams, neuroanatomy practical test, prac report, paper discussion sessions, library essay.

The aim of this course is to provide students with an introduction to the structure and function of the nervous system. Our current knowledge of how the brain works is based on the analysis of the normal structure of the nervous system and its pathways, the functional effects of lesions and neurological diseases in different parts of the nervous system, and the way that nerve cells work at the molecular, cellular and integrative level. This course focuses on to the neural circuits and the mechanisms that control somatic and autonomic motor systems, motivated behaviours, emotions, and other higher order functions. The lecture series addresses the different topics, each of which offers special insight into the function of the nervous system in health and disease.

Textbooks
Kandel, Schwartz, Jessel. Principles of Neural Science. 4th Ed, Elsevier, NY, 2000 or Bear, Connors, Paradiso. Neuroscience: Exploring the brain. Baltimore: Williams & Wilkins, 2001
Nolte. The Human Brain. 4th Ed, C.V. Mosby Co., St Louis, Washington D.C., Toronto, 1999

NEUR3902
Neuroscience: Motor Systems & Behav. Adv

Credit points: 6 **Teacher/Coordinator:** Dr Vladimir Balcar **Session:** Semester 1 **Classes:** Two 1 hour lectures per week, one 3 hour practical per fortnight and one 3 hour tutorial per fortnight. Advanced students may be exempt from attending some of these classes to permit meetings with supervisor. **Prerequisites:** For BMedSc students: Credit average in BMED(2801 or 2503) and BMED(2806 or 2505) For other students: Credit average in (PHSI(2101 or 2001 or 2901 or 2005 or 2905) or ANAT(2003 or 2010)) and 6 credit points of MBLG. **Prohibitions:** NEUR3002, PHSI3001 **Assumed knowledge:** ANAT2010 and PHSI2005 is assumed knowledge. **Assessment:** Two 1 hour exams, neuroanatomy practical test, prac report, paper discussion sessions, one research or review essay (research essay will replace some other assessment items from regular course).

Note: Permission from the coordinators is required for entry into this course. It is strongly recommended that students also take unit NEUR3001 or NEUR3901.

This unit of study is an extension of NEUR3002 for talented students with an interest in Neuroscience and research in this field. The lecture/practical component of the course is run in conjunction with NEUR3002. The aim of this course is to provide students with an introduction to the structure and function of the nervous system. Our current knowledge of how the brain works is based on the analysis of the normal structure of the nervous system and its pathways, the functional effects of lesions and neurological diseases in different parts of the nervous system, and the way that nerve cells work at the molecular, cellular and integrative level. This course focuses on to the neural circuits and the mechanisms that control somatic and autonomic motor systems, motivated behaviours, emotions, and other higher order functions. The lecture series addresses the different topics, each of which offers special insight into the function of the nervous system in health and disease.

Textbooks
Kandel, Schwartz, Jessel. Principles of Neural Science. 4th Ed, Elsevier, NY, 2000 or Bear, Connors, Paradiso. Neuroscience: Exploring the brain. Baltimore: Williams & Wilkins, 2001

Nolte. The Human Brain. 4th Ed, C.V. Mosby Co., St Louis, Washington D.C., Toronto, 1999

NEUR3004
Integrative Neuroscience

Credit points: 6 **Teacher/Coordinator:** Dr Kevin Keay and Dr Catherine Leamey **Session:** Semester 2 **Classes:** One 0-1 hour lecture, one 2 hour tutorial plus 1-2 hours small meeting/laboratory session per week. **Prerequisites:** For BMedSci: 42 credit points of intermediate BMed units. For others: 18 credit points of Intermediate science units of study from Anatomy & Histology, Biochemistry, Biology, Chemistry, Computer Science, Mathematics, Microbiology, Molecular Biology and Genetics, Physiology, Psychology or Statisitics. **Prohibitions:** NEUR3904, PHSI3002, PHSI3902 **Assumed knowledge:** Students should be familiar with the material in Bear, Connors & Paradiso Neuroscience: Exploring the Brain. **Assessment:** One mid-semester exam. 1 hour final exam. Major essay/report. Tutorial participation.

Note: Enrolment in NEUR3003 is HIGHLY RECOMMENDED. Courses are designed to be taken in conjunction with each other.

This second semester unit is designed to introduce students to "cutting edge" issues in the neurosciences and to be taken in conjunction with NEUR3003. This course is a combination of small group lectures on current issues in neuroscience, seminar groups and a research-based library project. Suitably qualified students may have the option of replacing the library project with a laboratory project. Seminars will be held on topics including imaging pain, emotions, cortical development & plasticity, colour vision, stroke and hypertension, long-term regulation of blood pressure, auditory hallucinations and the "cocktail party effect".

Textbooks
Kandell, Schwartz and Jessell. Principles of Neural Science. 4th edition.

NEUR3904
Integrative Neuroscience (Advanced)

Credit points: 6 **Teacher/Coordinator:** Dr Kevin Keay and Dr Catherine Leamey **Session:** Semester 2 **Classes:** One 1 hour lecture, one 2 hour tutorial and 1-2 hour small meeting/laboratory per week. **Prerequisites:** For BMedSCI: 42 credit points of intermediate BMed units. For others: 18 credit points of Intermediate science units of study from Anatomy & Histology, Biochemistry, Biology, Chemistry, Computer Science, Mathematics, Microbiology, Molecular Biology and Genetics, Physiology, Psychology or Statisitics. Plus, students must have a CREDIT (or better) in NEUR3001/3901 and NEUR3002/3902. **Prohibitions:** NEUR3004, PHSI3002, PHSI3902 **Assumed knowledge:** Students should be familiar with the material in Bear, Connors & Paradiso Neuroscience: Exploring the Brain. **Assessment:** One mid semester exam. One 1 hour final exam. Major essay/report. Tutorial participation. Mini-Lecture.

Note: Department permission required for enrolment. Note: Enrolment in NEUR3003/3903 is HIGHLY RECOMMENDED. Courses are designed to be taken in conjunction with each other. Students must receive permission from the coordinators for enrolment.

This unit encompasses the material taught in NEUR3004. Advanced students perform a research project and present a mini-lecture on a current topic in neuroscience research.

Textbooks
Kandell, Schwartz and Jessell. Principles of Neural Science. 4th edition.

For other NEUR units of study, see the entry under the School of Physiology.

Anatomy and Histology Honours and Graduate Diploma

Taking an Honours or Graduate Diploma provides the opportunity for students to do research on a project supervised by a member of staff. Assessment is based on a thesis summarising the results of the year's research, along with additional studies. To qualify for admission to Honours or the Graduate Diploma the student must obtain an appropriate standard in Senior Anatomy or Histology or Neuroscience.

Anatomy and Histology Higher Degrees

The award courses of Master of Science and Doctor of Philosophy by research are offered in the Faculty of Science by the Discipline of Anatomy and Histology.

Biochemistry

The discipline teaches Biochemistry and Molecular Biology to Science and Medical Science students at the Junior, Intermediate and Senior levels. This discipline area includes the fundamental principles governing the structure, function and interactions of biological molecules, the nature of genetic material and control of its expression and leads to an understanding of the molecular nature of living systems.

Junior program

The junior program has the introductory faculty unit of study Molecular Biology and Genetics Intro (MBLG1001).

Intermediate program

The comprehensive Intermediate program in Biochemistry and Molecular Biology includes Protein Biochemistry (BCHM2071/2971), Human Biochemistry (BCHM2072/2972) and the faculty unit of study Molecular Biology and Genetics A (MBLG2071/2971). Students wishing to progress to the Senior units of study in Biochemistry and Molecular Biology need to have completed MBLG1001 and 12 CP of Intermediate BCHM/MBLG units of study.

Senior program

The Senior program consists of Molecular Biology and Biochemistry - Genes (BCHM3071/3971), Molecular Biology and Biochemistry - Protein (BCHM3081/3981), Human Molecular Cell Biology (BCHM3072/3972), Medical and Metabolic Biochemistry, (BCHM3082/3982), Proteomics and Functional Genomics (BCHM3092/3992). Any four of these units of study constitute a major in Biochemistry. Students seeking further information should consult the relevant Tables in earlier Undergraduate Enrolment Advice chapters.

BCHM2071
Protein Biochemistry

Credit points: 6 **Teacher/Coordinator:** A/Prof Charles Collyer **Session:** Semester 1 **Classes:** Two 2 hour lectures per week, one 1 hour tutorial and one 4 hour practical per fortnight. **Prerequisites:** 12 credit points of Junior Chemistry and MBLG (1001 or 1901) **Corequisites:** Recommended concurrent units of study: MBLG2071 and BCHM2072 for progression to Senior Biochemistry. **Prohibitions:** BCHM2011, BCHM2971 **Assumed knowledge:** CHEM (1101 and 1102) **Assessment:** One 2hr theory and theory of practical exam, 2 prac reports.

This unit of study introduces biochemistry by describing the physical and chemical activities of proteins and their functions in cells. The details of protein interactions with other cellular components are presented and the relationship of protein structure and function is discussed. Techniques in protein chemistry and analysis, including proteomics are introduced together with key experiments which reveal the physical basis of the functioning of proteins. This course builds on the protein science presented in MBLG1001 and is ideally suited to students studying intermediate Chemistry together with Biochemistry. The practical course will nurture technical skills in biochemistry and will include protein preparation, the analysis of protein structure and enzymatic assays.

Textbooks
Lehninger Principles of Biochemistry 5th edition by Nelson and Cox
Resources Manual for Biochemistry 2 Practical Sessions, Sem 1

BCHM2971
Protein Biochemistry (Advanced)

Credit points: 6 **Teacher/Coordinator:** A/Prof Charles Collyer **Session:** Semester 1 **Classes:** Two 1 hour lectures per week, one 1 hour tutorial and one 4 hour practical per fortnight. **Prerequisites:** 12 credit points of Junior Chemistry and Distinction in MBLG1001 or MBLG1901 **Prohibitions:** BCHM2011, BCHM2071 **Assessment:** One 2 hour theory and theory of practical exam, online quizzes, practical assignments and laboratory book reports.

This advanced unit of study introduces biochemistry by describing the physical and chemical activities of proteins and their functions in cells. The details of protein interactions with other cellular components are presented and the relationship of protein structure and function is

discussed. Techniques in protein chemistry and analysis, including proteomics are discussed together with key experiments which reveal the physical basis of the functioning of proteins. This course builds on the protein science presented in MBLG1001 and is ideally suited to students studying Intermediate Chemistry together with Biochemistry. The advanced practical course will nurture technical skills in protein biochemistry and will include protein preparation, the interpretation of protein structure, enzymatic assays and biochemical analysis.

Textbooks

Lehninger Principles of Biochemistry 5th edition by Nelson and Cox
Resources Manual for Biochemistry 2 Practical Sessions, Sem 1

BCHM2072

Human Biochemistry

Credit points: 6 **Teacher/Coordinator:** A/Prof Gareth Denyer **Session:** Semester 2 **Classes:** Two lectures per week, one tutorial per fortnight, and one 4 hour practical per fortnight **Prerequisites:** Either MBLG (1001 or 1901) and 12 credit points of Junior Chemistry or either MBLG2071 or MBLG2971 **Prohibitions:** BCHM2972, BCHM2002, BCHM2102, BCHM2902, BCHM2112 **Assessment:** One 3 hour exam, practical reports

This unit of study aims to describe how cells work at the molecular level, with special emphasis on human biochemistry. The chemical reactions which occur inside cells are described in the first series of lectures, Cellular Metabolism. Aspects of the molecular architecture of cells which enable them to transduce messages and communicate are described in the second half of the unit of study. At every stage there is emphasis on the 'whole body' consequences of reactions, pathways and processes. Cellular Metabolism describes how cells extract energy from fuel molecules like fatty acids and carbohydrates, how the body controls the rate of fuel utilisation and how the mix of fuels is regulated (especially under different physiological circumstances such as starvation and exercise). The metabolic inter-relationships of the muscle, brain, adipose tissue and liver and the role of hormones in coordinating tissue metabolic relationships is discussed. The unit also discusses how the body lays down and stores vital fuel reserves such as fat and glycogen, how hormones modulate fuel partitioning between tissues and the strategies involved in digestion and absorption and transport of nutrients. Signal Transduction covers how communication across membranes occurs (i.e. via surface receptors and signaling cascades). This allows detailed molecular discussion of the mechanism of hormone action and intracellular process targeting. The practical component complements the lectures by exposing students to experiments which investigate the measurement of glucose utilisation using radioactive tracers and the design of biochemical assay systems. During the unit of study, generic skills are nurtured by frequent use of computers and problem solving activities. However student exposure to generic skills will be extended by the introduction of exercises designed to teach oral communication, instruction writing and feedback articulation skills.

BCHM2972

Human Biochemistry (Advanced)

Credit points: 6 **Teacher/Coordinator:** A/Prof Gareth Denyer **Session:** Semester 2 **Classes:** Two lectures per week, one tutorial per fortnight, and one 4 hour practical per fortnight **Prerequisites:** Distinction in one of (BCHM (2071 or 2971) or MBLG(2071 or 2971)) or (Distinction in MBLG (1001 or 1901) and Distinction average in all other Junior Science Units of Study undertaken). **Prohibitions:** BCHM2072, BCHM2002, BCHM2102, BCHM2902, BCHM2112 **Assessment:** One 3 hour exam, practical reports

This advanced unit aims to describe how cells work at the molecular level, with special emphasis on human biochemistry. The chemical reactions which occur inside cells are described in the first series of lectures, Cellular Metabolism. Aspects of the molecular architecture of cells which enable them to transduce messages and communicate are described in the second half of the unit of study. At every stage there is emphasis on the 'whole body' consequences of reactions, pathways and processes. Cellular Metabolism describes how cells extract energy from fuel molecules like fatty acids and carbohydrates, how the body controls the rate of fuel utilization and how the mix of fuels is regulated (especially under different physiological circumstances such as starvation and exercise). The metabolic inter-relationships of the muscle, brain, adipose tissue and liver and the role of hormones in coordinating tissue metabolic relationships is discussed. The unit also discusses how the body lays down and stores vital fuel reserves such as fat and glycogen, how hormones modulate fuel partitioning between tissues and the strategies involved in digestion and absorption and transport of nutrients. Signal Transduction covers how communication across membranes occurs (i.e., via surface receptors and signaling cascades). This allows detailed molecular discussion of the mechanism of hormone action and intracellular process targeting. The practical component complements the lectures by exposing students to experiments which investigate the measurement of glucose utilisation using radioactive tracers and the design of biochemical assay systems. During the unit of study, generic skills are nurtured by frequent use of computers and problem solving activities. However, student exposure to generic skills will be extended by the introduction of exercise designed to teach oral communication, instruction writing and feedback articulation skills.

BCHM3071

Molecular Biology & Biochemistry- Genes

Credit points: 6 **Teacher/Coordinator:** Mrs Jill Johnston, Prof Merlin Crossley. **Session:** Semester 1 **Classes:** Two 1 hour lectures per week and one 6 hour practical per fortnight. **Prerequisites:** MBLG (1001 or 1901) and 12 CP of Intermediate BCHM/MBLG units (taken from MBLG2071/2971 or BCHM2071/2971 or BCHM2072/2972) or 42CP of Intermediate BMedSc units, including BMED2802 and BMED2804. **Prohibitions:** BCHM3971, BCHM3001, BCHM3901 **Assessment:** One 2.5 hour exam, practical work.

This unit of study is designed to provide a comprehensive coverage of the activity of genes in living organisms, with a focus on eukaryotic and particularly human systems. The lecture component covers the arrangement and structure of genes, how genes are expressed, promoter activity and enhancer action. This leads into discussions on the biochemical basis of differentiation of eukaryotic cells, the molecular basis of imprinting, epigenetics, and the role of RNA in gene expression. Additionally, the course discusses the effects of damage to the genome and mechanisms of DNA repair. The modern techniques for manipulating and analysing macromolecules such as DNA and proteins and their relevance to medical and biotechnological applications are discussed. Techniques such as the generation of gene knockout and transgenic mice are discussed as well as genomic methods of analysing gene expression patterns. Particular emphasis is placed on how modern molecular biology and biochemical methods have led to our current understanding of the structure and functions of genes within the human genome. The practical course is designed to complement the lecture course and will provide students with experience in a wide range of techniques used in molecular biology laboratories.

Textbooks

Lewin, B. Genes IX (9th edition, Jones & Bartlett, 2008)

BCHM3971

Molecular Biology & Biochem- Genes (Adv)

Credit points: 6 **Teacher/Coordinator:** Mrs Jill Johnston, Prof Merlin Crossley **Session:** Semester 1 **Classes:** Two 1 hour lectures per week and one 6 hour practical per fortnight. **Prerequisites:** MBLG (1001 or 1901) and Distinction in 12 CP of Intermediate BCHM/MBLG units (taken from MBLG2071/2971 or BCHM2071/2971 or BCHM2072/2972) or 42CP of Intermediate BMedSc units, with Distinction in BMED2802 and BMED2804. **Prohibitions:** BCHM3071, BCHM3001, BCHM3901 **Assessment:** One 2.5 hour exam, practical work.

This unit of study is designed to provide a comprehensive coverage of the activity of genes in living organisms, with a focus on eukaryotic and particularly human systems. The lecture component covers the arrangement and structure of genes, how genes are expressed, promoter activity and enhancer action. This leads into discussions on the biochemical basis of differentiation of eukaryotic cells, the molecular basis of imprinting, epigenetics, and the role of RNA in gene expression. Additionally, the course discusses the effects of damage to the genome and mechanisms of DNA repair. The modern techniques for manipulating and analysing macromolecules such as DNA and proteins and their relevance to medical and biotechnological applications are discussed. Techniques such as the generation of gene knockout and transgenic mice are discussed as well as genomic

methods of analysing gene expression patterns. Particular emphasis is placed on how modern molecular biology and biochemical methods have led to our current understanding of the structure and functions of genes within the human genome. The practical course is designed to complement the lecture course and will provide students with experience in a wide range of techniques used in molecular biology laboratories.

The lecture component of this unit of study is the same as BCHM3071. Qualified students will attend seminars/practical classes in which more sophisticated topics in gene expression and manipulation will be covered.

Textbooks
Lewin, B. Genes IX. (9th edition, Jones & Bartlett, 2008)

BCHM3081
Mol Biology & Biochemistry- Proteins

Credit points: 6 **Teacher/Coordinator:** Mrs Jill Johnston, Dr Joel Mackay **Session:** Semester 1 **Classes:** Two 2 hour lectures week and one 6 hour practical per fortnight. **Prerequisites:** MBLG (1001 or 1901) and 12 CP of Intermediate BCHM/MBLG units (taken from MBLG2071/2971 or BCHM2071/2971 or BCHM2072/2972) or 42CP of Intermediate BMedSc units, including BMED2802 and BMED2804. **Prohibitions:** BCHM3981, BCHM3001, BCHM3901 **Assessment:** One 2.5 hour exam, practical work.

This unit of study is designed to provide a comprehensive coverage of the functions of proteins in living organisms, with a focus on eukaryotic and particularly human systems. Its lecture component deals with how proteins adopt their biologically active forms, including discussions of protein structure, protein folding and how recombinant DNA technology can be used to design novel proteins with potential medical or biotechnology applications. Particular emphasis is placed on how modern molecular biology and biochemical methods have led to our current understanding of the structure and functions of proteins. It also covers physiologically and medically important aspects of proteins in living systems, including the roles of chaperones in protein folding inside cells, the pathological consequences of misfolding of proteins, how proteins are sorted to different cellular compartments and how the biological activities of proteins can be controlled by regulated protein degradation. The practical course is designed to complement the lecture course and will provide students with experience in a wide range of techniques used in molecular biology and protein biochemistry laboratories.

Textbooks
Lesk, A. Introduction to Protein Science. Oxford University Press. 2004.

BCHM3981
Mol Biology & Biochemistry- Proteins Adv

Credit points: 6 **Teacher/Coordinator:** Mrs Jill Johnston, Dr Joel Mackay **Session:** Semester 1 **Classes:** Two 1 hour lectures per week and one 6 hour practical per fortnight. **Prerequisites:** MBLG (1001 or 1901) and Distinction in12 CP of Intermediate BCHM/MBLG units (taken from MBLG2071/2971 or BCHM2071/2971 or BCHM2072/2972) or 42CP of Intermediate BMedSc units, with Distinction in BMED2802 and BMED2804. **Prohibitions:** BCHM3081, BCHM3001, BCHM3901 **Assessment:** One 2.5 hour exam, practical work.

This unit of study is designed to provide a comprehensive coverage of the functions of proteins in living organisms, with a focus on eukaryotic and particularly human systems. Its lecture component deals with how proteins adopt their biologically active forms, including discussions of protein structure, protein folding and how recombinant DNA technology can be used to design novel proteins with potential medical or biotechnology applications. Particular emphasis is placed on how modern molecular biology and biochemical methods have led to our current understanding of the structure and functions of proteins. It also covers physiologically and medically important aspects of proteins in living systems, including the roles of chaperones in protein folding inside cells, the pathological consequences of misfolding of proteins, how proteins are sorted to different cellular compartments and how the biological activities of proteins can be controlled by regulated protein degradation. The practical course is designed to complement the lecture course and will provide students with experience in a wide range of techniques used in molecular biology and protein biochemistry laboratories.

The lecture component of this unit of study is the same as BCHM3081. Qualified students will attend seminars/practical classes in which more sophisticated topics in gene expression and manipulation will be covered.

Textbooks
Lesk, A. Introduction to Protein Science. Oxford University Press. 2004.

BCHM3072
Human Molecular Cell Biology

Credit points: 6 **Teacher/Coordinator:** Mrs Jill Johnston, Prof Iain Campbell **Session:** Semester 2 **Classes:** One 2 hour lecture per week and one 6 hour practical per fortnight. **Prerequisites:** (MBLG (1001 or 1901) and 12 CP of Intermediate BCHM/MBLG units (taken from MBLG2071/MBLG2971or BCHM2071/2971 or BCHM2072/2972)) or (42CP of Intermediate BMedSc units, including BMED2802 and BMED2804) **Prohibitions:** BCHM3972, BCHM3002, BCHM3902, BCHM3004, BCHM3904 **Assessment:** One 2.5 hour exam, practical work.

Note: BExSci/BSc(Nutrition) students successfully progressing though the combined degree meet the pre-requisites for this unit of study

This unit of study will explore the responses of cells to changes in their environment in both health and disease. The lecture course consists of four integrated modules. The first will provide an overview of the role of signalling mechanisms in the control of human cell biology and then focus on cell surface receptors and the downstream signal transduction events that they initiate. The second will examine how cells detect and respond to pathogenic molecular patterns displayed by infectious agents and injured cells by discussing the roles of relevant cell surface receptors, cytokines and signal transduction pathways. The third and fourth will focus on the life, death and differentiation of human cells in response to intra-cellular and extra-cellular signals by discussing the eukaryotic cell cycle under normal and pathological circumstances and programmed cell death in response to abnormal extra-cellular and intra-cellular signals. In all modules emphasis will be placed on the molecular processes involved in human cell biology, how modern molecular and cell biology methods have led to our current understanding of them and the implications of them for pathologies such as cancer. The practical component is designed to complement the lecture course, providing students with experience in a wide range of techniques used in modern molecular cell biology.

Textbooks
Alberts, B. et al. Molecular Biology of the Cell. (5th edition. Garland Science. 2008)

BCHM3972
Human Molecular Cell Biology (Advanced)

Credit points: 6 **Teacher/Coordinator:** Mrs Jill Johnston, Prof Iain Campbell **Session:** Semester 2 **Classes:** Two 1 hour lectures per week and one 6 hour practical per fortnight. **Prerequisites:** MBLG (1001 or 1901) and Distinction in 12 CP of Intermediate BCHM/MBLG units (taken from MBLG2071/MBLG2971 or BCHM2071/2971 or BCHM2072/2972) or 42CP of Intermediate BMedSc units, with Distinction in BMED2802 and BMED2804. **Corequisites:** MBLG3999 **Prohibitions:** BCHM3072, BCHM3002, BCHM3004, BCHM3902, BCHM3904 **Assessment:** One 2.5 hour exam, practical work.

This unit of study will explore the responses of cells to changes in their environment in both health and disease. The lecture course consists of four integrated modules. The first will provide an overview of the role of signalling mechanisms in the control of human cell biology and then focus on cell surface receptors and the downstream signal transduction events that they initiate. The second will examine how cells detect and respond to pathogenic molecular patterns displayed by infectious agents and injured cells by discussing the roles of relevant cell surface receptors, cytokines and signal transduction pathways. The third and fourth will focus on the life, death and differentiation of human cells in response to intra-cellular and extra-cellular signals by discussing the eukaryotic cell cycle under normal and pathological circumstances and programmed cell death in response to abnormal extra-cellular and intra-cellular signals. In all modules emphasis will be placed on the molecular processes involved in human cell biology, how modern molecular and cell biology methods have led to our current understanding of them and the implications of them for pathologies such as cancer. The practical component is designed to complement the lecture course, providing students with

experience in a wide range of techniques used in modern molecular cell biology. The lecture component of this unit of study is the same as BCHM3072. Qualified students will attend seminars/practical classes in which more sophisticated topics in gene expression and manipulation will be covered.

Textbooks

Alberts, B. et al. Molecular biology of the cell. (5th edition. Garland Science. 2008).

BCHM3082
Medical and Metabolic Biochemistry

Credit points: 6 **Teacher/Coordinator:** Mrs Jill Johnston, Prof Philip Kuchel **Session:** Semester 2 **Classes:** Two 1 hour lectures per week and one 6 hour practical per fortnight. **Prerequisites:** MBLG (1001 or 1901) and 12 CP of Intermediate BCHM/MBLG units (taken from MBLG2071/2971 or BCHM2071/2971 or BCHM2072/2972) or 42CP of Intermediate BMedSc units, including BMED2802 and BMED2804. **Prohibitions:** BCHM3982, BCHM3002, BCHM3004, BCHM3902, BCHM3904 **Assessment:** One 2.5 hour exam, practical work.

Note: BExSci/BSc(Nutrition) students successfully progressing though the combined degree meet the pre-requisites for this unit of study

This unit of study will explore the biochemical processes involved in the operation of cells and how they are integrated in tissues and in the whole human body in normal and diseased states. These concepts will be illustrated by considering whole-body aspects of energy utilisation, fat and glycogen storage and their regulation under normal conditions compared to obesity and diabetes. Key concepts that will be discussed include energy balance, regulation of metabolic rate, control of food intake, tissue interactions in fuel selection, the role of adipose tissue and transport of fuel molecules from storage organs and into cells. Particular emphasis will be placed on how the modern concepts of metabolomics, coupled with new methods, including magnetic resonance techniques, molecular biology methods and microarray technologies, as well as studies of the structure and function of enzymes, have led to our current understanding of how metabolic processes are normally integrated and how they become deranged in disease states. The practical component is designed to complement the lecture course and will provide students with experience in a wide range of techniques used in modern medical and metabolic biochemistry.

BCHM3982
Medical and Metabolic Biochemistry (Adv)

Credit points: 6 **Teacher/Coordinator:** Mrs Jill Johnston, Prof Philip Kuchel **Session:** Semester 2 **Classes:** Two 1 hour lectures per week and one 6 hour practical per fortnight. **Prerequisites:** MBLG (1001 or 1901) and Distinction in 12 CP of Intermediate BCHM/MBLG units (taken from MBLG2071/2971 or BCHM2071/2971 or BCHM2072/2972) or 42CP of Intermediate BMedSc units, with Distinction in BMED2802 and BMED2804. **Prohibitions:** BCHM3082, BCHM3002, BCHM3004, BCHM3902, BCHM3904 **Assessment:** One 2.5 hour exam, practical work.

This unit of study will explore the biochemical processes involved in the operation of cells and how they are integrated in tissues and in the whole human body in normal and diseased states. These concepts will be illustrated by considering whole-body aspects of energy utilisation, fat and glycogen storage and their regulation under normal conditions compared to obesity and diabetes. Key concepts that will be discussed include energy balance, regulation of metabolic rate, control of food intake, tissue interactions in fuel selection, the role of adipose tissue and transport of fuel molecules from storage organs and into cells. Particular emphasis will be placed on how the modern concepts of metabolomics, coupled with new methods, including magnetic resonance techniques, molecular biology methods and microarray technologies, as well as studies of the structure and function of enzymes, have led to our current understanding of how metabolic processes are normally integrated and how they become deranged in disease states. The practical component is designed to complement the lecture course and will provide students with experience in a wide range of techniques used in modern medical and metabolic biochemistry.

The lecture component of this unit of study is the same as BCHM3082. Qualified students will attend seminars/practical classes in which more sophisticated topics in gene expression and manipulation will be covered.

BCHM3092
Proteomics and Functional Genomics

Credit points: 6 **Teacher/Coordinator:** Dr Stuart Cordwell, Mrs Jill Johnston **Session:** Semester 2 **Classes:** Two 1 hour lectures per week and one 3 hour practical per week. **Prerequisites:** MBLG (1001 or 1901) and 12 CP of Intermediate BCHM/MBLG units (taken from MBLG2071/2971 or BCHM2071/2971 or BCHM2072/2972) or 42CP of Intermediate BMedSc units, including BMED2802 and BMED2804. **Prohibitions:** BCHM3992, BCHM3098 **Assessment:** One 2.5 hour exam, practical work.

This unit of study will focus on the high throughput methods for the analysis of gene structure and function (genomics) and the analysis of proteins (proteomics), which are at the forefront of discovery in the biomedical sciences. The course will concentrate on the hierarchy of gene-protein-structure-function through an examination of modern technologies built on the concepts of genomics versus molecular biology, and proteomics versus biochemistry. Technologies to be examined include DNA sequencing, nucleic acid and protein microarrays, two-dimensional gel electrophoresis of proteins, uses of mass spectrometry for high throughput protein identification, isotope tagging for quantitative proteomics, high-performance liquid chromatography, high-throughput functional assays, affinity chromatography and modern methods for database analysis. Particular emphasis will be placed on how these technologies can provide insight into the molecular basis of changes in cellular function under both physiological and pathological conditions as well as how they can be applied to biotechnology for the discovery of biomarkers, diagnostics, and therapeutics. The practical component is designed to complement the lecture course and will provide students with experience in a wide range of techniques used in proteomics and genomics.

Textbooks

Liebler, DC. Introduction to proteomics : tools for the new biology. Humana Press. 2002.

BCHM3992
Proteomics and Functional Genomics (Adv)

Credit points: 6 **Teacher/Coordinator:** Dr Stuart Cordwell, Mrs Jill Johnston **Session:** Semester 2 **Classes:** Two 1 hour lectures per week and one 3 hour practical per fortnight. **Prerequisites:** MBLG (1001 or 1901) and Distinction in 12 CP of Intermediate BCHM/MBLG units (taken from MBLG2071/2971 or BCHM2071/2971 or BCHM2072/2972) or 42CP of Intermediate BMedSc units, with Distinction in BMED2802 and BMED2804. **Prohibitions:** BCHM3092, BCHM3098 **Assessment:** One 2.5 hour exam, practical work.

This unit of study will focus on the high throughput methods for the analysis of gene structure and function (genomics) and the analysis of proteins (proteomics) which are at the forefront of discovery in the biomedical sciences. The course will concentrate on the hierarchy of gene-protein-structure-function through an examination of modern technologies built on the concepts of genomics versus molecular biology, and proteomics versus biochemistry. Technologies to be examined include DNA sequencing, nucleic acid and protein microarrays, two-dimensional gel electrophoresis of proteins, uses of mass spectrometry for high throughput protein identification, isotope tagging for quantitative proteomics, high-performance liquid chromatography, high-throughput functional assays, affinity chromatography and modern methods for database analysis. Particular emphasis will be placed on how these technologies can provide insight into the molecular basis of changes in cellular function under both physiological and pathological conditions as well as how they can be applied to biotechnology for the discovery of biomarkers, diagnostics, and therapeutics. The practical component is designed to complement the lecture course and will provide students with experience in a wide range of techniques used in proteomics and genomics.

The lecture component of this unit of study is the same as BCHM3092. Qualified students will attend seminars/practical classes in which more sophisticated topics in gene expression and manipulation will be covered.

Textbooks

Liebler, DC. Introduction to proteomics : tools for the new biology. Humana Press. 2002.

Biochemistry Honours

An honours program of study designed for those wishing to enter research or to undertake work leading to a higher degree is conducted in the fourth year. The program runs from early February until mid-November (mid-year entry will be available from 2008 and runs from early-September until mid-July). It provides the opportunity for laboratory research on a project supervised by a staff member, culminating in the production of a research thesis. During the year each student is also required to undertake a coursework program that involves six tutorials and an exam based on the critical evaluation of scientific manuscripts. Assessment of the year's work is based largely on the student's performance on the research project, and a written report on that project.

Honours Research Areas

Biochemistry Honours is conducted within the School of Molecular and Microbial Biosciences. The School offers projects in a wide range of research areas including Physical Biochemistry and Structural Biology, Microbiology, Proteomics and Biotechnology, Nutrition and Metabolism and Molecular Biology and Genetics. Specific research topics currently offered include: Anticancer drugs: synthesis and mechanism of action; Biochemistry of cellular signal transduction; The causes of diabetes and/or obesity; Chaperones and amyloid formation; X-ray crystallography of proteins and drug DNA complexes; NMR studies of membrane transport and metabolism in cells; Antibiotic resistance mechanisms in microbial pathogens; Eukaryotic transcription factors; Protein structure modeling; Molecular biology of humans and yeasts; Gene expression in transgenic mice; Glycaemic index of foods; oligosaccharides in human milk.

Applying for admission to Honours

An application form providing the list of possible research projects is provided to interested students and is available from the honours coordinator. Students must arrange to speak with potential supervisors and should choose two discipline areas and three supervisors in order of preference on the application form. A decision on honours entry is made in December. Attempts will be made where possible to assign students to the supervisor of their choice but this will not always be possible. In such cases the School will work with students to find an available project. Students should note that some supervisors cannot accommodate mid-year entrants. The usual requirement for acceptance into the Honours program is a credit average in a major relevant to the project of interest; any student with an undergraduate background relevant to specific projects (including Chemistry, Biochemistry, Nutrition and Dietetics, Microbiology, Immunobiology, Physiology, Neuroscience, Mathematics, Physics, Biology or other related Medical Sciences) may be admitted. It should be noted that the number of students accepted into the Honours program may be limited because of resource restrictions (availability of a supervisor and/or laboratory space) and that, in the event of there being more applicants than resources will allow, offers will be made on the basis of academic merit. The honours unit of study codes are listed in the Honours chapter of this handbook - chapter 12. The Honours year coordinator is Dr Stuart Cordwell.

Bioinformatics

Bioinformatics is an interdisciplinary area of science, involving Computer Science, Computational Science, Mathematics, Statistics, and the Life Sciences (ie. biology, medicine, etc). It is responsible for the development and use of computer systems, databases, software, networks, and hardware to solve scientific problems in a wide variety of areas ranging from biology to medicine.Due to its interdisciplinary nature, the BSc (Bioinformatics) degree is composed of units of study that are offered also to students enrolled in other degrees, the general aim being to equip the students enrolled in the BSc (Bioinformatics) degree with knowledge in key areas of relevance to Bioinformatics.

First Year

In the first year of their study, students devote time to units of study offered by the School of Biological Sciences, School of Chemistry, School of Information Technologies, School of Mathematics and Statistics, and School of Molecular and Microbial Biosciences (see Table 1A in chapter 4).

Second Year

In the second and third year of their study, students divide time equally between the Life Sciences and the mathematical, statistical, and computational sciences, choosing units of study from those offered by the School of Biological Sciences, School of Information Technologies, School of Mathematics and Statistics, School of Molecular and Microbial Biosciences, School of Physics, and the Department of Pharmacology (see Table 1A).

Third Year

In the third year of their study, the students are highly recommended to enrol in BIOL3027/3927 (Bioinformatics and Genomics) and BCHM3092/3992 (Proteomics and Functional Genomics). Furthermore, the students complete a unit of study - BINF3101 (Bioinformatics Project) - that is designed specifically to give them an opportunity to do real research, supervised by scientists from the bio-medical disciplines. For further information regarding third year requirements see Table 1A.

BINF3101
Bioinformatics Project

Credit points: 6 **Teacher/Coordinator:** A/Prof L Jermiin, Dr M Charleston **Session:** Semester 2 **Classes:** Meeting with academic supervisor 1hour per week & class meeting 1 hour per week. **Prerequisites:** INFO3402 and 12 credit points from Intermediate Biology, Molecular Biology and Genetics, Biochemistry, Microbiology, Pharmacology **Prohibitions:** COMP3206, BINF3001, INFO3600, SOFT3300, SOFT3600, SOFT3200, SOFT3700 **Assumed knowledge:** INFO2110 and (INFO1103 or INFO1903) **Assessment:** Individual presentation, oral examination and group report

This unit will provide students an opportunity to apply the knowledge and practice the skills acquired in the prerequisite and qualifying units, in the context of designing and building a substantial bioinformatics application. Working in groups, students will carry out the full range of activities including requirements capture, analysis and design, coding, testing and documentation.

Biological Sciences

Advice on units of study

Any student needing advice before enrolling should make an appointment to see an adviser from the School of Biological Sciences. Phone 9351 5819 (First Year Biology Office) for enquiries about junior units; or 9351 2848 for enquiries about Intermediate and Senior units. Units of study in Biology include those with the prefixes BIOL (Biology), PLNT (Plant Sciences) and MBLG (Molecular Biology and Genetics), as well as ENVI2111. Refer to the relevant sections of this handbook for details of PLNT, MBLG and ENVI units of study. For information on how to major in Biology or Plant Sciences, with advice on units of study, see www.bio.usyd.edu/au/futurestudents/future_ug.html.

Assistance during semester

The offices of junior year Biology staff and the Biology Learning Centre are on the 5th floor of Carslaw. Staff are available for consultation throughout semester. The School maintains a website that provides access to resources for students: www.bio.usyd.edu.au.

Summer School: January-February

The School of Biological Sciences offers some junior units of study in the Sydney Summer School. Consult The Sydney Summer School website for more information: www.summer.usyd.edu.au. Students may enrol in junior units of study offered at Summer School before their first semester of university enrolment.

Biology Bridging Course

Students who have not completed HSC Biology or equivalent are strongly encouraged to attend the Biology Bridging Course before commencing any Biology study at university. Details are available each year from the Continuing Education Website: www-secure.cce.usyd.edu.au.

Junior units of study

Students may take up to four units of study in Junior Biology: BIOL1001 or 1911 (Concepts in Biology); BIOL1003 or 1903 (Human Biology); BIOL1002 or 1902 (Living Systems); and MBLG1001 (Molecular Biology and Genetics).

BIOL1001
Concepts in Biology

Credit points: 6 **Session:** Semester 1, Summer Main **Classes:** Three 1 hour lectures and one 3 hour practical per week. **Prohibitions:** BIOL(1911 or 1101 or 1901) **Assumed knowledge:** None. However, students who have not completed HSC Biology (or equivalent) are strongly advised to take the Biology Bridging Course (in February). **Assessment:** One 2.5 hour exam, assignments, quizzes.

Note: It is recommended that BIOL (1001 or 1911) be taken concurrently with all other Junior units of study in Biology. Students who have completed HSC Biology and scored 80+ should enrol in BIOL1911. Students who lack 80+ in HSC Biology but have a UAI of at least 93 may enrol in BIOL1911 with permission from the UEO. The completion of MBLG 1001 is highly recommended.

Concepts in Biology is an introduction to the major themes of modern biology. The unit emphasizes how biologists carry out scientific investigations, from the cellular/molecular level to the level of ecosystems. Topics covered in lectures and practicals include: introductory cell biology, with particular emphasis on how cells obtain and use energy; the diversity and biology of microorganisms; an introduction to molecular biology through the role of DNA in protein synthesis, including current developments in DNA technology; genetics or organisms; theories of evolution and phylogenetic analysis, and how they are used to interpret the origins of the diversity of modern organisms; and interactions between organisms in biological communities, with emphasis on Australian ecology.

Textbooks
Knox R B et al. Biology, 3rd ed. McGraw-Hill. 2005

BIOL1911
Concepts in Biology (Advanced)

Credit points: 6 **Session:** Semester 1 **Classes:** 3 lectures & one 3 hrs prac/wk. **Prerequisites:** 80+ in HSC 2-unit Biology (or equivalent) or Distinction or better in a University level Biology unit, or by invitation. **Prohibitions:** BIOL (1001, 1101, 1901). **Assessment:** One 2.5hr exam, assignments, quizzes.

Note: Department permission required for enrolment. Note: It is recommended that BIOL (1001 or 1911) be taken concurrently with all other Junior units of study in Biology. The completion of MBLG1001 is highly recommended.

Concepts in Biology (Advanced) builds on the main themes introduced in HSC Biology, with emphasis on current research in biology. Topics covered in lectures and practicals include: cell biology, with particular emphasis on how cells obtain and use energy; the diversity and biology of microorganisms; current developments in molecular biology, including recombinant DNA technology and the human genome project; inheritance, genetics and the origins of diversity of modern organisms; and interactions between organisms in biological communities, with emphasis on Australian ecology. Research-based lectures will expand on the general lecture topics and include current investigations of such diverse topic areas as cancer therapies, metabolic malfunction, anarchy in beehives, evolutionary studies of snake reproductive strategies, plant phylogeny and global environmental change.

Textbooks
As for BIOL1001.

BIOL1003
Human Biology

Credit points: 6 **Session:** Semester 1, Summer Main **Classes:** Two 1 hour lectures per week (3 lectures in weeks 1 and 11). One 3 hour practical class and 6-9 hours HBOnline work every two weeks covering online practical activities, prework and homework. **Prohibitions:** BIOL1903, EDUH1016. **Assumed knowledge:** HSC 2-unit Biology. Students who have not taken HSC biology are strongly advised to take the Biology Bridging Course in February. **Assessment:** One 2.5 hour exam, assignment, poster and quizzes.

Note: It is recommended that BIOL (1001 or 1911) be taken concurrently with this unit of study.

This Unit of Study has three main components: lectures, practicals and HBOnline activities. The unit of study provides an introduction to human evolution and ecology, cell biology, physiology and anatomy, through lectures and practical work. The unit of study includes human nutrition, distribution of essential requirements to and from cells, control of body functions and defence mechanisms. After discussion of reproduction and development, it concludes with modern studies and research prospects in biotechnology and human genetics.

This unit of study, together with BIOL (1001 or 1911 or 1002 or 1902), or MBLG (1001 or 1901), provides entry to Intermediate units of study in Biology, but the contents of BIOL (1002 or 1902) is assumed knowledge for BIOL (2011 or 2012) and PLNT 2003, and students entering these units with BIOL (1003 or 1903) will need to do some preparatory reading.

Textbooks
Seeley, RR et al. 2005. Essentials of Anatomy and Physiology. 5th ed., McGraw Hill.
Mader, Sylvia. Human Biology 8th edition. McGraw Hill, (Chapters 19, 24, 26)

BIOL1903
Human Biology (Advanced)

Credit points: 6 **Session:** Semester 1 **Classes:** Two 1 hour lectures per week (3 lectures in weeks 1 and 11). One 3 hour practical class and 6-9 hours HBOnline work every two weeks covering online practical activities, prework and homework. **Prerequisites:** UAI of at least 93 and HSC Biology result in the 90+, or Distinction or better in a University level Biology unit, or by invitation. **Prohibitions:** BIOL1003, BIOL1904, EDUH1016 **Assessment:** One 2.5 hour exam, assignment, group project presentation, discussion activities and quizzes.

This unit of study is the same as BIOL1003 except for the addition of 3 special seminars from guest speakers, a three hour ethics and bioscience component and three student peer group case study presentations.

Textbooks
As for BIOL1003

BIOL1002
Living Systems

Credit points: 6 **Session:** Semester 2 **Classes:** Three 1 hour lectures and one 3 hour practical per week. **Prohibitions:** BIOL1902 **Assumed knowledge:** HSC 2-unit Biology. Students who have not undertaken an HSC biology course are strongly advised to complete a Biology Bridging Course (in February). **Assessment:** One 2.5 hour exam, assignments, quizzes.

Note: It is recommended that BIOL (1001 or 1911) be taken before this unit of study. This unit of study, together with BIOL (1001 or 1911) provides entry to all Intermediate units of study in biology in the School of Biological Sciences.

Living Systems deals with the biology of organisms, from bacteria to large plants and animals, and emphasises the ways in which they can live in a range of habitats. The importance of energy in living systems, and how elements are used and recycled in biological communities, are described. The unit of study includes lectures and laboratory classes on the physiology of nutrition and growth, basic physiological processes of animals and plants, the ways in which organisms control and integrate their activities, and their reproduction. Finally applications of knowledge of genetics and ecology to practical problems in agriculture and conservation are introduced.

Textbooks
Knox R B et al. Biology. 3rd ed. McGraw-Hill. 2005

BIOL1902
Living Systems (Advanced)

Credit points: 6 **Session:** Semester 2 **Classes:** Three 1 hour lectures and one 3 hour practical per week. **Prerequisites:** UAI of at least 93 and HSC Biology result in the 90th percentile or better, or Distinction or better in a University level Biology unit, or by invitation. **Prohibitions:** BIOL1002, BIOL1904, BIOL1905 **Assessment:** One 2.5 hour exam, assignments, quizzes, independent project.

Note: Department permission required for enrolment.

This unit of study shares lectures and practical classes with BIOL1002 but also includes more demanding alternative components of Living Systems

Textbooks
As for BIOL1002.

MBLG1001
Molecular Biology and Genetics (Intro)

Credit points: 6 **Teacher/Coordinator:** Dr Dale Hancock **Session:** Semester 2 **Classes:** Two 1 hour lectures per week; one 1 hour tutorial and one 4 hour practical per fortnight. **Prohibitions:** AGCH2001, BCHM2001, BCHM2101, BCHM2901, MBLG2101, MBLG2901, MBLG2001, MBLG2111, MBLG2771, MBLG2871, MBLG1901 **Assumed knowledge:** 6 credit points of Junior Biology and 6 cp of Junior Chemistry **Assessment:** One 2.5 hour exam, in-semester skills test and assignments

The lectures in this unit of study introduce the "Central Dogma" of molecular biology and genetics -i.e., the molecular basis of life. The course begins with the information macro-molecules in living cells: DNA,RNA and protein, and explores how their structures allow them to fulfill their various biological roles. This is followed by a review of how DNA is organised into genes leading to discussion of replication and gene expression (transcription and translation). The unit concludes with an introduction to the techniques of molecular biology and, in particular, how these techniques have led to an explosion of interest and research in Molecular Biology. The practical component complements the lectures by exposing students to experiments which explore the measurement of enzyme activity, the isolation of DNA and the 'cutting' of DNA using restriction enzymes. However, a key aim of the practicals is to give students higher level generic skills in computing, communication, criticism, data analysis/evaluation and experimental design.

Textbooks
Clarke, D. Molecular Biology. Elsevier 2005.

MBLG1901
Molecular Biology and Genetics (Adv)

Credit points: 6 **Teacher/Coordinator:** Dr Dale Hancock **Session:** Semester 2 **Classes:** Two 1 hour lectures per week; one 1 hour tutorial and one 4 hour practical per fortnight, four 1 hour seminars per semester. **Prerequisites:** UAI of 95 or minimum Band 5 in HSC chemistry and biology or by invitation **Prohibitions:** AGCH2001, BCHM2001, BCHM2101, BCHM2901, MBLG2101, MBLG2901, MBLG2001, MBLG2111, MBLG2771, MBLG2871, MBLG1001 **Assumed knowledge:** HSC Chemistry and Biology OR 6 credit points of Junior Biology and 6 cp of Junior Chemistry **Assessment:** One 2.5 hour exam, in-semester skills test and assignments

The lectures in this unit of study introduce the "Central Dogma" of molecular biology and genetics -i.e., the molecular basis of life. The course begins with the information macro-molecules in living cells: DNA,RNA and protein, and explores how their structures allow them to fulfill their various biological roles. This is followed by a review of how DNA is organised into genes leading to discussion of replication and gene expression (transcription and translation). The unit concludes with an introduction to the techniques of molecular biology and, in particular, how these techniques have led to an explosion of interest and research in Molecular Biology. The practical component complements the lectures by exposing students to experiments which explore the measurement of enzyme activity, the isolation of DNA and the 'cutting' of DNA using restriction enzymes. However,a key aim of the practicals is to give students higher level generic skills in computing, communication, criticism, data analysis/evaluation and experimental design.

The advanced component is designed for students interested in continuing in molecular biology. It consists of 7 advanced lectures (replacing 7 regular lectures) and 3 advanced laboratory sessions (replacing 3 regular practical classes). The advanced lectures will focus on the experiments which led to key discoveries in molecular biology. The advanced practical sessions will give students the opportunity to explore alternative molecular biology experimental techniques. Attendance at MBLG1999 seminars is strongly encouraged.

Textbooks
Clarked, D. Molecular Biology. Elsevier 2005.

Intermediate units of study

Students who wish to take Intermediate Biology units of study should refer to the booklet 'Information for Students Considering Intermediate Biology Units of Study' which is available at the website www.bio.usyd.edu.au/currentstudents/second.html and from the School Office (Science Rd Cottage, A10). Students should discuss their preferences unit of study choices, together with the other units of study they propose to study, with a Biology staff member before enrolling. If you are considering going on to study Senior Biology you must satisfy the Intermediate qualifying and prerequisite units of study for the senior units of study you intend taking. Units of study in Intermediate Biology include those with the prefixes BIOL (Biology), PLNT (Plant Sciences) and MBLG (Molecular Biology and Genetics), as well as ENVI2111. Refer to the relevant sections of this handbook for details of PLNT (Plant Science), MBLG (Molecular Biology and Genetics) and ENVI (Environmental Studies) units of study.MBLG (2071 or 2971) and MBLG (2072 or 2972) are highly recommended to be taken by Science students in combination with all 6 credit point Intermediate Biology units of study, and are qualifying units for BIOL (3018, 3025, 3026, 3027). Note that MBLG (2071 or 2971) is a prerequisite for students wishing to enrol in MBLG (2072 or 2972). See entry for MBLG 2071, 2971, 2072 and 2972 under the heading Molecular Biology and Genetics. The following Intermediate units of study are offered:

Semester 1 units of study

BIOL2011 Invertebrate Zoology, BIOL2016 Cell Biology, PLNT2001 Applied Plant Biochemistry, PLNT2002 Aust Flora: Ecology and Conservation, ENVI2111 Conservation Biology and Applied Ecology and MBLG2071 Molecular Biology and Genetics A. (Plus Advanced versions of the above – BIOL29xx, PLNT29xx, ENVI2911, MBLG29xx).

Semester 2 units of study

BIOL2012 Vertebrates and their Origins, BIOL2017 Entomology, BIOL2018 Introduction to Marine Biology, PLNT2003 Plant Form and Function, MBLG2072 Molecular Biology and Genetics B. (Plus Advanced versions of the above – BIOL29xx, PLNT29xx, MBLG29xx).

Note:

Only one component of each of the above listed Intermediate units of study may be credited towards the degree. Qualifying units of study for certain Senior Biology units of study are defined as combinations of 6 credit points of Intermediate Biology units of study (see the Senior unit of study descriptions or Information for Students booklets). For details of PLNT units please refer to the Plant Science entry in this chapter.

BIOL2011
Invertebrate Zoology

Credit points: 6 **Teacher/Coordinator:** Dr E May. **Session:** Semester 1 **Classes:** Two 1 hour lectures, one 1 hour tutorial and one 2 hour practical per week, or three 1 hour lectures and one 2 hour practical per week. **Prerequisites:** BIOL (1001 or 1911 or 1101 or 1901) and 6 additional credit points of Junior Biology (BIOL/MBLG/EDUH). 12 credit points of Junior Chemistry (or for students in the BSc[Marine Science] stream: 6 credit points of Junior Chemistry and 6 credit points of Junior Physics). **Prohibitions:** BIOL2911. **Assumed knowledge:** BIOL (1002 or 1902). **Assessment:** Mid-semester test, one 2 hour theory exam, one 1.5 hour prac exam, one essay, tutorial work.

Note: This unit of study may be taken alone, but when taken with BIOL2012 provides entry into certain Senior Biology units of study. The content of BIOL (1002 or 1902) is assumed knowledge and students entering without BIOL (1002 or 1902) will need to do some preparatory reading. The completion of 6 credit points of MBLG units of study is highly recommended.

This unit of study provides a thorough grounding in the diversity of animals by lectures and detailed laboratory classes, which include dissections and demonstrations of the functional anatomy of invertebrates. The material is presented within the conceptual framework of evolution and the principles and use of phylogeny and classification. Tutorials further explore concepts of phylogeny, animal structure and function, and provide opportunity to develop oral and written communication skills. The unit of study is designed to be taken in conjunction with BIOL2012 Vertebrates and their Origins; the two

units of study together provide complete coverage of the diversity of animals at the level of phylum.

BIOL2911
Invertebrate Zoology (Advanced)

Credit points: 6 **Teacher/Coordinator:** Dr E May **Session:** Semester 1 **Classes:** See BIOL2011 **Prerequisites:** Distinction average in BIOL (1001 or 1911 or 1101 or 1901) and 6 additional credit points of Junior Biology (BIOL/MBLG/EDUH). 12 credit points of Junior Chemistry (or for students in BSc[Marine Science] stream: 6 credit points of Junior Chemistry and 6 credit points of Junior Physics). These requirements may be varied and students with lower averages should consult the Unit Executive Officer **Prohibitions:** BIOL2011. **Assumed knowledge:** BIOL (1002 or 1902). **Assessment:** See BIOL2011

Note: The completion of 6 credit points of MBLG units of study is highly recommended.

Qualified students will participate in alternative components of BIOL2011 Invertebrate Zoology. The content and nature of these components may vary from year to year.

BIOL2012
Vertebrates and their Origins

Credit points: 6 **Teacher/Coordinator:** Dr E L May **Session:** Semester 2 **Classes:** Two 1 hour lectures, one 1 hour tutorial and one 2 hour practical per week, or three 1 hour lectures and one 2 hour practical per week; one field trip. **Prerequisites:** BIOL (1001 or 1911 or 1101 or 1901) and 6 additional credit points of Junior Biology (BIOL/MBLG/EDUH). 12 credit points of Junior Chemistry (or for students in the BSc[Marine Science] stream: 6 credit points of Junior Chemistry and 6 credit points of Junior Physics). **Prohibitions:** BIOL 2912. **Assumed knowledge:** The content of BIOL (1002 or 1902) is assumed knowledge and students who have not completed BIOL (1002 or 1902) will need to do some preparatory reading. **Assessment:** Mid-semester test, one 2 hour theory exam, one 1.5 hour prac exam, one assignment, one essay, tutorial work.

Note: This unit of study may be taken alone, but when taken with BIOL2011 provides entry into certain Senior Biology units of study. The completion of MBLG1001 is highly recommended.

This unit of study completes the grounding in the diversity of animals at the level of phylum introduced in BIOL2011 Invertebrate Zoology, by lectures and detailed laboratory classes, which include dissections and demonstrations of the functional anatomy of vertebrates and invertebrate phyla not covered in BIOL2011. Tutorials further explore concepts of phylogeny, animal structure and function, and provide opportunity to develop oral and written communication skills. Students may choose to attend an intensive 3.5 day field trip, which takes place in the July break preceding Semester 2.

BIOL2912
Vertebrates and their Origins (Advanced)

Credit points: 6 **Teacher/Coordinator:** Dr E May **Session:** Semester 2 **Classes:** See BIOL2012 **Prerequisites:** Distinction average in BIOL (1001 or 1911 or 1101 or 1901) and 6 additional credit points of Junior Biology (BIOL/MBLG/EDUH). 12 credit points of Junior Chemistry (or for students in BSc[Marine Science] stream: 6 credit points of Junior Chemistry and 6 credit points of Junior Physics). These requirements may be varied and students with lower averages should consult the Unit Executive Officer **Prohibitions:** BIOL2012. **Assumed knowledge:** The content of BIOL (1002 or 1902) is assumed knowledge and students who have not completed BIOL (1002 or 1902) will need to do some preparatory reading. **Assessment:** See BIOL2012

Note: The completion of MBLG1001 is highly recommended.

Qualified students will participate in alternative components of BIOL2012 Vertebrates and their Origins. The content and nature of these components may vary from year to year.

BIOL2016
Cell Biology

Credit points: 6 **Teacher/Coordinator:** Dr Murray Thomson. **Session:** Semester 1 **Classes:** Two 1 hour lectures and one 4 hour practical per week. **Prerequisites:** 6 credit points of BIOL (1001 or 1911 or 1101 or 1901) and 6 additional credit points of Junior Biology (BIOL/MBLG/EDUH). 12 credit points of Junior Chemistry (or for students in the BSc (Marine Science) 6 credit points of Junior Chemistry and either an additional 6 credit points of Junior Chemistry or 6 credit points of Junior Physics). **Prohibitions:** BIOL2916. **Assessment:** One 3 hour theory exam, one project assignment, one prac report

Note: The completion of MBLG1001 is highly recommended.

This unit of study focuses on contemporary principles in cell biology and development in plant and animals, with emphasis on cellular functions and favouring the molecular perspective. Topics include cancer and control of cell division and migration, pre-programmed cell death, molecular signaling and transport systems, cellular endocrinology and embryonic development. The practical component provides students with hands-on training in key industry techniques using modern equipment and is therefore of immense benefit to students contemplating honours study or a career in molecular and cellular research. The unit of study is designed to complement intermediate Molecular Biology and Genetics units and leads ideally to various senior units of study in biology, including Plant Growth & Development, Applications of Recombinant DNA Techology, Evolutionary Genetics & Animal Behaviour, Fungi in the Environment, Animal Physiology, Bioinformatics and Genomics, as well as senior units of study in biochemistry.

Textbooks
Alberts B, Johnson A, Lewis J, Raff M, Roberts K, Walter P. 2002. Molecular Biology of the Cell. 4th Edition. Garland Science.

BIOL2916
Cell Biology (Advanced)

Credit points: 6 **Teacher/Coordinator:** Dr Murray Thomson. **Session:** Semester 1 **Classes:** Two 1 hour lectures and one 4 hour practical per week. **Prerequisites:** Distinction average in BIOL (1001 or 1911 or 1101 or 1901) and 6 additional credit points of Junior Biology. 12 credit points of Junior Chemistry (or for students in the BSc (Marine Science) 6 credit points of Junior Chemistry and either an additional 6 credit points of Junior Chemistry or 6 credit points of Junior Physics. These requirements may be varied and students with lower averages should consult the Unit Executive Officer. This is a core Intermediate unit in the BSc (Molecular Biology and Genetics) award course. **Prohibitions:** BIOL2016. **Assessment:** One 3 hour exam, one practical report and one project assignment.

Note: The completion of MBLG1001 is highly recommended.

Qualified students will participate in alternative components of BIOL2016 Cell Biology.

Textbooks
As for BIOL2016

BIOL2017
Entomology

Credit points: 6 **Teacher/Coordinator:** Dr Dieter Hochuli **Session:** Semester 2 **Classes:** Two 1 hour lecture and one 3 hour practical per week. **Prerequisites:** BIOL (1001 or 1911 or 1101 or 1901) and 6 additional credit points of Junior Biology (BIOL/MBLG/EDUH). 12 credit points of Junior Chemistry (or for BSc (Marine Science) students 6 credit points of Junior Chemistry and either an additional 6 credit points of Junior Chemistry or 6 credit points of Junior Physics. **Prohibitions:** BIOL2917. **Assumed knowledge:** BIOL (2011 or 2911). **Assessment:** Two hour theory exam, two practical reports, spot test, review and an insect collection. **Practical field work:** The practical classes give students a working knowledge of the major orders of insects and species of importance, as well as principles of collection, preservation and identification. Project work considers forensic entomology, learning in social insects and insect behaviour. Field trips to the Australian Museum and Taronga Zoo will also consider insect husbandry and the role of insects in education. There will also be an introduction to entomological databases and an assignment that involves the making and presentation of a small collection of insects.

This is a general but comprehensive introduction to Insect Biology taught in 3 integrated modules. The first module examines morphology, classification, life histories and development, physiology, ecology, behaviour, conservation, and the biology of prominent members of major groups. The other two modules examine new developments in entomological research, focusing on research strengths at the University of Sydney, the biology of social insects and insect behaviour.

BIOL2917
Entomology (Advanced)

Credit points: 6 **Teacher/Coordinator:** Dr Dieter Hochuli. **Session:** Semester 2 **Classes:** Two 1 hour lectures and one 3 hour practical per week. **Prerequisites:** Distinction average in BIOL (1001 or 1911 or 1101 or 1901) and 6 additional credit points of Junior Biology (BIOL/MBLG/EDUH). 12 credit points of Junior Chemistry (or for BSc (Marine Science) students: 6 credit points of Junior Chemistry and either an additonal 6 credit points of Junior Chemistry or 6 credit points of Junior Physics. These requirements may be varied and students with lower averages should consult the Unit Executive Officer. **Prohibitions:** BIOL2017. **Assumed knowledge:** BIOL (2011 or 2911). **Assessment:** Two hour theory exam, two practical reports, spot test, review and an insect collection.

Qualified students will participate in alternative components of BIOL2017, Entomology. The content and nature of these components may vary from year to year.

BIOL2018
Introduction to Marine Biology

Credit points: 6 **Teacher/Coordinator:** Dr Adele Pile. **Session:** Semester 2 **Classes:** 2x1hr lectures per week. 6x1hr tutorials, 1x8hr field trip, 3x4hr field trips and 1x3hr practical. **Prerequisites:** BIOL (1001 or 1911 or 1101 or 1901) and 6 additional credit points of Junior Biology (BIOL/MBLG/EDUH). 12 credit points of Junior Chemistry (or for BSc (Marine Science) students 6 credit points of Junior Chemistry and either an additional 6 credit points of Junior Chemistry or 6 credit points of Junior Physics). **Prohibitions:** BIOL2918, MARS (2006 or 2906 or 2007 or 2907). **Assumed knowledge:** 12 credit points of Junior Biology; MARS2005. **Assessment:** Two hour theory exam, four written reports.

This unit will describe some of the ways in which the properties of the oceans affect marine organisms. It also introduces coral reefs and other marine ecosystems, together with their productivity, biological oceanography, the reproductive biology of marine organisms, and marine biological resources. The practical elements will provide the core skills and techniques that will equip students to perform laboratory and field studies in marine biology. The unit will introduce appropriate methodologies for the collection, handling and analysis of data; the scientific principles underlying experimental design; and the effective communication of scientific information.

Textbooks
Castro, P. and Humber, M. 2007. Marine Biology 4th Ed. McGraw-Hill Higher Education, Sydney.

BIOL2918
Introduction to Marine Biology (Adv)

Credit points: 6 **Teacher/Coordinator:** Dr Adele Pile. **Session:** Semester 2 **Classes:** 2x1hr lectures per week. 6x1hr tutorials, 1x8hr field trip, 3x4hr field trips and 1x3hr practical. **Prerequisites:** Distinction average in BIOL (1001 or 1911 or 1101 or 1901) and 6 additional credit points of Junior Biology (BIOL/MBLG/EDUH). 12 credit points of Junior Chemistry (or for BSc (Marine Science) students 6 credit points of Junior Chemistry and either an additional 6 credit points of Junior Chemistry or 6 credit points of Junior Physics. These requirements may be varied and students with lower averages should consult the Unit Executive Officer. **Prohibitions:** BIOL2018, MARS (2006 or 2906 or 2007 or 2907). **Assumed knowledge:** 12 credit points of Junior Biology; MARS2005. **Assessment:** Two hour theory exam, four written reports.

Note: Entry is restricted and selection is made from applicants on the basis of previous performance.

This unit has the same objectives as BIOL2018, Introduction to Marine Biology, and is suitable for students wishing to pursue aspects from the unit in greater depth. Students taking this unit will participate in alternatives to some elements of the ordinary level course and will be required to pursue the unit objectives by more independent means. Specific details of the unit will be announced in meetings, during the first week of teaching.

Textbooks
As for BIOL2018

Refer to the relevant sections of this handbook for details on the following units of study:

Environmental Studies: ENVI2111 Conservation Biology and Applied Ecology.Plant Science: PLNT2001 Applied Plant Biochemistry, PLNT2002 Australian Flora: Ecology and Conservation, PLNT2003 Plant Form and Function.Molecular Biology and Genetics: MBLG2071 Molecular Biology and Genetics A, MBLG2072 Molecular Biology and Genetics B. (Plus Advanced versions of the above – ENVI2911, PLNT29xx, MBLG29xx).

Senior units of study

Students who intend to proceed from Intermediate to Senior Biology should refer to the booklet Information for Students Considering Intermediate Biology Units of Study, which is available from the School Office (The Cottage, A10 Science Road) and at www.bio.usyd.edu.au/currentstudents/third.html. Students should discuss their unit of study choices with a Biology Staff member before enrolling. A major in Biology comprises 24 credit points of Senior Biology units of study. Units of study followed by (MS) may be used to count towards a major in Marine Science.

Senior units of study offered: Pre-semester 1

BIOL3010 Tropical Wildlife Biology and Management - (Pre-Semester 1 intensive).BIOL3017 Fungi in the Environment – (Summer Break and Semester 1).(Plus Advanced versions of the above – BIOL39xx)

Senior units of study offered: Semester 1

BIOL3006 Ecological Methods (MS), BIOL3011 Ecophysiology (MS), BIOL3012 Animal Physiology, BIOL3013 Marine Biology (MS), BIOL3018 Applications of Recombinant DNA Technology, BIOL3027 Bioinformatics and Genomics, PLNT 3003 Systematics and Evolution of Plants. (Plus advanced versions of the above - BIOL 39xx, PLNT 39xx).

Senior units of study offered: Pre-semester 2 intensive

BIOL3008 Marine Field Ecology (MS) – (Pre-Semester 2 intensive).BIOL3009 Terrestrial Field Ecology – (Pre-Semester 2 intensive).(Plus Advanced versions of the above - BIOL 39xx)

Senior units of study offered: Semester 2

BIOL3007 Ecology (MS), BIOL3025 Evolutionary Genetics and Animal Behaviour, BIOL3026 Developmental Genetics, PLNT3002 Plant Growth and Development. (Plus advanced versions of the above - BIOL 39xx, PLNT 39xx).

Further information

Details of lectures and practical classes are given in the booklet: Information for Students Considering Intermediate Biology Units of Study. Any combination of units may be chosen subject to timetable and prerequisite constraints. Units of study are offered subject to student numbers, availability of staff and resources. Quotas exist on BIOL 3008/3908 Marine Field Ecology, and BIOL 3009/3909 Terrestrial Field Ecology. When necessary, selection is based on academic merit. Students majoring in Marine Science must enrol in 24 credit points of Senior Marine Science, including at least 6 credit points of Senior Biology (from those marked MS) and 6 credit points from GEOS units. If these credit points are taken as part of Marine Science major they may not be counted towards a Biology major.

Selecting units of study

Select your unit of study after checking (a) that you have passed the qualifying units of study stated for each unit of study, and (b) checking your timetable. You are strongly advised to check the most up-to-date information (including details of quotas in Marine modules) in the booklet: Information for Students Considering Intermediate Biology Units of Study, available from the School Office (The Cottage, A10, Science Road).

Textbooks

A list of textbooks and reference books is provided in the booklet: Information for Students Considering Intermediate Biology Units of Study.

BIOL3006
Ecological Methods

Credit points: 6 **Teacher/Coordinator:** Dr Clare McArthur (UEO) **Session:** Semester 1 **Classes:** Two 1 hour lecture and one 3 hour laboratory per week. **Prerequisites:** 12 credit points of Intermediate Biology; or 6 credit points of Intermediate BIOL units and ENVI2111 or MARS2006; or 12 credit points of Intermediate MARS units, including MARS2006. **Prohibitions:** BIOL3906, MARS3102 **Assumed knowledge:** BIOL (2011 or 2911 or 2012 or 2912) or PLNT (2002 or 2902). **Assessment:** One 2 hour exam 40%, practical assignments (including calculations, reports and reviews) 60%.

This unit will consider ecology as a quantitative, experimental and theoretical science. It is concerned with the practical skills and philosophical background required to explore questions and test hypotheses in the real world. Application of ecological methods and theory to practical problems will be integrated throughout the unit of study. Lectures will focus on sound philosophical and experimental principles, drawing on real examples for demonstration of concepts, and will be useful as one basis for informed conservation and management of natural populations and habitats. Practical methods will include effective samplings,determining patterns of distribution

and abundance, estimating ecological variables, and statistical analysing field data. Computer simulations and analyses will be used where appropriate.

Textbooks

Dytham, C. 2003. Choosing and using statistics. A biologist's guide. 2nd edition. Blackwell Science. Melbourne.
Field, A. 2005. Discovering statistics using SPSS. 2nd edition. SAGE Publications, London.
Quinn, GP and Keough, MJ. 2002. Experimental Design and Data Analysis for Biologists. 1st edition. Cambridge University Press. Cambridge.
Underwood, AJ 1997. Experiments in Ecology: their logical design and interpretation using analysis of variance. Cambridge University Press. Cambridge.

BIOL3906
Ecological Methods (Advanced)

Credit points: 6 **Teacher/Coordinator:** Dr Clare McArthur (UEO) **Session:** Semester 1 **Classes:** Two 1 hour lectures and one 3 hour laboratory per week **Prerequisites:** Distinction average in 12 credit points of Intermediate Biology; or 6 credit points of Intermediate BIOL and ENVI2111 or MARS2006; or 12 credit points of Intermediate MARS units, including MARS2006. These requirements may be varied and students with lower averages should consult the Unit Executive Officer. **Prohibitions:** BIOL3006, MARS3102 **Assumed knowledge:** BIOL (2011 or 2911 or 2012 or 2912) or PLNT (2002 or 2902). **Assessment:** One 2 hour exam 40%, practical assignments (including calculations, reports and reviews) 60%.

This unit has the same objectives as BIOL3006 Ecological Methods, and is suitable for students who wish to pursue certain aspects in greater depth. Entry is restricted, and selection is made from the applicants on the basis of their previous performance. Students taking this unit of study will participate in alternatives to some elements of the standard course and will be required to pursue the objectives by more independent means. Specific details of this unit of study and assessment will be announced in meetings with students in week 1 of semester 1. This unit of study may be taken as part of the BSc (Advanced) program.

Textbooks

As for BIOL3006

BIOL3007
Ecology

Credit points: 6 **Teacher/Coordinator:** A/Prof Ross Coleman **Session:** Semester 2 **Classes:** Two 1 hour lecture and one 3 hour laboratory per week **Prerequisites:** 12 credit points of Intermediate Biology; or 6 credit points of Intermediate BIOL, and ENVI2111 or MARS2006 ; or 12 credit points of MARS units, including MARS2006 **Prohibitions:** BIOL3907, MARS3102 **Assumed knowledge:** Although not prerequisites, knowledge obtained from BIOL3006/3906, and BIOL3008/3908 and/or BIOL3009/3909, is strongly recommended. **Assessment:** One 2hr exam, presentations, essay, project report.

This unit explores the dynamics of ecological systems, and considers the interactions between individual organisms and populations, organisms and the environment, and ecological processes. Lectures are grouped around four dominant themes: Interactions, Evolutionary Ecology, The Nature of Communities, and Conservation and Management. Emphasis is placed throughout on the importance of quantitative methods in ecology, including sound planning and experimental designs, and on the role of ecological science in the conservation, management, exploitation and control of populations. Relevant case studies and examples of ecological processes are drawn from marine, freshwater and terrestrial systems, with plants, animals, fungi and other life forms considered as required. Students will have some opportunity to undertake short term ecological projects, and to take part in discussions of important and emerging ideas in the ecological literature.

Textbooks

Ecology: an Australian Perspective (2003) Edited by P. Attiwill and B. Wilson. Oxford University Press.

BIOL3907
Ecology (Advanced)

Credit points: 6 **Teacher/Coordinator:** A/Prof Ross Coleman (UEO) **Session:** Semester 2 **Classes:** Two 1 hour lectures and one 3 hour laboratory per week. **Prerequisites:** Distinction average in 12 credit points of Intermediate Biology; or 6 credit points of Intermediate BIOL and ENVI2111 or MARS2006; or 12 credit points of Intermediate MARS units, including MARS2006. **Prohibitions:** BIOL3007, MARS3102 **Assumed knowledge:** Although not prerequisites, knowledge obtained from BIOL3006/3906, and BIOL3008/3908 and/or BIOL3009/3909, is strongly recommended. Students entering this unit of study should have achieved Distinction average. **Assessment:** One 2hr exam, presentations, essay, project report.

This unit has the same objectives as BIOL3007 Ecology, and is suitable for students who wish to pursue certain aspects in greater depth. Entry is restricted, and selection is made from the applicants on the basis of their previous performance. Students taking this unit of study will participate in alternatives to some elements of the standard course and will be required to pursue the objectives by more independent means. Specific details of this unit of study and assessment will be announced in meetings with students in week 1 of semester 2. This unit of study may be taken as part of the BSc (Advanced) program.

Textbooks

As for BIOL3007

BIOL3008
Marine Field Ecology

Credit points: 6 **Teacher/Coordinator:** A/Prof Ross Coleman **Session:** S2 Intensive **Classes:** Intensive 8 day-field course held in the pre-semester break. **Prerequisites:** 12 credit points of Intermediate Biology; or 6 credit points of Intermediate BIOL and ENVI2111 or MARS2006; or 12 credit points of Intermediate MARS units, including MARS2006. **Prohibitions:** BIOL3908, MARS3102. **Assumed knowledge:** BIOL (3006 or 3906). Prior completion of one of these units is very strongly recommended. **Assessment:** Discussion groups, research project proposal, biodiversity survey report, data analysis and checking, research project report.

Note: Dates: 2 - 9 July 2009.

This field course provides a practical introduction to the experimental analysis of marine populations and assemblages. Students gain experience using a range of intertidal sampling techniques and develop a detailed understanding of the logical requirements necessary for manipulative ecological field experiments. No particular mathematical or statistical skills are required for this subject. Group experimental research projects in the field are the focus of the unit during the day, with lectures and discussion groups about the analysis of experimental data and current issues in experimental marine ecology occurring in the evening.

Note: Successful completion of BIOL3008/3908 and BIOL3007/3907 is a prerequisite for students wishing to proceed to Honours in Marine Ecology.

Textbooks

No textbook is prescribed but Coastal Marine Ecology of Temperate Australia. Eds. Underwood, A.J. & Chapman, M.G. 1995. University of New South Wales Press, provides useful background reading.

BIOL3908
Marine Field Ecology (Advanced)

Credit points: 6 **Teacher/Coordinator:** A/Prof Ross Coleman. **Session:** S2 Intensive **Classes:** One 8 day field course held in the pre-semester break, plus four 1 hour tutorials during semester 2. **Prerequisites:** Distinction average in 12 credit points of Intermediate Biology; or 6 credit points of Intermediate Biology and ENVI2111 or MARS2006; or 12 credit points of Intermediate MARS units, including MARS2006. **Prohibitions:** BIOL3008, MARS3102. **Assumed knowledge:** BIOL (3006 or 3906). Prior completion of one of these units is very strongly recommended. **Assessment:** Discussion groups, research project proposal, biodiversity report, data analysis and checking, research project report.

Note: Dates: 2 - 9 July 2009. Plus four 1 hour tutorials during semester 2.

This unit has the same objectives as Marine Field Ecology BIOL3008, and is suitable for students wishing to pursue certain aspects of marine field ecology in a greater depth. Entry is restricted and selection is made from applicants on the basis of past performance. Students taking this unit of study will be expected to take part in a number of additional tutorials after the field course on advanced aspects of experimental design and analysis and will be expected to incorporate these advanced skills into their analyses and project reports. This unit may be taken as part of the BSc(Advanced).

Note: Successful completion of BIOL3008/3908 and BIOL3007/3907 is a prerequisite for students wishing to proceed to Honours in Marine Ecology.

Textbooks

As for BIOL 3008.

BIOL3009
Terrestrial Field Ecology

Credit points: 6 **Teacher/Coordinator:** Dr Glenda Wardle **Session:** S2 Intensive **Classes:** One 6 day field trip held in the pre-semester break, and 4 practical classes during weeks 1-4 in Semester 2. **Prerequisites:** 12 credit points of Intermediate Biology or ANSC2004 and BIOM2001. **Prohibitions:** BIOL3909 **Assumed knowledge:** BIOL (3006 or 3906). Prior completion of one of these units is very strongly recommended. **Assessment:** Discussions and quiz (10%), research project proposal and brief presentation (10%), sampling project report (20%), specimen collection (10%), research project report (50%).

Note: One 6 day field trip held in the pre-semester break (19 - 24 July 2009) and 4 practical classes during weeks 1-4 in Semester 2.

This field course provides practical experience in the experimental analysis of terrestrial populations and assemblages. Students learn a broad range of ecological sampling techniques and develop a detailed understanding of the logical requirements necessary for manipulative ecological field experiments. The field work incorporates survey techniques for plants, small mammals and invertebrates and thus provides a good background for ecological consulting work. Students attend a week-long field course and participate in a large-scale research project as well as conducting their own research project. Invited experts contribute to the lectures and discussions on issues relating to the ecology, conservation and management of Australia's terrestrial flora and fauna.

BIOL3909
Terrestrial Field Ecology (Advanced)

Credit points: 6 **Teacher/Coordinator:** Dr Glenda Wardle. **Session:** S2 Intensive **Classes:** 6 day field trip held in the pre-semester break and 4 practical classes during weeks 1-4 in Semester 2. **Prerequisites:** Distinction average in 12 credit points of Intermediate Biology or ANSC2004 and BIOM2001 **Prohibitions:** BIOL3009. **Assumed knowledge:** BIOL (3006 or 3906). Prior completion of one of these units is very strongly recommended. **Assessment:** Discussions and quiz (10%), research project proposal and brief presentation (10%), sampling project report (20%), specimen collection (10%), research project report (50%).

Note: One 6 day field trip held in the pre-semester break (19 - 24 July 2009) and 4 practical classes during weeks 1-4 in Semester 2.

This unit has the same objectives as BIOL3009 Terrestrial Field Ecology, and is suitable for students who wish to pursue certain aspects in greater depth. Entry is restricted, and selection is made from applicants on the basis of previous performance. Students taking this unit of study will complete an individual research project on a topic negotiated with a member of staff. It is expected that much of the data collection will be completed during the field trip but some extra time may be needed during semester 2. Specific details of this unit of study and assessment will be announced in meetings with students at the beginning of the unit. This unit of study may be taken as part of the BSc (Advanced) program.

BIOL3010
Tropical Wildlife Biology and Management

Credit points: 6 **Session:** S1 Intensive **Classes:** 5 day Field School, followed by 5 days of classes at Sydney University. **Prerequisites:** 12 credit points of Intermediate Biology (BIOL/ENVI/PLNT). **Prohibitions:** BIOL3910 **Assumed knowledge:** None, although BIOL2011/2911 would be useful. **Assessment:** One 2 hour exam, one 1 hour practical exam, a 2000 word practical, a 15 min oral presentation, .

Note: Dates: 15 February - 20 February 2009 Northern Territory, followed by tutorials and practical classes at the University of Sydney 23 February - 27 February 2009.

Due to its isolation from the rest of the world and unique evolutionary history, the Australian terrestrial vertebrate fauna (amphibians, reptiles, birds and mammals) is highly unusual, and hence has a lot to offer in the study of evolutionary processes. The rarity of some species and Australia's unusual climate and landforms present special challenges for the management of our native wildlife. This unit of study addresses the evolution, ecology and management of Australia's terrestrial fauna. The subject comprises a five-day field course in the Northern Territory, near Darwin, where students will learn field-based techniques in wildlife management, combined with lectures given by experts in the evolution, ecology and management of wildlife.

BIOL3910
Tropical Wildlife Biol & Management Adv

Credit points: 6 **Session:** S1 Intensive **Classes:** 5 day Field School followed by 5 days of classes at Sydney University. **Prerequisites:** Distinction average in 12 credit points of Intermediate Biology (BIOL/ENVI/PLNT). **Prohibitions:** BIOL3010 **Assumed knowledge:** None, although Vertebrates and their Origins would be useful. **Assessment:** One 2 hour exam, one 1 hour practical exam, a 2000 word practical report, one 15 min oral presentation.

Note: Department permission required for enrolment. Note: 0

This unit has the same objectives as BIOL3010 Tropical Wildlife Biology and Management, and is suitable for students who wish to pursue certain aspects in greater depth. Entry is restricted, and selection is made from the applicants on the basis of their previous performance. Students taking this unit of study will participate in alternatives to some elements of the standard course and will be required to pursue the objectives by more independent means. Specific details of this unit of study and assessment will be announced in meetings with students at the beginning of the unit. This unit of study may be taken as part of the BSc(Advanced) program.

BIOL3011
Ecophysiology

Credit points: 6 **Teacher/Coordinator:** UEO A/Prof Seebacher **Session:** Semester 1 **Classes:** Two 1 hour lectures and one 4 hour laboratory per week. **Prerequisites:** 12 credit points of Intermediate Biology; or 6 credit points of Intermediate BIOL and ENVI2111 or MARS2006; or 12 credit points of Intermediate MARS units, including MARS2006. **Prohibitions:** BIOL3911 **Assumed knowledge:** BIOL (2012 or 2912 or 2016 or 2916) or PLNT (2003 or 2903). **Assessment:** One 1.5 hour exam, field trip seminar, laboratory report.

Note: The completion of 6 credit points of MBLG units is highly recommended.

Ecophysiology is a conceptually based unit of study that covers physiological interactions between organisms and their environments. The unit focuses on the evolution of physiological capacities and how these may explain the ecology and biogeography or organisms. Lectures are based on the current primary literature. Lecturers have active research programs on the topics they cover and will present original research findings where appropriate. Examples are mainly from insects, vertebrates, and marine organisms. As part of the practical component, students design their own original research projects to be conducted during a week-end long field trip, and during self-directed laboratory sessions.

BIOL3911
Ecophysiology (Advanced)

Credit points: 6 **Teacher/Coordinator:** UEO A/Prof Seebacher **Session:** Semester 1 **Classes:** Two 1 hour lectures and one 4 hour laboratory per week. **Prerequisites:** Distinction average in 12 credit points of Intermediate Biology; or 6 credit points of Intermediate BIOL and ENVI2111 or MARS2006; or 12 credit points of Intermediate MARS units, including MARS2006. These requirements may be varied and students with lower averages should consult the Unit Executive Officer. **Prohibitions:** BIOL3011 **Assumed knowledge:** BIOL (2012 or 2912 or 2016 or 2916) or PLNT (2003 or 2903) **Assessment:** One 1.5 hour exam, field trip seminar, independent project report.

Note: The completion of 6 credit points of MBLG units is highly recommended.

Ecophysiology (Advanced) shares the same lectures as BIOL 3011 Ecophysiology, but it includes an independent project in place of the laboratory report (equivalent of 30% of Ecophysiology). The content and nature of the independent project varies and students are encouraged to design their own project.

BIOL3012
Animal Physiology

Credit points: 6 **Teacher/Coordinator:** Dr M Thomson **Session:** Semester 1 **Classes:** Two 1 hour lectures, one 4 hour laboratory per week. **Prerequisites:** 12 credit points of Intermediate Biology including BIOL (2012 or 2912 or 2016 or 2916) or PLNT (2003 or 2903) and 6 additional credit points of Intermediate Biology (BIOL/MBLG/PLNT/ENVI). **Prohibitions:** BIOL3912 **Assessment:** One 1.5 hour exam, laboratory/library reports.

Note: The completion of 6 credit points of MBLG units is highly recommended.

In this unit of study students explore how animal physiology is influenced by environmental factors. There is a strong emphasis on how modern research is expanding the field of physiology throughout a diverse array of vertebrates and invertebrates and the unit is

designed to complement Ecophysiology. Particular emphasis will be placed on nutrition, animal behaviour, energy metabolism, endocrinology and neurobiology, as well as more exotic animal physiology such as electro-reception in sharks and infra-red detection of prey in snakes.

BIOL3912
Animal Physiology (Advanced)

Credit points: 6 **Teacher/Coordinator:** Dr M Thomson **Session:** Semester 1 **Classes:** Two 1 hour lectures and one 4 hour laboratory per week. **Prerequisites:** Distinction average in 12 credit points of Intermediate Biology including BIOL (2012 or 2912 or 2016 or 2916) or PLNT (2003 or 2903) and 6 additional credit points of Intermediate Biology. These requirements may be varied and students with lower averages should consult the Unit Executive Officer. **Prohibitions:** BIOL3012 **Assessment:** One 1.5 hour exam, laboratory reports, independent project report.

Note: The completion of 6 credit points of MBLG units is highly recommended.

Animal Physiology (Advanced) shares the same lectures as Animal Physiology, but it includes an independent project in place of one or more components of the laboratory classes to the equivalent of 30% of Animal Physiology. The content and nature of the independent project may vary from year to year.

BIOL3013
Marine Biology

Credit points: 6 **Teacher/Coordinator:** Dr Adele Pile **Session:** Semester 1 **Classes:** Two 1 hour lectures and one 4 hour laboratory per week. **Prerequisites:** 12 credit points of Intermediate Biology, or 6 credit points of Intermediate BIOL and ENVI2111 or MARS2006; or 12 credit points of Intermediate MARS units, including MARS2006. **Prohibitions:** BIOL3913 **Assumed knowledge:** BIOL 2018 or MARS2006 **Assessment:** Practical reports, paper criticisms and other assignments

Note: The completion of 6 credit points of MBLG units is highly recommended.

We will examine in detail processes that are important for the establishment and maintenance of marine communities. Lectures will expose students to the key ideas, researchers and methodologies within selected fields of marine biology. Laboratory sessions will complement the lectures by providing students with hands-on experience with the organisms and the processes that affect them. Students will develop critical analysis skills while examining the current literature.

BIOL3913
Marine Biology (Advanced)

Credit points: 6 **Teacher/Coordinator:** Dr Adele Pile **Session:** Semester 1 **Classes:** Two 1 hour lectures and one 4 hour laboratory per week. **Prerequisites:** Distinction average in 12 credit points of Intermediate Biology; or 6 credit points of Intermediate BIOL and ENVI2111 or MARS2006; or 12 credit points of Intermediate MARS units, including MARS2006. **Prohibitions:** BIOL3013 **Assumed knowledge:** BIOL2018 or MARS2006 **Assessment:** Practical reports, paper criticisms and other assignments.

Note: The completion of 6 credit points of MBLG units is highly recommended.

Qualified students will participate in alternative components of the BIOL3103 Marine Biology unit. The content and nature of these components may vary from year to year.

BIOL3017
Fungi in the Environment

Credit points: 6 **Teacher/Coordinator:** Dr Peter McGee **Session:** S1 Intensive **Classes:** 40 hours of practicals in a two week intensive program held immediately prior to semester one (laboratory componet each morning from 16-27 February 2009), plus the equivalent of 30 hours self-guided study during the semester. **Prerequisites:** 12 credit points of Intermediate Biology, or 6 credit points of Intermediate Biology and 6 Intermediate credit points of either Microbiology or Geography. **Prohibitions:** BIOL3917 **Assessment:** One 2 hour take home exam, laboratory and written assignments.

Note: Dates: 16-27 February 2009. The completion of 6 credit points of MBLG units is highly recommended.

The unit is designed to develop understanding of fungal ecology in relation to environmental and rehabilitation biology, biological control of pests and pathogens, and soil microbiology. Emphasis will be placed on the function of fungi, and the benefit provided by fungi in symbiotic interactions with plants, including mycorrhizal fungi and shoot-borne endophytes. Physiological and ecological implications of the interactions will also be considered. Each student will design and implement a research project. Analytical thinking and research-led activity will be encouraged. Using broad scientific approaches, each student will gain the capacity to work cooperatively to find and analyse information from primary sources, develop approaches to test their understanding, and to present their work in a scientifically acceptable manner. Students will develop a deeper understanding of one area of fungal biology through independent study. Part of the learning material will be available on the internet.

BIOL3917
Fungi in the Environment (Advanced)

Credit points: 6 **Teacher/Coordinator:** Dr Peter McGee **Session:** S1 Intensive **Classes:** 40 hours of practical work in a two week intensive program immediately prior to semester one (labs run from 16 - 27 February 2009), plus the equivalent of 30 hours self-guided study during the semester. **Prerequisites:** Distinction average in 12 credit points of Intermediate Biology, or 6 credit points of Intermediate Biology and 6 Intermediate credit points of either Microbiology or Geography. **Prohibitions:** BIOL3017 **Assessment:** One 2 hour take home exam, research project, laboratory and written assignments.

Note: The completion of 6 credit points of MBLG units is highly recommended.

Qualified students will be encouraged to develop a research project under supervision. The content and nature of the research will be agreed on with the executive officer.

BIOL3018
Applications of Recombinant DNA Tech

Credit points: 6 **Teacher/Coordinator:** Dr B Lyon **Session:** Semester 1 **Classes:** Two 1 hour lectures per week; up to 4 hours laboratory per week. **Prerequisites:** 12 credit points from MBLG (2071/297), MBLG (2072/2972) and Intermediate Biology units. For BMedSc students: 36 credit points of Intermediate BMED units including BMED 2802. **Prohibitions:** BIOL3918 **Assessment:** One 2 hour exam, practical reports, assignment/seminar

A unit of study with lectures, practicals and tutorials on the application of recombinant DNA technology and the genetic manipulation of prokaryotic and eukaryotic organisms. Lectures cover the applications of molecular genetics in biotechnology and consider the impact and implications of genetic engineering. Topics include the cloning and expression of foreign genes in bacteria, yeast, animal and plant cells, novel human and animal therapeutics and vaccines including human gene therapy, new diagnostic techniques for human and veterinary disease, the transformation of animal and plant cells, the genetic engineering of animals and plants, and the environmental release of genetically-modified (transgenic) organisms. Practical work may include nucleic acid isolation and manipulation, gene cloning and PCR amplification, DNA sequencing and computer analysis of gene sequences, immunological detection of proteins, and the genetic transformation and assay of plants.

BIOL3918
Applications of Recombinant DNA Tech Adv

Credit points: 6 **Teacher/Coordinator:** Dr B Lyon **Session:** Semester 1 **Classes:** Two 1 hour lectures per week, and up to 4 hours laboratory per week. **Prerequisites:** Distinction average in 12 credit points from MBLG (2071/2971), MBLG (2072/2972) and Intermediate Biology units. For BMedSc students: 36 credit points of Intermediate BMED units including Distinction in BMED2802. **Prohibitions:** BIOL3018 **Assessment:** One 2 hour exam, assignment/seminar

Qualified students will participate in alternative components of BIOL3018 Applications of Recombinant DNA Technology. The content and nature of these components may vary from year to year.

BIOL3025
Evolutionary Genetics & Animal Behaviour

Credit points: 6 **Teacher/Coordinator:** Prof Oldroyd, A/Prof Beekman. **Session:** Semester 2 **Classes:** Two 1 hour lectures and up to 4 hours laboratory per week. **Prerequisites:** 12 credit points from (MBLG 2071/2971), MBLG (2072/2972) and Intermediate Biology units. For BMedSc students: 36 credit points of Intermediate BMED units including BMED2802. **Prohibitions:** BIOL3925 **Assessment:** One 1.5 hour exam, assignments, seminar

The unit of study covers the main themes of modern evolutionary theory including population genetics. In the practicals, students use molecular methods to quantify genetic variation in natural populations. Using these skills we will search for population subdivision and discuss

how this can lead to speciation. Lectures will cover how the evolution of traits can be tracked using the comparative method. We will consider how studies of sex ratios, sexual selection, kin selection, game theory and quantitative genetics can illuminate the mechanisms by which animals have evolved, and explain why they behave as they do. We will then consider if these themes have any relevance to human sociobiology. The unit also covers the role of genetics in conservation. There will be a field trip to collect organisms for population genetic analysis. There will be plenty of opportunity in the student seminars to examine the more controversial aspects of modern evolutionary thought.

BIOL3925
Evolutionary Gen. & Animal Behaviour Adv

Credit points: 6 **Teacher/Coordinator:** Prof Oldroyd, A/Prof Beekman. **Session:** Semester 2 **Classes:** Two 1 hour lectures and up to 4 hours of laboratory per week. **Prerequisites:** Distinction average in12 credit points from (MBLG2071/2971), (MBLG2072/2972) and Intermediate Biology units. For BMedSc students: 36 credit points of Intermediate BMED units including Distinction in BMED2802. **Prohibitions:** BIOL3025. **Assessment:** One 1.5 hour exam, assignments, seminar.

Qualified students will participate in alternative components of BIOL3025 Evolutionary Genetics and Animal Behaviour. The content and nature of these components may vary from year to year. Some assessment will be in an alternative format to components of BIOL3025.

BIOL3026
Developmental Genetics

Credit points: 6 **Teacher/Coordinator:** Dr Saleeba **Session:** Semester 2 **Classes:** Two 1 hour lectures and up to 3 hours laboratory per week. **Prerequisites:** 12 credit points from MBLG (2071/2971) and MBLG (2072/2972). For BMedSc students: 36 credit points of Intermediate BMED units including BMED2802. **Prohibitions:** BIOL3926 **Assessment:** One 2 hour exam, assignments.

This unit discusses current understanding of developmental genetics with emphasis on molecular genetics. The developmental genetics of model plants and animals will be investigated. In particular, the molecular genetics of vertebrate development, pattern formation and gene expression, the study of mutants in development, plant specific processes such as root formation and flowering, will be covered making reference to modern techniques such as transgenics, recombinant DNA technology, and tissue-specific expression analysis. Various methods of genetic mapping will be covered. Practical work complements the theoretical aspects and develops important genetical skills.

BIOL3926
Developmental Genetics (Advanced)

Credit points: 6 **Teacher/Coordinator:** Dr Saleeba **Session:** Semester 2 **Classes:** Two 1 hour lectures and up to 3 hours of laboratory per week. **Prerequisites:** Distinction average in 12 credit points from MBLG (2071/2971), and MBLG (2072/2972). For BMedSc students: 36 credit points of Intermediate BMED units including Distinction in BMED2802. **Prohibitions:** BIOL3026 **Assessment:** One 2 hour exam, assignments.

Qualified students will participate in alternative components to BIOL3026 Developmental Genetics. The content and nature of these components may vary from year to year. Some assessment will be in an alternative format to components of BIOL3026.

BIOL3027
Bioinformatics and Genomics

Credit points: 6 **Teacher/Coordinator:** Dr Firth **Session:** Semester 1 **Classes:** Two 1 hour lectures and up to 3 hours laboratory per week. **Prerequisites:** 12 credit points from MBLG (2071/2971), MBLG (2072/2972) and Intermediate Biology units. For BMedSc students: 36 credit points of Intermediate BMED units including BMED 2802. **Prohibitions:** BIOL3927 **Assessment:** One 2 hour exam, assignments

A unit of study comprising lectures, practical assignments and tutorials on the application of bioinformatics to the storage, retrieval and analysis of biological information, principally in the form of nucleotide and amino acid sequences. Although the main emphasis is on sequence data, other forms of biological information are considered.

The unit begins with the assembly and management of nucleotide sequence data and an introduction to the databases that are normally used for the storage and retrieval of biological data, and continues with signal detection and analysis of deduced products, sequence alignment, and database search methods. Phylogenetic reconstruction based on distance-based methods, parsimony methods and maximum-likelihood methods is described and students are introduced to the idea of tree-space, phylogenetic uncertainty, and taught to evaluate phylogenetic trees and identify factors that will confound phylogenetic inference. Finally, whole genome analysis and comparative genomics are considered. The unit gives students an appreciation of the significance of bioinformatics in contemporary biological science by equipping them with skills in the use of a core set of programs and databases for "in silico" biology, and an awareness of the breadth of bioinformatics resources and applications.

BIOL3927
Bioinformatics and Genomics (Advanced)

Credit points: 6 **Teacher/Coordinator:** Dr Firth **Session:** Semester 1 **Classes:** Two 1 hour lectures and one 3 hour laboratory per week. **Prerequisites:** Distinction average in 12 credit points from MBLG (2071/2971), MBLG (2072/2972) and Intermediate Biology units. For BMedSc students: 36 credit points of Intermediate BMED units including Distinction in BMED2802. **Prohibitions:** BIOL3027 **Assessment:** One 2 hour exam, assignments.

Qualified students will participate in alternative components of BIOL3027 Bioinformatics and Genomics. The content and nature of these components may vary from year to year. Some assessment will be in alternative format.

Refer to the relevant sections of this handbook for details on the following PLNT units of study

Plant Science PLNT3001 Plant Cell and Environment, PLNT3002 Plant Growth and Development, PLNT3003 Systematics and Evolution of Plants.(Plus advanced versions of the above - PLNT39xx).

Biology Honours

A single Honours program in Biology accommodates students who have completed 24 credit points of Senior Biology Life Sciences units and have a minimum WAM of 65. Information about qualifications for entry into Honours is available from the School Office (Science Road Cottage, A10), or on the School of Biological Sciences website. During the honours year the principles established in the first three years of the undergraduate award course are further developed, and students are introduced to a wider field of biology and biological techniques. Students may elect to specialise in any of the aspects of biology that are studied in the School. Projects jointly supervised by staff in other Schools or Departments within the University may also be considered. Students who have indicated their intention of entering the Honours program will be notified of acceptance after the publication of the second semester Senior examination results. Honours students start their academic year in late January, or in July.

The honours year comprises:

1. A project in which the student investigates a problem and presents oral and written accounts of his or her research.2. A coursework unit – BIOL4015 Conducting and Communicating Research Scientific Research Practice in Biology, instruction in experimental design, and other technical training. The degree will be awarded on the basis of: (a) written assignments from coursework units; (b) marks awarded for a thesis on the subject of the project.

Graduate Diploma in Science (Biology)

The Graduate Diploma program in Biology is available as a one year full-time or two year part-time course. The course is intended for students wishing to progress beyond a pass degree but not via the honours degree, or who are ineligible for admission to honours. Students enrolled in the one year course will follow the same program as Biology honours students and be assessed using similar criteria. Students may therefore elect to specialise in any area within the

research interests of the School. Projects jointly supervised by staff in other Schools or Departments within the University may also be considered. Students undertaking the two year course (part-time) will follow the same curriculum but will satisfactorily complete the instructed elements of the course before progressing to the project element at the end of the first year. Students who have signified their intention to enter the Graduate Diploma program will be notified of acceptance after the publication of the second semester senior examination results. Graduate Diploma students are expected to start their academic year in late January, or in July. The composition of the Graduate Diploma course is identical to that for honours (see Biology Honours).

Postgraduate study in Biology

MSc and PhD degrees by research are available in the School.On completion of an honours degree (at first or second class level), MSc Preliminary course or Graduate Diploma in Science, students may pursue candidature for MSc degrees by research. The range of research fields offered and the fields of each member of academic staff are listed on the School's website at www.bio.usyd.edu.au.

Cell Pathology

Cell Pathology is taught by the Department of Pathology, located on Level 5 of the Blackburn Building (phone 9351 2414). The department maintains a website to help students access information and resources: www.pathology.usyd.edu.au.

CPAT3201

Pathogenesis of Human Disease 1

Credit points: 6 **Teacher/Coordinator:** Dr Bob Bao **Session:** Semester 2 **Classes:** Three 1 hour lectures and one 3 hour tutorial per week. **Prerequisites:** At least 6cp intermediate of one of the following: ANAT or BCHM or MBLG or BIOL or HPSC or MICR or PCOL or PHSI, or as the head of department determines. **Assessment:** One 2 hour exam (60%), one major research essay (1500w) (20%) generation of detractors for MCQ stems with referenced support texts for these (20%).

The Pathological Basis of Human Disease 1 unit of study modules will provide a theoretical background to the scientific basis of the pathogenesis of disease. Areas covered in theoretical modules include: tissue responses to exogenous factors, adaptive responses to foreign agents, cardiovascular/pulmonary/gut responses to disease, forensic science, neuropathology and cancer.

The aim of the course is

- To give students an overall understanding of the fundamental biological mechanisms governing disease pathogenesis in human beings.

- To introduce to students basic concepts of the pathogenesis, natural history and complications of common human diseases.

- To demonstrate and exemplify differences between normality and disease.

- To explain cellular aspects of certain pathological processes.

Together with CPAT3202, the unit of study would be appropriate for those who intend to proceed to Honours research, to professional degrees or to careers in biomedical areas such as hospital science. Together with CPAT3202, it fulfils the Pathology requirements for the Centre for Chiropractic at Macquarie University.

Textbooks

Robbins Basic Pathology, Kumar, Cotran & Robbins 7th Edition, 2003, Publ Saunders, Philadelphia, Pennsylvania, USA.

CPAT3202

Pathogenesis of Human Disease 2

Credit points: 6 **Teacher/Coordinator:** Dr Bob Bao **Session:** Semester 2 **Classes:** One 2 hour practical per week and one 2 hour museum practical. **Prerequisites:** At least 6cp intermediate of one of the following: ANAT or BCHM or MBLG or BIOL or HPSC or MICR or PCOL or PHSI, or as the head of department determines. **Corequisites:** CPAT3201 **Assessment:** One 2 hour exam (70%), Museum Practical Reports (30%).

The Pathological Basis of Human Disease 2 unit of study modules will provide a practical background to the scientific basis of the pathogenesis of disease. Areas covered in practical modules include disease specimen evaluation on a macroscopic and microscopic basis.

The aim of the course is

- To enable students to gain an understanding of how different organ systems react to injury and to apply basic concepts of disease processes.

- To equip students with skills appropriate for careers in the biomedical sciences and for further training in research or professional degrees.

At the end of the course students will:

- Have acquired practical skills in the use of a light microscope.

- Have an understanding of basic investigative techniques for disease detection in pathology.

- Be able to evaluate diseased tissue at the macroscopic and microscopic level.

- Have the ability to describe, synthesise and present information on disease pathogenesis.

- Transfer problem-solving skills to novel situations related to disease pathogenesis.

The unit of study would be appropriate for those who intend to proceed to Honours research, to professional degrees or to careers in biomedical areas such as hospital science. Together with CPAT3201, it fulfils the Pathology requirements for the Centre for Chiropractic at Macquarie University.

Textbooks

Robbins Basic Pathology, Kumar, Cotran & Robbins 7th Edition, 2003, Publ Saunders, Philadelphia, Pennsylvania, USA.

Chemical Engineering

The School of Chemical and Biomolecular Engineering is part of the Faculty of Engineering and Information Technologies. In addition to providing professional training in this branch of engineering it offers CHNG1103 Introduction to Material and Energy Transformations to students enrolled in the Faculty of Science.Details regarding this unit of study can be obtained from the Faculty of Engineering and Information Technologies Handbook. This unit of study is intended to give a science student some insight into the principles which control the design and performance of large scale industrial processing plants. Faculty of Science students are invited to enrol in any other chemical engineering unit of study, provided they have the appropriate prerequisites and have consulted with the Head of School.

Advanced standing for Science students transferring to BEng(Chemical Engineering)

Science graduates may obtain up to two years advanced standing towards a Bachelor of Engineering degree in Chemical Engineering. Students wishing to undertake this option must seek academic advice from the School of Chemical and Biomolecular Engineering. Further details regarding admission to the BE in Chemical Engineering may be obtained from the Engineering and Information Technologies Faculty Office.

Chemistry

Junior units of study

The School of Chemistry offers a number of 6 credit point units of study to cater for the differing needs of students. These units of study are: CHEM1001 Fundamentals of Chemistry 1A, CHEM1002 Fundamentals of Chemistry 1B, CHEM1101 Chemistry 1A, CHEM1102 Chemistry 1B, CHEM1108 Chemistry 1 Life Sciences A, CHEM1109 Chemistry 1 Life Sciences B, CHEM1901 Chemistry 1A (Advanced), CHEM1902 Chemistry 1B (Advanced), CHEM1903 Chemistry 1A (Special Studies Program), CHEM 1904 Chemistry 1B (Special Studies Program).

Obtaining detailed information about units

Details on Chemistry Junior Units of Study is available at the Chemistry First Year website (http://firstyear.chem.usyd.edu.au). This information is also provided in a booklet: 'Information for Students', which is

distributed to students at the time of enrolment, and is also available from the Chemistry First Year Office.

CHEM1001
Fundamentals of Chemistry 1A

Credit points: 6 **Session:** Semester 1 **Classes:** Three 1 hour lectures and one 1 hour tutorial per week; one 3 hour practical per week for 10 weeks. **Prohibitions:** CHEM1101, CHEM1901, CHEM1109, CHEM1903 **Assumed knowledge:** There is no assumed knowledge of chemistry for this unit of study, but students who have not undertaken an HSC chemistry course are strongly advised to complete a chemistry bridging course before lectures commence. **Assessment:** Theory examination (75%), laboratory exercises and continuous assessment quizzes (25%) **Practical field work:** A series of 10 three-hour laboratory sessions, one per week for 10 weeks of the semester.

The aim of the unit of study is to provide those students whose chemical background is weak (or non-existent) with a good grounding in fundamental chemical principles together with an overview of the relevance of chemistry. There is no prerequisite or assumed knowledge for entry to this unit of study. Lectures: A series of 39 lectures, three per week throughout the semester.

Textbooks
A booklist is contained in the booklet Junior Chemistry distributed at enrolment. Further information can be obtained from the School.

CHEM1002
Fundamentals of Chemistry 1B

Credit points: 6 **Session:** Semester 2 **Classes:** Three 1 hour lectures and one 1 hour tutorial per week; one 3 hour practical per week for 10 weeks. **Prerequisites:** CHEM (1001 or 1101) or equivalent **Prohibitions:** CHEM1102, CHEM1108, CHEM1902, CHEM1904 **Assessment:** Theory examination (75%), laboratory exercises and continuous assessment quizzes (25%) **Practical field work:** A series of 10 three-hour laboratory sessions, one per week for 10 weeks of the semester.

CHEM1002 builds on CHEM1001 to provide a sound coverage of inorganic and organic chemistry. Lectures: A series of 39 lectures, three per week throughout the semester.

Textbooks
A booklist is contained in the booklet Junior Chemistry distributed at enrolment. Further information can be obtained from the School.

CHEM1101
Chemistry 1A

Credit points: 6 **Session:** Semester 1, Semester 2, Summer Main **Classes:** Three 1 hour lectures and one 1 hour tutorial per week; one 3 hour practical per week for 10 weeks. **Corequisites:** Recommended concurrent units of study: 6 credit points of Junior Mathematics **Prohibitions:** CHEM1001, CHEM1109, CHEM1901, CHEM1903 **Assumed knowledge:** HSC Chemistry and Mathematics **Assessment:** Theory examination (75%), laboratory exercises and continuous assessment quizzes (25%) **Practical field work:** A series of 10 three-hour laboratory sessions, one per week for 10 weeks of the semester.

Chemistry 1A is built on a satisfactory prior knowledge of the HSC Chemistry course. A brief revision of basic concepts of the high school course is given. Chemistry 1A covers chemical theory and physical chemistry. Lectures: A series of 39 lectures, three per week throughout the semester.

Textbooks
A booklist is contained in the booklet Junior Chemistry distributed at enrolment. Further information can be obtained from the School.

CHEM1102
Chemistry 1B

Credit points: 6 **Session:** Semester 1, Semester 2, Summer Main **Classes:** One 3 hour lecture and 1 hour tutorial per week; one 3 hour practical per week for 10 weeks. **Prerequisites:** CHEM (1101 or 1901) or a Distinction in CHEM1001 or equivalent **Corequisites:** Recommended concurrent units of study: 6 credit points of Junior Mathematics **Prohibitions:** CHEM1002, CHEM1108, CHEM1902, CHEM1904 **Assessment:** Theory examination (75%), laboratory exercises and continuous assessment quizzes (25%) **Practical field work:** A series of 10 three-hour laboratory sessions, one per week for 10 weeks of the semester.

Chemistry 1B is built on a satisfactory prior knowledge of Chemistry 1A and covers inorganic and organic chemistry. Successful completion of Chemistry 1B is an acceptable prerequisite for entry into Intermediate Chemistry units of study. Lectures: A series of 39 lectures, three per week throughout the semester.

Textbooks
A booklist is contained in the booklet Junior Chemistry distributed at enrolment. Further information can be obtained from the School.

CHEM1108
Chemistry 1A Life Sciences

Credit points: 6 **Session:** Semester 1 **Classes:** Three 1 hour lectures and one 1 hour tutorial per week; one 3 hour practical per week for 10 weeks. **Corequisites:** Recommended concurrent units of study: 6 credit points of Junior Mathematics **Prohibitions:** CHEM1002, CHEM1102, CHEM1902, CHEM1904 **Assumed knowledge:** HSC Chemistry and Mathematics **Assessment:** Theory examination (75%), laboratory exercises and continuous assessment quizzes (25%). **Practical field work:** A series of 10 three-hour laboratory sessions, one per week for 10 weeks of the semester.

Note: This unit of study is available to students enrolled in the Bachelor of Medical Science, the Bachelor of Science (Molecular Biology and Genetics), the Bachelor of Science (Nutrition) and the Bachelor of Science (Molecular Biotechnology) only.

Lectures (39 hrs): A strong background in junior chemistry is essential for understanding molecular structures and processes. This unit of study provides the basis for understanding fundamental chemical processes and structures at an advanced level, with particular emphasis on how these apply to the life sciences. Topics to be covered include: atomic structure, chemical bonding and organic chemistry of functional groups with applications in life sciences.

Tutorials (12 hrs): These will provide aspects of problem solving relevant to the theory.

Textbooks
A booklist is contained in the booklet Junior Chemistry distributed at enrolment. Further information can be obtained from the School.

CHEM1109
Chemistry 1B Life Sciences

Credit points: 6 **Session:** Semester 2 **Classes:** Three 1 hour lectures and one 1 hour tutorial per week; one 3 hour practical per week for 10 weeks. **Prerequisites:** CHEM1108 **Corequisites:** Recommended concurrent units of study: 6 credit points of Junior Mathematics **Prohibitions:** CHEM1001, CHEM1101, CHEM1901, CHEM1903 **Assessment:** Theory examination (75%), laboratory exercises and continuous assessment quizzes (25%) **Practical field work:** A series of 10 three-hour laboratory sessions, one per week for 10 weeks of the semester.

Note: This unit of study is available to students enrolled in the Bachelor of Medical Science, the Bachelor of Science (Molecular Biology and Genetics), the Bachelor of Science (Nutrition) and the Bachelor of Science (Molecular Biotechnology) only.

Lectures (39 hrs): A strong background in junior chemistry is essential for understanding molecular structures and processes. This unit of study provides the basis for understanding fundamental chemical processes and structures at an advanced level, with particular emphasis on how these apply to the life sciences. Topics to be covered include: chemical equilibria, solutions, acids and bases, ions in solution, redox reactions, colloids and surface chemistry, the biological periodic table, chemical kinetics and radiochemistry with applications to life sciences.

Tutorials (12 hrs): These will provide aspects of problem solving relevant to the unit of study.

Textbooks
A booklist is contained in the booklet Junior Chemistry distributed at enrolment. Further information can be obtained from the School.

CHEM1901
Chemistry 1A (Advanced)

Credit points: 6 **Session:** Semester 1 **Classes:** Three 1 hour lecture and one 1 hour tutorial per week; one 3 hour practical per week for 10 weeks. **Prerequisites:** UAI of at least 96.4 and HSC Chemistry result in band 5 or 6, or Distinction or better in a University level Chemistry unit, or by invitation **Corequisites:** Recommended concurrent unit of study: 6 credit points of Junior Mathematics **Prohibitions:** CHEM1001, CHEM1101, CHEM1109, CHEM1903 **Assessment:** Theory examination (75%), laboratory exercises and continuous assessment quizzes (25%) **Practical field work:** A series of 10 three-hour laboratory sessions, one per week for 10 weeks of the semester.

Note: Department permission required for enrolment.

Chemistry 1A (Advanced) is available to students with a very good HSC performance as well as a very good school record in chemistry or science. Students in this category are expected to do Chemistry 1A (Advanced) rather than Chemistry 1A.

The theory and practical work syllabuses for Chemistry 1A and Chemistry 1A (Advanced) are similar, though the level of treatment in the latter unit of study is more advanced, presupposing a very good grounding in the subject at secondary level. Chemistry 1A (Advanced) covers chemical theory and physical chemistry. Lectures: A series of about 39 lectures, three per week throughout the semester.

Textbooks
A booklist is contained in the booklet Junior Chemistry distributed at enrolment. Further information can be obtained from the School.

CHEM1902
Chemistry 1B (Advanced)

Credit points: 6 **Session:** Semester 2 **Classes:** Three 1 hour lectures and one 1 hour tutorial per week; one 3 hour practical per week for 10 weeks. **Prerequisites:** CHEM (1901 or 1903) or Distinction in CHEM1101 or equivalent **Corequisites:** Recommended concurrent unit of study: 6 credit points of Junior Mathematics **Prohibitions:** CHEM1002, CHEM1102, CHEM1108, CHEM1904 **Assessment:** Theory examination (75%), laboratory exercises and continuous assessment quizzes (25%) **Practical field work:** A series of 10 three-hour laboratory sessions, one per week for 10 weeks of the semester.

Note: Department permission required for enrolment.

Chemistry 1B (Advanced) is built on a satisfactory prior knowledge of Chemistry 1A (Advanced) and covers inorganic and organic chemistry. Successful completion of Chemistry 1B (Advanced) is an acceptable prerequisite for entry into Intermediate Chemistry units of study. Lectures: A series of about 39 lectures, three per week throughout the semester.

Textbooks
A booklist is contained in the booklet Junior Chemistry distributed at enrolment. Further information can be obtained from the School.

CHEM1903
Chemistry 1A (Special Studies Program)

Credit points: 6 **Session:** Semester 1 **Classes:** Three 1 hour lecture, one 1 hour tutorial per week and one 3 hour practical per week. **Prerequisites:** UAI of at least 98.7 and HSC Chemistry result in Band 6 **Corequisites:** Recommended concurrent unit of study: 6 credit points of Junior Mathematics. **Prohibitions:** CHEM1001, CHEM1101, CHEM1109, CHEM1901 **Assessment:** Theory examination (75%), laboratory exercises and continuous assessment quizzes (25%)

Note: Department permission required for enrolment. Note: Entry is by invitation. This unit of study is deemed to be an Advanced unit of study.

Entry to Chemistry 1A (Special Studies Program) is restricted to students with an excellent school record in Chemistry. The practical work syllabus for Chemistry 1A (Special Studies Program) is very different from that for Chemistry 1A and Chemistry 1A (Advanced) and consists of special project-based laboratory exercises. All other unit of study details are the same as those for Chemistry 1A (Advanced). A Distinction in Chemistry 1A (Special Studies Program) is an acceptable prerequisite for entry into Chemistry 1B (Special Studies Program).

CHEM1904
Chemistry 1B (Special Studies Program)

Credit points: 6 **Session:** Semester 2 **Classes:** Three 1 hour lecture, one 1 hour tutorial per week and one 3 hour practical per week. **Prerequisites:** Distinction in CHEM1903 **Corequisites:** Recommended concurrent units of study: 6 credit points of Junior Mathematics. **Prohibitions:** CHEM1002, CHEM1102, CHEM1108, CHEM1902 **Assessment:** Theory examination (75%), laboratory exercises and continuous assessment quizzes (25%)

Note: Department permission required for enrolment. Note: Entry is by invitation. This unit of study is deemed to be an Advanced unit of study.

Entry to Chemistry 1B (Special Studies Program) is restricted to students who have gained a Distinction in Chemistry 1A (Special Studies Program). The practical work syllabus for Chemistry 1B (Special Studies Program) is very different from that for Chemistry 1B and Chemistry 1B (Advanced) and consists of special project-based laboratory exercises. All other unit of study details are the same as those for Chemistry 1B (Advanced) . Successful completion of Chemistry 1B (Special Studies Program) is an acceptable prerequisite for entry into Intermediate Chemistry units of study.

Intermediate units of study

The School of Chemistry offers a number of units of study to cater for the differing needs and interests of students. The following 6 credit point units of study are offered: CHEM2401 Molecular Reactivity and Spectroscopy, CHEM2402 Chemical Structure and Stability, CHEM2403 Chemistry of Biological Molecules, CHEM2404 Forensic and Environmental Chemistry, CHEM2911 Molecular Reactivity and Spectroscopy (Adv), CHEM2912 Chemical Structure and Stability (Adv), CHEM2915 Molecular Reactivity and Spectroscopy (SSP), CHEM2916 Chemical Structure and Stability (SSP).Note: The core Intermediate Chemistry units CHEM (2401 or 2911 or 2915) and CHEM (2402 or 2912 or 2916) are prerequisites for all Senior Chemistry units of study. Students who wish to enrol in Senior Chemistry in 2010 must have completed both core units.

CHEM2401
Molecular Reactivity and Spectroscopy

Credit points: 6 **Teacher/Coordinator:** Dr P J Rutledge **Session:** Semester 1 **Classes:** Three 1 hour lectures per week, seven 1 hour tutorials per semester, eight 4 hour practicals per semester. **Prerequisites:** CHEM (1101 or 1901 or 1903 or 1907 or 1908 or 1108) and CHEM (1102 or 1902 or 1904 or 1909 or 1109), 6 credit points of Junior Mathematics **Prohibitions:** CHEM2001, CHEM2101, CHEM2301, CHEM2311, CHEM2502, CHEM2901, CHEM2903, CHEM2911, CHEM2915 **Assessment:** One 3 hour examination, quizzes, lab reports

Note: This is a required chemistry unit of study for students intending to major in chemistry.

This is one of the two core units of study for students considering majoring in chemistry, and for students of other disciplines who wish to acquire a good general background in chemistry. The unit considers fundamental questions of molecular structure, chemical reactivity, and molecular spectroscopy: What are chemical reactions and what makes them happen? How can we follow and understand them? How can we exploit them to make useful molecules? This course includes the organic and medicinal chemistry of aromatic compounds, organic reaction mechanisms, vibrational and electronic spectroscopy and their applications, quantum chemistry, and molecular orbital theory.

CHEM2911
Molecular Reactivity & Spectroscopy Adv

Credit points: 6 **Teacher/Coordinator:** Dr P J Rutledge **Session:** Semester 1 **Classes:** Three 1 hour lectures per week, seven 1 hour tutorials per semester and eight 4 hour practicals per semester. **Prerequisites:** Credit average or better in CHEM (1101 or 1901 or 1903 or 1907 or 1908 or 1108) and CHEM (1102 or 1902 or 1904 or 1909 or 1109). 6 credit points of Junior Mathematics. **Prohibitions:** CHEM2001, CHEM2101, CHEM2301, CHEM2311, CHEM2401, CHEM2502, CHEM2901, CHEM2903, CHEM2915 **Assessment:** One 3 hour examination, quizzes, lab reports.

The syllabus for this unit is the same as that of CHEM2401 together with special Advanced material presented in the theory and practical programs. The lectures cover fundamental consideration of molecular electronic structure and its role in molecular reactivity and spectroscopy and include applications of spectroscopy, the organic chemistry of aromatic systems, molecular orbital theory and quantum chemistry.

CHEM2915
Molecular Reactivity & Spectroscopy SSP

Credit points: 6 **Teacher/Coordinator:** Dr P J Rutledge **Session:** Semester 1 **Classes:** Three 1 hour lectures per week, twelve 1 hour SSP seminars per semester, eight 4 hour practicals per semester. **Prerequisites:** By invitation. High WAM and a Distinction average in CHEM (1101 or 1901 or 1903 or 1907 or 1908 or 1108) and CHEM (1102 or 1902 or 1904 or 1909 or 1109). 6 credit points of Junior Mathematics **Prohibitions:** CHEM2001, CHEM2101, CHEM2301, CHEM2311, CHEM2401, CHEM2502, CHEM2901, CHEM2903, CHEM2911 **Assessment:** One 3 hour examination, quizzes, assignments, lab reports.

Note: Department permission required for enrolment. Note: The number of places in this unit of study is strictly limited and entry is by invitation only. Enrolment is conditional upon available places.

The lectures for this unit comprise the lectures for CHEM2401 and the Advanced practical program together with additional SSP seminars.

Two streams of SSP seminars are offered: Series One comprises three seminar series on state of the art topics in chemistry (in 2008, these covered Advanced Kinetics, Quantum Theory and Palladium in organic synthesis), Series Two is devoted to Advanced Theoretical Chemistry.

CHEM2402
Chemical Structure and Stability

Credit points: 6 **Teacher/Coordinator:** Dr P J Rutledge **Session:** Semester 2 **Classes:** Three 1 hour lectures per week, seven 1 hour tutorials per semester, eight 4 hour practicals per semester. **Prerequisites:** CHEM (1101 or 1901 or 1903 or 1907 or 1908 or 1108) and CHEM (1102 or 1902 or 1904 or 1909 or 1109), 6 credit points of Junior of Mathematics **Prohibitions:** CHEM2202, CHEM2302, CHEM2902, CHEM2912, CHEM2916 **Assessment:** One 3 hour examination, quizzes, lab reports

Note: This is a required chemistry unit of study for students intending to major in chemistry.

This is the second core unit of study for students considering majoring in chemistry, and for students seeking a good general background in chemistry. The unit continues the consideration of molecular structure and chemical reactivity. Topics include the structure and bonding of inorganic compounds, the properties of metal complexes, statistical thermodynamics, the organic chemistry of carbonyl compounds and organometallic reagents, and the art of synthesis.

CHEM2912
Chemical Structure and Stability (Adv)

Credit points: 6 **Teacher/Coordinator:** Dr P J Rutledge **Session:** Semester 2 **Classes:** Three 1 hour lectures per week, seven 1 hour tutorials per semester, eight 4 hour practicals per semester. **Prerequisites:** Credit average or better in CHEM (1101 or 1901 or 1903 or 1907 or 1908 or 1108) and CHEM (1102 or 1902 or 1904 or 1909 or 1109). 6 credit points of Junior Mathematics. **Prohibitions:** CHEM2202, CHEM2302, CHEM2402, CHEM2902, CHEM2916 **Assessment:** One 3 hour examination, quizzes, lab reports.

The syllabus for this unit is the same as that of CHEM2402 together with special Advanced material presented in the theory and practical programs. The lectures include the properties of inorganic compounds and complexes, statistical thermodynamics, the chemistry of carbonyls, nucleophilic organometallic reagents, and synthetic methods.

CHEM2916
Chemical Structure and Stability (SSP)

Credit points: 6 **Teacher/Coordinator:** Dr P J Rutledge **Session:** Semester 2 **Classes:** Three 1 hour lectures per week, twelve 1 hour SSP seminars per semester, eight 4 hour practicals per semester. **Prerequisites:** By invitation. High WAM and a Distinction average in CHEM (1101 or 1901 or 1903 or 1907 or 1908 or 1108) and CHEM (1102 or 1902 or 1904 or 1909 or 1109). 6 credit points of Junior Mathematics. **Prohibitions:** CHEM2202, CHEM2302, CHEM2402, CHEM2902, CHEM2912 **Assessment:** One 3 hour examination, quizzes, assignments, lab reports.

Note: Department permission required for enrolment. Note: The number of places in this unit of study is strictly limited and entry is by invitation only. Enrolment is conditional upon available places.

The lectures for this unit comprise the lectures for CHEM2402 and the Advanced practical program together with additional SSP seminars comprising three seminar series on state of the art topics in chemistry (in 2008, these covered carbon-rich chemistry, advanced theoretical chemistry and the chemistry of antibiotics).

CHEM2404
Forensic and Environmental Chemistry

Credit points: 6 **Teacher/Coordinator:** Dr P J Rutledge **Session:** Semester 1 **Classes:** Three 1 hour lectures per week, six 1 hour tutorials and five 4 hour practical sessions per semester. **Prerequisites:** 12 credit points of Junior Chemistry; 6 credit points of Junior Mathematics **Prohibitions:** CHEM3107, CHEM3197 **Assessment:** One 3 hour examination, quizzes, lab reports.

Note: To enrol in Senior Chemistry in 2010 students are required to have completed CHEM (2401 or 2911 or 2915) and CHEM (2402 or 2912 or 2916). Students are advised that combinations of CHEM2 units that do not meet this requirement will generally not allow progression to Senior Chemistry.

The identification of chemical species and quantitative determination of how much of each species is present are the essential first steps in solving all chemical puzzles. In this course students learn analytical techniques and chemical problem solving in the context of forensic and environmental chemistry. The lectures on environmental chemistry will cover two main topics: atmospheric chemistry (covering air pollution, global warming and ozone depletion), and water and soil chemistry (including bio-geochemical cycling, chemical speciation, catalysis and green chemistry). The forensic component of the course examines the gathering and analysis of evidence, using a variety of chemical techniques, and the development of specialised forensic techniques in the analysis of trace evidence. Students will also study forensic analyses of inorganic, organic and biological materials (dust, soil, inks, paints, documents, etc.) in police, customs and insurance investigations and learn how a wide range of techniques are used to examine forensic evidence.

CHEM2403
Chemistry of Biological Molecules

Credit points: 6 **Teacher/Coordinator:** Dr P J Rutledge **Session:** Semester 2 **Classes:** Three 1 hour lectures per week, six 1 hour tutorials per semester, five 4 hour practical sessions per semester. **Prerequisites:** 12 credit points of Junior Chemistry; 6 credit points of Junior Mathematics **Prohibitions:** CHEM2001, CHEM2901, CHEM2311, CHEM2903, CHEM2913 **Assessment:** One 3 hour examination, quizzes, lab reports

Note: To enrol in Senior Chemistry in 2010 students are required to have completed CHEM (2401 or 2911 or 2915) and CHEM (2402 or 2912 or 2916). Students are advised that combinations of CHEM2 units that do not meet this requirement will generally not allow progression to Senior Chemistry.

Life is chemistry. This unit of study examines the key chemical processes that underlie all living systems. Lectures cover the chemistry of carbohydrates, lipids and DNA, the mechanisms of organic and biochemical reactions that occur in biological systems, chemical analysis of biological systems, the inorganic chemistry of metalloproteins, biomineralisation, biopolymers and biocolloids, and the application of spectroscopic techniques to biological systems. The practical course will include the chemical characterisation of biopolymers, experimental investigations of iron binding proteins, organic and inorganic chemical analysis, and the characterisation of anti-inflammatory drugs.

Senior units of study

The School of Chemistry offers a choice of 6 credit point units of study to cater for the differing needs and interests of students. Each unit involves two lectures and 4 hours of lab each week.

CHEM3110
Biomolecules: Properties and Reactions

Credit points: 6 **Session:** Semester 1 **Classes:** Two 1 hour lecture and one 4 hour practical per week. **Prerequisites:** CHEM(2401 or 2911 or 2915) and CHEM(2402 or 2912 or 2916) **Prohibitions:** CHEM3910 **Assessment:** One 2 hour exam, prac reports

DNA, proteins and carbohydrates represent three classes of essential biomolecules present in all biological systems. This unit will cover the structure, reactivity and properties of biomolecules and the building blocks from which these molecules are assembled, their interactions with metal ions and small molecules, and highlight the chemical tools used to study the behaviour of biomolecules. The final section of the unit will illustrate how chemists apply the same principles used by nature in these systems to produce molecular sensors and switches for applications in medicine and industry.

CHEM3910
Biomolecules: Properties & Reactions Adv

Credit points: 6 **Session:** Semester 1 **Classes:** Two 1 hour lectures and one 4 hour practical per week. **Prerequisites:** WAM of 65 or greater and a Credit or better in: CHEM (2401 or 2911 or 2915) and CHEM (2402 or 2912 or 2916). **Prohibitions:** CHEM3110 **Assessment:** One 2 hour exam, prac reports

DNA, proteins and carbohydrates represent three classes of essential biomolecules present in all biological systems. This unit will cover the structure, reactivity and properties of biomolecules and the building blocks from which these molecules are assembled, their interactions with metal ions and small molecules, and highlight the chemical tools used to study the behaviour of biomolecules. The final section of the unit will illustrate how chemists apply the same principles used by

nature in these systems to produce molecular sensors and switches for applications in medicine and industry. CHEM3910 students attend the same lectures as CHEM3110 students but attend an additional advanced seminar series comprising one lecture a week for 12 weeks.

CHEM3111
Organic Structure and Reactivity

Credit points: 6 **Session:** Semester 1 **Classes:** Two 1 hour lectures and one 4 hour practical per week. **Prerequisites:** CHEM(2401 or 2911 or 2915) and CHEM(2402 or 2912 or 2916) **Prohibitions:** CHEM3911 **Assessment:** One 2 hour exam, prac reports

The structure and shape of organic molecules determines their physical properties, their reaction chemistry as well as their biological/medicinal activity. The determination of this structure and understanding its chemical consequences is of fundamental importance in chemistry, biochemistry, medicinal and materials chemistry. This course examines the methods and techniques used to establish the structure of organic molecules as well as the chemistry which dictates the shapes that they adopt. The first part of the course examines the use of modern spectroscopic methods (nuclear magnetic resonance spectroscopy, infrared spectroscopy and mass spectroscopy) which are used routinely to identify organic compounds. The second part of the course examines the chemical consequences of molecular shapes in more depth and looks at how different molecular shapes arise as a consequence of the mechanism of chemical reactions used to synthesise them.

CHEM3911
Organic Structure and Reactivity (Adv)

Credit points: 6 **Session:** Semester 1 **Classes:** Two 1 hour lectures and one 4 hour practicals per week. **Prerequisites:** WAM of 65 or greater and a Credit or better in: CHEM (2401 or 2911 or 2915) and CHEM (2402 or 2912 or 2916). **Prohibitions:** CHEM3111 **Assessment:** One 2 hour exam, prac reports

The structure and shape of organic molecules determines their physical properties, their reaction chemistry as well as their biological/medicinal activity. The determination of this structure and understanding its chemical consequences is of fundamental importance in chemistry, biochemistry, medicinal and materials chemistry. This course examines the methods and techniques used to establish the structure of organic molecules as well as the chemistry which dictates the shapes that they adopt. The first part of the course examines the use of modern spectroscopic methods (nuclear magnetic resonance spectroscopy, infrared spectroscopy and mass spectroscopy) which are used routinely to identify organic compounds. The second part of the course examines the chemical consequences of molecular shapes in more depth and looks at how different molecular shapes arise as a consequence of the mechanism of chemical reactions used to synthesize them. CHEM3911 students attend the same lectures as CHEM3111 students, but attend an additional advanced seminar series comprising one lecture a week for 12 weeks.

CHEM3112
Materials Chemistry

Credit points: 6 **Session:** Semester 1 **Classes:** One 2 hour lecture and one 4 hour practical per week. **Prerequisites:** CHEM(2401 or 2911 or 2915) and CHEM(2402 or 2912 or 2916) **Prohibitions:** CHEM3912 **Assessment:** One 2 hour exam, prac reports

This course concerns the inorganic chemistry of solid-state materials: compounds that possess 'infinite' bonding networks. The extended structure of solid materials gives rise to a wide range of important chemical, mechanical, electrical, magnetic and optical properties. Consequently such materials are of enormous technological significance as well as fundamental curiosity. In this course you will learn how chemistry can be used to design and synthesise novel materials with desirable properties. The course will start with familiar molecules such as C60 and examine their solid states to understand how the nature of chemical bonding changes in the solid state, leading to new properties such as electronic conduction. This will be the basis for a broader examination of how chemistry is related to structure, and how structure is related to properties such as catalytic activity, mechanical strength, magnetism, and superconductivity. The symmetry of solids will be used explain how their structures are classified, how they can transform between related structures when external conditions such as temperature, pressure and electric field are changed, and how this can be exploited in technological applications such as sensors and switches. Key techniques used to characterise solid-state materials will be covered, particularly X-ray diffraction, microscopy, and physical property measurements.

CHEM3912
Materials Chemistry (Adv)

Credit points: 6 **Session:** Semester 1 **Classes:** Two 1 hour lectures and one 4 hour practicals per week. **Prerequisites:** WAM of 65 or greater and a Credit or better in: CHEM (2401 or 2911 or 2915) and CHEM (2402 or 2912 or 2916). **Prohibitions:** CHEM3112 **Assessment:** One 2 hour exam, prac reports

This course concerns the inorganic chemistry of solid-state materials: compounds that possess 'infinite' bonding networks. The extended structure of solid materials gives rise to a wide range of important chemical, mechanical, electrical, magnetic and optical properties. Consequently, such materials are of enormous technological significance as well as fundamental curiosity. In this course you will learn how chemistry can be used to design and synthesize novel materials with desirable properties. The course will start with familiar molecules such as C60 and examine their solid states to understand how the nature of chemical bonding changes in the solid state, leading to new properties such as electronic conduction. This will be the basis for a broader examination of how chemistry is related to structure, and how structure is related to properties such as catalytic activity, mechanical strength, magnetism, and superconductivity. The symmetry of solids will be used explain how their structures are classified, how they can transform between related structures when external conditions such as temperature, pressure and electric field are changed, and how this can be exploited in technological applications such as sensors and switches. Key techniques used to characterise solid-state materials will be covered, particularly X-ray diffraction, microscopy, and physical property measurements. CHEM3912 students attend the same lectures as CHEM3112 students, but attend an additional advanced seminar series comprising one lecture a week for 12 weeks.

CHEM3113
Catalysis and Sustainable Processes

Credit points: 6 **Session:** Semester 1 **Classes:** One 2 hour lecture and one 4 hour practical per week. **Prerequisites:** CHEM(2401 or 2911 or 2915) and CHEM(2402 or 2912 or 2916) **Prohibitions:** CHEM3913 **Assessment:** One 2 hour exam, prac reports

Almost 90% of manufactured chemicals (from fuels through polymers to drugs) involve at least one catalytic step in their production. Catalysis by enzymes is fundamental to all chemical pathways in living things. This course provides the foundation for a molecular-scale understanding of even the most complex catalysts. It begins by showing how organometallic fundamentals can be used to understand and design transition-metal catalysts. Making use of these concepts, the chemistry involved in surface catalysts will be examined. The course will address two main applications of catalysis. Synthetic polymers (plastics, woven materials, films, coatings, etc.) are the most ubiquitous and diverse of modern materials. These are synthesized by a range of catalytic processes, whose chemistry will be described. It will be shown how the mechanisms of these reactions in turn control the molecular weights of the resulting polymers, as well as other aspects of molecular architecture such as degree of branching. The other major application is the use of porous solids (zeotypes) as acid/base and redox catalysts. Confinement-induced selectivity changes are discussed and related to similar phenomena in enzymatic catalysis. In both applications students will also examine the overall process and look at the reasons behind choice of product, catalyst and reaction design with a specific focus on economy and environmental sustainability.

CHEM3913
Catalysis and Sustainable Process (Adv)

Credit points: 6 **Session:** Semester 1 **Classes:** Two 1 hour lecture and one 4 hour practical per week. **Prerequisites:** WAM of 65 or greater and a Credit or better in: CHEM (2401 or 2911 or 2915) and CHEM (2402 or 2912 or 2916). **Prohibitions:** CHEM3113 **Assessment:** One 2 hour exam, prac reports

Almost 90% of manufactured chemicals (from fuels through polymers to drugs) involve at least one catalytic step in their production. Catalysis by enzymes is fundamental to all chemical pathways in living things. This course provides the foundation for a molecular-scale understanding of even the most complex catalysts. It begins by showing how organometallic fundamentals can be used to understand and design transition-metal catalysts. Making use of these concepts, the chemistry involved in surface catalysts will be examined. The course will address two main applications of catalysis. Synthetic polymers (plastics, woven materials, films, coatings, etc.) are the most ubiquitous and diverse of modern materials. There are synthesized by a range of catalytic processes, whose chemistry will be described. It will be shown how the mechanisms of these reactions in turn control the molecular weights of the resulting polymers, as well as other aspects of molecular architecture such as degree of branching. The other major application is the use of porous solids (zeotypes) as acid/base and redox catalysts. Confinement-induced selectivity changes are discussed and related to similar phenomena in enzymatic catalysis. In both applications students will also examine the overall process and look at the reasons behind choice of product, catalyst and reaction design with a specific focus on economy and environmental sustainability. CHEM3913 students attend the same lectures as CHEM3113 students, but attend an additional advanced seminar series comprising one lecture a week for 12 weeks.

CHEM3114
Metal Complexes: Medicine and Materials

Credit points: 6 **Session:** Semester 2 **Classes:** Two 1 hour lectures and one 4 hour practical per week. **Prerequisites:** CHEM(2401 or 2911 or 2915) and CHEM(2402 or 2912 or 2916) **Prohibitions:** CHEM3914 **Assessment:** One 2 hour exam, prac reports

Coordination compounds, with bonds between a central metal atom and surrounding ligands, play critical roles in biology, biochemistry and medicine, controlling the structure and function of many enzymes and their metabolism. They play similarly vital roles in many industrial processes and in the development of new materials with specifically designed properties. Building on the foundation of crystal field theory, this course offers a comprehensive treatment of the structures and properties of coordination compounds, with a qualitative molecular orbital description of metal-ligand bonds, and their spectroscopic, magnetic and dynamic effects. The exploitation of these properties in medicine and materials will be emphasized.

CHEM3914
Metal Complexes: Medic. & Mater. (Adv)

Credit points: 6 **Session:** Semester 2 **Classes:** Two 1 hour lectures and one 4 hour practical per week. **Prerequisites:** WAM of 65 or greater and a Credit or better in: CHEM (2401 or 2911 or 2915) and CHEM (2402 or 2912 or 2916). **Prohibitions:** CHEM3114 **Assessment:** One 2 hour exam, prac reports

Coordination compounds, with bonds between a central metal atom and surrounding ligands, play critical roles in biology, biochemistry and medicine, controlling the structure and function of many enzymes and their metabolism. They play similarly vital roles in many industrial processes and in the development of new materials with specifically designed properties. Building on the foundation of crystal field theory, this course offers a comprehensive treatment of the structures and properties of coordination compounds, with a qualitative molecular orbital description of metal-ligand bonds, and their spectroscopic, magnetic and dynamic effects. The exploitation of these properties in medicine and materials will be emphasized. CHEM3914 students attend the same lectures as CHEM3114 students, but attend an additional advanced seminar series comprising one lecture a week for 12 weeks.

CHEM3115
Synthetic Medicinal Chemistry

Credit points: 6 **Session:** Semester 2 **Classes:** Two 1 hour lectures and one 4 hour practical per week. **Prerequisites:** CHEM(2401 or 2911 or 2915) and CHEM(2402 or 2912 or 2916) **Prohibitions:** CHEM3915 **Assessment:** One 2 hour exam, prac reports

The development of new pharmaceuticals fundamentally relies on the ability to design and synthesize new compounds. Synthesis is an enabling discipline for medicinal chemistry - without it, the development of new drugs cannot progress from design to implementation, and ultimately to a cure. This unit will tackle important factors in drug design, and will highlight the current arsenal of methods used in the discovery of new drugs, including rational drug design, high throughput screening and combinatorial chemistry. We will develop a logical approach to planning a synthesis of a particular target structure. The synthesis and chemistry of heterocycles, which comprise some 40% of all known organic compounds and are particularly common in pharmaceuticals, will be outlined. Examples will include important ring systems present in biological systems, such as pyrimidines and purines (DNA and RNA), imidazole and thiazole (amino acids and vitamins) and porphyrins (natural colouring substances and oxygen carrying component of blood). Throughout the course, the utility of synthesis in medicinal chemistry will be illustrated with case studies such as anti-influenza (Relenza), anaesthetic (benzocaine), anti-inflammatory (Vioxx), antihypertensive (pinacidil) and cholesterol-lowering (Lovastatin) drugs.

CHEM3915
Synthetic Medicinal Chemistry (Adv)

Credit points: 6 **Session:** Semester 2 **Classes:** Two 1 hour lectures and one 4 hour practical per week. **Prerequisites:** WAM of 65 or greater and a Credit or better in: CHEM (2401 or 2911 or 2915) and CHEM (2402 or 2912 or 2916). **Prohibitions:** CHEM3115 **Assessment:** One 2 hour exam, prac reports

The development of new pharmaceuticals fundamentally relies on the ability to design and synthesize new compounds. Synthesis is an enabling discipline for medicinal chemistry - without it, the development of new drugs cannot progress from design to implementation, and ultimately to a cure. This unit will tackle important factors in drug design, and will highlight the current arsenal of methods used in the discovery of new drugs, including rational drug design, high throughput screening and combinatorial chemistry. We will develop a logical approach to planning a synthesis of a particular target structure. The synthesis and chemistry of heterocycles, which comprise some 40% of all known organic compounds and are particularly common in pharmaceuticals, will be outlined. Examples will include important ring systems present in biological systems, such as pyrimidines and purines (DNA and RNA), imidazole and thiazole (amino acids and vitamins) and porphyrins (natural colouring substances and oxygen carrying component of blood). Throughout the course, the utility of synthesis in medicinal chemistry will be illustrated with case studies such as anti-influenza (Relenza), anaesthetic (benzocaine), anti-inflammatory (Vioxx), antihypertensive (pinacidil) and cholesterol-lowering (Lovastatin) drugs. CHEM3915 students attend the same lectures as CHEM3115 students, but attend an additional advanced seminar series comprising one lecture a week for 12 weeks.

CHEM3116
Membranes, Self Assembly and Surfaces

Credit points: 6 **Session:** Semester 2 **Classes:** Two 1 hour lecture and one 4 hour practical per week. **Prerequisites:** CHEM(2401 or 2911 or 2915) and CHEM(2402 or 2912 or 2916) **Prohibitions:** CHEM3916 **Assessment:** One 2 hour exam, prac reports

Away from the covalent and ionic interactions that hold molecules and solids together is the world of fragile objects - folded polymers, membranes, surface adsorption and stable molecular aggregates - held together by weak forces such as van der Waals and the hydrophobic effect. The use of molecules rather than atoms as building blocks means that there are an enormous number of possibilities for stable aggregates with interesting chemical, physical and biological properties, many of which still wait to be explored. In this course we will examine the molecular interactions that drive self assembly and

the consequences of these interactions in supramolecular assembly, lipid membrane formations and properties, microemulsions, polymer conformation and dynamics and range of fundamental surface properties including adhesion, wetting and colloidal stability.

CHEM3916
Membranes, Self Assembly & Surfaces(Adv)

Credit points: 6 **Session:** Semester 2 **Classes:** Two 1 hour lectures and one 4 hour practical per week. **Prerequisites:** WAM of 65 or greater and a Credit or better in: CHEM (2401 or 2911 or 2915) and CHEM (2402 or 2912 or 2916). **Prohibitions:** CHEM3116 **Assessment:** One 2 hour exam, prac reports

Away from the covalent and ionic interactions that hold molecules and solids together is the world of fragile objects - folded polymers, membranes, surface adsorption and stable molecular aggregates - held together by weak forces such as van der Waals and the hydrophobic effect. The use of molecules rather than atoms as building blocks means that there are an enormous number of possibilities for stable aggregates with interesting chemical, physical and biological properties, many of which still wait to be explored. In this course we examine the molecular interactions that drive self assembly and the consequences of these interactions in supramolecular assembly, lipid membrane formations and properties, microemulsions, polymer conformation and dynamics and range of fundamental surface properties including adhesion, wetting and colloidal stability. CHEM3916 students attend the same lectures as CHEM3916 students, but attend an additional advanced seminar series comprising one lecture a week for 12 weeks.

CHEM3117
Molecular Spectroscopy & Quantum Theory

Credit points: 6 **Session:** Semester 2 **Classes:** Two 1 hour lecture and one 4 hour practical per week. **Prerequisites:** CHEM(2401 or 2911 or 2915) and CHEM(2402 or 2912 or 2916) **Prohibitions:** CHEM3917 **Assessment:** One 2 hour exam, prac reports

This course will cover the fundamentals of molecular spectroscopy as a modern research tool and as a theoretical basis with which to understand everyday phenomena. This course is aimed at students who wish to acquire a rigorous understanding of the interaction between light and matter. The course teaches the quantum theory needed to understand spectroscopic phenomena (such as the absorption of light) without the need for difficult mathematics. This low level theory is used as a tool with which to understand models of everyday phenomena. The course teaches application and theory, with descriptions of applied spectroscopic techniques. Alongside the coverage of modern spectroscopy, the course provides an accessible treatment of the science behind vision, flames, solar cells and photochemical smog.

CHEM3917
Mol. Spectroscopy & Quantum Theory (Adv)

Credit points: 6 **Session:** Semester 2 **Classes:** Two 1 hour lecture and one 4 hour practical per week. **Prerequisites:** WAM of 65 or greater and a Credit or better in: CHEM (2401 or 2911 or 2915) and CHEM (2402 or 2912 or 2916). **Prohibitions:** CHEM3117 **Assessment:** One 2 hour exam, prac reports

This course will cover the fundamentals of molecular spectroscopy as a modern research tool and as a theoretical basis with which to understand everyday phenomena. This course is aimed at students who wish to acquire a rigorous understanding of the interaction between light and matter. The course teaches the quantum theory needed to understand spectroscopic phenomena (such as the absorption of light) without the need for difficult mathematics. This low level theory is used as a tool with which to understand models of everyday phenomena. The course teaches application and theory, with descriptions of applied spectroscopic techniques. Alongside the coverage of modern spectroscopy, the course provides an accessible treatment of the science behind vision, flames, solar cells and photochemical smog. CHEM3917 students attend the same lectures as CHEM3117 students, but attend an additional advanced seminar series comprising one lecture a week for 12 weeks.

Chemistry Honours

The honours program in the School of Chemistry gives students the opportunity to get involved in a research program in an area that is of interest to them. It provides training in research techniques and experience using modern research instrumentation. The honours program adds a new dimension to the skills that the students have acquired during their undergraduate years and enhances their immediate employment prospects and, more significantly, their future career potential. All students with a sound record in Chemistry are encouraged to apply for entry to the honours program. The School of Chemistry offers a wide range of possible projects in all areas of contemporary chemistry including Biological and Medicinal Chemistry, Synthesis and Catalysis, Physical and Theoretical Chemistry, Supramolecular Chemistry, Polymers and Colloids and Chemical Spectroscopy. Details of available projects are contained in the School's Honours Booklet that is available from the School's Information Desk. In the honours year, each student undertakes a research project under the supervision of a member of staff; writes a thesis which explains the problem; outlines the research undertaken and the results obtained; attends advanced lecture courses, normally given by leaders in their field from overseas or Australia; attends research seminars and undertakes additional written assessment. Further information is available from the Honours Coordinator, or at www.chem.usyd.edu.au/future/honours.html.

Civil Engineering

The School of Civil Engineering is part of the Faculty of Engineering and Information Technologies. In addition to providing professional training in this branch of engineering it offers units of study to students enrolled in the Faculty of Science majoring in Mathematics, Physics, Chemistry, Geology, Computer Science or Soil Science.The most relevant units of study are CIVL2201 - Structural Mechanics, CIVL2230 - Introduction to Structural Concepts and Design, CIVL2410 Soil Mechanics, and CIVL2611 Fluid Mechanics. Details regarding these units of study can be obtained from the Faculty of Engineering and Information Technologies Handbook. These units of study are intended first to demonstrate the application of scientific principles in an engineering context. The second intention is to introduce the application of this understanding to analysis and design in civil engineering.As well as the above units of study, Faculty of Science students are invited to enrol in other civil engineering units of study, provided they have the appropriate pre-requisites and assumed knowledge.

Double Degree

BSc graduates, who have passed all four of the above four units of study within the School of Civil Engineering, may obtain a Bachelor of Engineering degree in Civil Engineering after an additional two years' study, following the award of the BSc. Students wishing to undertake this option must apply through UAC and compete on the basis of academic merit. Prospective students are advised to discuss their plans with the School of Civil Engineering before enrolment. Further details regarding admission to the BE in Civil Engineering may be obtained from the Engineering Faculty Office in the Engineering and Information Technologies Faculty Building.

Computational Science

Coordinator
Dr Mike Wheatland

Junior units of study

COSC1001
Computational Science in Matlab

Credit points: 3 **Session:** Semester 2 **Classes:** One 1 hour lecture and one 2 hour practical per week. **Prohibitions:** COSC1901 **Assumed knowledge:** HSC Mathematics **Assessment:** One assignment, practical work, including practical exams, theory exam.

This unit of study focuses on scientific problem solving and data visualisation using computers and is complementary to COSC1002. Students will learn how to solve problems arising in the natural sciences and mathematics using core features of the problem solving environment MATLAB, with a choice of problems from various areas of science at each stage. Emphasis will be placed on graphical display and visualisation of data and solutions to problems. No previous knowledge of programming is assumed.

COSC1901
Computational Science in Matlab (Adv)

Credit points: 3 **Session:** Semester 2 **Classes:** One 1 hour lecture and one 2 hour practical per week. **Prerequisites:** UAI of at least 90, or COSC1902, or a distinction or better in COSC1002, SOFT (1001, 1002, 1901 or 1902). **Prohibitions:** COSC1001 **Assumed knowledge:** HSC Mathematics **Assessment:** One assignment, practical work, including practical exams, theory exam.

This unit of study is the advanced version of COSC1001 and is complementary to COSC1902. The subject matter is very similar but more challenging problems will be covered and some additional programming and visualisation techniques will be used.

COSC1002
Computational Science in C

Credit points: 3 **Session:** Semester 2 **Classes:** One 1 hour lecture and one 2 hour practical per week. **Prohibitions:** COSC1902 **Assumed knowledge:** HSC Mathematics **Assessment:** One assignment, practical work, including practical exams, theory exam.

This unit of study focuses on scientific problem-solving using computers and is complementary to COSC1001. Students will learn how to solve problems arising in the natural sciences and mathematics using core features of the language C, with a choice of problems from various areas of science at each stage. No previous knowledge of programming is assumed.

COSC1902
Computational Science in C (Adv)

Credit points: 3 **Session:** Semester 2 **Classes:** One 1 hour lecture and one 2 hour practical per week. **Prerequisites:** UAI of at least 90, or COSC1901, or a distinction or better in COSC1001, SOFT (1001, 1002, 1901 or 1902). **Prohibitions:** COSC1002 **Assumed knowledge:** HSC Mathematics **Assessment:** One assignment, practical work, including practical exams, theory exam.

This unit of study is the advanced version of COSC1002 and is complementary to COSC1901. The subject matter is very similar, but more challenging problems will be covered and some additional programming techniques will be used.

Senior units of study

For a major in Computational Science, the minimum requirement is 24 credit points chosen from the core or elective senior units of study listed for this subject area, of which at least 12 credit points must be from the following core senior units of study: COSC3011 Scientific Computing; COSC3911 Scientific Computing (Advanced); MATH3076 Mathematical Computing*; MATH3976 Mathematical Computing (Advanced)*. For Senior elective units see Table 1.

Notes

* Refer to Mathematics listing in this chapter for descriptions of these units of study. Senior elective units of study for a major in Computational Science are listed in Table 1 in chapter 3.

COSC3011
Scientific Computing

Credit points: 6 **Session:** Semester 2 **Classes:** Two 1 hour lectures and one 3 hour practical per week. **Prerequisites:** 12 credit points chosen from Junior Mathematics and Statistics, 12 credit points of Intermediate units in Science subject areas. **Prohibitions:** COSC3911, COSC3001, COSC3901, PHYS3301, PHYS3901 **Assumed knowledge:** Programming experience in MATLAB **Assessment:** Assignments, lab, project work and written exam

This unit of study provides a senior-level treatment of scientific problem solving using computers. Students will understand and apply a wide range of numerical schemes for solving ordinary and partial differential equations. Linear algebra is used to provide detailed insight into stability analysis, relaxation methods, and implicit integration. A variety of scientific problems are considered, including planetary motion, population demographics, heat diffusion, traffic flow and quantum mechanics. All coding is performed with MATLAB, and basic programming experience is assumed.

Textbooks

Garcia, AL. Numerical Methods for Physics, 2nd Edition.

COSC3911
Scientific Computing (Advanced)

Credit points: 6 **Session:** Semester 2 **Classes:** Two 1 hour lectures and one 3 hour practical per week. **Prerequisites:** 12 credit points chosen from Junior Mathematics and Statistics, 12 credit points of Intermediate units in Science subject areas with a credit average. **Prohibitions:** COSC3011, COSC3001, COSC3901, PHYS3301, PHYS3901 **Assumed knowledge:** Programming experience in MATLAB **Assessment:** Assignments, lab, project work and written exam

This unit is the Advanced version of COSC3011. The subject matter is very similar, but more challenging problems will be covered.

Textbooks

Garcia, AL. Numerical Methods for Physics, 2nd Edition.

MATH3076
Mathematical Computing

Credit points: 6 **Teacher/Coordinator:** Dr D J Ivers **Session:** Semester 1 **Classes:** Three 1 hour lectures and one 1 hour laboratory per week. **Prerequisites:** 12 credit points of Intermediate Mathematics and one of MATH(1001 or 1003 or 1901 or 1903 or 1906 or 1907) **Prohibitions:** MATH3976, MATH3016, MATH3916 **Assessment:** One 2 hour exam, assignments, quizzes

This unit of study provides an introduction to Fortran 95 programming and numerical methods. Topics covered include computer arithmetic and computational errors, systems of linear equations, interpolation and approximation, solution of nonlinear equations, quadrature, initial value problems for ordinary differential equations and boundary value problems.

MATH3976
Mathematical Computing (Advanced)

Credit points: 6 **Teacher/Coordinator:** Dr D J Ivers **Session:** Semester 1 **Classes:** Three 1 hour lectures and one 1 hour tutorial per week. **Prerequisites:** 12 credit points of Intermediate Mathematics and one of MATH(1903 or 1907) or Credit in MATH1003 **Prohibitions:** MATH3076, MATH3016, MATH3916 **Assessment:** One 2 hour exam, assignments, quizzes

See entry for MATH3076 Mathematical Computing.

Electrical Engineering

The School of Electrical and Information Engineering is part of the Faculty of Engineering and Information Technologies. In addition to providing professional training in this branch of engineering it offers many units of study that are available to students enrolled in the Faculty of Science. Details regarding these units of study can be obtained from the Faculty of Engineering and Information Technologies Handbook or from the school website: www.ee.usyd.edu.au/ugrad

Double Degree

Science graduates may obtain up to two years advanced standing towards a Bachelor of Engineering degree in Computer, Electrical, Software or Telecommunications Engineering. Students wishing to undertake this option must seek academic advice from the School of Electrical and Information Engineering. Further details regarding admission to the BE may be obtained from the Engineering and Information Technologies Faculty Office. The School of Engineering is located in Building J03.

Environmental Science

Environmental Science is an applied interdisciplinary field concerned with the environment around us, regardless of whether it is natural or human-made, and how we can utilize or manage it for our benefit. It

draws on a wide range of science-based disciplines and applications, from ecology to solar power, analytical chemistry to geomorphology. Environmental Science is also concerned with the social issues involved, including environmental law and policy, sustainability, resource economics, urban planning, and environmental ethics. Environmental scientists and managers need to have a broad knowledge base and the ability to be flexible and innovative in their application of such knowledge. Consequently, the emphasis of the Environmental Science program is placed upon studies that span and integrate several disciplines, involve adaptive problem solving, and develop new skills and expertise. In particular, the Environmental Science program looks to supplement studies in the science disciplines with units that provide complimentary information on environmental issues that not only show how the sciences interact in the environment but how humans impact upon it. Prior to 2007, students wanting to Study Environmental Science did so through the specialist BSc (Environmental) degree - see Table 1B. Now students wanting to take Environmental Science can only do so by taking a double major in the BSc, one major in Environmental Studies and the other in a Science discipline of the students' choice. For descriptions of the ENVI units of study, refer to the entries under Environmental Studies.

Honours in the Bachelor of Science (Environmental)

Students of sufficient merit may be admitted to an Honours course in the Bachelor of Science (Environmental). In the Honours year, a student will undertake an interdisciplinary research exercise in association with one or more supervising members of the academic staff at the University of Sydney, write a thesis based upon the research, and attend advanced lecture units of study and seminars as required by their supervisor(s). The honours year is not only rewarding but enjoyable as well, and marks the transition period where a student becomes a research collaborator. Eligible students can choose to complete Honours in the following Science Subject Areas: Agricultural Chemistry, Biology, Chemistry, Geography, Geology, Marine Science, Microbiology, or Soil Science. (Please note that there are no honours units of study entitled 'Environmental Science').

Environmental Studies

Environmental Studies is the examination of the human interactions with the natural and built environment. It encapsulates the fundamental social aspects of sustainability, environmental impact, law, ethics, development, energy use, economics and politics. In order to properly cover this material, the ENVI units are taught by various staff from within the Faculties of Science, Architecture and Law. Consequently, the ENVI units are complimentary to studies not only in the physical and natural Science disciplines but also to the social disciplines.

Obtaining a major in Environmental studies

A major in Environmental Studies constitutes the completion of 24 credit points of Senior units as listed in Table 1, including at least 12 credit points of Senior ENVI units of study listed below. Study of at least one Intermediate ENVI unit is highly recommended.

ENVI2111
Conservation Biology and Applied Ecology

Credit points: 6 **Teacher/Coordinator:** Dr C Taylor **Session:** Semester 1 **Classes:** Two 1 hour lectures and one 2 hour practical per week, plus one 2 day field trip during the semester. **Prerequisites:** 24 credit points of Junior Science units, including 12 credit points of Junior Biology (BIOL/MBLG/EDUH). **Prohibitions:** ENVI2911, ENVI2001. **Assessment:** Essays, tutorial papers, exam.

This topic examines the role of conservation biology and applied ecology in environmental science, examining pattern and process in natural systems and evaluating how these are being affected by pervasive anthropogenic impacts. Focusing on the conservation, assessment of impacts and the restoration of natural systems, we consider the range of ecological issues environmental scientists must address. We examine the extent of environmental problems; derive explanations of why and how they are occurring and address management options for resolving them. We will derive general principles for these by addressing case studies, chosen from Australian examples when possible. The aim of this unit is for you to understand the processes that go into solving environmental problems from an ecological perspective and how to identify management options.

ENVI2911
Conservation Biology (Advanced)

Credit points: 6 **Teacher/Coordinator:** Dr Charlotte Taylor **Session:** Semester 1 **Classes:** Two 1 hour lectures and one 2 hour practical per week, plus one 2 day field trip during the semester. **Prerequisites:** Distinction average in BIOL (1001 or 1911 or 1101 or 1901) and 6 additional credit points of Junior Biology (BIOL/MBLG/EDUH). 12 credit points of Junior Chemistry (or for BSc (Marine Science) students 6 credit points of Junior Chemistry and 6 credit points of Junior Physics). These requirements may be varied and students with lower averages should consult the Unit Executive Officer. **Prohibitions:** ENVI2111, ENVI2001. **Assessment:** One 2 hour exam, field report, briefing paper, oral presentation.

Qualified students will participate in alternative components of ENVI2111, Conservation Biology, including an independent reseach project.

Textbooks

Caughley G, Gunn. 1996. Conservation Biology in Theory and Practice, Blackwell, Oxford.
Lindenmeyer D, Burgman M. 2005. Practical Conservation Biology, CSIRO Publishing, Victoria
Attiwill P, Wilson B. 2003. Ecology: An Australian Perspective, Oxford University Press.

ENVI2112
Atmospheric Processes and Climate

Credit points: 6 **Teacher/Coordinator:** Edwina Tanner **Session:** Semester 2 **Classes:** Three 1 hour lectures and one 2 hour practical per week. **Prerequisites:** 24 credit points of Junior Science units, including 12 credit points of Junior Chemistry or Physics **Prohibitions:** ENVI2002 **Assessment:** Assignments, tutorial papers, exam

This unit of study investigates the physical and chemical characteristics of our atmosphere, as well as the natural processes that occur within it and how these contribute to the climate we live in. Topics such as atmospheric structure, photochemical processes, and weather will be examined. The effects of ocean circulation are investigated, particularly examining the ocean's importance as a source/sink for atmospheric constituents and as a heat regulator. The impact of glaciation is also examined, including sources, quantity, magnitude of threat, and the potential impact to our climate, are then explored. Finally, the unit examines issues surrounding climate change and the modelling of these changes.

ENVI3111
Environmental Law and Ethics

Credit points: 6 **Teacher/Coordinator:** Dr Gerry Bates Dr Jane Johnson **Session:** Semester 1 **Classes:** Two 2 hour lectures per week. **Prerequisites:** 12 credit points of Intermediate Science or Agriculture units. **Prohibitions:** ENVI3001, ENVI3003. **Assumed knowledge:** Intermediate Environmental Science. **Assessment:** Essays, tutorial papers.

This unit of study covers topics in environmental law and ethics. The environmental law component provides an overview of all laws in Australia pertaining to environmental matters and looks at a number of environmental issues at the various levels of analysis, policy making, implementation of policy, enforcement, and dispute resolution. It also provides a broad background to the political and economical issues as they relate to the legal issues involved. It also examines international environmental law, particularly examining how these influence and affect our local policies. The ethics component helps students develop thoughtful and informed positions on issues in environmental ethics using arguments derived from traditional ethics as well as environmentally specific theories. Ethical conflicts are often inevitable and difficult to resolve but using the resources of philosophical ethics and regular reference to case studies, students can learn to recognize the values and considerations at stake in such conflicts, acknowledge differing viewpoints and defend their own well considered positions.

ENVI3112
Environmental Assessment

Credit points: 6 **Teacher/Coordinator:** Dr John Dee Dr Scott Kable **Session:** Semester 2 **Classes:** Two 2 hour lectures per week. **Prerequisites:** 12 credit points of Intermediate Science or Agriculture units. **Prohibitions:** ENVI3002, ENVI3004. **Assumed knowledge:** Intermediate Environmental Science. **Assessment:** Essays, tutorial papers, report.

This unit of study is composed of two components: environmental impact assessment and risk assessment. The former is generally concerned with issues related to environmental impact assessment and builds toward the process of producing an EIS/EIA. Moor specifically it seeks to establish a critical understanding of the theory and practice of environmental impact studies/statements (EIS) and environmental impact assessment processes (EIA) from both the positive (scientific) and normative (value) perspectives. Emphasis is placed on gaining skills in writing and producing an assessment report, which contains logically ordered and tightly structured argumentation that can stand rigorous scrutiny by political processes, the judiciary, the public and the media. The risk assessment component considers a more chemical approach to the assessment of risk and issues of safety with respect to chemicals, ecotoxicology and the environment.

ENVI3114
Energy and the Environment

Credit points: 6 **Teacher/Coordinator:** Dr Chris Dey **Session:** Semester 2 **Classes:** Two 1 hour lectures and one 1 hour tutorial per week and three field trips. **Prerequisites:** 12 credit points of Intermediate Science or Agriculture units. **Prohibitions:** ENVI3001, PHYS3600. **Assumed knowledge:** Junior Physics or Intermediate Environmental Science. **Assessment:** Essays, tutorial papers, field reports, exam.

This unit covers the following aspects of energy and the environment: energy use; electrical power generation including alternate methods such as wind turbines; the environmental impact of energy use and power generation including the enhanced greenhouse effect; transportation and pollution; energy management in buildings; solar thermal energy, photovoltaics, and nuclear energy; and, socio-economic and political issues related to energy use and power generation.

GEOS3513
Regional Development and Environment

Credit points: 6 **Teacher/Coordinator:** Dr Bill Pritchard; Dr Timohir Ancev **Session:** Semester 1 **Classes:** 2 hours of lectures per week and 2 hours of tutorials/practicals per week **Prerequisites:** 24 credit points of intermediate and/or senior units of study including 6 credit points of Intermediate units of study in Geography. **Prohibitions:** ENVI3113, GEOS3511, GEOS3911, GEOS3913 **Assessment:** Two in-class tests, one 1,500 word essay, one GIS report

This unit of study acquaints students with debates and tools associated with regional development and the economic analysis of environmental issues. It provides a useful preparation for professional employment in the field of regional development, environmental policy and management, and is relevant for students interested in economic and social issues in regional Australia. Co-taught be a geographer and an economist, the unit addresses four key areas of relevance: (i) regional development theory and practice; (ii) the economics of efficiently utilising and managing the environment; (iii) debates on regional development in Australia (including consideration of the farm sector, Indigenous communities and environmental sustainability), and (iv) the use of GIS to analyse population census date. The unit requires no prior knowledge of economic theory or GIS software.

GEOS3913
Regional Development & Environment (Adv)

Credit points: 6 **Teacher/Coordinator:** Dr Bill Pritchard, Dr Timohir Ancev **Session:** Semester 1 **Classes:** 2 hours of lectures per week and 2 hours of tutorials/practicals per week. **Prerequisites:** 24 credit points of intermediate and/or senior units of study including 6 credit points of intermediate units of study in Geography with a grade of Credit or better **Prohibitions:** ENVI3113, GEOS3513, GEOS3911 **Assessment:** In-class tests, essay, report

This unit of study is a more advanced version of GEOS3513. It includes more challenging assessment tasks.

Financial Mathematics and Statistics

This is an interdisciplinary major offered in the Faculty of Science consisting of several core units and a number of elective units from mathematics, statistics and information technologies. The program is designed to meet the need for high level quantitative and modelling skills in the banking, insurance, stockbroking and finance industries without constraining students to a full major in mathematics or statistics. Graduates with specifically strong mathematical and statistics backgrounds are in very high demand. The core units Optimisation and Financial Mathematics (MATH2070/2970) and Financial Mathematics (MATH3075/3975) are the backbone of the program and introduce the student to important financial concepts within a mathematical and statistical framework. The core mathematics and statistics units provide the technical base that is required by a quantitative analyst, while the elective units offer the student increased flexibility and additional opportunities to develop related skills. Students completing the program at the Advanced Level may continue into Fourth Year Honours where a number of further Financial Mathematics and Statistics units are on offer. It is envisaged that students completing the Honours program will not only be highly trained in quantitative finance, but will also be well prepared for active research in the field. Students should refer to Table 1 for an enrolment guide and to entries under the contributing Schools for unit of study descriptions.

Geosciences

The School of Geosciences offers units of study in the discipline areas of Geography and Geology and Geophysics. Students may take a major in either of these disciplines, and many of the Geoscience units also form key components of the Environmental Studies and Marine Science majors. The junior units GEOS1001, GEOS1002 and GEOS1003 provide a comprehensive introduction to both Geography and Geology and Geophysics. A major in Geography or Geology and Geophysics can be included within various degree programs across the University, including Science, Arts, Liberal Studies, Economics and Social Sciences.

Geography

Geography is the study of earth as the home of people. As the need to find solutions to issues of environmental sustainability, population change and globalisation have become more challenging, the skills and knowledge of geographers have come to the forefront. Students of Geography are interested in their world, and are taught to think critically about the relationships between people, environments and places. The knowledge and skills gained from studying Geography at the University of Sydney provide a launch pad to a professional career in an array of fields including environmental management, planning, overseas development and consulting research. Our Geography program has strong linkages with various national and international organizations that provide pathways for further studies at Honours and post-graduate levels, and into the work force. It differs from High School Geography in that it provides more opportunities for independent learning, introduces new techniques and skills, offers flexibility for you to follow your interests and is tailored to real world events and issues.

Geology and Geophysics

Geology and Geophysics provides a unifying context for understanding the workings of the earth system and the dynamic structural and ecosystem relationships between the continents and the oceans. Global climate change and shrinking resources have heightened our sense of dependence on Earth as a complex system. Geology and Geophysics provides students with an understanding of change on Earth, its origin, plate tectonics, surface processes, evolution of life and geologic time. Intermediate units highlight the role of the earth system in all natural phenomena, including those of concern to humans such as geo-biodiversity, salinity, seismicity, volcanic hazards, climate and sea level change. Senior units of study cover methods of field data collection and provide access to cutting edge computing and

data resources used for turning such observations into knowledge. Students will acquire the skills necessary for employment in all areas of sustainable exploration and management of our natural, mineral and energy resources.

Geosciences Advice

As a Geoscience student at the University of Sydney, you will participate in an array of learning environments that complement traditional lecture and tutorial classes; for example, studies can include field trips to destinations in Australia and overseas. Students who wish to obtain advice concerning the units of study described below should approach School advisors during the enrolment week or the unit coordinators during semester. Further information is available at www.geosci.usyd.edu.au, as well as in the Geosciences' student handbook available from the School's administrative office (Room 348, Madsen Building).

Website

The School of Geosciences website is: www.geosci.usyd.edu.au.

Location

The School of Geosciences is located in the Madsen Building (F09). All student enquiries can be made at the Madsen Building, Room 348 - 9 am to 4.30pm, Mon to Fri.

Further information

Further information is available at www.geosci.usyd.edu.au, as well as in the Geosciences' student handbook available from the School's administrative office.

Geosciences junior units of study

Students are encouraged to commence their studies of Geography, Geology and Geophysics, Environmental Studies or Marine Science by enrolling in GEOS1001 (Earth, Environment and Society) (February semester). This unit of study provides an overarching introduction to issues and themes taught across the School of Geosciences. In the second (July) semester, Geography students should enroll in GEOS1002 (Introductory Geography); Geology and Geophysics students need to enroll in GEOS1003 (Introduction to Geology). Entry into any of these units of study does not require any prior knowledge

GEOS1001
Earth, Environment and Society

Credit points: 6 **Teacher/Coordinator:** Dr Mel Neave, Dr Bill Pritchard, Ms Edwina Tanner **Session:** Semester 1 **Classes:** Two 1 hour lectures and one 2 hour practical per week. **Prohibitions:** GEOS1901, GEOG1001, GEOG1002, GEOL1001, GEOL1002, GEOL1902 **Assessment:** One 2 hour exam, 2000 word essay, field and prac reports

This is the gateway unit of study for Human Geography, Physical Geography and Geology. Its objective is to introduce the big questions relating to the origins and current state of the planet: climate change, environment, landscape formation, and the growth of the human population. During the semester you will be introduced to knowledge, theories and debates about how the world's physical and human systems operate. The first module investigates the system of global environmental change, specifically addressing climate variability and human impacts on the natural environment. The second module presents Earth as an evolving and dynamic planet, investigating how changes take place, the rate at which they occur and how they have the potential to dramatically affect the way we live. Finally, the third module, focuses on human-induced challenges to Earth's future. This part of the unit critically analyses the relationships between people and their environments, with central consideration to debates on population change and resource use.

GEOS1002
Introductory Geography

Credit points: 6 **Teacher/Coordinator:** Dr Mel Neave, Dr Kurt Iveson **Session:** Semester 2 **Classes:** Two 1 hour lectures and one 2 hour practical per week. **Prohibitions:** GEOS1902, GEOG1001, GEOG1002 **Assessment:** One 2 hour exam, one 2000 word essay, five practical reports

This unit of study provides an introduction to the ways that human and physical landscapes are produced. It begins with an investigation of Earth's surface features, exploring the distribution of landforms across Earth and interpreting their evolutionary histories. Several landscapes will be examined including those formed by rivers, wind, oceans and glaciers. But physical landscapes evolve under the influence of and affect human operations. Therefore, the unit of study will also consider the political, economic, cultural and urban geographies which shape contemporary global society. Each of these themes will be discussed with reference to key examples, in order to consider the ways in which the various processes (both physical and human) interact in the shaping of places. The unit of study will also include short field trips to localities surrounding the university to observe processes of spatial change and conflict. The unit of study is designed to attract and interest students who wish to pursue geography as a major within their undergraduate degree, but also has relevance to students who wish to consider the way geographers understand the contemporary world.

GEOS1003
Introduction to Geology

Credit points: 6 **Teacher/Coordinator:** Dr Tom Hubble, A/Prof Clarke **Session:** Semester 2 **Classes:** Three 1 hour lectures and one 1 hour practical per week. **Prohibitions:** GEOS1903, GEOL1002, GEOL1902 **Assessment:** One 2 hour exam, practical reports, field report

The aim of this unit of study is to examine the chemical and physical processes involved in mineral formation, the interior of the Earth, surface features, sedimentary environments, volcanoes, and metamorphism. Lectures and laboratory sessions on mountain building processes and the formation of mineral deposits will lead to an understanding of the forces controlling the geology of our planet. Processes such as weathering, erosion and nature of sedimentary environments are related to the origin of the Australian landscape. In addition to laboratory classes there is a two-day excursion to the western Blue Mountains and Lithgow to examine geological objects in their setting.

Textbooks

The recommended text is Hamblin & Christiansen. Earth's Dynamic Systems. 9th Edition. Prentice Hall. 2001.

GEOL1501
Engineering Geology 1

Credit points: 6 **Teacher/Coordinator:** Dr Tom Hubble **Session:** Semester 2 **Classes:** 39 hours lectures, 26 hours laboratory. Field excursions in the Sydney region, as appropriate. **Prohibitions:** GEOL1002, GEOL1902, GEOS1003, GEOS1903 **Assumed knowledge:** No previous knowledge of Geology assumed **Assessment:** Practical laboratory work, assignment, and a combined theory and practical exam.

Course objectives: To introduce basic geology to civil engineering students.

Expected outcomes: Students should develop an appreciation of geologic processes as they influence civil engineering works and acquire knowledge of the most important rocks and minerals and be able to identify them.

Syllabus summary: Geological concepts relevant to civil engineering and the building environment. Introduction to minerals; igneous, sedimentary and metamorphic rocks, their occurrence, formation and significance. General introduction to physical geology and geomorphology, structural geology, plate tectonics, and hydrogeology. Associated laboratory work on minerals, rocks and mapping.

Textbooks

Approved readings will be provided via WebCT

GEOS1901
Earth, Environment and Society Advanced

Credit points: 6 **Teacher/Coordinator:** Dr Mel Neave, Dr Bill Pritchard, Ms Edwina Tanner **Session:** Semester 1 **Classes:** Two 1 hour lectures and one 2 hour practical per week. **Prerequisites:** Departmental permission is required for enrolment. A UAI above 93 is normally required for admission. This requirement may be varied and students should consult the unit of study coordinator. **Prohibitions:** GEOS1001, GEOG1001, GEOG1002, GEOL1001,

GEOL1002, GEOL1902 **Assessment:** One 2 hour exam, 2000 word essay, field and prac reports

Note: Department permission required for enrolment.

Advanced students will complete the same core lecture material as for GEOS1001, but will be required to carry out more challenging practical assignments.

GEOS1902
Introductory Geography (Advanced)

Credit points: 6 **Teacher/Coordinator:** Dr Mel Neave, Dr Kurt Iveson **Session:** Semester 2 **Classes:** Two 1 hour lectures and one 2 hour practica per week. **Prerequisites:** Departmental permission is required for enrolment. A UAI above 93 is normally required for admission. This requirement may be varied and students should consult the unit of study coordinator. **Prohibitions:** GEOS1002, GEOG1001, GEOG1002 **Assessment:** One 2 hour exam, one 2000 word essay, five practical reports

Note: Department permission required for enrolment.

Advanced students will complete the same core lecture material as for GEOS1002, but will be required to carry out more challenging practical assignments.

GEOS1903
Introduction to Geology (Advanced)

Credit points: 6 **Teacher/Coordinator:** Dr Tom Hubble, A/Prof Geoff Clarke **Session:** Semester 2 **Classes:** Three 1 hour lectures and one 1 hour practical per week. **Prerequisites:** Departmental permission is required for enrolment. A UAI above 93 is normally required for admission. This requirement may be varied and students should consult the unit of study coordinator. **Prohibitions:** GEOL1002, GEOL1902, GEOS1003 **Assessment:** One 2 hour exam, practical reports, field report

Note: Department permission required for enrolment.

This unit has the same objectives as GEOS1003 and is suitable for students who wish to pursue aspects of the subject in greater depth. Entry is restricted and selection is made from the applicants on the basis of their performance to date. Students that elect to take this unit will participate in alternatives to some aspects of the standard unit and will be required to pursue independent work to meet unit objectives. This unit may be taken as part of the BSc (Advanced).

Geosciences intermediate units of study

Geoscience intermediate units of study are listed below. All intermediate students are encouraged to enroll in GEOS2111 (Natural Hazards: a GIS Approach) which covers concepts and skills relevant to all Geoscience disciplines. Students interested in different areas of the Geoscience disciplines might select intermediate units of study as follows: physical and environmental Geography: GEOS2111 and/or GEOS2113 (Feb semester); GEOS2121 and/or GEOG2321 (July semester), human and environmental Geography: GEOS2112 and/or GEOS2111 (Feb semester); GEOS2122 and/or GEOS2121 (July semester), Geology and Geophysics: GEOS2111, GEOL2112 and/or GEOS2114 (Feb semester); GEOS2124 and/or GEOS2121 (July semster). Regardless, subject to the prerequisites for each individual unit of study, students may vary their enrolment across these streams. The School of Geosciences encourages students to construct a sequential ordering of units that best meets their interests and aspirations.

GEOG2321
Fluvial and Groundwater Geomorphology

Credit points: 6 **Teacher/Coordinator:** Dr Melissa Neave **Session:** Semester 2 **Classes:** Two 1 hour lectures and one 2 hour practical per week. **Prerequisites:** GEOG(2311 or 2001) or 36 credit points of Junior study including GEOS1001 or GEOS1901 or GEOG1001 or ENVI (1001 or 1002) or GEOL (1001 or 1002 or 1501). Students in the Bachelor of Resource Economics should have 36 credit points of study in Biology (or Land and Water Science), Chemistry and Mathematics. Students in the Bachelor of Land and Water Science should have ENVI1002, 12 credit points of Chemistry, 6 credit points of Biology, BIOM1002. **Prohibitions:** GEOG (2002 or 2302 or 2303) or MARS2002 or MARS2006 **Assessment:** One 2 hr exam, one quiz, one field report, practical exercises

This unit of study provides an introduction to the fundamentals of fluvial geomorphology (the study of surface water as an agent of landscape change) and groundwater hydrology. The fluvial geomorphology section of the unit will describe the movement of water in stream channels and investigate the landscape change associated with that movement. Topics to be covered will include open channel flow hydraulics, sediment transport processes and stream channel morphology. Practical work will focus on the collection and analysis of field data. The quantity and quality of the groundwater resources are closely linked to geology and fluvial geomorphology. The groundwater section of this unit is based around four common groundwater issues: contamination, extraction, dryland salinity and groundwater-surface water interaction. In the practical component, common groundwater computer models such as FLOWTUBE and MODFLOW will be used to further explore these problems.

Textbooks

Recommended Textbooks: Fetter, CW. Applied Hydrogeology. Prentice-Hall. 2001. & Knighton, D. Fluvial Forms and Processes. Hodder-Arnold. 1998

GEOS2111
Natural Hazards: a GIS Approach

Credit points: 6 **Teacher/Coordinator:** Dr Patrice Rey and others **Session:** Semester 1 **Classes:** Two 1 hour lectures and one 3 hour practical per week. **Prerequisites:** 24 credit points of junior units of study including one of GEOS1001 or GEOS1002 or GEOS1003 or GEOG1001 or GEOG1002 or ENVI1002 or GEOL1001 or GEOL1002 or GEOS1902 or GEOL1501 or GEOS1901 or GEOS1903 **Prohibitions:** GEOG2411, GEOS2911 **Assessment:** One 2 hour exam, one assignment, report.

The geosciences provide an essential framework for understanding the environmental response to short- and long-term geologic, oceanic and atmospheric processes. This unit of study introduces students to a variety of natural phenomena that affect society with impact levels ranging from nuisance to disastrous. The discussion of each hazard focuses on: (1) the process mechanics, (2) hazards and risk, and (3) methods for mitigation. Geographic Information Systems (GIS) are used by scientists, planners, policy-makers and the insurance industry alike to address many issues relating to natural hazards. This unit of study will introduce students to the major concepts relating to GIS and provide practical experience in the application of GIS techniques to hazard mapping, risk assessment and mitigation.

GEOS2112
Economic Geography of Global Development

Credit points: 6 **Teacher/Coordinator:** Dr Bill Pritchard, A/Prof Phil Hirsch **Session:** Semester 1 **Classes:** Two 1 hour lectures and one 2 hour practical per week. **Prerequisites:** 24 credit points of Junior units of study, including GEOS1001 or GEOS1002 or GEOS1003 or GEOS1901 or GEOS1902 or GEOS1903 or ECOP1001 or ECOP1002 or GEOG1002 or GEOG1001 or GEOL1002 or GEOL1902 **Prohibitions:** GEOS2912, GEOG2511 **Assessment:** One 2 hour exam, 2000 word essay, tutorial papers, practical report

In this unit of study, students will be introduced to the sub-discipline of economic geography by way of debates on the spatial character of global development. We focus on questions relating to who are the winners and losers from contemporary patterns of global economic change. This includes the analysis of relevant conceptual approaches to these questions (including comparative advantage, global commodity chain theory, regionalism, economic governance etc), plus 'hands-on' examination of the key institutions (such as the WTO and ADB) driving these changes. In general, issues are tailored to themes being played out in Asia-Pacific countries. Students are expected to participate in a variety of practical class exercises throughout the semester, which will include presenting the fruits of independent research activities. This unit provides an especially relevant feeder-unit into GEOS3053/ GEOS3054, the Asia-Pacific Field School.

GEOS2113
Making the Australian Landscape

Credit points: 6 **Teacher/Coordinator:** Dr S.J. Gale **Session:** Semester 1 **Classes:** Two - three 1 hour lectures and one - two 1 hour practicals per week. **Prerequisites:** 24 credit points of Junior units of study, including GEOS1002 or GEOS1003 or GEOS1902 or GEOS1903 or GEOG1001 or ENVI1002 or GEOL1001 or GEOL1002 or GEOL1902 **Prohibitions:** GEOS2913 **Assessment:** One 2 hour examination, practical reports.

The shifts in the nature of the Earth's environment over time and the resultant changes in process regimes have had dramatic impacts on

the way the Australian physical landscape has evolved. We consider here the effects of these changes on the broad pattern of the landscape, focusing particularly on slopes and soils. We follow this by investigating the environmental changes that have taken place since the end of the last glacial, the time when the continent's climates and environments first took on a recognisably modern form. We deal specifically with the impact of human activity on the Australian biophysical environment, emphasising both pre-European impacts and those changes that have taken place since European contact.

GEOS2114
Volcanoes, Hot Rocks and Minerals

Credit points: 6 **Teacher/Coordinator:** Dr Derek Wyman, Dr Patrice Rey, Prof Geoff Clarke **Session:** Semester 1 **Classes:** Two 1 hour lectures and one 3 hour practical per week. **Prerequisites:** One of (GEOG1001, GEOL1001, GEOL1002, GEOS1003, GEOS1903, ENVI1002, GEOL1902, GEOL1501) and 24 credit points of Junior Science units of study. **Prohibitions:** GEOL2111, GEOL2911, GEOS2914 **Assessment:** One 2 hour exam, practical reports, field trip report, group presentation

This unit of study relates the plate tectonics of subduction zones to a) volcanoes and their hazards; b) geological processes in the deep crust; and c) the formation of precious metal and gemstone ores around the Pacific Rim. A problem solving approach is used to develop the skills required to understand the history of individual volcanoes and predict their future activity and hazards. The unit includes a two to three day field trip to study an extinct volcanoe in NSW. Practical work includes independent study of igneous systems, rocks and minerals employing both microscope-based techniques and computer modeling. The unit provides relevant knowledge for GEOS3006/3906 - Mineral Deposits and Spatial Data Analysis.

GEOS2115
Oceans, Coasts and Climate Change

Credit points: 6 **Teacher/Coordinator:** Ass/Prof Dietmur Müller, Dr Peter Cowell **Session:** Semester 1 **Classes:** 26 x 1 hour lectures 6 x 1 hour workshops 1 x 8 hour field work 1 x 24 hour field school (3 days, Easter break) **Prerequisites:** 48 credit points from Junior Units of Study **Prohibitions:** GEOS2915, MARS2006 **Assumed knowledge:** At least one of (GEOG1001, GEOL1001, GEOL1002, GEOS1003, GEOS1903, ENVI1002, GEOL1902, GEOL1501) **Assessment:** 3 x web-based on-line reports (30% of total marks) 1 seminar presentation: field school (20% of total marks) 1 x 2 hour exam (50% of total marks)

This Unit of Study introduces core concepts about how the formation of ocean basins and their influence on climate govern the development of coasts and continental margins. These concepts provide a framework for understanding the geographic variation of coasts, continental shelves and sediment accumulations in the deep ocean. Ocean-basin evolution is explained in terms of movements within the Earth's interior and how these movements determine the geometry of ocean basins, and their alpine counterparts, which interact with the global circulation of the ocean and atmosphere. Affects of this interaction on energy regimes and hydrology are described in accounting for regional controls that govern supply and dispersal of sediments on continental margins and in ocean basins. These controls include effects on wave climates, wind-driven currents and tidal regimes. These controls also govern environmental conditions determining development of coral reefs and other ecosystems that play a key role in marine sedimentation. The Unit of Study systematically outlines how these factors have played out with climate change to produce the beaches, dunes, estuaries and deltas we see today, as well as the less familiar deposits hidden beneath the sea. The Unit also outlines how knowledge of responses to climate change in the past allow us to predict responses of coasts to accelerated climate change occurring now and in the future due to the industrial greenhouse effect. Overall therefore, the Unit aims to provide familiarity with fundamental phenomena central to the study of marine geoscience, introduced through process-oriented explanations. The Unit of Study is structure around problem-based project work, for which lectures provide the theoretical background.

Textbooks
Thurman, HV and Trujillo, AP. Introductory Oceanography. Pearson, Prentice-Hall, 10th Edition. 2004.

GEOS2121
Environmental and Resource Management

Credit points: 6 **Teacher/Coordinator:** Dr Phil McManus **Session:** Semester 2 **Classes:** Two 1 hour lectures and one 1 hour tutorial per week, one fieldtrip. **Prerequisites:** 24 credit points of junior units of study, including one of: GEOS1001 or GEOS1002 or GEOS1003 or GEOS1901 or GEOS1902 or GEOS1903 or ECOP1001 or ECOP1002 or GEOL1002 or GEOL1902 or GEOL1501 **Prohibitions:** GEOG2421, GEOL2202, GEOS2921 **Assessment:** One 2 hour exam, one 2000 word essay, tutorial papers, one fieldtrip report

This unit of study explores cultural constructions of nature and resources, the evolution of environmental thought and the debates about sustainable development. It integrates environmental, economic, cultural and social considerations, with particular regard to water, mining, forestry and fishing industries in Australia and other countries. The unit includes a fieldtrip to the Hunter Valley to look at geological and geographical issues pertaining to mines, wines and the thoroughbred breeding industries in this region. The unit of study enables students to learn about the economics of resource extraction and the social, cultural and environmental considerations that must be taken into account when developing and implementing environmental and resource management policies.

GEOS2122
Urban Geography

Credit points: 6 **Teacher/Coordinator:** Prof John Connell, Dr Kurt Iveson **Session:** Semester 2 **Classes:** Two 1 hour lectures and one 2 hour practical per week. **Prerequisites:** 24 credit points of Junior units of study, including GEOS1001 or GEOS1002 or GEOS1003 or ECOP1001 or ECOP1002. **Prohibitions:** GEOS2922, GEOG2521 **Assessment:** One 2 hour exam, 2000 word essay, tutorial papers, practical reports

Cities are full of different people doing all sorts of different things. Developing an understanding of these processes necessitates attention to the goegraphical principles that underlie varied social practices (work, leisure, sport, music etc) and social categories such as ethnicity, gender, sexuality and race. We will investigate how different people perceive space and construct space, primarily in Western contexts and thereby seek to understand the cultural and political dimensions of everyday life in cities.

GEOS2124
Fossils and Tectonics

Credit points: 6 **Teacher/Coordinator:** A/Prof Dietmar Müller **Session:** Semester 2 **Classes:** Two 1 hour lectures plus one 3 hour practical each week. **Prerequisites:** 24 credit points of Junior units of study, including GEOS1003 or GEOS1903 or GEOL1002 or GEOL1902 or GEOL1501 **Prohibitions:** GEOS2924, GEOL2123, GEOL2124 **Assessment:** One 2 hour exam, practical reports, field report

The unit aims to convey how fossils, stratigraphic and structural data are used together to determine ages and environments and the deformation history of rock layers. It covers an introduction to historical geology and the evolution of the major fossils groups. Methods of stratigraphic age determination include litho-, bio-, chemo-, magneto-stratigraphy, as well as radiometric geochronology and the stratigraphic characteristics of the main geological time intervals. Structural methods are focused on brittle deformation in the upper crust and sediments. Students will gain familiarity with the most important fossil groups and how to identify them, and with the most important types of faults and folds. The formation of fossil fuels such as coal, oil and gas will also be covered in an earth history and resource exploration context. The simultaneous use of fossils, stratigraphy and structure to unravel the geological history of a set of exposed rock layers is demonstrated during a field excursion to Yass.

Textbooks
Classnotes available in co-op bookshop

GEOS2911
Natural Hazards: a GIS Approach Advanced

Credit points: 6 **Teacher/Coordinator:** Dr Patrice Rey and others. **Session:** Semester 1 **Classes:** Two 1 hour lectures and one 3 hour practical per week. **Prerequisites:** 24 credit points of junior units of study including a distinction in one of GEOS1001 or GEOS1002 or GEOS1003 or GEOS1901 or GEOS1902 or GEOS1903 or GEOG1001 or GEOG1002 or ENVI1002 or GEOL1001 or

GEOL1002 or GEOL1902 or GEOL1501 **Prohibitions:** GEOG2411, GEOS2111 **Assessment:** One 2 hour exam, one assignment, practical report.

The geosciences provide an essential framework for understanding the environmental response to short- and long-term geologic, oceanic and atmospheric processes. This unit of study introduces students to a variety of natural phenomena that affect society with impact levels ranging from nuisance to disastrous. The discussion of each hazard focuses on: (1) the process mechanics, (2) hazards and risk, and (3) methods for mitigation. Geographic Information Systems (GIS) are used by scientists, planners, policy-makers and the insurance industry alike to address many issues relating to natural hazards. This unit of study will introduce students to the major concepts relating to GIS and provide practical experience in the application of GIS techniques to hazard mapping, risk assessment and mitigation.

GEOS2912
Economic Geography of Global Dev. Adv.

Credit points: 6 **Teacher/Coordinator:** Dr Bill Pritchard, A/Prof Phil Hirsch **Session:** Semester 1 **Classes:** Two 1 hour lectures and one 2 hour practical per week. **Prerequisites:** 24 credit points of Junior units of study, including a distinction in one of: GEOS1001 or GEOS1901 or GEOS1002 or GEOS1902 or GEOS1003 or GEOS1903 or ECOP1001 or ECOP1002 or GEOG1001 or GEOG1002 or GEOL1002 or GEOL1902 or GEOL1501 **Prohibitions:** GEOS2112, GEOG2511 **Assessment:** One 2 hour exam, 2000 word essay, tutorial papers, practical reports.

This is an Advanced version of GEOS2112. In this unit of study, students will be introduced to the sub-discipline of economic geography by way of debates on the spatial character of global development. We focus on questions relating to who are the winners and losers from contemporary patterns of global economic change. This includes the analysis of relevant conceptual approaches to these questions (including comparative advantage, global commodity chain theory, regionalism, economic governance etc), plus 'hands-on' examination of the key institutions (such as the WTO and ADB) driving these changes. In general, issues are tailored to themes being played out in Asia-Pacific countries. Students are expected to participate in a variety of practical class exercises throughout the semester, which will include presenting the fruits of independent research activities. This unit provides an especially relevant feeder-unit into GEOS3053/ GEOS3054, the Asia-Pacific Field School.

GEOS2914
Volcanoes, Hot Rocks and Minerals Adv

Credit points: 6 **Teacher/Coordinator:** Dr Derek Wyman Dr Patrice Rey Dr Geoff Clarke **Session:** Semester 1 **Classes:** Two 1 hour lectures and one 3 hour practical per week. **Prerequisites:** 24 credit points of Junior Science units of study and Distinction in one of GEOL1002 or GEOS1002 or ENVI1002 or GEOL1501 or GEOL1902 or GEOS1003 or GEOS1903.This requirement may be varied and students should consult the unit of study coordinator. **Prohibitions:** GEOL2001, GEOS2114 **Assessment:** One 2 hour exam, practical reports, field trip report, group presentation.

This unit has the same objectives as GEOS2114 and is suitable for students who wish to pursue aspects of the subject in greater depth. Entry is restricted and selection is made from the applicants on the basis of their performance to date. Students that elect to take this unit will participate in alternatives to some aspects of the standard unit and will be required to pursue independent work to meet unit objectives. This unit may be taken as part of the BSc (Advanced).

Textbooks
No required textbook. Course notes available.

GEOS2921
Environmental & Resource Management Adv

Credit points: 6 **Teacher/Coordinator:** Dr Phil McManus **Session:** Semester 2 **Classes:** Two 1 hour lectures, one 1 hour tutorial per week and one fieldtrip. **Prerequisites:** 24 credit points of Junior units of study, including a distinction in one of: GEOS1001 or GEOS1901 or GEOS1002 or GEOS1902 or GEOS1003 or GEOS1903 or ECOP1001 or ECOP1002 or GEOG1001 or GEOG1002 or GEOL1002 or GEOL1902 or GEOL1501. This requirement may be varied and students should consult the unit of study coordinator. **Prohibitions:** GEOG2421, GEOL2202, GEOS2121 **Assessment:** One 2 hour exam, one 2000 word essay, one 2500 word essay, one fieldtrip report

Advanced students will complete the same core lecture materials as for GEOS2121 but are required to complete an essay in place of the regular tutorial reports prepared in GEOS2121.

GEOS2922
Urban Geography (Advanced)

Credit points: 6 **Teacher/Coordinator:** Prof John Connell, Dr Kurt Iveson **Session:** Semester 2 **Classes:** Two 1 hour lectures and one 2 hour practical per week. **Prerequisites:** 24 credit points of Junior units of study, including a distinction in one of: GEOS1001 or GEOS1901 or GEOS1002 or GEOS 1902 or GEOS1003 or GEOS1903 or ECOP1001 or ECOP1002 or GEOG1001 or GEOG1002 **Prohibitions:** GEOS2122 **Assessment:** One 2 hour exam, 2000 word essay, tutorial papers, practical reports

Cities are full of different people doing all sorts of different things. Developing an understanding of these processes necessitates attention to the geographical principles that underlie varied social practices (work, leisure, sport, music, etc) and social categories such as ethnicity, gender, sexuality and race. This unit will examine how these process create and re-create urban landscapes. We will investigate how different people perceive space and construct space, primarily in western contexts, and thereby seek to understand the cultural and political dimensions of everyday life in cities.

GEOS2924
Fossils and Tectonics (Advanced)

Credit points: 6 **Teacher/Coordinator:** A/Prof Dietmar Müller, Dr Patrice Rey, Prof Peter Hatherly **Session:** Semester 2 **Classes:** Two 1 hour lectures plus one 3 hour practical each week. **Prerequisites:** Distinction in GEOS1003 or Distinction average in 12 credit points of Junior Geoscience units (Geoscience is the disciplines of Geography, Geology and Geophysics) **Prohibitions:** GEOS2124, GEOL2123, GEOL2124 **Assessment:** One 2 hour exam, practical reports, field report

This unit has the same objectives as GEOS2124 and is suitable for students who wish to pursue aspects of the subject in greater depth. Entry is restricted and selection is made from the applicants on the basis of their performance to date. Students that elect to take this unit will participate in alternatives to some aspects of the standard unit and will be required to pursue independent work to meet unit objectives. This unit may be taken as part of the BSc (Advanced).

Textbooks
Classnotes by available in co-op bookshop

Geosciences senior units of study

Geosciences Senior units of study provide specialist themes or topics relevant to ongoing studies or professions. Students may select from any of the units listed below.

Geography Major

The requirements for a Major in Geography are defined in Table 1. As with intermediate units, students would normally select sequential units of study from one of four overlapping streams - Physical Geography, Environmental Geography, Human Geography, and Geographic Computer Methods - although students may construct any ordering of these units that cater to their interests and aspirations, subject to satisfying any prerequisites.

Physical Geography stream

GEOS3009/3909 (Coastal Environments & Processes); GEOS3015/3915 (Environmental Geomorphology), GEOS3513/3913 (Regional Development and Environment), GEOS3018/3918 (Rivers: Science, Policy and Management)

Environmental Geography stream

GEOS3017/3917 (Global Energy-Exploration & Exploitation), GEOS3014/3914 (GIS in Coastal Management), GEOS3018/3918 (Rivers: Science, Policy and Management)GEOS3511/3911 (Understanding Australia's Regions)

Human Geography stream

GEOS3053/3953 (Asia-Pacific field school-Assessment A), GEOS3054/3954 (Asia-Pacific field school-Assessment B), GEOS3513/3913 (Regional Development and Environment),

GEOG3522/3922 (Cities and Citizenship), GEOS3521/3921 (Sustainable Cities)

Geographic Computer Methods stream

GEOS3014/3914 (GIS in Coastal Management), GEOS3007/3917 (Remote Sensing: Imaging the Earth), GEOS3016/3916 (Seafloor Processes & Imaging).

Geology and Geophysics Major

The requirements for a major in Geology and Geophysics are defined in Table 1. Students are required to take two compulsory units (GEOS3101/3801 and the field studies unit GEOS3008/3908, as well as two of GEOS3102, GEOS3103, GEOS3104. These units provide students with a foundation training that prepares them for further study in an Honours or postgraduate coursework program as well as enabling them to enter the main professional fields of the discipline, eg. Resource and Energy Exploration, Engineering Geology, and Environmental Geology.

GEOS3008
Field Geology and Geophysics

Credit points: 6 **Teacher/Coordinator:** Dr Patrice Rey, Prof Peter Hatherley **Session:** Semester 2 **Classes:** (weeks 1-7) 14 days of field work **Prerequisites:** 12 credit points of Intermediate GEOS units **Prohibitions:** GEOL3103, GEOS3908 **Assessment:** The field work will be assessed by written reports (up to 30 pages in total) and field exercises

This unit is considered an essential component all Geology and Geophysics majors. All students will undertake a range of exercises, but concentrate on aspects that emphasise their chosen major: (1) field mapping and the analysis of geological objects in the field, in weakly to complexly deformed sedimentary and volcanic sequences; (2) field investigations of mineral deposits and their relationships to host rocks; and (3) the practical application of magnetic and electrical methods commonly employed in the search for mineral deposits. The field course complements other subject areas in Geology & Geophysics and will give students experience in the field identification of rocks and minerals, regional geology, stratigraphy, structure and rock relationships. Students will be required to pay the cost of hostel-style accommodation during field work, which may involve camping.

GEOS3009
Coastal Environments & Processes

Credit points: 6 **Teacher/Coordinator:** Assoc Prof. Gavin Birch, Dr Ana Vila-Concejo **Session:** Semester 1 **Classes:** Two 1 hour lectures and one 2 hour practical per week; weekend excursion. **Prerequisites:** (6 credit points of Intermediate Geoscience* units) and (6 further credit points of Intermediate Geoscience or 6 credit points of Physics or Mathematics or Information Technology or Engineering units) or ((MARS2005 or MARS2905) and (MARS2006 or MARS2906)) **Prohibitions:** GEOS3909, MARS3003, MARS3105 **Assessment:** One 2 hour exam, two 1500 word reports.

*Note: * Geoscience is the disciplines of Geography, Geology and Geophysics.*

Australian coastal environments are dynamic systems responding to input sediments and processes as well as solid boundary conditions.

The unit focuses on high-energy wave and wind dominated coastal systems that include the beach-surf zone, dunes, barriers, carbonate (coral reef) environments and their Holocene/Quaternary evolution. The regional impact of waves, tides, embayments, and other environmental parameters in controlling morphology and deposits are addressed. The practical program uses real data sets collected during recent research programs and during two field excursions which address issues

specifically relevant to Australia's coastline. The excursions include one 2 day weekend field trip and one 5 day field trip to the Great Barrier Reef in the mid semester break. Note: Students will incur costs in attending the excursions. Alternative

work will be provided if students cannot attend the 5 day field trip.

Textbooks
Recommended:
Short, A D (ed) Beach and Shoreface Morphodynamics. John Wiley & Sons, Chichester. 1999.
Course notes will be available from the Photocopy Centre.

GEOS3014
GIS in Coastal Management

Credit points: 6 **Teacher/Coordinator:** Dr Eleanor Bruce, Dr Peter Cowell. **Session:** Semester 2 **Classes:** Two 1 hour lectures and one 3 hour practical per week. **Prerequisites:** MARS(2005 or 2905) and MARS(2006 or 2906), or 12 credit points of Intermediate Geoscience* units, or (GEOS(2115 or 2915) and BIOL(2018 or 2918)) **Prohibitions:** GEOS3914, MARS3104. **Assessment:** One 2 hour exam, two project reports, quizzes.

*Note: * Geoscience is the disciplines of Geography, Geology and Geophysics.*

Coastal Management is about how scientific knowledge is used to support policy formulation and planning decisions in coastal environments. The course links coastal science to policy and practice in management of estuaries, beaches and the coastal ocean. The principles are exemplified through specific issues, such as coastal erosion, pollution, and impacts of climate-change. The issues are dealt with in terms of how things work in nature, and how the issues are handled through administrative mechanisms. These mechanisms involve planning strategies like Marine Protected Areas and setback limits on civil development in the coastal zone. At a practical level, the link between science and coastal management is given substance through development and use of 'decision-support models'. These models involve geocomputing methods that entail application of simulation models, remotely sensed information, and Geographic Information Systems (GIS). The course therefore includes both principles and experience in use of these methods to address coastal-management issues. (It thus also involves extensive use of computers.) Although the focus is on the coast, the principles and methods have broader relevance to environmental management in particular, and to problem-solving in general. That is, the course has vocational relevance in showing how science can be exploited to the benefit of society and nature conservation.

Textbooks
Burrough, PA and McDonnell, RA. Principles of Geographical Information Systems: Spatial information systems and geostatistics. Oxford University Press. Oxford. 1998.

GEOS3015
Environmental Geomorphology

Credit points: 6 **Teacher/Coordinator:** Dr Stephen Gale **Session:** Semester 2 **Classes:** Two 1 hour lectures, one 1 hour tutorial and one 2 hour practical per week or equivalent. **Prerequisites:** 24 credit points of Intermediate units, including 6 credit points of Intermediate Geography. **Prohibitions:** GEOS3915 **Assumed knowledge:** Intermediate geomorphology/ physical geography/ geology. **Assessment:** One 2 hour exam, practical & field reports

The first part of this unit deals with the effects of weathering on the physical and the built environment, and considers the relationship between soil and landforms. The second part investigates the environmental changes that have taken place since the end of the last glacial, the time when the world's climates and environments first took on a recognisably modern form. It deals specifically with changes to the Australian biophysical environment and will focus on human-environmental impacts, both under pre-European and post-contact conditions.

GEOS3018
Rivers: Science, Policy and Management

Credit points: 6 **Teacher/Coordinator:** Dr Mel Neave. **Session:** Semester 1 **Classes:** Two 1 hour lectures, one 1 hour tutorial, two 4 hour practicals per week; fieldwork **Prerequisites:** (24 credit points of Intermediate units of study including 6 credit points of Intermediate Geography units of study) or ((MARS2005 or MARS2905) and (MARS2006 or MARS2906)) **Prohibitions:** GEOS3918 **Assessment:** One 2 hour exam, two 1500 word essays

The unit of study is concerned with understanding the functioning of river catchments from both natural science and social science perspectives, at a variety of scales. The catchment as a morphodynamic process-response system is addressed with an emphasis on the relationships between processes and landform entities. Similarly, relationships within social, economic, and political systems are explored within the catchment context, with particular emphasis on the interactions between the social system and bio-physical system. Empirical context for the unit will primarily be

drawn from the Murray-Darling, Mekong, and Hawkesbury-Nepean catchments. Fieldwork in the latter is integral to the unit of study.

Textbooks
Gordon, et al. Stream Hydrology: An Introduction for Ecologists. 2004.

GEOS3513
Regional Development and Environment

Credit points: 6 **Teacher/Coordinator:** Dr Bill Pritchard; Dr Timohir Ancev **Session:** Semester 1 **Classes:** 2 hours of lectures per week and 2 hours of tutorials/practicals per week **Prerequisites:** 24 credit points of intermediate and/or senior units of study including 6 credit points of Intermediate units of study in Geography. **Prohibitions:** ENVI3113, GEOS3511, GEOS3911, GEOS3913 **Assessment:** Two in-class tests, one 1,500 word essay, one GIS report

This unit of study acquaints students with debates and tools associated with regional development and the economic analysis of environmental issues. It provides a useful preparation for professional employment in the field of regional development, environmental policy and management, and is relevant for students interested in economic and social issues in regional Australia. Co-taught be a geographer and an economist, the unit addresses four key areas of relevance: (i) regional development theory and practice; (ii) the economics of efficiently utilising and managing the environment; (iii) debates on regional development in Australia (including consideration of the farm sector, Indigenous communities and environmental sustainability), and (iv) the use of GIS to analyse population census date. The unit requires no prior knowledge of economic theory or GIS software.

GEOS3913
Regional Development & Environment (Adv)

Credit points: 6 **Teacher/Coordinator:** Dr Bill Pritchard, Dr Timohir Ancev **Session:** Semester 1 **Classes:** 2 hours of lectures per week and 2 hours of tutorials/practicals per week. **Prerequisites:** 24 credit points of intermediate and/or senior units of study including 6 credit points of intermediate units of study in Geography with a grade of Credit or better **Prohibitions:** ENVI3113, GEOS3513, GEOS3911 **Assessment:** In-class tests, essay, report

This unit of study is a more advanced version of GEOS3513. It includes more challenging assessment tasks.

GEOG3521
Sustainable Cities

Credit points: 6 **Teacher/Coordinator:** Dr Phil McManus **Session:** Semester 2 **Classes:** Two 1 hour lectures and one 2 hour practical/tutorial per week. **Prerequisites:** 24 credit points of Intermediate Units of study including 6 credit points of Intermediate Geography units of study. **Prohibitions:** GEOG3921, GEOG3202 **Assessment:** One 2 hour exam; 2000 word essay, tutorial papers, practical reports

Are cities sustainable? Why or why not? This unit of study develops themes introduced in Intermediate units in Geography relating to sustainability, focusing on the ways we manage urban regions. This involves discussion of topics including utopian visions for cities, urban history, ecological footprint analysis, bioregionalism, transport options, urban form and urban policy, with reference to sustainable futures. The unit of study looks at different Australian cities and includes practical work on a current sustainability issue in Sydney.

GEOS3522
Cities and Citizenship

Credit points: 6 **Teacher/Coordinator:** Dr Kurt Iveson **Session:** Semester 2 **Classes:** One 2 hour lecture, one 1 hour tutorial and one 2 hour practical per week. **Prerequisites:** 6 credit points of intermediate geography. **Prohibitions:** GEOG3203, GEOS3922 **Assessment:** One 2 hour exam, one 2000 word essay, one 3000 word practical report, tutorial participation

What does it mean to be a 'citizen', and what has this got to do with cities? This unit explores the urban dimension of contests over the meaning of citizenship. The first half will consider historical configurations of urban citizenship, from the Greek city-states of antiquity through to imperial, colonial and industrial cities. The second half will then focus on contemporary globalising cities. A series of case studies will consider the production of new configurations of urban citizenship across a range of cities in the world, looking at issues such as: asylum-seekers and the city; children and the city; homelessness in the city; 'culture jamming' and new forms of urban protest; trans-national social movements. The module will involve a substantial practical component, encouraging students to draw on their own experiences of city life to reflect on the meanings of citizenship.

GEOS3101
Earth's Structure and Evolution

Credit points: 6 **Teacher/Coordinator:** Dr Patrice Rey, Prof Geoff Clarke **Session:** Semester 1 **Classes:** two 1 hour lectures and one 3 hour tutorial/practical class per week. **Prerequisites:** GEOS(2114 or 2914) and GEOS(2124 or 2924); or 24 credit points of Intermediate Science units of study and GEOS1003 with permission of the Head of School **Prohibitions:** GEOS(3801 and 3003 and 3903 and 3004 and 3904 and 3006 and 3906 and 3017 and 3917) **Assumed knowledge:** GEOS2114, GEOS2124 **Assessment:** one 2 hour exam, practical and field reports

The Earth's crust and upper mantle, or lithosphere, are a consequence of dynamic and thermalprocesses operating since the beginning of the Archaean. This unit focuses on information and techniques that enable anunderstanding of these processes. The main topics presented in this unit include: the formation and evolution of oceanic and continental lithosphere; structural deformation, magmatism and metamorphism at plate boundries; and the mesoscopic and microscopic analysis of igneous and metamorphic rocks. Practical classes are designed to enable students to competently and independently identify the common crystalline rocks in hand-specimen; and to gather and interpret the structural field data which enables the determination of the structural style and deformational history presented in particular tectonic settings. The concepts and content presented in this unit are generally considered to be essential knowledge for geologists and geophysicists and provide a conceptual framework for their professional practice. Students wishing to specialise in the field and become professional geologists will normally need to expand upon the knowledge gained from this unit and either complete an honours project or progress to postgraduate coursework in this field.

GEOS3102
Global Energy and Resources

Credit points: 6 **Teacher/Coordinator:** Dr Derek Wyman and A/Prof Gavin Birch **Session:** Semester 1 **Classes:** two 1 hour lectures and one 2 hour tutorial/practicals per week. **Prerequisites:** GEOS(2114 or 2914) and GEOS(2124 or 2924); or 24 credit points of Intermediate Science units of study and GEOS1003 with permission of the Head of School **Prohibitions:** GEOS3802, 3003, 3903, 3004, 3904, 3006,3906, 3017 and 3917 **Assumed knowledge:** GEOS 2114 and GEOS2124 **Assessment:** one 2 hour exam, practical and field reports

This unit examines the processes that form energy and mineral resources, outlines the characteristics of major fossil fuel and metal ore deposits and introduces the principles that underpin exploration strategies used to discover and develop geological resources. The unit will focus on a variety of topics including: coal; petroleum formation and migration, hydrocarbon traps and maturation; precious metal, base metal and gemstone deposit types; and exploration strategies. An integrated approach will relate tectonic processes through time to the formation of fossil fuel and mineral provinces. Practical exercises will introduce students to the techniques used to identify economically viable geological resources using a variety of exercises based on actual examples of resource exploration drawn from both the petroleum and minerals industry. An excursion to active and historic mining sites in NSW will complement the practical studies.

GEOS3103
Environmental & Sedimentary Geology

Credit points: 6 **Teacher/Coordinator:** Dr Tom Hubble and Dr Adriana Dutkiewicz **Session:** Semester 2 **Classes:** two 1 hour lectures and one 3 hour tutorial/practical class per week. **Prerequisites:** GEOS(2124 or 2924) and GEOS(2111 or 2911 or 2114 or 2914 or 2113 or 2913); or GEOS(1003 or 1903) and 24 credit points of intermediate Science units of study with permission of the Head of School **Prohibitions:** GEOS3803 **Assumed knowledge:** GEOS1003, GEOS2124 **Assessment:** one 2 hour exam, practical and field reports

Sediments and sedimentary rocks cover most of the Earth's surface, record much of the Earth's geological history and host important resources such as petroleum, coal, water and mineral ores. The aim of this unit is to provide students with the skills required to examine, describe and interpret sediments and sedimentary rocks for a variety of different purposes. Specific focuses of the unit will be on identifying the recent or ancient environment in which sedimentary materials were deposited; the techniques used to identify anthropogenic pollution of modern sediments; and an assessment of natural hazards commonly associated with the formation of sediment bodies such as landslides and deep marine slides. On completion of this unit students will be familiar with the natural processes that form, modify, pollute and lithify sediments and the recognition and management of the environmental hazards associated with sediment bodies. A variety of of sedimentary settings will be examined including fluvial, alluvial, lacustrine, marginal marine and deep marine environments. The various controls on the sedimentary record such as climate and sea-level change, as well as diagenesis and geochemical cycles will also be discussed. Practical exercises will require students to examine global datasets, determine the properties of sedimentary rocks, as well as collect and interpret their own field data. The course is relevant to students interested in petroleum or mineral exploration, environmental and engineering geology as well as marine geoscience.

Textbooks

Course notes will be available from the Copy Centre and an appropriate set of reference texts will be placed on special reserve in the library.

GEOS3104

Geophysical Methods

Credit points: 6 **Teacher/Coordinator:** Prof Peter Hatherly and A/Prof Dietmar Mueller **Session:** Semester 2 **Classes:** two 1 hour lectures and one 3 hour tutorial/practical class per week. **Prerequisites:** 24 credit points of intermediate Science units of study or (GEOS(2114, 2914) and GEOS(2124, 2924)) **Prohibitions:** GEOS3804, GEOS3003, GEOS 3903, GEOS3006, GEOS3906, GEOS3016, GEOS3916, GEOS3017, GEOS3917 **Assumed knowledge:** GEOS2114 and GEOS2124 **Assessment:** one 2 hour exam, practical and field reports

This unit introduces the common geophysical methods used to investigate the interior of the Earth and focuses on the techniques used for mineral and hydrocarbon exploration and production. Applications of these methods to problems in global geophysics will also be examined with an emphasis on on their use in marine and terrestrial environments. On completion of this unit students will have developed a thorough understanding of the commonly used geophysical methods and will be able to evaluate and critically assess most forms of geophysical data as well as be able to actively participate in geophysical explorations. The unit is aimed at students with interests in land-based and marine resource exploration, plate tectonics, internal earth structure, and near-surface investigations of groundwater resources and environmental pollution. Students wishing to specialise in the field and become professional geophysicists will normally need to expand upon the geophysics knowledge gained from this unit and either complete an honours project or progress to postgraduate coursework in this field.

Textbooks

Class notes will be supplied through the University copy Centre. Geophysical textbooks held in the library provide adequate additional information that supports the class notes.

GEOS3053

Asia-Pacific Field School-Assessment A

Credit points: 6 **Teacher/Coordinator:** Prof Phil Hirsch. **Session:** S1 Intensive **Classes:** Six weeks intensive. eight modules of 3 lectures each; ten full days' equivalent fieldwork; 20 hours small group work. **Prerequisites:** 6 credit points of Intermediate units of study in Geography. Department permission is required for enrolment. **Corequisites:** GEOS3054 **Prohibitions:** GEOG3201, GEOS3953 **Assessment:** One tutorial paper, one extended field report, one exam

Note: Department permission required for enrolment. Note: Students must contact the unit coordinator no later than the end of May in the year before taking this Unit.

The unit of study can be taken only in coincidence with GEOS 3054 and with prior permission from the unit of study coordinator. It constitutes a Field School run over a six- week period in January-February, prior to the commencement of the semester. In 2010 the Field School will be held in China, Thailand, Laos, Cambodia and Viet Nam. In other years it may be held in the South Pacific (Vanuatu and Fiji). GEOS3053 will focus on the use, development and management of the Mekong River at various scales from village to international river basin. The Field School is run in close association with local universities, whose staff and students participate in some components of the course. Places are limited, and students interested in the 2010 Field School should indicate expression of interest to philip.hirsch@usyd.edu.au before the end of May 2009.

GEOS3054

Asia-Pacific Field School-Assessment B

Credit points: 6 **Teacher/Coordinator:** Prof Phil Hirsch. **Session:** S1 Intensive **Classes:** Six weeks intensive. eight modules of 3 lectures each; ten full days' equivalent fieldwork; 20 hours small group work **Prerequisites:** 6 credit points of Intermediate units of study in Geography. Department permission required for enrolment. **Corequisites:** GEOS3053 **Prohibitions:** GEOG3201, GEOS3954 **Assessment:** One tutorial paper, one extended field report, one exam

Note: Department permission required for enrolment. Note: Students must contact the unit coordinator no later than the end of May in the year before taking this Unit.

The unit of study can be taken only in coincidence with GEOS3053 and with prior permission from the unit of study coordinator. It constitutes a Field School run over a six- week period in January-February, prior to the commencement of the semester. In 2010 the Field School will be held in China, Thailand, Laos, Cambodia and Viet Nam. In other years it may be held in the South Pacific (Vanuatu and Fiji). GEOS3054 will focus on economic development and regional intergration in the Greater Mekong Subregion and their social & environmental implications at various scales from village to transnational region. It is run in close association with local universities, whose staff and students participate in some components of the course. Places are limited, and students interested in the 2010 Field School should indicate expression of interest to philip.hirsch@usyd.edu.au before the end of May 2009.

GEOS3801

Earth's Structure and Evolutions (Adv)

Credit points: 6 **Teacher/Coordinator:** Dr Patrice Rey, Prof Geoff Clarke **Session:** Semester 1 **Classes:** two 1 hour lectures and one 3 hour tutorial/practical class per week. **Prerequisites:** Distinctions in GEOS(2114 or 2914) and GEOS(2124 or 2924); Students who have a credit average for all Geoscience units may enrol in this unit with the permission of the Head of School **Prohibitions:** GEOS3101, GEOS3003, GEOS3903, GEOS3004, GEOS3904, GEOS3006, GEOS3906, GEOS3017 and GEOS3917 **Assumed knowledge:** GEOS2114, GEOS2124 **Assessment:** one 2 hour exam, practical and field reports

This unit has the same objectives as GEOS3101 and is suitable for students who wish to pursue aspects of the subject in greater depth. Entry is restricted and selection is made from the applicants on the basis of their performance to date. Students that elect to take this unit will participate in alternatives to some aspects of the standard unit and will be required to pursue independent work to meet unit objectives. Specific details for this unit of study will be announced in meetings with students in week 1 of semester.

GEOS3802

Global Energy and Resources (Adv)

Credit points: 6 **Teacher/Coordinator:** Dr Derek Wyman and A/Prof Gavin Birch **Session:** Semester 1 **Classes:** two 1 hour lectures and one 3 hour tutorial/practical class per week **Prerequisites:** Distinction in GEOS(2114 or 2914) and GEOS(2124 or 2924); Students who have a credit average for all Geoscience units may enrol in this unit with the permission of the Head of School. **Prohibitions:** GEOS3102, GEOS3003, GEOS3903, GEOS3004, GEOS3904, GEOS3006, GEOS3906, GEOS3017, and GEOS3917 **Assumed knowledge:** GEOS2114 and GEOS2124 **Assessment:** one 2 hour exam, practical and field reports

This unit has the same objectives as GEOS3102 and is suitable for students who wish to pursue aspects of the subject in greater depth. Entry is restricted and selection is made from the applicants on the basis of their performance to date. Students that elect to take this unit will participate in alternatives to some aspects of the standard unit

and will be required to pursue independent work to meet unit objectives. Specific details for this unit of study will be announced in meetings with students in week 1 of semester.

GEOS3803
Environmental & Sedimentary Geology(Adv)

Credit points: 6 **Teacher/Coordinator:** Dr Tom Hubble and Dr Adriana Dutkiewicz **Session:** Semester 2 **Classes:** two 1 hour lectures and one 3 hour tutorial/practical class per week. **Prerequisites:** Distinctions in GEOS(2114 or 2914) and GEOS(2124 or 2924); Students who have a credit average for all Geoscience units may enrol in this unit with permission of the Head of School **Prohibitions:** GEOS3103 **Assumed knowledge:** GEOS1003, GEOS2124 **Assessment:** one 2 hour exam, practical and field reports

This unit has the same objectives as GEOS3103 and is suitable for students who wish to pursue aspects of the subject in greater depth. Entry is restricted and selection is made from the applicants on the basis of their performance to date. Students that elect to take this unit will participate in alternatives to some aspects of the standard unit and will be required to pursue independant work to meet unit objectives. Specific details for this unit of study will be announced in meetings with students in week 1 of semester.

Textbooks
Course notes will be available from the copy centre and appropriate set of reference texts will be placed on special reserve in the library.

GEOS3804
Geophysical Methods (Advanced)

Credit points: 6 **Teacher/Coordinator:** Prof Peter Hatherly and A/Prof Dietmar Müller **Session:** Semester 2 **Classes:** two 1 hour lectures and one 3 hour tutorial/practical class per week. **Prerequisites:** Distinction in GEOS2114 or GEOS2914 and GEOS2124 or GEOS2924; Students who have a credit average for all Geoscience units may enrol in this unit with the permission of the Head of School **Prohibitions:** GEOS3104, GEOS3003, GEOS3903, GEOS3006, GEOS3906, GEOS3016, GEOS3916, GEOS3017, GEOS3917 **Assessment:** one 2 hour exam, practical and field reports

This unit has the same objectives as GEOS3104 and is suitable for students who wish to pursue aspects of the subject in greater depth. Entry is restricted and selection is made from the applicants on the basis of their performance to date. Students that elect to take this unit will participate in alternatives to some aspects of the standard unit and will be required to pursue independant work to meet unit objectives. Specific details for this unit of study will be announced in meetings with students in week 1 of semester.

Textbooks
Class notes will be supplied through the University Copy Centre. Geophysical textbooks held in the library provide adequate additional information that supports the class notes.

GEOS3908
Field Geology and Geophysics (Advanced)

Credit points: 6 **Teacher/Coordinator:** Dr Patrice Rey Prof Peter Hatherly **Session:** Semester 2 **Classes:** 14 days of fieldwork. **Prerequisites:** Distinction average in 12 credit points of Intermediate GEOS units. Department permission required for enrolment. **Prohibitions:** GEOS3008 **Assessment:** Written reports and field exercises

Note: Department permission required for enrolment. Note: A Distinction average in prior Geology units of study is normally required for admission. This requirement may be varied and students should consult the unit of study coordinator.

This unit has the same objectives as GEOS3008 and is suitable for students who wish to pursue aspects of the subject in greater depth. Entry is restricted and selection is made from the applicants on the basis of their performance to date. Students that elect to take this unit will participate in alternatives to some aspects of the standard unit and will be required to pursue independent work to meet unit objectives. Specific details for this unit of study will be announced in meetings with students in week prior to the field camp which is usually in the break between semester 1 and 2. This unit of study may be taken as part of the BSc (Advanced).

GEOS3909
Coastal Environments and Processes (Adv)

Credit points: 6 **Teacher/Coordinator:** A/Prof Gavin Birch Dr Ana Vila Concejo **Session:** Semester 1 **Classes:** Three 1 hour lectures, two 3 hour practicals per week, fieldwork. **Prerequisites:** Distinction average in ((6 credit points of Intermediate Geoscience* units) and (6 further credit points of Intermediate Geoscience or 6 credit points of Physics, Mathematics, Information Technology or Engineering units) or ((MARS2005 or MARS2905) and (MARS2006 or MARS2906))) **Prohibitions:** GEOS3009, MARS3003, MARS3105 **Assessment:** One 2 hour exam, two 1500 word reports.

Note: A distinction average in prior Geography or Geology units is normally required for admission. This requirement may be varied and students should consult the unit of study coordinator.

Advanced students will complete the same core lecture material as for GEOS3009 but will carry out more challenging projects, practicals, assignments and tutorials.

GEOS3914
GIS in Coastal Management (Advanced)

Credit points: 6 **Teacher/Coordinator:** Dr Peter Cowell & Dr Eleanor Bruce. **Session:** Semester 2 **Classes:** Two hours of lectures, one 3 hour practical per week comprising one 1 hour practical demonstration and one 2 hour practical. **Prerequisites:** Distinction average in 12 credit points of intermediate geography or geology units or GEOS (2115 or 2915) and BIOL (2018 or 2918) Department permission required for enrolment. **Prohibitions:** GEOS3014, MARS3104 **Assessment:** One 2 hour exam, project work, two practical-based project reports, fortnightly progress quizzes.

Note: Department permission required for enrolment. Note: A distinction average in prior Geography, Geology or Marine Science units of study is normally required for admission. This requirement may be varied and students should consult the unit of study coordinator.

Advanced students will complete the same core lecture material as for GEOS3014 but will carry out more challenging projects, practicals, assignments and tutorials.

GEOS3915
Environmental Geomorphology (Advanced)

Credit points: 6 **Teacher/Coordinator:** Dr Stephen Gale. **Session:** Semester 2 **Classes:** 3 hours lectures, 6 hours practical per week, fieldwork. **Prerequisites:** Distinction average in 24 credit points of Intermediate units of study including 6 credit points of Intermediate Geography units of study. **Prohibitions:** GEOS3015 **Assessment:** One 2 hour exam, two 1500 word essays, prac and field reports.

Note: Department permission required for enrolment.

Advanced students will complete the same core lecture material as for GEOS3015, but will carry out more challenging projects, practicals, and field reports.

GEOS3918
Rivers: Science and Management (Adv)

Credit points: 6 **Teacher/Coordinator:** Dr Melissa Neave **Session:** Semester 1 **Classes:** Two 1 hour lecture, one 1 hour tutorial, two 4 hour practicals per week, fieldwork. **Prerequisites:** Distinction average in (24 credit points of Intermediate units of study including 6 credit points of Intermediate Geography units of study) or ((MARS2005 or MARS2905) and (MARS2006 or MARS2906)) **Prohibitions:** GEOS3018 **Assessment:** One 2 hour exam, two 1500 word essays.

Advanced students will complete the same core lecture material as for GEOS3018, but will carry out more challenging projects, practicals, assignments and tutorials.

GEOG3921
Sustainable Cities (Adv)

Credit points: 6 **Teacher/Coordinator:** Dr Phil McManus **Session:** Semester 2 **Classes:** Two 1 hour lectures and one 2 hour practical/tutorial per week. **Prerequisites:** Distinction average 24 credit points of Intermediate Units of study including 6 credit points of Intermediate Geography units of study. **Prohibitions:** GEOG3521, GEOG3202 **Assessment:** One 2 hour exam; 2000 word essay, tutorial papers, practical reports.

Advanced students will complete the same core lecture material as for GEOG3521, but will carry out more challenging projects, practicals, assignments and tutorials.

GEOS3922
Cities and Citizenship (Advanced)

Credit points: 6 **Teacher/Coordinator:** Dr Kurt Iveson **Session:** Semester 2 **Classes:** Two 1 hour lectures and one 2 hour practical per week. **Prerequisites:** Distinction average in 24 credit points of Intermediate Units of study including 6 credit points of Intermediate Geography units of study.

Prohibitions: GEOS3522 **Assessment:** One 2 hour exam; e-Sim assignments, tutorial papers.

Advanced students will complete the same core lecture material as for GEOS3022, but will carry out more challenging projects, assignments and tutorials.

GEOS3953
Asia-Pacific Field School-A (Adv)

Credit points: 6 **Teacher/Coordinator:** Prof Phil Hirsch **Session:** S1 Intensive **Classes:** Six weeks intensive. eight modules of 3 lectures each; 10 full days' equivalent fieldwork; 20 hours small group work **Prerequisites:** Distinction average in 24 credit points of Intermediate units of study including 6 credit points of Intermediate Geography units of study. Department permission required for enrolment. **Corequisites:** GEOS3954 **Prohibitions:** GEOS3053 **Assessment:** One tutorial paper, one extended field report, one exam

Note: Department permission required for enrolment. Note: Students must contact the unit coordinator no later than the end of May in the year before taking this Unit.

The unit of study can be taken only in coincidence with GEOS 3954 and with prior permission from the unit of study coordinator. It constitutes a Field School run over a six- week period in January-February, prior to the commencement of the semester. In 2010 the Field School will be held in China, Thailand, Laos, Cambodia and Viet Nam. In other years it may be held in the South Pacific (Vanuatu and Fiji). GEOS3953 will focus on the use, development and management of the Mekong River at various scales from village to international river basin. The Field School is run in close association with local universities, whose staff and students participate in some components of the course. Places are limited, and students interested in the 2010 Field School should indicate expression of interest to philip.hirsch@usyd.edu.au before the end of May 2009. Advanced students will carryout more challenging fieldwork reports.

GEOS3954
Asia-Pacific Field School-B (Adv)

Credit points: 6 **Teacher/Coordinator:** Prof Phil Hirsch. **Session:** S1 Intensive **Classes:** six weeks intensive. eight modules of 3 lectures each; 10 full days' equivalent fieldwork; 20 hours small group work **Prerequisites:** Distinction average in 24 credit points of Intermediate units of study including 6 credit points of Intermediate Geography units of study. Department permission required for enrolment. **Corequisites:** GEOS3953 **Prohibitions:** GEOS3054 **Assessment:** One tutorial paper, one extended field report, one exam

Note: Department permission required for enrolment. Note: Students must contact the unit coordinator no later than the end of May in the year before taking this Unit.

The unit of study can be taken only in coincidence with GEOS 3953 and with prior permission from the unit of study coordinator. It constitutes a Field School run over a six- week period in January-February, prior to the commencement of the semester. In 2010 the Field School will be held in China, Thailand, Laos, Cambodia and Viet Nam. In other years it may be held in the South Pacific (Vanuatu and Fiji). GEOS3954 will focus on the use, development and management of the Mekong River at various scales from village to international river basin. The Field School is run in close association with local universities, whose staff and students participate in some components of the course. Places are limited, and students interested in the 2010 Field School should indicate expression of interest to philip.hirsch@usyd.edu.au before the end of May 2009. Advanced students will carryout more challenging fieldwork reports.

Geography or Geology and Geophysics Honours

Offered February and July. Information sessions about Geography or Geology and Geophysics Honours are held for interested third year students during Second Semester. Students contemplating Honours in their fourth year should consider possible thesis topics and discuss these with potential staff supervisors. Entry into fourth year Honours will require completion of units in Intermediate and Senior Geoscience units (to be passed at the level of credit or better) and a satisfactory WAM. In some years when the number of applicants exceeds resources (availability of supervisors, laboratory space etc.) offers will be made according to academic merit. Students will be notified in January of their formal acceptance into the Honours program. Honours students are required to undertake formal coursework during their first semester and to participate in seminars throughout the year as arranged. They will be required to study original problems, working as appropriate in the field, the laboratory, libraries, and in some instances in conjunction with other university or government departments. A dissertation of not more than 20 000 words must be submitted during the second semester, followed by an examination that may include both written and oral work. Further details relating to Geography Honours are available from Dr. Mel Neave (mneave@geosci.usyd.edu.au) Further details of Geology and Geophysics Honours are available from Dr. Michael Hughes (michaelh@mail.usyd.edu.au)

Geosciences Postgraduate Study

Details concerning fields of postgraduate study in Geology and Geophysics may be obtained from Dr Derek Wyman or the Head of School. Details concerning Geography may be obtained from A/Prof Deirdre Dragovich or the Head of School.

History and Philosophy of Science

History and Philosophy of Science allows students to enrich their knowledge of science and stand back from the specialised concerns of their other subjects by gaining a broader perspective on what science is, how it acquired its current form and how it fits into contemporary society. HPS is particularly relevant for students hoping to make careers in science policy, science administration, science education and science reporting. Any student with a genuine interest in science will derive benefit from study in HPS.

Course Advice

An advisor will be available in the Unit for History and Philosophy of Science during the enrolment period. The Unit is located on Level 4 of the Carslaw Building. More detailed information on courses is available either in a handbook from the Unit office or electronically via the Unit website http://www.usyd.edu.au/hps/.The Unit for History and Philosophy of Science offers the Junior unit of study Bioethics (HPSC1000), which analyses and discusses the ethical concerns raised by scientific accomplishments in modern society. Students interested in related topics should consider taking the unit Concepts and Issues in Physical Science (PHYS1600) offered in the School of Physics. This unit serves as useful background for further studies in HPS and is offered as an Arts unit for all students, including students enrolled in the Faculty of Science.

Junior units of study

HPSC1000
Bioethics

Credit points: 6 **Teacher/Coordinator:** Dr Catherine Mills **Session:** Semester 1 **Classes:** One 1 hour and one 2 hour lecture and one 1 hour tutorial per week. **Prohibitions:** HPSC1900 **Assessment:** Short essays, tutorial work, tests

Note: This Junior unit of study is highly recommended to Intermediate and Senior Life Sciences students.

Science has given us nearly infinite possibilities for controlling life. Scientists probe the origins of life through research with stem cells and embryos. To unlock the secrets of disease, biomedicine conducts cruel experiments on animals. GM crops are presented as the answer to hunger. Organ transplantation is almost routine. The international traffic in human body parts and tissues is thriving. The concept of brain death makes harvesting organs ethically more acceptable. It may also result in fundamental changes in our ideas about life. Science has provided new ways of controlling and manipulating life and death. As a consequence, difficult ethical questions are raised in increasingly complex cultural and social environments. This course will discuss major issues in the ethics of biology and medicine, from gene modification to Dolly the sheep. This unit will be introductory, but a small number of topical issues will be studied in depth. No scientific background beyond School Certificate level will be assumed.

Textbooks
Course reader

HPSC1900
Bioethics (Advanced)

Credit points: 6 **Teacher/Coordinator:** HPS Staff **Session:** Semester 1 **Classes:** Three 1 hour lectures, one 1 hour tutorial per week. **Prohibitions:** HPSC1000 **Assessment:** Tutorial work, essays, exam, tutorial participation.

Note: Department permission required for enrolment.

The topics covered by HPSC1000 - Bioethics will be treated in more depth, in a special tutorial set aside for Advanced students.

Textbooks
Course reader

Intermediate units of study

There are two Intermediate units of study offered by the Unit for History and Philosophy of Science. They provide a broad background in the history and the philosophy of science, and a solid background for students in arts and science who wish to acquaint themselves with principles and methods in the history and philosophy of science. For students who wish to major in HPS, they provide essential background knowledge.

HPSC2100
The Birth of Modern Science

Credit points: 6 **Teacher/Coordinator:** Dr Ofer Gal **Session:** Semester 1 **Classes:** Three 1 hour lectures, one 1 hour tutorial per week. **Prerequisites:** 24 credit points of Junior units of study **Prohibitions:** HPSC2002, HPSC2900 **Assessment:** Short essays, tutorial work, tests.

Modern culture is a culture of science. Modern Western science is the outcome of a historical process of 2,500 years. In this course we investigate how Western knowledge-theoretical, technological and medical-acquired the characteristics of modern science: its specific social structure, contents, values and methods. We will look at some primary chapters of this process, from antiquity to the end of the seventeenth century, and try to understand their implications to understanding contemporary science in its culture. Special emphasis will be given to the scientific revolution of the seventeenth century, which is often described as the most important period in the history of science and as one of the most vital stages in human intellectual history.

Textbooks
Henry, J. The Scientific Revolution and the Origins of Modern Science.
Course reader

HPSC2101
What Is This Thing Called Science?

Credit points: 6 **Teacher/Coordinator:** Dean Rickles **Session:** Semester 2, Summer Main **Classes:** Three 1 hour lectures and one 1 hour tutorial per week. **Prerequisites:** 24 credit points of Junior units of study **Prohibitions:** HPSC2001, HPSC2901 **Assessment:** Short essays, tutorial work, tests.

Philosophers of science aim to define what distinguishes creationism from evolutionary theory, or astrology from astronomy. They give reasons why we can believe that today's theories are improvements over those that preceded them and how we know that what we see and do in scientific practice reflects the nature of reality. This course critically examines the most important attempts to define the scientific method, to draw a line dividing science from non-science, and to justify the high status generally accorded to scientific knowledge. The philosophies of science studied include Karl Popper's idea that truly scientific theories are falsifiable, Thomas Kuhn's proposal that science consists of a series of paradigms separated by scientific revolutions; and Feyerabend's anarchist claim that there are no objective criteria by which science can be distinguished from pseudo-science. This unit of study also explores contemporary theories about the nature of science and explores ideas about the nature of the experimental method and concepts such as underdetermination, the nature of scientific explanation, theory confirmation, realism, the role of social values in science, sociological approaches to understanding science, and the nature of scientific change.

Textbooks
Alan F Chalmers. What Is This Thing Called Science? 3rd edition.
Course reader

HPSC2900
The Birth of Modern Science (Advanced)

Credit points: 6 **Teacher/Coordinator:** Dr Ofer Gal **Session:** Semester 1 **Classes:** Three 1 hour lectures and one 1 hour tutorial per week. **Prerequisites:** Enrolment in the Talented Student Program or 24 credit points of Junior study with a Distinction average **Prohibitions:** HPSC2002, HPSC2100 **Assessment:** Short essays, tutorial work, tests.

Note: Department permission required for enrolment.

The topics covered in 'The Birth of Modern Science' will be covered in more depth, in a special tutorial set aside for advanced students.

Textbooks
Henry, J. The Scientific Revolution and the Origins of Modern Science.
Course reader

HPSC2901
What Is This Thing Called Science? (Adv)

Credit points: 6 **Teacher/Coordinator:** Dean Rickles **Session:** Semester 2 **Classes:** Three 1 hour lectures and one 1 hour tutorial per week. **Prerequisites:** Enrolment in the Talented Student Program or 24 credit points of Junior study with a Distinction average **Prohibitions:** HPSC2002, HPSC2100 **Assessment:** Short essays, tutorial work, tests.

Note: Department permission required for enrolment.

The topics covered in 'What is This Thing Called Science?' will be covered in more depth, in a special tutorial set aside for advanced students.

Textbooks
Alan F Chalmers. What Is This Thing Called Science? 3rd edition.
Course reader

Senior units of study

Students wishing to major in History and Philosophy of Science in either the BSc, BA or BLibSt must take 24 credit points from the following Senior units of study. Our Intermediate courses provide students with a background in the history and philosophy of science. HPSC3022 Science and Society, provides students with an essential background in the sociology of science. This unit of study is compulsory for majors in history and philosophy of science.

HPSC3002
History of Biological/Medical Sciences

Credit points: 6 **Teacher/Coordinator:** Dr Hans Pols **Session:** Semester 2 **Classes:** Two 1 hour lectures and two 1 hour tutorials per week. **Prerequisites:** At least 12 credit points of Intermediate HPSC units or Credit or better in at least 6 credit points of Intermediate HPSC units, and at least 24 credit points of Intermediate or Senior units **Assumed knowledge:** HPSC (2001 and 2002) or HPSC (2100 and 2101) **Assessment:** Short essays, presentation, tutorial work, final essay.

Throughout the ages people have been born, have died, and in between have lived in various stages of sickness or health. In this unit of study we shall look at how these states of being were perceived in different times and places throughout history, while at the same time noting the increasing medicalisation of everyday life, together with the irony that the "miracles" of modern medicine appear to have created a generation of the "worried well". Using this historical perspective, we shall ask how perceptions of sickness, health and the related provision of health care have been intertwined with social, political and economic factors and, indeed still are today.

Textbooks
Course reader

HPSC3016
The Scientific Revolution

Credit points: 6 **Teacher/Coordinator:** Dr Ofer Gal **Session:** Semester 2 **Classes:** Two 1 hour lectures and two 1 hour tutorials per week. Individual student consultation as required. **Prerequisites:** At least 12 credit points of Intermediate HPSC units or Credit or better in at least 6 credit points of Intermediate HPSC units, and at least 24 credit points of Intermediate or Senior units. **Prohibitions:** HPSC3001, HPSC3106 **Assumed knowledge:** HPSC (2100 and 2101) or HPSC (2001 and 2002) **Assessment:** Take-home tests, short essays, tutorial participation.

Note: This unit will not be offered every year.

Modern Western science has a number of characteristics which distinguish it from other scientific cultures. It ascribes its tremendous

success to sophisticated experiments and meticulous observation. It understands the universe in terms of tiny particles in motion and the forces between them. It is characterised by high- powered mathematical theorising and the rejection of any intention, value or purpose in Nature. Many of these characteristics were shaped in the 17th century, during the so called scientific revolution. We will consider them from an integrated historical- philosophical perspective, paying special attention to the intellectual motivations of the canonical figures of this revolution and the cultural context in which they operated. Topics will include: experimentation and instrumentation, clocks, mechanistic philosophy, and the changing role of mathematics.

Textbooks
Course reader

HPSC3021
Philosophy and Sociology of Biology

Credit points: 6 **Teacher/Coordinator:** Dr Dominic Murphy **Session:** Semester 1 **Classes:** Two 1 hour lectures and two 1 hour tutorials per week **Prerequisites:** At least 12 credit points of Intermediate HPSC units or Credit or better in at least 6 credit points of Intermediate HPSC units, and at least 24 credit points of Intermediate or Senior units. **Prohibitions:** HPSC3103 **Assumed knowledge:** HPSC (2100 and 2101) or HPSC (2001 and 2002). **Assessment:** Essays, take home tests, tutorial assessment.

The first part of this class examines the century of the gene from Darwin up to the present. We investigate the various conceptual changes that have occurred in this period, both directly within biology and within society at large. We will explore the disappearance of the Western Christian consensus, rivalries between scientists wedded to different theories and experimental practices, and the different approaches of evolutionary biology and molecular biology. It appears that the more we learn about genes the less agreement and certainty there is about what a gene really is. The second part of the course uses the idea of biological determinism and eugenics as an example of the interrelationships between science and society.

No previous study of biology is assumed.

Textbooks
Course reader

HPSC3022
Science and Society

Credit points: 6 **Teacher/Coordinator:** Dean Rickles **Session:** Semester 1 **Classes:** Two 1 hour lectures and two 1 hour tutorials per week. **Prerequisites:** At least 12 credit points of Intermediate HPSC units or Credit or better in at least 6 credit points of Intermediate HPSC units, and at least 24 credit points of Intermediate or Senior units. **Prohibitions:** HPSC3003 **Assumed knowledge:** HPSC (2100 and 2101) or HPSC (2001 and 2002). **Assessment:** Short essays, tutorial work, presentation.

Note: This unit is a requirement for HPS majors.

Science has become an essential element of Western societies. It is impossible to imagine our lives today without the achievements of science, technology, and medicine. Many scientists and laypeople think that scientific knowledge transcends political, social, cultural, and economic conditions. Sociologists of science think otherwise. In this unit, we will investigate the nature of science, the position of science in society, and the internal dynamics of science.

Sociologists of science have compared scientific knowledge to a ship in a bottle: if you see the finished product, you can't understand how it came about, and you can't believe that it is not what it claims to be: the empirically-determined truth about the world. In this unit, we will have a close look at some of these ships in bottles and examine how they got there. When observing science-in-the-making, rather than the finished product, the factors that influence science become much clearer. We will introduce some the most exciting and innovative ideas about what science is and how it works by examining the sociological and anthropological approaches to science that have become the basis for research in the social studies of science, technology, and medicine, including: the norms of science, scientists' images of themselves, the boundaries between science and other subjects, the rhetoric of scientific writing, laboratory work, science museums and science in the media.

Textbooks
Course reader

HPSC3023
Psychology & Psychiatry: History & Phil

Credit points: 6 **Teacher/Coordinator:** Dr Hans Pols and Dr Fiona Hibberd **Session:** Semester 1 **Classes:** Two 1 hour lectures and one 2 hour tutorial per week. **Prerequisites:** (at least 12 credit points of intermediate HPSC Units of study) OR (a CR or above in one HPSC intermediate Unit of Study) OR (12 intermediate credit points in psychology). **Prohibitions:** PSYC3202 **Assumed knowledge:** Basic knowledge about the history of modern science as taught in HPSC2100 AND the principles of philosophy of science as taught in HPSC2101 OR knowledge of the various sub-disciplines within Psychology. **Assessment:** Take-home essay (2500 words), one 2 hour exam, tutorial work.

Across the unit we examine one of the most interesting aspects of the history and philosophy of science. Viz., the scientific practices and assumptions involved in making human beings an object of study. We will examine the ways in which psychologists and psychiatrists have investigated human nature, the kinds of experimental approaches they have developed to that end, the major controversies in this field, and the basic philosophical assumptions that have been made in the sciences of human nature. We investigate the developments of psychological theories and investigative methods as well as the development of psychiatric theory, treatment methods, and institutions.

Textbooks
Course reader
Leahey, TH (2004). A History of Psychology: Main currents in Psychological Thought. Pearson. Upper Saddle River, N.J.

HPSC3024
Science and Ethics

Credit points: 6 **Teacher/Coordinator:** HPS Staff **Session:** Semester 2 **Classes:** Two 1 hour lectures and two 1 hour tutorials per week. **Prerequisites:** At least 24 credit points of Intermediate or Senior units of study **Prohibitions:** HPSC3007 **Assessment:** Short essays, tutorial work, tests.

Note: This unit will not be offered every year.

Is science really neutral, impartial, and objective? Should it be? Or should it tell us what is right, good, fair, or just? Does scientific progress imply social progress and benefits for humanity? Are scientists responsible when their discoveries are used for evil purposes? Should the publication of dangerous discoveries be prevented? What if the same discoveries might be used for beneficial purposes as well?

In this unit, we give study possible answers to these questions by examining the relationships between science and human values. We consider the extent to which science is, or should be, influenced by the values of scientists and the societies in which they operate. And we question the extent to which science promotes or threatens the good of humankind. Issues such as these are pursued via philosophical examination of major historical episodes involving weapons of mass destruction, Nazi medicine, cloning, mind control in neuroscience, human experimentation and censorship. We also examine contemporary developments in genetics and brain science.

This unit is for science and non-science students alike. It will be of interest to anyone concerned about the social responsibilities of scientists, matters of science policy, and relationships between science and society.

Textbooks
Course reader

History and Philosophy of Science Honours

An Honours course in HPS is available to students of sufficient merit who have satisfied the requirements for the degree of BSc or BA or BLibSt with a major in HPS or another relevant area. Students who have obtained the TSP Certificate in HPS are also eligible for the Honours program. The Honours course consists of 48 points of Honours level units of study, which must include HPSC4201 HPS Research Project 1, HPSC4202 HPS Research Project 2, HPSC4203 HPS Research Project 3 and HPSC4204 HPS Research Project 4. In their final semester all students must also enrol in the zero credit point non-assessable unit HPSC4999. Students intending to proceed to Honours or to enrol in the Graduate Diploma in Science (HPS) are strongly advised to contact the Unit towards the end of the previous

academic year to discuss thesis topic and supervision. Note: Honours level (4000) Units of Study are available only to students admitted to HPS Honours, Graduate Diploma in Science (History and Philosophy of Science) and Graduate Certificate in Science (History and Philosophy of Science), or by special permission. A number of our Honours-level courses are also open to students in the medical humanities and liberal studies.

HPSC4101
Philosophy of Science

Credit points: 6 **Teacher/Coordinator:** Dean Rickles **Session:** Semester 1 **Classes:** One 2 hour seminar per week, individual consultation. **Prerequisites:** Available only to students admitted to HPS Honours, Graduate Diploma in Science (History and Philosophy of Science) and Graduate Certificate in Science (History and Philosophy of Science), or by special permission. **Assessment:** Written assignments, seminar participation.

Note: Department permission required for enrolment.

The success of science in enabling us to manipulate the natural world has been so surprising, so often, that it has caused many individuals to revise a large part of their pre-scientific philosophical and religious consensus. Something very important is going on, and a number of fascinating philosophical topics emerge when we try to analyse what it is. Working backwards from the success of an epistemological enterprise offers a fruitful way to do philosophy, and, reciprocally, our philosophical insights help to clarify the contentious question of what it means to claim that science is successful.

This unit investigates the relationships between scientific theories and evidence, and the relationships between scientific theories. Participants will have an opportunity to relate the successes and failures of specific sciences to contemporary philosophical debates. Each week the seminar will discuss a piece of philosophical theory in the light of examples from particular sciences. Technical topics will be covered, but very little background knowledge will be assumed.

Textbooks
Blackburn S., The Oxford Dictionary of Philosophy, and course reader.

HPSC4102
History of Science

Credit points: 6 **Teacher/Coordinator:** Ofer Gal **Session:** Semester 1, Semester 2 **Classes:** One 2 hour seminar per week. **Prerequisites:** Available only to students admitted to HPS Honours, Graduate Diploma in Science (History and Philosophy of Science) and Graduate Certificate in Science (History and Philosophy of Science), or by special permission. **Assessment:** Essays, seminar participation.

Note: Department permission required for enrolment.

This unit explores major episodes in the history of science as well as introducing students to historiographic methods. Special attention is paid to developing practical skills in the history and philosophy of science.

Textbooks
Course reader

HPSC4103
Sociology of Science

Credit points: 6 **Teacher/Coordinator:** Dr Hans Pols **Session:** Semester 2 **Classes:** One 2 hour seminar per week, individual consultation. **Prerequisites:** Available only to students admitted to HPS Honours, Graduate Diploma in Science (History and Philosophy of Science) and Graduate Certificate in Science (History and Philosophy of Science), or by special permission. **Assessment:** Essays, fieldwork report, seminar participation mark.

Note: Department permission required for enrolment.

This unit explores recent approaches in the social studies of scientific knowledge. Students evaluate various sociological approaches by conducting their own research on topics relevant to their own major thesis.

The unit starts with an overview of the development of history and philosophy of science since 1945, to put the emergence of the sociology of science into perspective, before moving on to a selection of readings from the field. Topics will include: the strong program critique of traditional philosophy of science, the sociology of technology, the impact of feminism on the study of science, and the actor-network approach developed by Bruno Latour and Michel Callon.

Textbooks
Course reader

HPSC4104
Recent Topics in HPS

Credit points: 6 **Teacher/Coordinator:** HPS Staff **Session:** Semester 1, Semester 2 **Classes:** One 2 hour seminar per week, individual consultation. **Prerequisites:** Available only to students admitted to HPS Honours, Graduate Diploma in Science (History and Philosophy of Science) and Graduate Certificate in Science (History and Philosophy of Science), or by special permission. **Assessment:** Essays, seminar participation.

Note: Department permission required for enrolment.

An examination of one area of the contemporary literature in the history and philosophy of science. Special attention will be paid to development of research skills in the history and philosophy of science.

Textbooks
Course reader

HPSC4105
HPS Research Methods

Credit points: 6 **Teacher/Coordinator:** Hans Pols **Session:** Semester 1, Semester 2 **Classes:** One 2 hour seminar per week, individual consultation. **Prerequisites:** Available only to students admitted to HPS Honours, Graduate Diploma in Science (History and Philosophy of Science) and Graduate Certificate in Science (History and Philosophy of Science), or by special permission. **Assessment:** Literature review, archival research project, seminar participation mark, short essays.

Note: Department permission required for enrolment.

Adopting a seminar style, this unit provides students with an advanced knowledge of the skills necessarily to conduct their own original research in the sociology, history and philosophy of science. Participants will be given a weekly set of core readings, and specialists both from within the Unit and from outside will present their views on the topic in question. This presentation will form the basis for a discussion involving the students, the academic members of the Unit, and invited speakers.

Topics will include: the use of case studies in the philosophy of science, how to conduct oral history projects, institutional history, and sociological methodology.

Textbooks
Course reader

HPSC4108
Core topics: History & Philosophy of Sci

Credit points: 6 **Teacher/Coordinator:** HPS staff. **Session:** Semester 1, Semester 2 **Classes:** One 2 hour seminar per week. **Prerequisites:** Available only to students admitted to HPS Honours, Graduate Diploma in Science (History and Philosophy of Science) and Graduate Certificate in Science (History and Philosophy of Science), or by special permission **Prohibitions:** Not available to students who have completed a major in History and Philosophy of Science or an equivalent program of study at another institution. **Assessment:** Essays, seminar presentations, seminar participation mark.

Note: Department permission required for enrolment.

An intensive reading course, supported by discussion seminars, in the main figures and events of the 'Scientific Revolution' of the 16th to 18th centuries, in the leading historiographic interpretations of the scientific revolution and in the use of episodes in the scientific revolution as evidence for the philosophies of science of Karl Popper, Imre Lakatos, Thomas Kuhn and contemporary authors.

Textbooks
Course reader

HPSC4201
HPS Research Project 1

Credit points: 6 **Teacher/Coordinator:** HPS Staff **Session:** Semester 1, Semester 2 **Classes:** Weekly individual supervision, fortnightly 90-minute research seminars. **Prerequisites:** Available only to students admitted to HPS Honours and Graduate Diploma or Certificate in Science (History and Philosophy of Science). **Prohibitions:** HPSC4106, HPSC4107 **Assumed knowledge:** HPSC (2001 and 2002) or HPSC (2100 and 2101) **Assessment:** HPSC4201, HPSC4202, HPSC4203 and HPSC4204 are jointly assessed by a research thesis of up to 15,000 words.

Note: Department permission required for enrolment.

Research into a topic in history, philosophy or sociology of science under the supervision of one or more members of the HPS staff.

HPSC4202
HPS Research Project 2

Credit points: 6 **Teacher/Coordinator:** HPS Staff **Session:** Semester 1, Semester 2 **Classes:** Weekly individual supervision, fortnightly 90-minute research seminars. **Prerequisites:** Available only to students admitted to HPS Honours and Graduate Diploma or Certificate in Science (History and Philosophy of Science). **Prohibitions:** HPSC4106 and HPSC4107 **Assumed knowledge:** HPSC (2001 and 2002) or HPSC (2100 and 2101) **Assessment:** HPSC4201, HPSC4202, HPSC4203 and HPSC4204 are jointly assessed by a research thesis of up to 15,000 words.

Note: Department permission required for enrolment.

Research into a topic in history, philosophy or sociology of science under the supervision of one or more members of the HPS staff.

HPSC4203
HPS Research Project 3

Credit points: 6 **Teacher/Coordinator:** HPS Staff **Session:** Semester 1, Semester 2 **Classes:** Weekly individual supervision, fortnightly 90-minute research seminars. **Prerequisites:** Available only to students admitted to HPS Honours and Graduate Diploma or Certificate in Science (History and Philosophy of Science). **Prohibitions:** HPSC4106, HPSC4107 **Assumed knowledge:** HPSC (2001 and 2002) or HPSC (2100 and 2101) **Assessment:** HPSC4201, HPSC4202, HPSC4203 and HPSC4204 are jointly assessed by a research thesis of up to 15,000 words.

Note: Department permission required for enrolment.

Research into a topic in history, philosophy or sociology of science under the supervision of one or more members of the HPS staff.

HPSC4204
HPS Research Project 4

Credit points: 6 **Teacher/Coordinator:** HPS Staff **Session:** Semester 1, Semester 2 **Classes:** Weekly individual supervision, fortnightly 90-minute research seminars. **Prerequisites:** Available only to students admitted to HPS Honours and Graduate Diploma or Certificate in Science (History and Philosophy of Science). **Prohibitions:** HPSC4106, HPSC4107 **Assumed knowledge:** HPSC (2001 and 2002) or HPSC (2100 and 2101) **Assessment:** HPSC4201, HPSC4202, HPSC4203 and HPSC4204 are jointly assessed by a research thesis of up to 15,000 words.

Note: Department permission required for enrolment.

Research into a topic in history, philosophy or sociology of science under the supervision of one or more members of the HPS staff.

HPSC4999
History & Philosophy of Science Honours

Session: Semester 1, Semester 2 **Prerequisites:** Available only to students admitted to HPS Honours.

Note: Department permission required for enrolment.

All students in History and Philosophy of Science Honours must enrol in this non-assessable unit of study in their final semester.

Immunobiology major

The Discipline of Infectious Diseases and Immunology administers the Immunobiology Major. Our location is on Level 6, Blackburn Building D06. Further information from Helen Briscoe (phone: (02) 9351 7308, email: hbriscoe@med.usyd.edu.au). A major in Immunobiology requires successful completion of 12 credit points of Senior study in Immunology plus 12 credit points from the elective Senior units of study in Biochemistry, Biology, Cell Pathology, Molecular Biology and Genetics, Microbiology, Physiology or Virology listed in Table I. Participants in the Immunobiology major will select accompanying Senior units according to their particular interest. Concurrent study in the life science disciplines will add a depth of understanding in a particular aspect of immunology. Participants are invited to consult with Helen Briscoe and with elective unit of study co-ordinators before selecting concurrent study units and should note that a unit of study taken as part of the Immunobiology Major cannot count towards a major in another Science discipline area.

Immunology

Immunology is offered as Introductory Immunology (IMMU2101) at Intermediate level, Molecular and Cellular Immunology (IMMU3102) and Immunology in Human Disease (IMMU3202) at Senior level, and Immunology Honours. Further information can be obtained from Helen Briscoe (phone: (02) 9351 7308, email: hbriscoe@med.usyd.edu.au).

Immunology intermediate units of study

IMMU2101
Introductory Immunology

Credit points: 6 **Teacher/Coordinator:** A/Prof Helen Briscoe **Session:** Semester 1 **Classes:** Two 1 hour lectures per week, one 3 hour tutorial or practical or independent study per week. **Prerequisites:** 24 credit points of Junior units of study from any of the Science discipline areas. **Prohibitions:** IMMU2001, BMED2506, BMED2807 **Assumed knowledge:** Junior Biology and Junior Chemistry. **Assessment:** One 2 hour examination (60%), one 2000 word essay (20%), online quizzes and tutorial group presentation (20%)

Note: This is a prerequisite unit of study for IMMU3102 and IMMU3202. The completion of 6 credit points of MBLG units of study is highly recommended.

This unit of study will provide an overview of the human immune system and essential features of immune responses. The lecture course begins with a study of immunology as a basic research science. This includes the nature of the cells and molecules that recognise antigens and how these cells respond at the cellular and molecular levels. Practical/tutorial sessions will illustrate particular concepts introduced in the lecture program. Further lectures and self-directed learning sessions will integrate this fundamental information into studies of mechanisms of host defence against infection, transplantation, and dysfunction of the immune system including allergy, immunodeficiency and autoimmune diseases.

Textbooks

Abbas, AK, Lichtman, AH. Basic Immunology Functions and Disorders of the Immune System.
Saunders 2004.

Immunology senior units of study

IMMU3102
Molecular and Cellular Immunology

Credit points: 6 **Teacher/Coordinator:** Dr Allison Abendroth **Session:** Semester 2 **Classes:** Three 1 hour lectures, one tutorial and one practical per fortnight. **Prerequisites:** BMED2807 or BMED2506 or IMMU2101 or IMMU2001 and 6cp of Intermediate units of study from Biochemistry or Biology or Microbiology or Molecular Biology and Genetics or Pharmacology or Physiology. **Prohibitions:** IMMU3002, BMED3003 **Assumed knowledge:** Intermediate biochemistry and molecular biology and genetics. **Assessment:** Formal examination: 60% one 2 hour exam. Progressive assessment: 40% includes practical assessment (lab quizzes/practical assignment), 2000word essay, tutorial presentation

Note: The completion of 6 CP of MBLG units of study is highly recommended. Concurrent study of IMMU3202 Immunology in Human Disease is strongly recommended.

This study unit builds on the series of lectures that outlined the general properties of the immune system, effector lymphocytes and their functions, delivered in the core courses, IMMU2101 - Introductory Immunology and BMED2807 -Microbes & Body Defences (formerly IMMU2001 and BMED2506). In this unit the molecular and cellular aspects of the immune system are investigated in detail. We emphasise fundamental concepts to provide a scientific basis for studies of the coordinated and regulated immune responses that lead to elimination of infectious organisms. Guest lectures from research scientists eminent in particular branches of immunological research are a special feature of the course. These provide challenging information from the forefront of research that will enable the student to become aware of the many components that come under the broad heading 'Immunology'. Three lectures (1 hour each) will be given each fortnight: 2 lectures in one week and one lecture the following week, for the duration of the course. This unit directly complements the unit "Immunology in human disease IMMU3202" and students are strongly advised to undertake these study units concurrently.

Textbooks

Abbas, AK, Lichtman, AH, Cellular and Molecular Immunology 5th edition 2003. WB Saunders Company and/or Janeway, CA, Travers, P, Walport, M and Shlomchik, M. Immunobiology -the immune system in health and disease 6th edition. Garland Press. 2005.

IMMU3202
Immunology in Human Disease

Credit points: 6 **Teacher/Coordinator:** Dr Allison Abendroth **Session:** Semester 2 **Classes:** Three 1 hour lectures, one tutorial and one practical per fortnight. **Prerequisites:** BMED2807 or BMED2506 or IMMU2101 or IMMU2001 and 6cp of Intermediate units of study from Biochemistry, or Biology or Microbiology or Molecular Biology and Genetics or Pharmacology or Physiology. **Prohibitions:** IMMU3002, BMED3003 **Assumed knowledge:** Intermediate biochemistry and molecular biology and genetics. **Assessment:** Progressive assessment: 40% includes practical assignment, portfolio of case studies, poster presentation, tutorial presentation. Formal examination: 60% one 2 hour exam.

Note: The completion of 6CP of MBLG units of study is highly recommended. Concurrent study of IMMU3102 Molecular and Cellular Immunology is very strongly recommended.

This study unit builds on the series of lectures that outlined the general properties of the immune system, effector lymphocytes and their functions, delivered in the core courses, IMMU2101 - Introductory Immunology and BMED2807 - Microbes & Body Defences (formerly IMMU2001 and BMED2506). We emphasise fundamental concepts to provide a scientific basis for studies in clinical immunology; dysfunctions of the immune system e.g. autoimmune disease, immunodeficiencies, and allergy, and immunity in terms of host - pathogen interactions. This unit has a strong focus on significant clinical problems in immunology and the scientific background to these problems. The unit includes lectures from research scientists and clinicians covering areas such as allergy, immunodeficiency, autoimmune disease and transplantation. This course provides challenging information from the forefront of clinical immunology and helps the student develop an understanding of immune responses in human health and disease. Three lectures (1 hour each) will be given each fortnight: 2 lectures in one week and one lecture the following week, for the duration of the course. This unit directly complements the unit "Molecular and Cellular Immunology" and students are very strongly advised to undertake these study units concurrently.

Textbooks
Abbas, AK, Lichtman, AH, Cellular and Molecular Immunology 5th edition 2003. WB Saunders Company and/or Janeway, CA, Travers, P, Walport, M and Shlomchik, M. Immunobiology -the immune system in health and disease 6th edition. Garland Press. 2005. Rosen and Geha. Case studies in immunology-a clinical companion 4th edition. Garland Press. 2005

Immunology Honours

The Honours program in Immunology provides the opportunity for full-time research on a proposed project supervised by a staff member expert in that field. Experimental research, a seminar and a thesis constitute the major part of the program and of assessment. Guidance in research techniques is given in training programs covering experimental design, data analysis, written and oral communication and critical appraisal of the literature. Student contributions to this program are also assessed. In addition, a supplementary seminar program keeps students informed and abreast of wider issues in immunology.

Applying for Honours

Students are invited to apply for Honours enrolment during semester two of the year preceding Honours. Applicants should consult the Honours coordinator in the first instance. A list of possible research topics is provided, and students select projects of interest, speak with prospective supervisors and apply for permission to enrol, before the end of semester two. Within the constraints of availability, an attempt is made to assign students to the project of their choice.

General Requirements for Admission

Usually Honours candidates will have achieved a Credit in Senior Immunology units of study and will also have successfully completed Senior study in Biochemistry, Biology, Cell Pathology, Microbiology, Physiology or Virology. BSc candidates will have gained a major in Immunobiology, or a related discipline such as Biochemistry, Biology, Cell Pathology, Microbiology or Physiology. Usually Honours candidates will have an overall SCIWAM of 65 or greater. Departmental permission is required for enrolment.

Honours coordinators

The Immunology Honours coordinator is Dr Allison Abendroth (allisona@med.usyd.edu.au, 9351 6867).

Information Technologies

Information Technologies in the Bachelor of Science degree

The School of Information Technologies is part of the Faculty of Engineering and Information Technologies. In addition to providing professional training in Computer Science and Information Systems leading toward bachelor level degrees, it offers many units of study that students who are enrolled in the Faculty of Science may take as a part of a major in either Information Systems or Computer Science or a minor in Information Technology. Details regarding the units of study required for the award of a Science major in Information Systems or Computer Science can be obtained from the Faculty of Science Handbook or from the website www.it.usyd.edu.au.

Special consideration applications for illness or misadventure

Students should note that applications for special consideration on grounds of illness or miasaventure for COMP, INFO, ISYS or ELEC units are processed by the Faculty of Engineering

Minor in IT

Students enrolled in non-IT degrees or majors who, are eligible (upon application) for a Minor in Information Technology if they complete at least 18 credit points of intermediate or above units of study offered by the School of IT, within a completed degree. For further information see www.it.usyd.edu.au/future_students/undergrad/minor.shtml.

Advanced standing for Science students transferring to BIT, BCST or BCST (Advanced)

Students enrolled in Science degrees or Science graduates may obtain advanced standing towards the Bachelor of Information Technology, Bachelor of Computer Science and Technology or Bachelor of Computer Science and Technology (Advanced) degrees. Students wishing to undertake this option must seek academic advice from the School of Information Technologies. Further details regarding admission to the BIT, BCST or BCST(Advanced) may be obtained from the Engineering and Information Technologies handbook or from the Faculty Office.

Computer Science

The requirements for a major in Computer Science are defined in Table 1. Computer Science is a scientific discipline which has grown out of the use of computers to manage and transform information. It is concerned with the design of computers, their applications in science, government and business, and the formal and theoretical properties which can be shown to characterise these applications. The current research interests in the School include algorithms, bioinformatics, data management, data mining and machine learning, internet working, wireless networks, network computing, biomedical image processing, parallel and distributed computing, user-adaptive systems and information visualisation. The School has a range of computers and specialised laboratories for its teaching and research.

Information Systems

The requirements for a major in Information Systems are defined in Table 1. Information Systems is the study of people and organisations in order to determine, and deliver solutions to meet, their technological needs. Hence Information Systems deals with the following type of issues: strategic planning, system development, system implementation, operational management, end-user needs and education. Information Systems study is related to Computer Science but the crucial distinction is that the Information Systems is about the architecture of computer systems and making them work for people, whereas much of Computer Science is about developing and improving the performance of computers. The School's research in Information

Systems encompasses natural language processing, IT economics, social networking analysis, ontologies design, data mining and knowledge management and open source software.

Summer School: January-February

This School sometimes offers some units of study in The Sydney Summer School. Consult The Sydney Summer School web site for more information: www.summer.usyd.edu.au/

Computer Science and Information Systems junior units of study

See the School web site www.it.usyd.edu.au for advice on choosing appropriate units of study from this list.

INFO1003
Foundations of Information Technology

Credit points: 6 **Session:** Semester 1, Semester 2 **Classes:** (Lec 2 hrs & Prac 3hrs) per week **Prohibitions:** INFO (1903 or 1000) or INFS1000 **Assessment:** In-course involvement, assignments, quizzes and written exam.

This unit prepares students from any academic discipline to develop the necessary knowledge, skills and abilities to be competent in the use of information technology for solving a variety of problems. The main focus of this unit is on modelling and problem solving through the effective use of IT. Students will learn how to navigate independently to solve their problems on their own, and to be capable of fully applying the power of IT tools in the service of their goals in their own domains while not losing sight of the fundamental concepts of computing.

Students are taught core skills related to general purpose computing involving a range of software tools such as spreadsheets, database management systems, internet search engines, HTML, and JavaScript. Students will undertake practical tasks including authoring an interactive website using HTML and JavaScript and building a small scale application for managing information. In addition, the course will address the many social, ethical, and intellectual property issues arising from the wide-spread use of information technology in our society.

INFO1103
Introduction to Programming

Credit points: 6 **Session:** Semester 1, Semester 2 **Classes:** (Lec 2hrs & Prac 3hrs) per week **Prohibitions:** INFO1903 or SOFT (1001 or 1901) or COMP (1001 or 1901) or DECO2011 **Assumed knowledge:** HSC Mathematics **Assessment:** In-course involvement, assignments, quizzes and written exam

This unit provides an introduction to programming using Java. The main aims are (i) to develop basic programming skills and (ii) learn how to express algorithms using computer programming and develop basic algorithmic problem solving skills.

INFO1903
Informatics (Advanced)

Credit points: 6 **Session:** Semester 1 **Classes:** (Lec 3hrs & Prac 3hrs) per week **Prerequisites:** UAI sufficient to enter BCST(Adv), BIT or BSc(Adv), or portfolio of work suitable for entry **Prohibitions:** INFO1003, INFO1103 **Assumed knowledge:** HSC Mathematics **Assessment:** In-course involvement, assignments, quizzes, lab exam and written exam

Note: Department permission required for enrolment.

This unit covers advanced data processing and management, integrating the use of existing productivity software, e.g. spreadsheets and databases, with the development of custom software using the powerful general-purpose Python scripting language. It will focus on skills directly applicable to research in any quantitative domain. The unit will also cover presentation of data through written publications and dynamically generated web pages, visual representations and oral presentation skills. The assessment, a long project, involves the demonstration of these skills and techniques for processing and presenting data in a choice of domains.

Textbooks

Given the diversity of the material, the main resource for INFO1903 will be the course notes, which will be made available through the University Copy Centre. Additional suggested readings:

M. Lutz and D. Ascher. Learning Python, 2nd Ed., O'Reilly, 2003. ISBN 0-596-00281-5

INFO1105
Data Structures

Credit points: 6 **Session:** Semester 2 **Classes:** (Lec 2hrs & Prac 3hrs) per week **Prohibitions:** INFO1905 or SOFT (1002 or 1902) or COMP (1002 or 1902 or 2160 or 2860 or 2111 or 2811 or 2002 or 2902) **Assumed knowledge:** Programming, as for INFO1103 **Assessment:** In-course involvement, assignments, quizzes and written exam

The unit will teach some powerful ideas that are central to quality software: data abstraction and recursion. It will also show how one can analyse the scalability of algorithms using mathematical tools of asymptotic notation. Contents include: both external "interface" view, and internal "implementation" details, for commonly used data structures, including lists, stacks, queues, priority queues, search trees, hash tables, and graphs; asymptotic analysis of algorithm scalability, including use of recurrence relations to analyse recursive code. This unit covers the way information is represented in each structure, algorithms for manipulating the structure, and analysis of asymptotic complexity of the operations. Outcomes include: ability to write code that recursively performs an operation on a data structure; experience designing an algorithmic solution to a problem using appropriate data structures, coding the solution, and analysing its complexity.

INFO1905
Data Structures (Advanced)

Credit points: 6 **Session:** Semester 2 **Classes:** (Lec 2hrs & Prac 3hrs) per week **Prerequisites:** Distinction-level performance in INFO1103 or INFO1903 or SOFT1001 or SOFT1901. **Prohibitions:** INFO1105 or SOFT (1002 or 1902) or COMP (1002 or 1902) **Assessment:** In-course involvement, assignments, quizzes and written exam

An advanced alternative to INFO1105; covers material at an advanced and challenging level. See the description of INFO1105 for more information.

Computer Science and Information Systems intermediate units of study

It is important to choose second year subjects appropriately to keep options open for further study. See www.it.usyd.edu.au for advice.

COMP2007
Algorithms and Complexity

Credit points: 6 **Session:** Semester 2 **Classes:** (Lec 2hrs & Prac 2hrs) per week **Prohibitions:** COMP (2907 or 3309 or 3609 or 3111 or 3811) **Assumed knowledge:** INFO1105, MATH1004 or MATH1904Discrete Maths **Assessment:** In-course involvement, assignments, quizzes and written exam.

This unit provides an introduction to the design and analysis of algorithms. The main aims are (i) to learn how to develop algorithmic solutions to computational problem and (ii) to develop understanding of algorithm efficiency and the notion of computational hardness.

COMP2907
Algorithms and Complexity (Advanced)

Credit points: 6 **Session:** Semester 2 **Classes:** (Lec 2hrs & Prac 2hrs) per week **Prerequisites:** Distinction level result in INFO (1105 or 1905) or SOFT (1002 or 1902) **Prohibitions:** COMP (2007 or 3309 or 3609 or 3111 or 3811) **Assessment:** In-course involvement, assignments, quizzes and written exam

An advanced alternative to COMP2007; covers material at an advanced and challenging level. See the description of COMP2007 for more information.

COMP2129
Operating Systems and Machine Principles

Credit points: 6 **Session:** Semester 1 **Classes:** (Lec 2hrs & Prac 2hrs) per week **Prohibitions:** SOFT (2130 or 2830 or 2004 or 2904) or COMP (2004 or 2904) **Assumed knowledge:** Programming, as from INFO1103 **Assessment:** In-course involvement, assignments, quizzes and written exam.

In this unit of study elementary methods for developing robust, efficient and re-usable software will be covered. The unit is taught in C, in a

Unix environment. Specific coding topics include memory management, the pragmatic aspects of implementing data structures such as lists and hash tables and managing concurrent threads. Debugging tools and techniques are discussed and common programming errors are considered along with defensive programming techniques to avoid such errors. Emphasis is placed on using common Unix tools to manage aspects of the software construction process, such as version control and regression testing. The subject is taught from a practical viewpoint and it includes a considerable amount of programming practice, using existing tools as building blocks to complete a large-scale task.

INFO2110
Systems Analysis and Modelling

Credit points: 6 **Session:** Semester 2 **Classes:** (Lec 2hrs & Prac 2hrs) per week **Prohibitions:** INFO (2810 or 2000 or 2900) **Assumed knowledge:** Experience with a data model as in INFO1003 or INFO1103 or INFS1000 **Assessment:** In-course involvement, assignments, quizzes and written exam.

This unit provides a comprehensive introduction to the analysis of complex systems. Key topics are the determination and expression of system requirements (both functional and non-functional), and the representation of structural and behavioural models of the system in UML notations. Students will be expected to evaluate requirements documents and models as well as producing them. This unit covers essential topics from the ACM/IEEE SE2004 curriculum, especially from MAA Software Modelling and Analysis.

INFO2120
Database Systems 1

Credit points: 6 **Session:** Semester 1 **Classes:** (Lec 2hrs & Prac 2hrs) per week **Prohibitions:** INFO (2820 or 2005 or 2905) **Assumed knowledge:** Some exposure to programming and some familiarity with data model concepts such as taught in INFO1103 or INFO1003 or INFS1000 or INFO1903 **Assessment:** In-course involvement, assignments, quizzes and written exam.

The proper management of data is essential for all data-centric applications and for effective decision making within organizations. This unit of study will introduce the basic concepts of database designs at the conceptual, logical and physical levels. Particular emphasis will be placed on introducing integrity constraints and the concept of data normalization which prevents data from being corrupted or duplicated in different parts of the database. This in turn helps in the data remaining consistent during its lifetime. Once a database design is in place, the emphasis shifts towards querying the data in order to extract useful information. The unit will introduce different query languages with a particular emphasis on SQL, which is industry standard. Other topics covered will include the important concept of transaction management, application development with a backend database, an overview of data warehousing and online analytic processing, and the use of XML as a data integration language.

INFO2820
Database Systems 1 (Advanced)

Credit points: 6 **Session:** Semester 1 **Classes:** (Lec 2hrs & Prac 2hrs) per week **Prerequisites:** Distinction-level result in INFO (1003 or 1103 or 1903 or 1105 or 1905) or SOFT (1001 or 1901 or 1002 or 1902) **Prohibitions:** INFO (2120 or 2005 or 2905) **Assessment:** In-course involvement, assignments, quizzes and written exam.

An advanced alternative to INFO2120; covers material at an advanced and challenging level. See the description of INFO2120 for more information.

INFO2315
Introduction to IT Security

Credit points: 6 **Session:** Semester 2 **Classes:** (Lec 2hrs & Prac 2hrs) per week **Prohibitions:** NETS (3305 or 3605 or 3016 or 3916) or ELEC (5610 or 5616) **Assumed knowledge:** Computer literacy **Assessment:** In-course involvement, assignments, quizzes and written exam.

This unit provides a broad introduction to the field of IT security. We examine secure and insecure programs, secure and insecure information, secure and insecure computers, and secure and insecure network infrastructure. Key content includes the main threats to security; how to analyse risks; the role in reducing risk that can be played by technical tools (such as encryption, signatures, access control, firewalls, etc); the limitations of technical defences; and the simple process and behavioural changes that can reduce risk.

ISYS2140
Information Systems

Credit points: 6 **Session:** Semester 1 **Classes:** (Lec 2hrs & Prac 2hrs) per week **Prohibitions:** ISYS (2006 or 2007) **Assumed knowledge:** INFO1003 or INFS1000 **Assessment:** In-course involvement, assignments, quizzes and written exam.

This unit of study will provide a comprehensive conceptual and practical introduction to information systems (IS) in contemporary organisations. Content: General Systems Theory; Basic concepts of organisations, systems and information; The role of information systems in operating and managing organisations; How IS and the Internet enables organisations to adopt more competitive business models, including e-Commerce; The technologies that underpin IS; Distributed systems, including security, networking principles, the client server model and how distributed components locate and communicate with each other; The integration of disparate systems both within the organisation and between organisations, including the role of XML; Behavioural, managerial and ethical issues in implementing and managing IS.

Textbooks
Management Information Systems: Managing the Digital Firm, 8th Edition, Kenneth C. Laudon & Jane P. Laudon, Prentice Hall 2004
Computer Networking: A Top-down Approach Featuring the Internet, 2nd edition, James F. Kurose and Keith W. Ross, Pearson/Addison Wesley 2003

Computer Science and Information Systems senior units of study in the BSc

Students are advised that doing less than 24 Senior credit points is not regarded as adequate preparation for a professional career in computing or for further study. Students are advised to balance their workload between semesters. It is important to choose second year subjects appropriately to keep options open for further study. See www.it.usyd.edu.au for advice.

COMP3109
Programming Languages and Paradigms

Credit points: 6 **Session:** Semester 2 **Classes:** (Lec 2hrs & Prac 2hrs) per week **Assumed knowledge:** COMP2007 **Assessment:** In-course involvement, assignments, quizzes and written exam.

This unit provides an introduction to the foundations of programming languages and their implementation. The main aims are to teach what are: grammars, parsers, semantics, programming paradigms and implementation of programming languages.

COMP3308
Introduction to Artificial Intelligence

Credit points: 6 **Session:** Semester 1 **Classes:** (Lec 2hrs & Tut 2hrs) per week **Prohibitions:** COMP (3608 or 3002 or 3902) **Assumed knowledge:** COMP2007 **Assessment:** Assignments, written exam.

Artificial Intelligence (AI) is all about programming computers to perform tasks normally associated with intelligent behaviour. Classical AI programs have played games, proved theorems, discovered patterns in data, planned complex assembly sequences and so on. This unit of study will introduce representations, techniques and architectures used to build intelligent systems. It will explore selected topics such as heuristic search, game playing, machine learning, and knowledge representation. Students who complete it will have an understanding of some of the fundamental methods and algortihms of AI, and an appreciation of how they can be applied to interesting problems. The unit will involve a practical component in which some simple problems are solved using AI techniques.

Textbooks
S.J. Russell and P.Norvig, Artificial Intelligence, A Modern Approach, 2d edition Prentice Hall, 0-13-080302-2, 2003

COMP3608
Intro. to Artificial Intelligence (Adv)

Credit points: 6 **Session:** Semester 1 **Classes:** (Lec 2hrs & Prac 2hrs) per week. **Prerequisites:** Distinction-level results in some 2nd year COMP or MATH or SOFT units. **Prohibitions:** COMP (3308 or 3002 or 3902) **Assessment:** Assignments, written exam.

An advanced alternative to COMP3308; covers material at an advanced and challenging level. See the description of COMP3308 for more information.

Textbooks
S.J. Russell and P.Norvig, Artificial Intelligence, A Modern Approach, 2d edition Prentice Hall, 0-13-080302-2, 2003

COMP3419
Graphics and Multimedia

Credit points: 6 **Session:** Semester 1 **Classes:** (Lec 2hrs & Prac 2hrs) per week **Prohibitions:** MULT (3306 or 3606 or 3019 or 3919 or 3004 or 3904) or COMP(3004 or 3904) **Assumed knowledge:** COMP2007, MATH1002 **Assessment:** In-course involvement, assignments, quizzes and written exam.

Computer Graphics and Multimedia are core technologies to support an interdisciplinary computing and communication environment. This unit provides a broad introduction to the field of multimedia to meet the diverse requirements of application areas such as entertainment, industrial design, virtual reality, intelligent media management, medical imaging and remote sensing. The unit covers both the underpinning theories and the practices of manipulating and enhancing digital media including image, computer graphics, audio, computer animation, and video. It introduces principles and cutting-edge techniques such as multimedia data processing, content analysis, media retouching, media coding and compression. It elaborates on various multimedia coding standards. A particular focus is on principles and the state-of-the-art research and development topics of Computer Graphics such as modelling, rendering and shading, and texturing.

COMP3456
Computational Methods for Life Sciences

Credit points: 6 **Session:** Semester 2 **Classes:** (Lec 2hrs & Prac 2hrs) per week **Prerequisites:** INFO1105 and (COMP2007 or INFO2120) and 6 credit points from BIOL or MBLG **Assessment:** In-course involvement, assignments, quizzes and written exam.

This unit introduces the algorithmic principles driving advances in the life sciences. It discusses biological and algorithmic ideas together, linking issues in computer science and biology and thus is suitable for students in both disciplines. Students will learn algorithm design and analysis techniques to solve practical problems in biology.

COMP3520
Operating Systems Internals

Credit points: 6 **Session:** Semester 1 **Classes:** (Lec 2hrs & Prac 2hrs) per week **Prohibitions:** NETS (3304 or 3604 or 3009 or 3909) or COMP (3009 or 3909) **Assumed knowledge:** COMP2129, INFO1105 **Assessment:** In-course involvement, assignments, quizzes and written exam.

This unit will provide a comprehensive discussion of relevant OS issues and principles and describe how those principles are put into practice in real operating systems. The contents include internal structure of OS; several ways each major aspect (process scheduling, inter-process communication, memory management, device management, file systems) can be implemented; the performance impact of design choices; case studies of common OS (Linux, MS Windows NT, etc). The contents also include concepts of distributed systems: naming and binding, time in distributed systems, resource sharing, synchronization models (distributed shared memory, message passing), fault-tolerance, and case study of distributed file systems.

COMP3615
Software Development Project

Credit points: 6 **Session:** Semester 2 **Classes:** (Meeting with academic supervisor 1hr & Class meeting 1hr) per week **Prerequisites:** INFO3402 **Prohibitions:** INFO3600 or SOFT (3300 or 3600 or 3200 or 3700) **Assessment:** Individual presentation, oral examination and group report.

This unit will provide students an opportunity to apply the knowledge and practise the skills acquired in the prerequisite and qualifying units, in the context of designing and building a substantial software development system in diverse application domains including life sciences. Working in groups students will need to carry out the full range of activities including requirements capture, analysis and design, coding, testing and documentation.

INFO3220
Object Oriented Design

Credit points: 6 **Session:** Semester 1 **Classes:** (Lec 2hrs & Prac 2 hrs) per week **Prohibitions:** SOFT (3301 or 3601 or 3101 or 3801) or COMP (3008 or 3908) **Assumed knowledge:** INFO2110, INFO1105 **Assessment:** In-course involvement, assignments, quizzes and written exam.

This unit covers essential design methods and language mechanisms for successful object-oriented design and programming. C++ is used as the implementation language and a special emphasis is placed on those features of C++ that are important for solving real-world problems. Advanced software engineering features, including exceptions and name spaces are thoroughly covered.

INFO3315
Human-Computer Interaction

Credit points: 6 **Session:** Semester 2 **Classes:** (Lec 2hrs & Prac 2hrs) per week **Prohibitions:** MULT (3307 or 3607 or 3018 or 3918) or SOFT (3102 or 3802) or COMP (3102 or 3802) **Assumed knowledge:** INFO2110 **Assessment:** In-course involvement, assignments, quizzes and written exam.

This unit will introduce techniques to evaluate software user interfaces using heuristic evaluation and user observation techniques. Students will (i) learn how to design formal experiments to evaluate usability hypothesis and (ii) apply user centered design and usability engineering principles to design software user interfaces. A brief introduction to the psychological aspects of human-computer interaction will be provided.

INFO3402
Management of IT Projects and Systems

Credit points: 6 **Session:** Semester 1 **Classes:** (Lec 2hrs & Prac 2hrs) per week. **Prohibitions:** ISYS (3000 or 3012) or ELEC3606 **Assumed knowledge:** INFO (2000 or 2110 or 2810 or 2900) **Assessment:** In-course involvement, assignments, quizzes and written exam.

This course introduces the basic processes and techniques for managing IT projects, systems and services, throughout the IT lifecycle. It addresses both the technical and behavioural aspects of IT management at the enterprise level. Major topics include: organisational strategy and IT alignment, IT planning, project planning, tracking, resource estimation, team management, software testing, delivery and support of IT services, service level agreements, change and problem management, cost effectiveness and quality assurance.

Textbooks
Martin, E. W., C. V. Brown, et al. (2002). Managing Information Technology. New Jersey, Pearson Education Inc.

INFO3404
Database Systems 2

Credit points: 6 **Session:** Semester 2 **Classes:** (Lec 2hrs & Prac 2hrs) per week **Prohibitions:** INFO (3504 or 3005 or 3905) or COMP (3005 or 3905) **Assumed knowledge:** Introductory database study such as INFO2120 or INFO2820 or INFO2005 or INFO2905. Students are expected to be familiar with SQL and the relational data model, and to have some programming experience. **Assessment:** In-course involvement, assignments, quizzes and written exam.

This unit of study provides a comprehensive overview of the internal mechanisms of Database Management Systems (DBMS) and other systems that manage large data collections. These skills are needed for successful performance tuning, to understand the scalability challenges faced by the information age. Topics include: the internal components of a DBMS engine, physical data organization and disk-based index structures, query processing and optimisation, locking and logging, database tuning, distributed and replicated databases, web search engines, and indices and processing when doing

information retrieval from textual data. This unit will be valuable to those pursuing such careers as Software Engineers, Database Experts, Database Administrators, Web Developers and e-Business Consultants.

INFO3504
Database Systems 2 (Adv)

Credit points: 6 **Teacher/Coordinator:** - **Session:** Semester 2 **Classes:** (Lec 2hrs & Prac 2hrs) per week **Prerequisites:** Distinction-level result in INFO (2120 or 2820) or COMP (2007 or 2907) **Prohibitions:** INFO (3404 or 3005 or 3905) or COMP (3005 or 3905) **Assessment:** In-course involvement, assignments, quizzes and written exam.

An advanced alternative to INFO3404; covers material at an advanced and challenging level. See the description of INFO3404 for more information.

INFO3600
Major Development Project (Advanced)

Credit points: 12 **Session:** Semester 2 **Prerequisites:** INFO3402 **Prohibitions:** COMP3615 or ISYS3400 or SOFT (3300 or 3600 or 3200 or 3700) **Assessment:** Individual presentation, oral examination and group report.
Note: Only available to students in BIT, BCST(Adv) or BSc(Adv)

This unit will provide students an opportunity to carry out substantial aspects of a significant software development project. The project will be directed towards assisting a client group (from industry or with strong industry links). The student's contribution could cover one or more aspects such as requirements capture, system design, implementation, change management, upgrades, operation, and/or tuning. Assessment will be based on the quality of the delivered outputs, the effectiveness of the process followed, and the understanding of the way the work fits into the client's goals, as shown in a written report.

ISYS3400
Information Systems Project

Credit points: 6 **Session:** Semester 2 **Classes:** (Meeting with academic supervisor 1hr & Class meeting 1hr) per week **Prerequisites:** (INFO3402 or ISYS3012) and (ISYS3401 or ISYS3015) **Prohibitions:** INFO3600 or ISYS3207 **Assumed knowledge:** INFO2120 **Assessment:** Individual presentation, oral examination, group report

This unit will provide students an opportunity to apply the knowledge and practise the skills acquired in the prerequisite and qualifying units, in the context of a substantial information systems research or development project and to experience in a realistic way many aspects of analysing and solving information systems problems. Since information systems projects are often undertaken by small teams, the experience of working in a team is seen as an important feature of the unit. Students often find it difficult to work effectively with others and will benefit from the opportunity provided by this unit to further develop this skill.

ISYS3401
Analytical Methods & Information Systems

Credit points: 6 **Session:** Semester 1 **Classes:** (Lec 2hrs & Prac 1hr) per week **Prohibitions:** ISYS3015 **Assumed knowledge:** INFO2110, ISYS2140 **Assessment:** In-course involvement, assignments, quizzes and written exam.

This course will provide an introduction to the scientific approach and basic research methods that are relevant for conceptualizing and solving complex problems encountered Information Systems practice. A collection of different methods for collecting and analyzing information will be studied in the context of a few typical information system projects. These methods include surveys, controlled experiments, questionnaire design and sampling.

Textbooks
Leedy P. and Ornrod J. Practical Research: planning and design (7th ed). Prentice Hall

Computer Science or Information Systems Honours in the BSc

To be awarded Honours in Computer Science, a student must complete units of study (as specified below) to a total of 48 credit points. Note that the Faculty requires that Honours be completed in two consecutive semesters of full-time study, or four consecutive semesters of part-time study; a single final grade and mark is given for the Honours course, as determined by the Faculty based on performance in Honours and in prior undergraduate study.

Honours units of study in Computer Science in the BSc

COMP4011
Computer Science Honours A

Credit points: 12 **Session:** Semester 1, Semester 2
Note: Department permission required for enrolment.

Students enrolled in the Honours programs study various advanced aspects of Computer Science. The program may include lectures, tutorials, seminars and practicals. They will undertake a research project. Assessment will include the project and may include examinations and classwork.

COMP4012
Computer Science Honours B

Credit points: 12 **Session:** Semester 1, Semester 2
Note: Department permission required for enrolment.

Students enrolled in the Honours programs study various advanced aspects of Computer Science. The program may include lectures, tutorials, seminars and practicals. They will undertake a research project. Assessment will include the project and may include examinations and classwork.

COMP4013
Computer Science Honours C

Credit points: 12 **Session:** Semester 1, Semester 2
Note: Department permission required for enrolment.

Students enrolled in the Honours programs study various advanced aspects of Computer Science. The program may include lectures, tutorials, seminars and practicals. They will undertake a research project. Assessment will include the project and may include examinations and classwork.

COMP4014
Computer Science Honours D

Credit points: 12 **Session:** Semester 1, Semester 2
Note: Department permission required for enrolment.

Students enrolled in the Honours programs study various advanced aspects of Computer Science. The program may include lectures, tutorials, seminars and practicals. They will undertake a research project. Assessment will include the project and may include examinations and classwork.

Honours units of study in Information Systems in the BSc

ISYS4301
Information Systems Honours A

Credit points: 12 **Session:** Semester 1, Semester 2
Note: Department permission required for enrolment.

Students enrolled in the Honours programs study various advanced aspects of Information Systems. The program may include lectures, tutorials, seminars and practicals. They will undertake a research project. Assessment will include the project and may include examinations and classwork.

ISYS4302
Information Systems Honours B

Credit points: 12 **Session:** Semester 1, Semester 2 **Corequisites:** ISYS4301

See ISYS4301

ISYS4303
Information Systems Honours C
Credit points: 12 **Session:** Semester 1, Semester 2 **Corequisites:** ISYS4302

See ISYS4301

ISYS4304
Information Systems Honours D
Credit points: 12 **Session:** Semester 1, Semester 2 **Corequisites:** ISYS4303

See ISYS4301

Law units of study

The following units of study are only available to students in the Bachelor of Science/Bachelor of Laws degree. Please consult degree information in chapter 9, and the relevant Departments/Schools entries in this chapter for descriptions of other units of study required for this degree.

Curriculum Review

The Faculty of Law is undertaking a curriculum review, anticipated to be completed in 2007/2008. Combined law students are expected to complete 48 credit points of Law units of study in the first three years of the combined degree. Third year combined law students who are not able to accumulate 48 credit points of Law units of study using the unit of study codes in Table 2 as it appears in Chapter 9 must contact the Faculty of Law for alternative unit of study codes for Federal Constitutional Law and Law, Lawyers and Justice.

LAWS1006
Foundations of Law

Credit points: 6 **Teacher/Coordinator:** Professor David Kinley (Combined), Mr Fady Aoun (Graduate) **Session:** Semester 1 **Classes:** Combined: 1x1hr lec and 1x2hr seminar/wk; Graduate: The unit is taught to Graduate Law 1 students on an intensive basis over three weeks. The aim of this is to give students a good grounding in the basic legal skills needed for law studies before underta **Prohibitions:** LAWS1000 **Assessment:** Combined: class participation (20%), case analysis (30%), essay (50%); Graduate: class participation (20%), 1x1000wd essay (10%), 1x1800wd case assignment (20%) and 1x3000wd essay (50%)

This unit of study provides a foundation core for the study of law. We aim to provide a practical overview of the Australian legal system, an introduction to the skills of legal reasoning and analysis which are necessary to complete your law degree, and an opportunity for critical engagement in debate about the role of law in our lives. The course will introduce students to issues such as: (i) the development of judge made and statute law; (ii) the relationship between courts and parliament; (iii) the role and function of courts, tribunals and other forms of dispute resolution; (iv) understanding and interrogating principles of judicial reasoning and statutory interpretation; (v) the relationship between law, government and politics; (vi) what are rights in Australian law, where do they come from and where are they going; (vii) the development and relevance of international law.

LAWS1010
Torts

This unit of study is not available in 2009

Credit points: 6 **Teacher/Coordinator:** Mr Ross Anderson **Session:** Semester 2 **Classes:** (1x2hr seminar and 1x1hr seminar)/wk **Prerequisites:** LAWS1006 **Prohibitions:** LAWS1005, LAWS1012, LAWS3001 **Assessment:** 2x class tests (15% each) and 1x2hr exam (70%)

Note: Department permission required for enrolment. Note: Available to Combined Law candidates who commenced prior to 2007.

This is a general introductory unit of study concerned with liability for civil wrongs. The unit seeks to examine and evaluate, through a critical and analytical study of primary and secondary materials, the function and scope of modern tort law and the rationale and utility of its governing principles. Particular topics on which the unit will focus include:

(a) The relationship between torts and other branches of the common law including contract and criminal law;

(b) The role of fault as the principal basis of liability in the modern law;

(c) Historical development of trespass and the action on the case and the contemporary relevance of this development;

(d) Trespass to the person (battery, assault, and false imprisonment);

(e) Interference with goods (trespass, detinue and conversion);

(f) Trespass to land and private nuisance;

(g) The action on the case for intentional injury;

(h) Defences to trespass, including consent, intellectual disability, childhood, necessity and contributory negligence;

(i) Development and scope of the modern tort of negligence, including detailed consideration of duty of care and breach of duty with particular reference to personal and psychiatric injury;

(j) Injuries to relational interests, including compensation to relatives of victims of fatal accidents;

(k) Defences to negligence.

LAWS1012
Torts

Credit points: 6 **Teacher/Coordinator:** Mr Ross Anderson (Graduate), Assoc Prof Barbara McDonald (Combined) **Session:** Semester 1, Semester 2 **Classes:** Combined: 1x2hr lectures and 1x1hr seminars/wk; Graduate: 3x4hr seminar/wk for 3 weeks and 1x3hr seminar in week 13. **Prerequisites:** LAWS1006 **Prohibitions:** LAWS1005, LAWS1010, LAWS3001 **Assessment:** Graduate: 1x1hr class test (30%) and 1x2hr exam (70%); Combined: 2500w assignment (30%), tutorial participation (10%) and 1x2hr exam (60%)

Note: Available to candidates proceeding under the new LLB resolutions.

This is a general introductory unit of study concerned with liability for civil wrongs. The unit seeks to examine and evaluate, through a critical and analytical study of primary and secondary materials, the function and scope of modern tort law and the rationale and utility of its governing principles. Particular topics on which the unit will focus include:

(a) The relationship between torts and other branches of the common law including contract and criminal law;

(b) The role of fault as the principal basis of liability in the modern law;

(c) Historical development of trespass and the action on the case and the contemporary relevance of this development;

(d) Trespass to the person (battery, assault, and false imprisonment);

(e) Trespass to land and private nuisance;

(f) The action on the case for intentional injury;

(g) Defences to trespass, including consent, intellectual disability, childhood, necessity and contributory negligence;

(h) Development and scope of the modern tort of negligence, including detailed consideration of duty of care and breach of duty and causation and remoteness of damage with particular reference to personal and psychiatric injury;

(i) Compensation for personal injuries, including special and alternative compensation schemes;

(j) Injuries to relational interests, including compensation to relatives of victims of fatal accidents;

(k) Defences to negligence.

LAWS1013
Legal Research I

Teacher/Coordinator: Mr Graeme Coss **Session:** Semester 1, Semester 2 **Classes:** Combined Law: 6x1hr seminars **Corequisites:** LAWS1006 **Prohibitions:** LAWS1008 **Assessment:** Satisfactory attendance, WebCT-based quizzes and 1x in-class test

Note: Available to candidates proceeding under the new LLB resolutions. Semester 1 classes are for Combined Law candidates in the faculties of Arts, Engineering and Science. Semester 2 classes are for Combined Law candidates in the Faculty of Economics & Business.

This is a compulsory unit taught on a pass/fail basis. The aim of the unit is to introduce you to finding and citing primary and secondary legal materials and introduce you to legal research techniques. These are skills which are essential for a law student and which you will be required to apply in other units.

LAWS1014
Civil and Criminal Procedure

Credit points: 6 **Teacher/Coordinator:** Professor Mark Findlay **Session:** Semester 1, Semester 1b **Classes:** 2x2hr seminars/wk (combined), 3x4hr seminars a week for 3 weeks followed by 1x3hr seminar in week 13 (graduate) **Prerequisites:** LAWS1006 **Prohibitions:** LAWS1001, LAWS1007, LAWS3002, LAWS3004 **Assessment:** 1x tutorial assessment (25%) and 1x 2hr final exam (75%)

Note: Available to candidates proceeding under the new LLB resolutions.

This unit of study aims to introduce students to civil and criminal procedure. It is concerned with the procedures relating to civil dispute resolution and criminal justice which are separate to the substantive hearing. The unit will consider the features of an adversarial system of justice and its impact on process. Recent reforms to the adversarial system of litigation will be explored. The civil dispute resolution part of the unit will cover alternative dispute resolution, the procedures for commencing a civil action, case management, gathering evidence and the rules of privilege. Criminal process will be explored by reference to crime and society, police powers, bail and sentencing. International dispute resolution will also be introduced. The course focuses on practical examples with consideration of ethics, and contextual and theoretical perspectives.

LAWS1015
Contracts

Credit points: 6 **Teacher/Coordinator:** Dr Greg Tolhurst **Session:** Semester 1, Semester 1b, Summer Late **Classes:** Combined: 2x2hr lectures or seminars/wk; Graduate: 3x4hr seminar/wk for 3 weeks and 1x3hr seminar in week 13. **Prerequisites:** LAWS1006 **Prohibitions:** LAWS1002, LAWS2008 **Assessment:** class participation (10%) and 1x2hr exam (90%)

Note: Available to candidates proceeding under the new LLB resolutions.

Contract law provides the legal background for transactions involving the supply of goods and services and is, arguably the most significant means by which the ownership of property is transferred from one person to another. It vitally affects all members of the community and a thorough knowledge of contract law is essential to all practising lawyers. In the context of the law curriculum as a whole, Contracts provides background which is assumed knowledge in many other units. The aims of the course are composite in nature. The course examines the rules that regulate the creation, terms, performance, breach and discharge of a contract. Remedies and factors that may vitiate a contract such as misrepresentation are dealt with in Torts and Contracts II. The central aim of the course is to provide an understanding of the basic principles of contract law and how those principles are applied in practice to solve problems. Students will develop the skills of rules based reasoning and case law analysis. A second aim is to provide students an opportunity to critically evaluate and make normative judgments about the operation of the law. Successful completion of this unit of study is a prerequisite to the elective unit Advanced Contracts.

LAWS1016
Criminal Law

Credit points: 6 **Teacher/Coordinator:** Prof Mark Findlay **Session:** Semester 2 **Classes:** Combined: 2x2hr seminar/wk; Graduate: 3x4hr seminar/wk for 3 weeks and 1x3hr seminar/wk in week 13. **Prerequisites:** LAWS1006, LAWS1014 **Prohibitions:** LAWS1003, LAWS3001, LAWS2009 **Assessment:** class participation (10%), 1x 2000wd problem (40%) and 1x 2hr exam (50%)

Note: Available to candidates proceeding under the new LLB resolutions.

This unit of study is designed to introduce the general principles of criminal law in context as they operate in NSW, and to critically analyse these in their contemporary social and political relevance. In order to achieve these goals, the unit will consider a range of theoretical literature as well as critical commentary, and will focus on particular substantive legal topics in problem-centred contexts. Although the topic structure is necessarily selective, it is intended that students will gain a broad understanding of crime and justice issues, as well as of the applications of the criminal law. Students will encounter problem-based learning and will be encouraged to challenge a range of conventional wisdom concerning the operation of criminal justice. This unit of study is designed to assist students in developing the following understandings: (1) A critical appreciation of certain key concepts which recur throughout the substantive criminal law. (2) A knowledge of the legal rules in certain specified areas of criminal law and their application. (3) A preliminary knowledge of how the criminal law operates in its broader societal context. (4) Through following the process of proof in a criminal prosecution and its defense, to understand the determination of criminal liability. The understandings referred to in the foregoing paragraphs will have a critical focus and will draw on procedural, substantive, theoretical and empirical sources. The contradictions presented by the application of legal principle to complex social problems will be investigated.

LAWS1017
Torts and Contracts II

Credit points: 6 **Teacher/Coordinator:** Assoc Prof Barbara McDonald (Combined), Mr Ross Anderson (Graduate) **Session:** Semester 2, Semester 2b **Classes:** 1x2hr lecture and 1x2hr tutorial/wk (combined), 3x4hr seminars/wk for 3 weeks, and 1x3hr seminar in week 13 (graduate) **Prerequisites:** (LAWS1010 or LAWS1012) and LAWS1015 **Assessment:** 1x1hr class test (30%) and 1x2hr exam (70%) (Graduate); Ix 3000 word assignment (30%), tutorial participation (10%) 1x 2 hour exam (60%).

Note: Available to candidates proceeding under the new LLB resolutions.

The laws of tort and contract frequently overlap in practice and are increasingly regulated by statute. This unit aims to develop the integrated study of the law of obligations and remedies. It builds on the introduction to tort and contract law which students have acquired in Torts and Contracts. It will include the study of more advanced topics in both areas and the impact of related statutory liability and remedies. Topics:

(a) Concurrent, proportionate and vicarious liability;

(b) The role of statutory duties and powers in tort law;

(b) Liability for misrepresentation in tort, contract and under statute (eg statutory duties, s 52 Trade Practices Act 1974 (Cth));

(c) Liability for economic loss in tort, including some comparative study;

(d) Detailed consideration of causation and remoteness of damage in tort and contract;

(e) Damages for breach of contract;

(f) Unfair dealing in contracts and vitiating factors: mistake, misrepresentation, duress, undue influence, unconscionable conduct. This topic includes a study of equitable principles and statutory rights.

LAWS1018
International Law

Credit points: 6 **Teacher/Coordinator:** Dr Timothy Stephens (Combined), Mr Ross Anderson (Graduate) **Session:** Semester 1, Semester 2 **Classes:** 1x2hr lecture and 1x1hr tutorial/wk (combined), 3x4hr seminars/wk for 3 weeks and 1x3hr seminar in week 13 (graduate) **Prerequisites:** LAWS1006 **Prohibitions:** LAWS2005 **Assessment:** Combined: 1x1,500wd assignment (30%), 1x2hr final exam (70%), Tutorial Presentation (Pass/Fail). Graduate: 1x1hr class test (30%) and 1x2hr exam (70%).

Note: Available to candidates proceeding under the new LLB resolutions.

The unit of study is a general introduction to private international law and public international law and the relationship between these disciplines. The following private international law topics receive detailed treatment: (1) Nature, function and scope of private international law; (2) Jurisdiction, including discretionary non-exercise of jurisdiction; (3) Substance and procedure; (4) Proof of foreign law; (5) Exclusionary doctrines; and (6) Choice of law in tort. The following public international law topics receive detailed treatment: (1) Nature, function and scope of public international law, including the relationship between public international law and municipal law; (2) Sources of public international law; (3) State jurisdiction, including civil and criminal jurisdiction and jurisdictional immunities; and (4) State responsibility, including diplomatic protection, nationality of claims and exhaustion of local remedies.Available to candidates proceeding under the new LLB resolutions.

LAWS1019
Legal Research II

Teacher/Coordinator: Mr Graeme Coss **Session:** Semester 1, Semester 2 **Classes:** Combined Law: 3x2hr seminars **Prerequisites:** LAWS1013 **Prohibitions:** LAWS1008, LAWS1022 **Assessment:** Satisfactory attendance and 1x assignment

Note: Available to candidates proceeding under the new LLB resolutions. Semester 1 classes are for Combined Law candidates in the faculties of Arts, Engineering and Science. Semester 2 classes are for Combined Law candidates in the Faculty of Economics & Business.

This is a compulsory unit taught on a pass/fail basis. It is a continuation of Legal Research I and covers advanced searching techniques and the use of Lexis.com, Westlaw and other complex commercial databases. The purpose of this unit is to further develop the skills you will need as a law student and to introduce you to the legal research skills you will need after graduation.

LAWS2008
Contracts

Credit points: 6 **Teacher/Coordinator:** Dr Gregory Tolhurst **Session:** Semester 1 **Classes:** 2x2hr lectures or seminars/wk **Prerequisites:** LAWS1006 **Prohibitions:** LAWS1002, LAWS1015 **Assessment:** class participation (10%), 1x assignment (30%) and 1x2hr exam (60%)

Note: Department permission required for enrolment. Note: Available to Combined Law candidates proceeding under the old LLB resolutions.

Contract law provides the legal background for transactions involving the supply of goods and services and is, arguably the most significant means by which the ownership of property is transferred from one person to another. It vitally affects all members of the community and a thorough knowledge of contract law is essential to all practising lawyers. In the context of the law curriculum as a whole, Contracts provides background which is assumed knowledge in many other units. The aims of the unit are composite in nature. The central aim is to provide an understanding of the basic principles of the common law, equity and statutes applicable to contracts. A second aim is to provide students an opportunity to critically evaluate and make normative judgments about the operation of the law. As Contracts is basically a case law unit, the final aim of the unit of study is to provide experience in problem solving through application of the principles derived from decided cases. Successful completion of this unit of study is a prerequisite to the elective unit Advanced Contracts.

LAWS2009
Criminal Law

Credit points: 6 **Teacher/Coordinator:** Prof Mark Findlay **Session:** Semester 2 **Classes:** 2x2hr seminars/wk **Prerequisites:** LAWS1006 **Prohibitions:** LAWS1003, LAWS1016 **Assessment:** class participation, 1x 2000wd problem, 1x2000wd essay, and 1x 2hr exam

Note: Department permission required for enrolment. Note: Available to Combined Law candidates proceeding under the old LLB resolutions.

This unit of study is designed to introduce the general principles of criminal law and process as they operate in NSW, and to critically analyse these in their contemporary social context. In order to achieve these goals, the unit will consider a range of socio-legal literature, and will focus on particular substantive legal topics. Although the topic structure is necessarily selective, it is intended that students will gain a broad understanding of crime and justice issues, as well as of the applications of the criminal law. Students will encounter problem-based learning and will be encouraged to challenge a range of conventional wisdom concerning the operation of criminal justice. This unit of study is designed to assist students in developing the following understandings: (1) A critical appreciation of certain key concepts which recur throughout the substantive criminal law. (2) A knowledge of the legal rules in certain specified areas of criminal law and their application. (3) A preliminary understanding of the working criminal justice system as a process and the interaction of that process with the substantive criminal law. (4) A preliminary knowledge of how the criminal law operates in its broader societal context. (5) Through following the process of proof in a criminal prosecution and its defense, to understand the determination of criminal liability. The understandings referred to in the foregoing paragraphs will have a critical focus and will draw on procedural, substantive, theoretical and empirical sources. The contradictions presented by the application of legal principle to complex social problems will be investigated.

LAWS3003
Federal Constitutional Law

Credit points: 12 **Teacher/Coordinator:** Dr Peter Gerangelos **Session:** Semester 1 **Classes:** 2x2hr seminars/wk for 10 weeks **Prerequisites:** LAWS1006 **Prohibitions:** LAWS1004, LAWS2011, LAWS3000 **Assessment:** 2 x mid-semester assignments and 1x exam

Note: Department permission required for enrolment. Note: Available to Combined Law candidates proceeding under the old LLB resolutions. Students will attend classes for LAWS2011.

This unit of study aims to achieve an understanding of the principles of Australian constitutional law. The unit commences with an overview of the Commonwealth Constitution within the Australian legal and political framework. Substantive topics include, but are not confined to: the defence power, the marriage power, the external affairs power, federalism (including state constitutions and the relationship between Commonwealth and state laws); economic and fiscal power and relations (including the corporations power, the trade and commerce power, freedom of interstate trade, and excise); the judicial power of the Commonwealth; express and implied constitutional rights and freedoms; and principles of constitutional interpretation. Other topics may be covered, especially if a constitutional power becomes controversial or topical. The unit aims to develop a capacity to evaluate the principles of constitutional law critically, from the perspective of both doctrine and policy.

LAWS3004
Law, Lawyers and Justice

Credit points: 12 **Teacher/Coordinator:** Dr Rita Shackel **Session:** Semester 2 **Classes:** 2x2hr seminars/wk **Prerequisites:** LAWS1006 **Prohibitions:** LAWS1001, LAWS1007, LAWS2013, LAWS3002 **Assessment:** class participation, 1x2500wd assignment, 1x assignment, and 1x open book exam

Note: Department permission required for enrolment. Note: Available to Combined Law candidates proceeding under the old LLB resolutions. Students attend classes for LAWS2013 The Legal Profession.

Law, Lawyers and Justice has a distinct intellectual focus. It is the only unit in the curriculum that concentrates on the regulation of the legal profession and legal practice. Part 1 of Law, Lawyers and Justice examines the nature and structure of the legal profession, historical struggles to regulate the profession, and the current regulatory regime in New South Wales. Part 2 explores specific forms of legal practice, highlights the major cultural and economic forces that challenge attempts to regulate the profession and canvasses alternative ways of organising legal practice and providing legal services. Part 3 investigates the adversary system and considers its advantages and limitations. More specifically, the material in Part 3 addresses how the adversary system moulds lawyers' behaviour within and outside the judicial process and analyses current regulatory measures aimed at curbing the undesirable aspects of an adversarial culture. Part 4 evaluates the way clients are treated by lawyers and suggests strategies to change their conduct in the interests of both equality and effective communication. Furthermore, it examines lawyers' duties to their clients and the ways in which the rules and principles of confidentiality, legal professional privilege and conflicts of interest shape the advice and representation lawyers provide for their clients.

Liberal Studies units of study

The Bachelor of Liberal Studies degree is offered jointly by the Faculties of Science and Arts. The Faculty of Arts administers the degree program. Liberal Studies students should consider the Faculty of Arts their home Faculty for administrative purposes. The following units of study form part of the requirements of the Bachelor of Liberal Studies degree. Please consult degree information in Chapter 2, the Tables earlier in this chapter, and the relevant Departments/Schools entries in this chapter for descriptions of other units of study required for this degree.

ENGL1007
Language, Texts and Time

Credit points: 6 **Teacher/Coordinator:** Dr N Riemer **Session:** Semester 2 **Classes:** Two 1 hour lectures and one 1 hour tutorial per week **Assessment:** Two 500 word assignments, one 2000 word essay and one 1.5 hour exam

This course equips students with some general tools for the close analysis of literary language. Grammatical concepts will be introduced and applied to the description of prose, poetry and drama, and students will explore the changing relations between form and meaning in English from the earliest times up to the present. A number of key strands in contemporary language study will also be presented, including semiotic theory, rhetoric and discourse studies and theorizations of the relationship between texts and subjectivity.

Textbooks
Collins, Peter & Carmella Hollo: English Grammar,An Introduction (Palgrave, 2000)
A Resource book will be available from the University Copy Centre.

LNGS1001
Structure of Language

Credit points: 6 **Teacher/Coordinator:** Prof B Foley **Session:** Semester 1 **Classes:** Two 1 hour lectures and one 1 hour tutorial per week **Prohibitions:** LNGS1004, LNGS1005 **Assessment:** Ten short problem based assignments, each about 150 words, for a total of 1500 words; one 1 hour mid-term exam (equivalent to 1000 words); one 2 hour formal final examination (equivalent to 2000 words)

This unit is a comparative look at the general structure of human language. It looks at the sounds of human language: how the speech organs make them and their variety, in particular, a detailed description of English consonants and vowels and how to transcribe them. It investigates what is a possible word in English and other languages. It looks at the way speakers put words together to form sentences and how and why is English different from Japanese or even Irish.

Textbooks
Fromkin, V., Rodman, R., Hyams, N., Collins., Collins, P., Amberber, M. 2005. 'An Introduction to Language'. Fifth edition. Sydney: Harcourt.

Marine Science

The University of Sydney Institute of Marine Science (USIMS) provides for undergraduate units of study of a transdisciplinary nature in the marine sciences at the Intermediate, Senior and Honours levels. Staff from the School of Biological Sciences and the School of Geosciences teach these units. For further information on all units of study, please refer to the Marine Science website (www.usyd.edu.au/marine)

Marine Science Intermediate units of study

GEOS2115
Oceans, Coasts and Climate Change

Credit points: 6 **Teacher/Coordinator:** Ass/Prof Dietmur Müller, Dr Peter Cowell **Session:** Semester 1 **Classes:** 26 x 1 hour lectures 6 x 1 hour workshops 1 x 8 hour field work 1 x 24 hour field school (3 days, Easter break) **Prerequisites:** 48 credit points from Junior Units of Study **Prohibitions:** GEOS2915, MARS2006 **Assumed knowledge:** At least one of (GEOG1001, GEOL1001, GEOL1002, GEOS1003, GEOS1903, ENVI1002, GEOL1902, GEOL1501) **Assessment:** 3 x web-based on-line reports (30% of total marks) 1 seminar presentation: field school (20% of total marks) 1 x 2 hour exam (50% of total marks)

This Unit of Study introduces core concepts about how the formation of ocean basins and their influence on climate govern the development of coasts and continental margins. These concepts provide a framework for understanding the geographic variation of coasts, continental shelves and sediment accumulations in the deep ocean. Ocean-basin evolution is explained in terms of movements within the Earth's interior and how these movements determine the geometry of ocean basins, and their alpine counterparts, which interact with the global circulation of the ocean and atmosphere. Affects of this interaction on energy regimes and hydrology are described in accounting for regional controls that govern supply and dispersal of sediments on continental margins and in ocean basins. These controls include effects on wave climates, wind-driven currents and tidal regimes. These controls also govern environmental conditions determining development of coral reefs and other ecosystems that play a key role in marine sedimentation. The Unit of Study systematically outlines how these factors have played out with climate change to produce the beaches, dunes, estuaries and deltas we see today, as well as the less familiar deposits hidden beneath the sea. The Unit also outlines how knowledge of responses to climate change in the past allow us to predict responses of coasts to accelerated climate change occurring now and in the future due to the industrial greenhouse effect. Overall therefore, the Unit aims to provide familiarity with fundamental phenomena central to the study of marine geoscience, introduced through process-oriented explanations. The Unit of Study is structure around problem-based project work, for which lectures provide the theoretical background.

Textbooks
Thurman, HV and Trujillo, AP. Introductory Oceanography. Pearson, Prentice-Hall, 10th Edition. 2004.

GEOS2915
Oceans, Coasts and Climate Change (Adv)

Credit points: 6 **Teacher/Coordinator:** Ass/Prof Dietmur Müller, Dr Peter Cowell **Session:** Semester 1 **Classes:** 26 x 1 hour lectures, 1 x 16 hour field school (2 days, Easter break), 2 x 1 hour workshops, 1 x 4 hour field work, 1 x 4 hour field work, 5 x 3 hours lab work **Prerequisites:** Distinction average in 48 credit points from Junior units of study **Prohibitions:** GEOS2115, MARS2006 **Assumed knowledge:** (GEOG1001, GEOL1001, GEOL1002, GEOS1003, GEOS1903, ENVI1002, GEOL1902, GEOL1501) **Assessment:** Field School Report (20%), Field and Lab report (45%), 2 web based online reports (15% of total marks), one 1 hour exam: subset of GEOS2115 (20% of total marks)

This unit has the same objectives as GEOS2115 and is suitable for students who wish to pursue aspects of the subject in greater depth. Entry is restricted and selection is made from the applicants on the basis of their performance to date. Students who elect to take this unit will participate in alternatives to some aspects of the standard unit and will be required to pursue independent work to meet unit objectives.

Textbooks
None: Online reading materials are provided via Fisher Library.

BIOL2018
Introduction to Marine Biology

Credit points: 6 **Teacher/Coordinator:** Dr Adele Pile. **Session:** Semester 2 **Classes:** 2x1hr lectures per week. 6x1hr tutorials, 1x8hr field trip, 3x4hr field trips and 1x3hr practical. **Prerequisites:** BIOL (1001 or 1911 or 1101 or 1901) and 6 additional credit points of Junior Biology (BIOL/MBLG/EDUH). 12 credit points of Junior Chemistry (or for BSc (Marine Science) students 6 credit points of Junior Chemistry and either an additional 6 credit points of Junior Chemistry or 6 credit points of Junior Physics). **Prohibitions:** BIOL2918, MARS (2006 or 2906 or 2007 or 2907). **Assumed knowledge:** 12 credit points of Junior Biology; MARS2005. **Assessment:** Two hour theory exam, four written reports.

This unit will describe some of the ways in which the properties of the oceans affect marine organisms. It also introduces coral reefs and other marine ecosystems, together with their productivity, biological oceanography, the reproductive biology of marine organisms, and marine biological resources. The practical elements will provide the core skills and techniques that will equip students to perform laboratory and field studies in marine biology. The unit will introduce appropriate methodologies for the collection, handling and analysis of data; the scientific principles underlying experimental design; and the effective communication of scientific information.

Textbooks
Castro, P. and Humber, M. 2007. Marine Biology 4th Ed. McGraw-Hill Higher Education, Sydney.

BIOL2918
Introduction to Marine Biology (Adv)

Credit points: 6 **Teacher/Coordinator:** Dr Adele Pile. **Session:** Semester 2 **Classes:** 2x1hr lectures per week. 6x1hr tutorials, 1x8hr field trip, 3x4hr field trips and 1x3hr practical. **Prerequisites:** Distinction average in BIOL (1001 or 1911 or 1101 or 1901) and 6 additional credit points of Junior Biology (BIOL/MBLG/EDUH). 12 credit points of Junior Chemistry (or for BSc (Marine Science) students 6 credit points of Junior Chemistry and either an additional 6 credit points of Junior Chemistry or 6 credit points of Junior Physics. These requirements may be varied and students with lower averages should consult the Unit Executive Officer. **Prohibitions:** BIOL2018, MARS (2006 or 2906 or

2007 or 2907). **Assumed knowledge:** 12 credit points of Junior Biology; MARS2005. **Assessment:** Two hour theory exam, four written reports.

Note: Entry is restricted and selection is made from applicants on the basis of previous performance.

This unit has the same objectives as BIOL2018, Introduction to Marine Biology, and is suitable for students wishing to pursue aspects from the unit in greater depth. Students taking this unit will participate in alternatives to some elements of the ordinary level course and will be required to pursue the unit objectives by more independent means. Specific details of the unit will be announced in meetings, during the first week of teaching.

Textbooks
As for BIOL2018

Marine Science senior units of study

Students can major in Marine Science, Marine Geoscience and Marine Biology by completing Senior units of study to a total worth of 24 credit points from the units listed in Table 1 for the respective majors. The marine science major is interdisciplinary so it must include at least one BIOL and one GEOS unit. Students in the specialist BSc (Marine Science) degree must enrol in a minimum of 36 credit points of Senior Marine Science units of study, which may include up to 3 Tropical Marine Science (NTMP) units, and which must include at least one BIOL and one GEOS unit. Students are encouraged to select those electives in which they have a particular interest, subject to certain conditions (see Table 1). Because of limited facilities available for some units of study, particularly in marine biology, it may be necessary to restrict number of students taking these electives. If this need arises selection will be based on academic merit and/or other courses completed. All students intending to enrol in any of the biology options must consult the booklet information for Students Considering Senior Biology Units of Study available from the School of Biological Sciences Office during the last few weeks of the academic year prior to this enrolment. Such students should also complete a preliminary enrolment form in the School of Biological Sciences before first semester commences.

Descriptions of senior Marine Science options

Students should consult electives as listed in this chapter under Biological Sciences and Geosciences in this handbook. BIOL3006 Ecological Methods; BIOL3007 Ecology; BIOL3008 Marine Field Ecology; BIOL3011 Ecophysiology; BIOL3013 Marine Biology; GEOS3009 Coastal Environments and Processes; GEOS3014 GIS in Coastal Management; GEOS3015 Environmental Geomorphology; GEOS3018 Rivers: Science, Policy and Management; GEOS3103 Environmental & Sedimentary Geology; GEOS3104 Geophysical Methods (Plus Advanced versions of the above - BIOL39XX, GEOS39XX).

Marine Sciences Honours

The structure of Honours in Marine Science will be about one third formal coursework, seminars and reading, and about two thirds devoted to preparation of a thesis on a topic with a clear marine or estuarine orientation. The formal coursework may comprise units of study mainly chosen from existing Honours options offered in the Department of the student's principal interest. Background study in a subsidiary field of interest may be required. Students may commence Honours in either semester 1 or semester 2. Generally, Honours enrolments will be with the School in which the project research is undertaken.

Admission to Honours

In general, a Credit average or better in Senior Marine Sciences units of study and at least a Pass in another Senior unit of study are required for entry. Arrangements for the supervision and School of primary location of students will be made in the light of their proposed thesis topic. Joint supervision involving staff of more than one School may be arranged if a thesis topic is deemed to be transdisciplinary. Upon acceptance, students should register formally with the Undergraduate Advisor of USIMS.

Tropical Marine Network Program

Students enrolled in the BSc (Marine Science) are eligible to enrol in units of study offered as part of the Tropical Marine Network Program. This is a joint program of the University of Sydney, the University of Queensland and James Cook University, which offers four units of study in tropical marine science, all taught at marine island research stations off the Queensland coast. Students majoring in Marine Science or Marine Geoscience but who are not enrolled in the BSc (Marine Science) may be eligible for enrolment in some TMNP units subject to places available.

Stations used

The following stations will be used:Lizard Island (Australian Museum field station, north of Cairns); Orpheus Island (James Cook University field station, off Townsville); Heron Island (University of Queensland field station, off Gladstone); One Tree Island (University of Sydney field station, off Gladstone); North Stradbroke Island (University of Queensland field station, off Brisbane)

Teaching and assessment

The four units of study, each worth 6 credit points, are conducted as field schools offered only during the Easter (Semester 1 mid-semester) break and the July mid-year break. Each field school will run for approximately 10 days. Assessment will be based on participation and reports completed during the field school, and an assignment to be completed following the field school. The Coral Reef Ecosystems unit and the Coastal Management unit will be offered each year, together with one of the other two units. Students may enrol in these units in academic year 2 and year 3 as part of the BSc (Marine Science). Students enrolling in these units of study will be selected from the three participating Universities, as well as some overseas Study Abroad students. Preference will however be given to students enrolled in the program at the three participating universities.

Quotas on numbers of students enrolling in NTMP units

Owing to the size of facilities and accommodation at the island research stations all units will have a quota with entry based on merit. There are no Advanced versions of these units. For further information on the availability and timing of these units please refer to the website: www.usyd.edu.au/marine.

NTMP3001
Coral Reef Ecosystems

Credit points: 6 **Teacher/Coordinator:** Professor Maria Byrne **Session:** S2 Intensive **Classes:** Fieldwork, 80 hours block mode. **Prerequisites:** MARS(2005 or 2905), plus 12 credit points from Intermediate Science units of study which must include at least 6 credit points of Biology. **Assumed knowledge:** General concepts in Biology **Assessment:** Participation in field work and submission of a report.

Note: Department permission required for enrolment.

Coral Reef Ecosystems is an intensive unit that will be held at either the Heron Island or One Tree Island Tropical Research Stations on the Great Barrier Reef. The unit focuses on the dominant taxa in reef environments ad linkages between them. Emphasis is given to corals, other reef associated invertebrates (eg. echinoderms and plankton) and fishes. Ecological and physiological aspects of key organisms are explored. Aspects covered include: distribution of corals; coral bleaching; coral symbionts and the health of the corals based on photosynthetic activity; predation on corals; the input of plankton to reefs; and, the role of fishes and invertebrates in reef environments.

NTMP3003
Fisheries Biology and Management

This unit of study is not available in 2009

Credit points: 6 **Teacher/Coordinator:** Professor Maria Byrne **Session:** S2 Intensive **Classes:** Fieldwork, 80 hours block mode. **Prerequisites:** MARS(2005 or 2905), plus 12 credit points from Intermediate Science units of study which must include at least 6 credit points of Biology. **Assumed knowledge:** General concepts in Biology. **Assessment:** Participation in field work and submission of a report

Note: Department permission required for enrolment.

Fisheries Biology and Management is an intensive unit that will be held at the tropical research station on Orpheus Island in the Great Barrier Reef. The unit focuses on approaches to quantitative fisheries biology in tropical marine environments. Emphasis is given to sampling design and hypothesis testing, underwater visual census surveys, fishery surveys, assessments of habitat types, and tagging and trapping of organisms. Most field aspects will be covered while diving and data storage will be dealt with at the end of each day. The assessment will focus on the manipulation of data and reporting.

NTMP3004
Aquaculture

Credit points: 6 **Teacher/Coordinator:** Professor Maria Byrne **Session:** S2 Intensive **Classes:** Fieldwork, 80 hours block mode. **Prerequisites:** 12 credit points from Intermediate Science units of study which must include at least 6 credit points of Biology. **Assumed knowledge:** General concepts in Biology. **Assessment:** Assignments and report.

Note: Department permission required for enrolment.

Aquaculture is an intensive unit that will be held at the tropical research station on Orpheus Island in the Great Barrier Reef. The unit focuses on approaches to aquaculture in tropical marine environments. Emphasis is given to aquaculture of tropical invertebrates (especially bivalves and clams) and fishes. Some aspects of the unit may also be done using the aquarium system on campus at James Cook University. Aspects covered include: the design of aquarium facilities; water quality; rearing of algae; rearing of planktonic food; stocking densities; and, growth and genetics of the target species.

NTMP3005
Coastal Management

Credit points: 6 **Teacher/Coordinator:** Belinda McMillen (course contact) **Session:** S2 Intensive **Classes:** Fieldwork, 80 hours block mode. **Prerequisites:** 12 credit points from Intermediate Science units of study which must include at least 6 credit points of Biology. **Assumed knowledge:** General concepts in Biology. **Assessment:** Assignment and report.

Note: Department permission required for enrolment. Note: These units are only available to BSc (Marine Science) students. Department permission required for enrolment

This unit examines the impacts of human activities on coastal and marine environments. It explores the complex relationships among the ecological and social values of these environments and outlines strategies and tools for their management. This is an intensive unit that will be held at the Moreton Bay Research Station.

Mathematics and Statistics

The School of Mathematics and Statistics offers units of study in Applied Mathematics, Mathematical Statistics and Pure Mathematics. The Junior units of study cover a range of topics in mathematics and statistics and are offered at four levels, viz. Introductory, Life Sciences, Normal and Advanced, to suit various levels of previous knowledge. Intermediate, Senior and Honours units of study are mostly provided within one of the subject areas of Applied Mathematics, Mathematical Statistics and Pure Mathematics.

Applied Mathematics

Applied Mathematics is concerned with the development of mathematical and computing methods and their application in particular contexts which may arise in the natural sciences, engineering, economics or the social sciences. Units of study are designed to give training to students who will specialise in other subjects, and also for training applied mathematicians. While mathematical rigour is not neglected, particular emphasis is given to questions such as the treatment of observational models which are relevant to particular contexts.

Mathematical Statistics

Mathematical Statistics is concerned with the theory of probability and the mathematical methods of statistics applied to such problems as statistical inference, the design of experiments and sample surveys, and all problems of data analysis. The major units of study are designed to train those who wish to become professional statisticians, tertiary teachers and research workers, but there are units of study which provide a knowledge of statistical methods and techniques for students specialising in other fields.

Pure Mathematics

Pure Mathematics units of study have two main aims. One of these is to equip students with the background of mathematical knowledge, understanding and skill necessary for units of study in many branches of science. The other is the provision of training in pure mathematics necessary for those who wish to make a career in mathematics. This might be either in teaching or research or in one of the many avenues where highly developed mathematical ability and a thorough knowledge of modern mathematical techniques are required, such as computing, operations research, management, finance and economics. Website: Further information about all units of study is available at www.maths.usyd.edu.au/Teaching.html

Summer School

This School offers some units of study in The Sydney Summer School (January-February). Consult The Sydney Summer School website for more information: www.summer.usyd.edu.au/

Mathematics Junior units of study

Various combinations of Junior units of study may be taken, subject to the prerequisites listed. Often specific Junior units of study are prerequisites for Mathematics and Statistics units in the Intermediate and Senior years. Before deciding on a particular combination of Junior units of study, students are advised to check carefully the prerequisites relating to Mathematics for all units of study.

Junior introductory unit of study

Students who have not studied a calculus course at high school may enrol in the Introductory Calculus 6-credit point unit.

MATH1111
Introduction to Calculus

Credit points: 6 **Session:** Semester 1 **Classes:** Three 1 hour lectures and two 1 hour tutorials per week. **Prohibitions:** MATH1001, MATH1901, MATH1011, MATH1906 **Assumed knowledge:** At least Year 10 Mathematics **Assessment:** One 2 hour exam, assignments, quizzes

Note: Department permission required for enrolment. Note: Students who have previously studied calculus at any level are prohibited from enrolling in this unit. In particular, students with HSC Mathematics/Extension 1/Extension 2 (or equivalent) are prohibited.

This unit is an introduction to the calculus of one and two variables. Topics covered include elementary functions, differentiation, basic integration techniques and partial derivatives. Applications in science and engineering are emphasised.

Textbooks
Calculus: Single and Multivariable. Hughes-Hallett, Gleason, McCallum, et al. Wiley

Junior Life Sciences units of study

Life Sciences units of study are designed to provide students with an overview of the necessary mathematical and statistical background for studies in the Life Sciences. They are provided for students in the Faculty of Science whose major interest lies outside mathematics. There are more details in the Junior Mathematics Handbook, available from the School at the time of enrolment.

Assumed knowledge

Knowledge equivalent to the HSC 2-unit Mathematics course is assumed. Students who do not have this knowledge are strongly advised to attend a bridging course conducted jointly by the School and the Mathematics Learning Centre in February.

Relationship of Life Sciences units to other units of study and recommendations

The four Life Science units of study together give 12 credit points of mathematics, which is the minimum required by the BSc degree regulations. Students obtaining a Distinction in MATH1011 are

encouraged to enrol in normal units of study in subsequent semesters. Students obtaining a Distinction or better in MATH1011, 1012 or 1013 may proceed to Intermediate units of study in the Mathematics Discipline Area. Students with a Credit or better in MATH1011 and a Pass or better in MATH1015 may proceed to Intermediate units of study in the Statistics discipline area. Students with a Pass in only MATH1015 are limited to the Intermediate Statistics units of study STAT2011 and STAT2012.

MATH1011
Life Sciences Calculus

Credit points: 3 **Session:** Semester 1, Summer Main **Classes:** Two 1 hour lectures and one 1 hour tutorial per week. **Prohibitions:** MATH1111, MATH1001, MATH1901, MATH1906, BIOM1003 **Assumed knowledge:** HSC Mathematics **Assessment:** One 1.5 hour examination, assignments and quizzes.

This unit is designed for students of the life sciences who do not intend to undertake higher year mathematics and statistics. It includes the fitting of data to various functions and demonstrates the use of calculus in optimisation problems. It extends differential calculus to functions of two variables and develops integral calculus, including the definite integral and multiple integrals.

Textbooks
As set out in the Junior Mathematics Handbook

MATH1013
Differential and Difference Equations

Credit points: 3 **Session:** Semester 2, Summer Main **Classes:** Two 1 hour lectures and one 1 hour tutorial per week. **Prohibitions:** MATH1003, MATH1903, MATH1907 **Assumed knowledge:** HSC Mathematics or MATH1111 **Assessment:** One 1.5 hour examination, assignments and quizzes.

MATH1013 is designed for students of the life sciences who do not intend to undertake higher year mathematics and statistics.

This unit of study looks at the solution of equations by bisection and iteration, first and second order difference equations where chaos is met, and examples of modelling using simple first and second order differential equations.

Textbooks
As set out in the Junior Mathematics Handbook

MATH1014
Introduction to Linear Algebra

Credit points: 3 **Session:** Semester 2 **Classes:** Two 1 hour lectures and one 1 hour tutorial per week. **Prohibitions:** MATH1012, MATH1002, MATH1902 **Assumed knowledge:** HSC Mathematics or MATH1111 **Assessment:** One 1.5 hour exam, assignments, quizzes

This unit is an introduction to Linear Algebra. Topics covered include vectors, systems of linear equations, matrices, eigenvalues and eigenvectors. Applications in life and technological sciences are emphasised.

Textbooks
Linear Algebra: A Modern Introduction, David Poole, Thompson Brook/Cole

MATH1015
Biostatistics

Credit points: 3 **Session:** Semester 1 **Classes:** Two 1 hour lectures and one 1 hour tutorial per week. **Prohibitions:** MATH1005, MATH1905, STAT1021, STAT1022, ECMT1010, BIOM1003 **Assumed knowledge:** HSC Mathematics **Assessment:** One 1.5 hour examination, assignments and quizzes.

MATH1015 is designed to provide a thorough preparation in statistics for students in the Biological and Medical Sciences. It offers a comprehensive introduction to data analysis, probability and sampling, inference including t-tests, confidence intervals and chi-squared goodness of fit tests.

There are comprehensive details of this unit of study in the Junior Mathematics Handbook distributed at the time of enrolment.

Textbooks
As set out in the Junior Mathematics Handbook

Mathematics and Statistics Normal units of study

Normal units of study are designed for students who have both the necessary background and the interest in mathematics and who need to study mathematics beyond Junior units of study in order to satisfy their own aspirations or degree requirements. There are more details of these units of study in the Junior Mathematics Handbook, available from the School at the time of enrolment.

Assumed knowledge

For the units MATH1001, MATH1002 and MATH1004, knowledge equivalent to the HSC Mathematics Extension 1 course is assumed. The assumed knowledge for MATH1005 is HSC 2-unit Mathematics. For MATH1003 the assumed knowledge is MATH1001 or HSC Mathematics Extension 2.

Relation to other units of study and recommendations

Students should take at least two units of study in each semester in order to meet the minimum requirement of 12 credit points of Mathematics in the BSc award course. The usual enrolment for Normal level students is in the three units MATH1001, MATH1002, MATH1003 and (at least) one of MATH1004 and MATH1005. Passes in Junior units of study at this level qualify students to proceed to Intermediate units of study in Mathematics and Statistics. Students should note however that some Intermediate units of study in both Mathematics and Statistics require specific Junior units of study to be passed as prerequisites. Students obtaining a Credit or better in Normal units of study may enrol in other Advanced units of study.

MATH1001
Differential Calculus

Credit points: 3 **Session:** Semester 1, Summer Main **Classes:** Two 1 hour lectures and one 1 hour tutorial per week. **Prohibitions:** MATH1011, MATH1901, MATH1906, MATH1111 **Assumed knowledge:** HSC Mathematics Extension 1 **Assessment:** One 1.5 hour examination, assignments and quizzes.

MATH1001 is designed to provide a thorough preparation for further study in mathematics and statistics. It is a core unit of study providing three of the twelve credit points required by the Faculty of Science as well as a Junior level requirement in the Faculty of Engineering.

This unit of study looks at complex numbers, functions of a single variable, limits and continuity, vector functions and functions of two variables. Differential calculus is extended to functions of two variables. Taylor's theorem as a higher order mean value theorem.

Textbooks
As set out in the Junior Mathematics Handbook.

MATH1002
Linear Algebra

Credit points: 3 **Session:** Semester 1, Summer Main **Classes:** Two 1 hour lectures and one 1 hour tutorial per week. **Prohibitions:** MATH1902, MATH1012, MATH1014 **Assumed knowledge:** HSC Mathematics Extension 1 **Assessment:** One 1.5 hour examination, assignments and quizzes.

MATH1002 is designed to provide a thorough preparation for further study in mathematics and statistics. It is a core unit of study providing three of the twelve credit points required by the Faculty of Science as well as a Junior level requirement in the Faculty of Engineering.

This unit of study introduces vectors and vector algebra, linear algebra including solutions of linear systems, matrices, determinants, eigenvalues and eigenvectors.

Textbooks
As set out in the Junior Mathematics Handbook

MATH1003
Integral Calculus and Modelling

Credit points: 3 **Session:** Semester 2, Summer Main **Classes:** Two 1 hour lectures and one 1 hour tutorial per week. **Prohibitions:** MATH1013, MATH1903, MATH1907 **Assumed knowledge:** HSC Mathematics Extension 2 or MATH1001 or MATH1111 **Assessment:** One 1.5 hour examination, assignments and quizzes.

MATH1003 is designed to provide a thorough preparation for further study in mathematics and statistics. It is a core unit of study providing

three of the twelve credit points required by the Faculty of Science as well as a Junior level requirement in the Faculty of Engineering.This unit of study first develops the idea of the definite integral from Riemann sums, leading to the Fundamental Theorem of Calculus. Various techniques of integration are considered, such as integration by parts.The second part is an introduction to the use of first and second order differential equations to model a variety of scientific phenomena.

Textbooks
As set out in the Junior Mathematics Handbook

MATH1004
Discrete Mathematics

Credit points: 3 **Session:** Semester 2 **Classes:** Two 1 hour lectures and one 1 hour tutorial per week. **Prohibitions:** MATH1904, MATH2011 **Assumed knowledge:** HSC Mathematics Extension 1 **Assessment:** One 1.5 hour examination, assignments and quizzes.

MATH1004 is designed to provide a thorough preparation for further study in Mathematics. It is a core unit of study providing three of the twelve credit points required by the Faculty of Science as well as a Junior level requirement in the Faculty of Engineering.

This unit provides an introduction to fundamental aspects of discrete mathematics, which deals with 'things that come in chunks that can be counted'. It focuses on the enumeration of a set of numbers, viz. Catalan numbers. Topics include sets and functions, counting principles, Boolean expressions, mathematical induction, generating functions and linear recurrence relations, graphs and trees.

Textbooks
As set out in the Junior Mathematics Handbook

MATH1005
Statistics

Credit points: 3 **Session:** Semester 2, Summer Main **Classes:** Two 1 hour lectures and one 1 hour tutorial per week. **Prohibitions:** MATH1015, MATH1905, STAT1021, STAT1022, ECMT1010 **Assumed knowledge:** HSC Mathematics **Assessment:** One 1.5 hour examination, assignments and quizzes.

MATH1005 is designed to provide a thorough preparation for further study in mathematics and statistics. It is a core unit of study providing three of the twelve credit points required by the Faculty of Science as well as a Junior level requirement in the Faculty of Engineering.

This unit offers a comprehensive introduction to data analysis, probability, sampling, and inference including t-tests, confidence intervals and chi-squared goodness of fit tests.

Textbooks
As set out in the Junior Mathematics Handbook

Mathematics and Statistics Junior Advanced units of study

Advanced units of study are designed for students who have a strong background and a keen interest in mathematics and who need to study mathematics at a higher level to satisfy their own aspirations or degree requirements. All students aiming for high achievement, such as an Honours degree or postgraduate study, are advised to enrol in Advanced units of study.

Content

The unit of study content is similar in outline to that of the Normal units of study above but proceeds more deeply and at a faster rate, covers more difficult material and requires more mathematical sophistication. There are more details of these units of study in the Junior Mathematics Unit of Study Handbook, available from the School at the time of enrolment.

Assumed knowledge

Knowledge equivalent to the HSC Mathematics Extension 2 course is assumed. Students who have a very good result in the equivalent of the HSC Mathematics Extension 1 course may be permitted to enrol in these units of study after discussion with a Mathematics adviser.

Relation to other units of study and recommendations

Students should take two units of study in each semester in order to meet the minimum requirement of 12 credit points of Mathematics in the BSc award course. The usual enrolment for Advanced level students is in the units MATH1901, MATH1902, MATH1903 and MATH1905. Passes in Junior units of study at this level qualify students to proceed to Intermediate units of study in Mathematics and Statistics at the Advanced level. It should be noted that some Intermediate and Senior units of study in both Mathematics and Statistics require specific Junior units of study as prerequisites. Students who are awarded at least a Credit grade in this level are encouraged to proceed to Intermediate units of study in Mathematics and Statistics at the Advanced level. Enrolment in MATH1906 or MATH1907 is by invitation only.

MATH1901
Differential Calculus (Advanced)

Credit points: 3 **Session:** Semester 1 **Classes:** Two 1 hour lectures and one 1 hour tutorial per week. **Prerequisites:** HSC Mathematics Extension 2. This requirement may be varied. Students with an interest in mathematics, but without HSC mathematics Extension 2, should consult the unit of study coordinator. **Prohibitions:** MATH1111, MATH1011, MATH1001, MATH1906 **Assumed knowledge:** HSC Mathematics Extension 2 **Assessment:** One 1.5 hour examination, assignments and quizzes.

This unit is designed to provide a thorough preparation for further study in mathematics and statistics. It is a core unit of study providing three of the twelve credit points required by the Faculty of Science as well as a Junior level requirement in the Faculty of Engineering. It parallels the normal unit MATH1001 but goes more deeply into the subject matter and requires more mathematical sophistication.

Textbooks
As set out in the Junior Mathematics Handbook

MATH1902
Linear Algebra (Advanced)

Credit points: 3 **Session:** Semester 1 **Classes:** Two 1 hour lectures and one 1 hour tutorial per week. **Prerequisites:** HSC Mathematics Extension 2. This requirement may be varied. Students with an interest in mathematics, but without HSC mathematics Extension 2, should consult the unit of study coordinator. **Prohibitions:** MATH1002, MATH1012, MATH1014 **Assumed knowledge:** HSC Mathematics Extension 2 **Assessment:** One 1.5 hour examination, assignments and quizzes.

This unit is designed to provide a thorough preparation for further study in mathematics and statistics. It is a core unit of study providing three of the twelve credit points required by the Faculty of Science as well as a Junior level requirement in the Faculty of Engineering. It parallels the normal unit MATH1002 but goes more deeply into the subject matter and requires more mathematical sophistication.

Textbooks
As set out in the Junior Mathematics Handbook

MATH1903
Integral Calculus and Modelling Advanced

Credit points: 3 **Session:** Semester 2 **Classes:** Two 1 hour lectures and one 1 hour tutorial per week. **Prerequisites:** HSC Mathematics Extension 2. This requirement may be varied. Students with an interest in mathematics, but without HSC mathematics Extension 2, should consult the unit of study coordinator. **Prohibitions:** MATH1003, MATH1013, MATH1907 **Assumed knowledge:** HSC Mathematics Extension 2 or Credit or better in MATH1001 or MATH1901 **Assessment:** One 1.5 hour examination, assignments and quizzes.

MATH1903 is designed to provide a thorough preparation for further study in mathematics and statistics. It is a core unit of study providing three of the twelve credit points required by the Faculty of Science as well as a Junior level requirement in the Faculty of Engineering.

This unit of study parallels the normal unit MATH1003 but goes more deeply into the subject matter and requires more mathematical sophisticaton.

Textbooks
As set out in the Junior Mathematics Handbook

MATH1905
Statistics (Advanced)

Credit points: 3 **Session:** Semester 2 **Classes:** Two 1 hour lectures and one 1 hour tutorial per week. **Prerequisites:** HSC Mathematics Extension 2. This requirement may be varied. Students with an interest in mathematics, but without HSC mathematics Extension 2, should consult the unit of study coordinator. **Prohibitions:** MATH1015, MATH1005, STAT1021, STAT1022, ECMT1010 **Assumed knowledge:** HSC Mathematics Extension 2 **Assessment:** One 1.5 hour examination, assignments and quizzes.

This unit is designed to provide a thorough preparation for further study in mathematics and statistics. It is a core unit of study providing three of the twelve credit points required by the Faculty of Science as well as a Junior level requirement in the Faculty of Engineering. This Advanced level unit of study parallels the normal unit MATH1005 but goes more deeply into the subject matter and requires more mathematical sophistication.

Textbooks
As set out in the Junior Mathematics Handbook

MATH1906
Mathematics (Special Studies Program) A

Credit points: 3 **Session:** Semester 1 **Classes:** Two 1 hour lectures, one 1 hour seminar and one 1 hour tutorial per week. **Prerequisites:** UAI of at least 98.5 and result in Band E4 HSC Mathematics Extension 2; by invitation **Prohibitions:** MATH1111, MATH1001, MATH1011, MATH1901 **Assessment:** One 1.5 hour exam, assignments, classwork.

Note: Department permission required for enrolment.

This is an Advanced unit of study. Entry to Mathematics (Special Studies Program) A is restricted to students with a UAI of 98.5 and an excellent school record in Mathematics. Students will cover the material in MATH1901 Differential Calculus (Advanced). In addition there will be a selection of special topics, which are not available elsewhere in the Mathematics and Statistics program.

MATH1907
Mathematics (Special Studies Program) B

Credit points: 3 **Session:** Semester 2 **Classes:** Two 1 hour lectures, one 1 hour seminar and one 1 hour tutorial per week. **Prerequisites:** Distinction in MATH1906; by invitation **Prohibitions:** MATH1003, MATH1013, MATH1903 **Assessment:** One 1.5 hour exam, assignments, classwork.

Note: Department permission required for enrolment.

This is an Advanced unit of study. Entry to Mathematics (Special Studies Program) B is normally restricted to students with a Distinction in MATH1906. Students will cover the material in MATH1903 Integral Calculus and Modelling (Advanced). In addition there will be a selection of special topics, which are not available elsewhere in the Mathematics and Statistics program.

Mathematics Intermediate units of study

The School of Mathematics provides a range of Intermediate units of study, each worth 6 credit points covering a variety of topics in Pure and Applied Mathematics. A normal Intermediate load in a discipline is 12 credit points and this is the minimum that should be undertaken by anyone intending to specialise in Senior Mathematics. The units of study are taught at either the Normal or the Advanced level. Entry to an Advanced unit of study usually requires a Credit or better in a Normal level prerequisite or a Pass in an Advanced level prerequisite. For ease of overview the units of study are arranged under Pure, for students wishing to specialise in Pure Mathematics, and Applied, for those wishing to specialise in Applied Mathematics. Several units of study are suitable for either. Details of each unit of study appear below whilst full details of unit of study structure, content and examination procedures are provided in the Second Year Mathematics Handbook available from the School at the time of enrolment.

Pure units of study (each 6 credit points)

Algebra (Adv) MATH2968; Discrete Maths & Graph Theory MATH2069; Discrete Maths & Graph Theory (Adv) MATH2969; Linear Mathematics & Vector Calculus MATH2061; Linear Mathematics & Vector Calculus (Adv) MATH2961; Number Theory and Cryptography MATH2068; Real and Complex Analysis (Adv) MATH2962

Applied units of study (each 6 credit points)

Introduction to Partial Differential Equations MATH2065; Introduction to Partial Differential Equations (Adv) MATH2965; Linear Mathematics & Vector Calculus MATH2061; Linear Mathematics & Vector Calculus (Adv) MATH2961; Mathematical Computing & Nonlinear Systems MATH2063; Mathematical Computing & Nonlinear Systems (Adv) MATH2963; Optimisation & Financial Mathematics MATH2070; Optimisation & Financial Mathematics (Adv) MATH 2970

Relation to other units of study and recommendations

In general, 2 units of study (12 credit points) of Intermediate mathematics are needed to progress to a Senior Mathematics unit of study. If your major interest is in mathematics, then you are strongly encouraged to enrol in at least 3 units of study in Intermediate Mathematics. If you are considering doing Honours in mathematics, they should include some Advanced units of study. Students intending to specialise in Applied Mathematics are encouraged to include MATH2061 or 2961, and MATH2065 or 2965. Students intending to specialise in Pure Mathematics should include MATH2061 or 2961. Students considering Honours in Pure Mathematics should also take MATH2962 and MATH2968. Computer Science students may like to include MATH2069 or 2969 among their choices. Physics students would be well-advised to choose MATH2061 or 2961, and MATH2065 or 2965. Prospective teachers of mathematics should consider MATH2061 and 2068.

MATH2916
Working Seminar A (SSP)

Credit points: 3 **Session:** Semester 1 **Classes:** One 1 hour seminar per week. **Prerequisites:** By invitation, High Distinction average over 12 credit points of Advanced Junior Mathematics **Assessment:** One 1 hour presentation, 15-20 page essay.

Note: Department permission required for enrolment.

The main aim of this unit is to develop the students' written and oral presentation skills. The material will consist of a series of connected topics relevant to modern mathematics and statistics. The topics are chosen to suit the students' background and interests, and are not covered by other mathematics or statistics units. The first session will be an introduction on the principles of written and oral presentation of mathematics. Under the supervision and advice of the lecturer(s) in charge, the students present the topics to the other students and the lecturer in a seminar series and a written essay in a manner that reflects the practice of research in mathematics and statistics.

MATH2917
Working Seminar B (SSP)

Credit points: 3 **Session:** Semester 2 **Classes:** One 1 hour seminar per week. **Prerequisites:** By invitation, High Distinction average over 12 credit points of Advanced Junior Mathematics **Assessment:** One 1 hour presentation, 15-20 page essay.

Note: Department permission required for enrolment.

The main aim of this unit is to develop the students' written and oral presentation skills. The material will consist of a series of connected topics relevant to modern mathematics and statistics. The topics are chosen to suit the students' background and interests, and are not covered by other mathematics or statistics units. The first session will be an introduction on the principles of written and oral presentation of mathematics. Under the supervision and advice of the lecturer(s) in charge, the students present the topics to the other students and the lecturer in a seminar series and a written essay in a manner that reflects the practice of research in mathematics and statistics.

MATH2061
Linear Mathematics and Vector Calculus

Credit points: 6 **Session:** Semester 1, Summer Main **Classes:** Three 1 hour lectures, one 1 hour tutorial and one 1 hour practice class per week. **Prerequisites:** MATH (1111 or 1001 or 1901 or 1906) and MATH (1014 or 1002 or 1902) and MATH (1003 or 1903 or 1907) **Prohibitions:** MATH2001, MATH2901, MATH2002, MATH2902, MATH2961, MATH2067 **Assessment:** One 2 hour exam, assignments, quizzes

This unit starts with an investigation of linearity: linear functions, general principles relating to the solution sets of homogeneous and inhomogeneous linear equations (including differential equations), linear independence and the dimension of a linear space. The study of eigenvalues and eigenvectors, begun in junior level linear algebra, is extended and developed. Linear operators on two-dimensional real space are investigated, paying particular attention to the geometrical significance of eigenvalues and eigenvectors. The unit then moves on to topics from vector calculus, including vector-valued functions (parametrised curves and surfaces; vector fields; div, grad and curl; gradient fields and potential functions), line integrals (arc length; work; path-independent integrals and conservative fields; flux across a curve), iterated integrals (double and triple integrals; polar, cylindrical and spherical coordinates; areas, volumes and mass; Green's Theorem), flux integrals (flow through a surface; flux integrals through a surface defined by a function of two variables, though cylinders, spheres and parametrised surfaces), Gauss' Divergence Theorem and Stokes' Theorem.

MATH2961
Linear Mathematics & Vector Calculus Adv

Credit points: 6 **Session:** Semester 1 **Classes:** Four 1 hour lectures and one 1 hour tutorial per week. **Prerequisites:** MATH (1901 or 1906 or Credit in 1001) and MATH (1902 or Credit in 1002) and MATH (1903 or 1907 or Credit in 1003) **Prohibitions:** MATH2001, MATH2901, MATH2002, MATH2902, MATH2061, MATH2067 **Assessment:** 2 hour exam, assignments

This unit is an advanced version of MATH2061, with more emphasis on the underlying concepts and on mathematical rigour. Topics from linear algebra focus on the theory of vector spaces and linear transformations.

The connection between matrices and linear transformations is studied in detail. Determinants, introduced in first year, are revised and investigated further, as are eigenvalues and eigenvectors. The calculus component of the unit includes local maxima and minima, Lagrange multipliers, the inverse function theorem and Jacobians.

There is an informal treatment of multiple integrals: double integrals, change of variables, triple integrals, line and surface integrals, Green's theorem and Stokes' theorem.

MATH2962
Real and Complex Analysis (Advanced)

Credit points: 6 **Session:** Semester 1 **Classes:** Three 1 hour lectures, one 1 hour tutorial and one 1 hour practice class per week. **Prerequisites:** MATH (1901 or 1906 or Credit in 1001) and MATH (1902 or Credit in 1002) and MATH (1903 or 1907 or Credit in 1003) **Prohibitions:** MATH2007, MATH2907 **Assessment:** 2 hour exam, assignments, quizzes

Analysis is one of the fundamental topics underlying much of mathematics including differential equations, dynamical systems, differential geometry, topology and Fourier analysis. Starting off with an axiomatic description of the real number system, this first course in analysis concentrates on the limiting behaviour of infinite sequences and series on the real line and the complex plane. These concepts are then applied to sequences and series of functions, looking at point-wise and uniform convergence. Particular attention is given to power series leading into the theory of analytic functions and complex analysis. Topics in complex analysis include elementary functions on the complex plane, the Cauchy integral theorem, Cauchy integral formula, residues and related topics with applications to real integrals.

MATH2063
Math Computing and Nonlinear Systems

Credit points: 6 **Session:** Semester 1 **Classes:** Three 1 hour lectures, one 1 hour tutorial and one 1 hour computer laboratory per week (lectures in common with MATH2963). **Prerequisites:** MATH (1001 or 1901 or 1906) and MATH (1002 or 1902) and MATH (1003 or 1903 or 1907) **Prohibitions:** MATH2003, MATH903, MATH2006, MATH2906, MATH2963 **Assessment:** 2 hour exam, assignments, quizzes

This unit will introduce students to techniques of mathematical computation as applied to nonlinear systems, using the numerical programming language MATLAB and, where appropriate, computer algebra. This knowledge will be applied to a number of modelling problems, particularly those involving nonlinear mappings and nonlinear ordinary differential equations (ODEs). Throughout the unit of study the essential nonlinear theory will be developed, and the resulting ideas will be explored computationally. This will allow us to explore the modern concepts of chaos using a variety of examples, including the logistic map, the Henon map and the Lorenz equations. No prior knowledge of programming or of the MATLAB language or computer algebra is required.

MATH2963
Math Computing & Nonlinear Systems (Adv)

Credit points: 6 **Session:** Semester 1 **Classes:** Three 1 hour lectures, one 1 hour tutorial and one 1 hour computer laboratory per week (lectures in common with MATH2063). **Prerequisites:** MATH (1901 or 1906 or Credit in 1001) and MATH (1902 or Credit in 1002) and MATH (1903 or 1907 or Credit in 1003) **Prohibitions:** MATH2003, MATH2903, MATH2006, MATH2906, MATH2063 **Assessment:** 2 hour exam, assignments/quizzes

The content of this unit of study parallels that of MATH2063, but both computational and theory components will place more emphasis on Advanced topics, including Lyapunov exponents, stability, 2- and 3-cycles for mappings and concepts such as strange attractors. No prior knowledge of programming or of the MATLAB language or computer algebra is required.

MATH2065
Partial Differential Equations (Intro)

Credit points: 6 **Session:** Semester 2 **Classes:** Three 1 hour lectures, one 1 hour tutorial, one 1 hour example class per week. **Prerequisites:** MATH (1001 or 1901 or 1906) and MATH (1002 or 1902) and MATH (1003 or 1903 or 1907) **Prohibitions:** MATH2005, MATH2905, MATH2965, MATH2067 **Assessment:** 2 hour exam, mid-semester test, assignments

This is an introductory course in the analytical solutions of PDEs (partial differential equations) and boundary value problems. The techniques covered include separation of variables, Fourier series, Fourier transforms and Laplace transforms.

MATH2965
Partial Differential Equations Intro Adv

Credit points: 6 **Session:** Semester 2 **Classes:** Three 1 hour lectures, one 1 hour tutorial and one 1 hour computer laboratory per week (lectures in common with MATH2065). **Prerequisites:** MATH (2961 or Credit in 2061) or {MATH (2901 or Credit in 2001) and MATH (2902 or Credit in 2002)} **Prohibitions:** MATH2005, MATH 2905, MATH2065, MATH2067 **Assessment:** 2 hour exam, assignments

This unit of study is essentially an Advanced version of MATH2065, the emphasis being on solutions of differential equations in applied mathematics. The theory of ordinary differential equations is developed for second order linear equations, including series solutions, special functions and Laplace transforms, and boundary-value problems including separation of variables, Fourier series and Fourier transforms.

MATH2068
Number Theory and Cryptography

Credit points: 6 **Session:** Semester 2 **Classes:** Three 1 hour lectures, one 1 hour tutorial and one 1 hour computer laboratory per week. **Prerequisites:** 6 credit points of Junior level Mathematics **Prohibitions:** MATH3024, MATH3009, MATH2988 **Assumed knowledge:** MATH (1014 or 1002 or 1902) **Assessment:** 2 hour exam, assignments, quizzes

Cryptography is the branch of mathematics that provides the techniques for confidential exchange of information sent via possibly insecure channels. This unit introduces the tools from elementary number theory that are needed to understand the mathematics underlying the most commonly used modern public key cryptosystems. Topics include the Euclidean Algorithm, Fermat's Little Theorem, the Chinese Remainder Theorem, Möbius Inversion, the RSA Cryptosystem, the Elgamal Cryptosystem and the Diffie-Hellman Protocol. Issues of computational complexity are also discussed.

MATH2988
Number Theory and Cryptography Advanced)

Credit points: 6 **Session:** Semester 2 **Classes:** Three 1 hour lectures, one 1 hour tutorial and one 1 hour computer laboratory per week. **Prerequisites:** At

least 9cp from MATH (1901 or Credit in 1001), MATH (1902 or Credit in 1002), MATH (1903 or Credit in 1003), MATH (1904 or Credit in 1004), MATH (1905 or Credit in 1005), MATH1906, MATH1907, MATH (2961 or Credit in MATH2061), MATH2962 or MATH (2969 or Credit in MATH2069). **Prohibitions:** MATH2068 **Assessment:** One 2 hr exam, homework assignments

This unit of study is an advanced version of MATH2068, sharing the same lectures but with more advanced topics introduced in the tutorials and computer laboratory sessions.

MATH2968
Algebra (Advanced)

Credit points: 6 **Session:** Semester 2 **Classes:** Three 1 hour lectures, one 1 hour tutorial and one 1 hour practice class per week. **Prerequisites:** 9 credit points of Junior Mathematics (advanced level or Credit at normal level) including (MATH1902 or Credit in MATH1002) **Prohibitions:** MATH2908, MATH2918, MATH2008 **Assessment:** 2 hour exam, assignments

This unit provides an introduction to modern abstract algebra, via linear algebra and group theory. It extends the linear algebra covered in Junior Mathematics and in MATH2961, and proceeds to a classification of linear operators on finite dimensional spaces. Permutation groups are used to introduce and motivate the study of abstract goup theory. Topics covered include actions of groups on sets, subgroups, homomorphisms, quotient groups and the classification of finite abelian groups.

MATH2069
Discrete Mathematics and Graph Theory

Credit points: 6 **Session:** Semester 1 **Classes:** Three 1 hour lectures, one 1 hour tutorial and one 1 hour practice class per week. **Prerequisites:** 6 credit points of Junior level Mathematics **Prohibitions:** MATH2011, MATH2009, MATH2969 **Assessment:** One 2 hour exam, assignments, quizzes

This unit introduces students to several related areas of discrete mathematics, which serve their interests for further study in pure and applied mathematics, computer science and engineering. Topics to be covered in the first part of the unit include recursion and induction, generating functions and recurrences, combinatorics, asymptotics and analysis of algorithms. Topics covered in the second part of the unit include Eulerian and Hamiltonian graphs, the theory of trees (used in the study of data structures), planar graphs, the study of chromatic polynomials (important in scheduling problems), maximal flows in networks, matching theory.

MATH2969
Discrete Mathematics & Graph Theory Adv

Credit points: 6 **Session:** Semester 1 **Classes:** Three 1 hour lectures, one 1 hour tutorial and one 1 hour practice class per week. **Prerequisites:** 9 credit points of Junior Mathematics (advanced level or Credit at the normal level) **Prohibitions:** MATH2011, MATH2009, MATH2069 **Assessment:** Two 1.5 hour exams, assignments, quizzes

This unit will cover the same material as MATH2069 with some extensions and additional topics.

MATH2070
Optimisation and Financial Mathematics

Credit points: 6 **Session:** Semester 2 **Classes:** Three 1 hour lectures, one 1 hour tutorial and one 1 hour computer laboratory per week. **Prerequisites:** MATH (1001 or 1901 or 1906) and MATH (1002 or 1902) **Prohibitions:** MATH2010, MATH2033, MATH2933, MATH2970, ECMT3510 **Assumed knowledge:** MATH (1003 or 1903 or 1907) **Assessment:** One 2 hour exam, assignments, quiz, project

Note: Students may enrol in both MATH2070 and MATH3075 in the same semester

Problems in industry and commerce often involve maximising profits or minimising costs subject to constraints arising from resource limitations. The first part of this unit looks at programming problems and their solution using the simplex algorithm; nonlinear optimisation & the Kuhn Tucker conditions.

The second part of the unit deals with utility theory and modern portfolio theory. Topics covered include: pricing under the principles of expected return and expected utility; mean-variance Markowitz portfolio theory, the Capital Asset Pricing Model, log-optimal portfolios and the Kelly criterion; dynamical programming. Some understanding of probability theory including distributions and expectations is required in this part.

Theory developed in lectures will be complemented by computer laboratory sessions using MATLAB. Minimal computing experience will be required.

MATH2970
Optimisation & Financial Mathematics Adv

Credit points: 6 **Session:** Semester 2 **Classes:** Three 1 hour lectures, one 1 hour tutorial and one 1 hour computer laboratory per week (lectures given in common with MATH2070). **Prerequisites:** MATH (1901 or 1906 or Credit in 1001) and MATH (1902 or Credit in 1002) **Prohibitions:** MATH2010, MATH2033, MATH2933, MATH2070 **Assumed knowledge:** MATH (1903 or 1907) or Credit in MATH1003 **Assessment:** One 2 hour exam, assignments, quizzes

Note: Students may enrol in both MATH2970 and MATH3975 in the same semester

The content of this unit of study parallels that of MATH2070, but students enrolled at Advanced level will undertake more advanced problem solving and assessment tasks, and some additional topics may be included.

Mathematics Senior units of study

The School of Mathematics and Statistics provides a range of senior units of study in the Science Subject Area MATH. (The separate Science Subject Area STAT is dealt with in the next section.) Each unit of study is worth 6 credit points; students wishing to obtain a major in mathematics must therefore take at least 4 units of senior mathematics, while those wishing to obtain a double major must take 8. To proceed to honours in either Applied Mathematics or Pure Mathematics, students must have a major in mathematics. Honours entry is further restricted to students attaining a sufficiently high average mark in their senior year. Students interested in doing honours should consult the School to find out the precise details, and obtain advice on an appropriate senior year program. As well as majors in Mathematics and Statistics, the School offers a major in Financial Mathematics and Statistics. The precise requirements for this major can be found in Table 1. Alternatively, consult the School directly.

Normal and Advanced

Each unit of study is designated either as "Normal" or "Advanced". Advanced units have more stringent prerequisites than normal units, and are significantly more demanding. Although the precise requirements vary from unit to unit, it is generally inadvisable for a student who has not achieved a Credit average in intermediate level mathematics to attempt an advanced senior mathematics unit.

Semester 1

MATH3063 Differential Equations and Biomaths; MATH3065 Logic and Foundations; MATH3076 Mathematical Computing; MATH3961 Metric Spaces (Advanced); MATH3962 Rings, Fields and Galois Theory (Adv); MATH3963 Differential Equations and Biomaths (Adv); MATH3976 Mathematical Computing (Advanced)

Semester 2

MATH3061 Geometry and Topology; MATH3062 Algebra and Number Theory; MATH3067 Information and Coding Theory (Not offered in 2009) MATH3075 Financial Mathematics; MATH3078 PDEs and Waves; MATH3964 Complex Analysis with Applications (Advanced) (Not offered in 2009) MATH3966 Modules and Group Representations (Adv); MATH3968 Differential Geometry (Adv); MATH3969 Measure Theory & Fourier Analysis (Adv); MATH3974 Fluid Dynamics (Advanced); MATH3975 Financial Mathematics (Advanced); MATH3977 Lagrangian & Hamiltonian Dynamics (Adv); MATH3978 PDEs and Waves (Advanced)

Relation to other units of study and recommendations

In general, 4 units of study (24 credit points) are required in order to major in Mathematics and a credit average is required to progress to an Honours year. Potential Honours students are strongly encouraged to include one or more Advanced level unit(s) of study and seek advice

from a Senior year coordinator. Particular combinations would be suitable for students with special interests.

Computer Science students

MATH3065, MATH3962, MATH3076/3976, MATH3062, MATH3067, MATH3966, MATH3061, MATH3075/3975.

Engineering (BSc/BE) students

MATH3961, MATH3068, MATH3063/3963, MATH3065, MATH3974, MATH3076/3976, MATH3969, MATH3078/3978, MATH3968, MATH3067, MATH3977, MATH3964, MATH3075/3975.

Physics or Chemistry students

MATH3061/3961, MATH3068, MATH3962, MATH3063/3963, MATH3065, MATH3974, MATH3076/3976, MATH3969, MATH3966, MATH3968, MATH3078/3978, MATH3964, MATH3977, 3075/3975, MATH3067.

Prospective teachers of Mathematics

MATH3065, MATH3068, MATH3063/3963, MATH3962, MATH3961, MATH3076/3976, MATH3067, MATH3062, MATH3061, MATH3078/3978.

MATH3061
Geometry and Topology

Credit points: 6 **Session:** Semester 2 **Classes:** Three 1 hour lectures and one 1 hour tutorial per week. **Prerequisites:** 12 credit points of Intermediate Mathematics **Prohibitions:** MATH3001, MATH3006 **Assessment:** One 2 hour exam, tutorial tests, assignments.

The aim of the unit is to expand visual/geometric ways of thinking. The geometry section is concerned mainly with transformations of the Euclidean plane (that is, bijections from the plane to itself), with a focus on the study of isometries (proving the classification theorem for transformations which preserve distances between points), symmetries (including the classification of frieze groups) and affine transformations (transformations which map lines to lines). The basic approach is via vectors and matrices, emphasising the interplay between geometry and linear algebra. The study of affine transformations is then extended to the study of collineations in the real projective plane, including collineations which map conics to conics. The topology section considers graphs, surfaces and knots from a combinatorial point of view. Key ideas such as homeomorphism, subdivision, cutting and pasting and the Euler invariant are introduced first for graphs (1-dimensional objects) and then for triangulated surfaces (2-dimensional objects). The classification of surfaces is given in several equivalent forms. The problem of colouring maps on surfaces is interpreted via graphs. The main geometric fact about knots is that every knot bounds a surface in 3-space. This is proven by a simple direct construction, and this fact is used to show that every knot is a sum of prime knots.

MATH3961
Metric Spaces (Advanced)

Credit points: 6 **Session:** Semester 1 **Classes:** Three 1 hour lectures and one 1 hour tutorial per week. **Prerequisites:** 12 credit points of Intermediate Mathematics units **Prohibitions:** MATH3901, MATH3001 **Assumed knowledge:** MATH2961 or MATH2962 **Assessment:** 2 hour exam, assignments, quizzes

Topology, developed at the end of the 19th Century to investigate the subtle interaction of analysis and geometry, is now one of the basic disciplines of mathematics. A working knowledge of the language and concepts of topology is essential in fields as diverse as algebraic number theory and non-linear analysis. This unit develops the basic ideas of topology using the example of metric spaces to illustrate and motivate the general theory. Topics covered include: Metric spaces, convergence, completeness and the contraction mapping theorem; Metric topology, open and closed subsets; Topological spaces, subspaces, product spaces; Continuous mappings and homeomorphisms; Compact spaces; Connected spaces; Hausdorff spaces and normal spaces, Applications include the implicit function theorem, chaotic dynamical systems and an introduction to Hilbert spaces and abstract Fourier series.

MATH3062
Algebra and Number Theory

Credit points: 6 **Session:** Semester 1 **Classes:** Three 1 hour lectures and one 1 hour tutorial per week. **Prerequisites:** 12 credit points of Intermediate Mathematics **Prohibitions:** MATH3962, MATH3902, MATH3002, MATH3009 **Assessment:** One 2 hour exam, quizzes and assignments

Note: Students are advised to take MATH(2068 or 2968) before attempting this unit.

The first half of the unit continues the study of elementary number theory, with an emphasis on the solution of Diophantine equations (for example, finding all integer squares which are one more than twice a square). Topics include the Law of Quadratic Reciprocity, representing an integer as the sum of two squares, and continued fractions. The second half of the unit introduces the abstract algebraic concepts which arise naturally in this context: rings, fields, irreducibles and unique factorisation. Polynomial rings, algebraic numbers and constructible numbers are also discussed.

Textbooks

Walters, RFC. Number Theory: an Introduction. Carslaw Publications.
Niven, I. Zuckerman, HS. Montgomery, HL. An Introduction to the Theory of Numbers. Wiley.
Herstein, IN. Topics in Algebra. Blaisdell.
Childs, LN. A Concrete Introduction to Higher Algebra. Springer.

MATH3962
Rings, Fields and Galois Theory (Adv)

Credit points: 6 **Session:** Semester 1 **Classes:** Three 1 hour lectures and one 1 hour tutorial per week. **Prerequisites:** 12 credit points of Intermediate Mathematics **Prohibitions:** MATH3062, MATH3902, MATH3002 **Assumed knowledge:** MATH2961 **Assessment:** One 2 hour exam, assignments and quizzes

Note: Students are advised to take MATH2968 before attempting this unit.

This unit of study investigates the modern mathematical theory that was originally developed for the purpose of studying polynomial equations. The philosophy is that it should be possible to factorize any polynomial into a product of linear factors by working over a "large enough" field (such as the field of all complex numbers). Viewed like this, the problem of solving polynomial equations leads naturally to the problem of understanding extensions of fields. This in turn leads into the area of mathematics known as Galois theory.

The basic theoretical tool needed for this program is the concept of a ring, which generalizes the concept of a field. The course begins with examples of rings, and associated concepts such as subrings, ring homomorphisms, ideals and quotient rings. These tools are then applied to study quotient rings of polynomial rings. The final part of the course deals with the basics of Galois theory, which gives a way of understanding field extensions.

Textbooks

I.H. Herstein, Abstract algebra, second edition, MacMillian, 1990.
S. Lang Algebra, third edition, Springer-Verlag, Graduate texts in Mathematics, 2002.
I.N. Stewart, Galois Theory, Chapman and Hall, 1973.

MATH3063
Differential Equations & Biomaths

Credit points: 6 **Session:** Semester 1 **Classes:** Three 1 hour lectures and one 1 hour tutorial per week. **Prerequisites:** 12 credit points of Intermediate Mathematics **Prohibitions:** MATH3020, MATH3920, MATH3003, MATH3923, MATH3963 **Assumed knowledge:** MATH2061 **Assessment:** One 2 hour exam, assignments, quizzes

This unit of study is an introduction to the theory of systems of ordinary differential equations. Such systems model many types of phenomena in engineering, biology and the physical sciences. The emphasis will not be on finding explicit solutions, but instead on the qualitative features of these systems, such as stability, instability and oscillatory behaviour. The aim is to develop a good geometrical intuition into the behaviour of solutions to such systems. Some background in linear algebra, and familiarity with concepts such as limits and continuity, will be assumed. The applications in this unit will be drawn from

predator-prey systems, transmission of diseases, chemical reactions, beating of the heart and other equations and systems from mathematical biology.

MATH3963
Differential Equations & Biomaths (Adv)

Credit points: 6 **Session:** Semester 1 **Classes:** Three 1 hour lectures and one 1 hour tutorial per week. **Prerequisites:** 12 credit points of Intermediate Mathematics **Prohibitions:** MATH3020, MATH3920, MATH3003, MATH3923, MATH3063 **Assumed knowledge:** MATH2961 **Assessment:** One 2 hour exam, assignments, quizzes

The theory of ordinary differential equations is a classical topic going back to Newton and Leibniz. It comprises a vast number of ideas and methods of different nature. The theory has many applications and stimulates new developments in almost all areas of mathematics. The applications in this unit will be drawn from predator-prey systems, transmission of diseases, chemical reactions, beating of the heart and other equations and systems from mathematical biology. The emphasis is on qualitative analysis including phase-plane methods, bifurcation theory and the study of limit cycles. The more theoretical part includes existence and uniqueness theorems, stability analysis, linearisation, and hyperbolic critical points, and omega limit sets.

MATH3964
Complex Analysis with Applications (Adv)

This unit of study is not available in 2009

Credit points: 6 **Session:** Semester 2 **Classes:** Three 1 hour lectures and one 1 hour tutorial per week. **Prerequisites:** 12 credit points of Intermediate Mathematics **Prohibitions:** MATH3904, MATH3915 **Assumed knowledge:** MATH2962 **Assessment:** One 2 hour exam, assignments and quizzes

This unit continues the study of functions of a complex variable and their applications introduced in the second year unit Real and Complex Analysis (MATH2962). It is aimed at highlighting certain topics from analytic function theory and the analytic theory of differential equations that have intrinsic beauty and wide applications. This part of the analysis of functions of a complex variable will form a very important background for students in applied and pure mathematics, physics, chemistry and engineering.

The course will begin with a revision of properties of holomorphic functions and Cauchy theorem with added topics not covered in the second year course. This will be followed by meromorphic functions, entire functions, harmonic functions, elliptic functions, elliptic integrals, analytic differential equations, hypergeometric functions. The rest of the course will consist of selected topics from Greens functions, complex differential forms and Riemann surfaces.

MATH3965
Logic and Foundations

Credit points: 6 **Session:** Semester 1 **Classes:** Three 1 hour lectures and one 1 hour tutorial per week. **Prerequisites:** 6 credit points of Intermediate Mathematics **Prohibitions:** MATH3005 **Assessment:** One 2 hour exam, tutorial tests, assignments.

This unit is in two halves. The first half provides a working knowledge of the propositional and predicate calculi, discussing techniques of proof, consistency, models and completeness. The second half discusses notions of computability by means of Turing machines (simple abstract computers). (No knowledge of computer programming is assumed.) It is shown that there are some mathematical tasks (such as the halting problem) that cannot be carried out by any Turing machine. Results are applied to first-order Peano arithmetic, culminating in Gödel's Incompleteness Theorem: any statement that includes first-order Peano arithmetic contains true statements that cannot be proved in the system. A brief discussion is given of Zermelo-Fraenkel set theory (a candidate for the foundations of mathematics), which still succumbs to Gödel's Theorem.

MATH3966
Modules and Group Representations (Adv)

Credit points: 6 **Session:** Semester 2 **Classes:** Three 1 hour lectures and one 1 hour tutorial per week. **Prerequisites:** 12 credit points of Intermediate Mathematics **Prohibitions:** MATH3906, MATH3907 **Assumed knowledge:** MATH3962 **Assessment:** One 2 hour exam, assignments and quizzes

This unit deals first with generalized linear algebra, in which the field of scalars is replaced by an integral domain. In particular we investigate the structure of modules, which are the analogues of vector spaces in this setting, and which are of fundamental importance in modern pure mathematics. Applications of the theory include the solution over the integers of simultaneous equations with integer coefficients and analysis of the structure of finite abelian groups.

In the second half of this unit we focus on linear representations of groups. A group occurs naturally in many contexts as a symmetry group of a set or space. Representation theory provides techniques for analysing these symmetries. The component will deals with the decomposition of representation into simple constituents, the remarkable theory of characters, and orthogonality relations which these characters satisfy.

MATH3967
Information and Coding Theory

This unit of study is not available in 2009

Credit points: 6 **Session:** Semester 2 **Classes:** Three 1 hour lectures and one 1 hour tutorial per week. **Prerequisites:** 12 credit points of Intermediate Mathematics **Prohibitions:** MATH3007, MATH3010 **Assessment:** One 2 hour exam, tutorial tests, assignments.

The related theories of information and coding provide the basis for reliable and efficient storage and transmission of digital data, including techniques for data compression, digital broadcasting and broadband internet connectivity. The first part of this unit is a general introduction to the ideas and applications of information theory, where the basic concept is that of entropy. This gives a theoretical measure of how much data can be compressed for storage or transmission. Information theory also addresses the important practical problem of making data immune to partial loss caused by transmission noise or physical damage to storage media. This leads to the second part of the unit, which deals with the theory of error-correcting codes. We develop the algebra behind the theory of linear and cyclic codes used in modern digital communication systems such as compact disk players and digital television.

MATH3968
Analysis

Credit points: 6 **Session:** Semester 2 **Classes:** Three 1 hour lectures and one 1 hour tutorial per week. **Prerequisites:** 12 credit points of Intermediate Mathematics **Prohibitions:** MATH3008, MATH2007, MATH2907, MATH2962 **Assessment:** One 2 hour exam, tutorial tests, assignments.

Analysis grew out of calculus, which leads to the study of limits of functions, sequences and series. The aim of the unit is to present enduring beautiful and practical results that continue to justify and inspire the study of analysis. The unit starts with the foundations of calculus and the real number system. It goes on to study the limiting behaviour of sequences and series of real and complex numbers. This leads naturally to the study of functions defined as limits and to the notion of uniform convergence. Returning to the beginnings of calculus and power series expansions leads to complex variable theory: analytic functions, Taylor expansions and the Cauchy Integral Theorem.

Power series are not adequate to solve the problem of representing periodic phenomena such as wave motion. This requires Fourier theory, the expansion of functions as sums of sines and cosines. This unit deals with this theory, Parseval's identity, pointwise convergence theorems and applications.

The unit goes on to introduce Bernoulli numbers, Bernoulli polynomials, the Euler MacLaurin formula and applications, the gamma function and the Riemann zeta function. Lastly we return to the foundations of analysis, and study limits from the point of view of topology.

MATH3969
Differential Geometry (Advanced)

Credit points: 6 **Session:** Semester 2 **Classes:** Three 1 hour lectures and one 1 hour tutorial per week. **Prerequisites:** 12 credit points of Intermediate

Mathematics, including MATH2961 **Prohibitions:** MATH3903 **Assumed knowledge:** At least 6 credit points of Advanced Mathematics units of study at Intermediate or Senior level. **Assessment:** One 2 hour exam and 2 assignments

This unit is an introduction to Differential Geometry, using ideas from calculus of several variables to develop the mathematical theory of geometrical objects such as curves, surfaces and their higher-dimensional analogues. Differential geometry also plays an important part in both classical and modern theoretical physics. The initial aim is to develop geometrical ideas such as curvature in the context of curves and surfaces in space, leading to the famous Gauss-Bonnet formula relating the curvature and topology of a surface. A second aim is to present the calculus of differential forms as the natural setting for the key ideas of vector calculus, along with some applications.

MATH3969
Measure Theory & Fourier Analysis (Adv)

Credit points: 6 **Session:** Semester 2 **Classes:** Three 1 hour lectures and one 1 hour tutorials per week. **Prerequisites:** 12 credit points Intermediate Mathematics **Prohibitions:** MATH3909 **Assumed knowledge:** At least 6 credit points of Advanced Mathematics units of study at Intermediate or Senior level **Assessment:** One 2 hour exam, assignments, quizzes

Measure theory is the study of such fundamental ideas as length, area, volume, arc length and surface area. It is the basis for the integration theory used in advanced mathematics since it was developed by Henri Lebesgue in about 1900. Moreover, it is the basis for modern probability theory. The course starts by setting up measure theory and integration, establishing important results such as Fubini's Theorem and the Dominated Convergence Theorem which allow us to manipulate integrals. This is then applied to Fourier Analysis, and results such as the Inversion Formula and Plancherel's Theorem are derived. Probability Theory is then discussed, with topics including independence, conditional probabilities, and the Law of Large Numbers.

MATH3974
Fluid Dynamics (Advanced)

Credit points: 6 **Session:** Semester 2 **Classes:** Three 1 hour lectures and one 1 hour tutorial per week. **Prerequisites:** 12 credit points of Intermediate Mathematics with average grade of at least Credit **Prohibitions:** MATH3914 **Assumed knowledge:** MATH2961, MATH2965 **Assessment:** One 2 hour exam

This unit of study provides an introduction to fluid dynamics, starting with a description of the governing equations and the simplifications gained by using stream functions or potentials. It develops elementary theorems and tools, including Bernoulli's equation, the role of vorticity, the vorticity equation, Kelvin's circulation theorem, Helmholtz's theorem, and an introduction to the use of tensors. Topics covered include viscous flows, lubrication theory, boundary layers, potential theory, and complex variable methods for 2-D airfoils. The unit concludes with an introduction to hydrodynamic stability theory and the transition to turbulent flow.

MATH3075
Financial Mathematics

Credit points: 6 **Session:** Semester 2 **Classes:** Three 1 hour lectures and one 1 hour tutorial per week. **Prerequisites:** 12 credit points of Intermediate Mathematics **Prohibitions:** MATH3975, MATH 3015, MATH3933 **Assessment:** Two class quizzes and one 2 hour exam

This unit is an introduction to the mathematical theory of modern finance. Topics include: notion of arbitrage, pricing riskless securities, risky securities, utility theory, fundamental theorems of asset pricing, complete markets, introduction to options, binomial option pricing model, discrete random walks, Brownian motion, derivation of the Black-Scholes option pricing model, extensions and introduction to pricing exotic options, credit derivatives. A strong background in mathematical statistics and partial differential equations is an advantage, but is not essential. Students completing this unit have been highly sought by the finance industry, which continues to need graduates with quantitative skills. The lectures in the Normal unit are held concurrently with those of the corresponding Advanced unit.

MATH3975
Financial Mathematics (Advanced)

Credit points: 6 **Session:** Semester 2 **Classes:** Three 1 hour lectures and one 1 hour tutorial per week. **Prerequisites:** 12 credit points of Intermediate Mathematics with at least Credit average **Prohibitions:** MATH3933, MATH3015, MATH3075 **Assessment:** Two class quizzes and one 2 hour exam

This unit is an introduction to the mathematical theory of modern finance. Topics include: notion of arbitrage, pricing riskless securities, risky securities, utility theory, fundamental theorems of asset pricing, complete markets, introduction to options, binomial option pricing model, discrete random walks, Brownian motion, derivation of the Black-Scholes option pricing model, extensions and introduction to pricing exotic options, credit derivatives. A strong background in mathematical statistics and partial differential equations is an advantage, but is not essential. Students completing this unit have been highly sought by the finance industry, which continues to need graduates with quantitative skills. Students enrolled in this unit at the Advanced level will be expected to undertake more challenging assessment tasks. The lectures in the Advanced unit are held concurrently with those of the corresponding Normal unit.

MATH3076
Mathematical Computing

Credit points: 6 **Teacher/Coordinator:** Dr D J Ivers **Session:** Semester 1 **Classes:** Three 1 hour lectures and one 1 hour laboratory per week. **Prerequisites:** 12 credit points of Intermediate Mathematics and one of MATH(1001 or 1003 or 1901 or 1903 or 1906 or 1907) **Prohibitions:** MATH3976, MATH3016, MATH3916 **Assessment:** One 2 hour exam, assignments, quizzes

This unit of study provides an introduction to Fortran 95 programming and numerical methods. Topics covered include computer arithmetic and computational errors, systems of linear equations, interpolation and approximation, solution of nonlinear equations, quadrature, initial value problems for ordinary differential equations and boundary value problems.

MATH3976
Mathematical Computing (Advanced)

Credit points: 6 **Teacher/Coordinator:** Dr D J Ivers **Session:** Semester 1 **Classes:** Three 1 hour lectures and one 1 hour tutorial per week. **Prerequisites:** 12 credit points of Intermediate Mathematics and one of MATH(1903 or 1907) or Credit in MATH1003 **Prohibitions:** MATH3076, MATH3016, MATH3916 **Assessment:** One 2 hour exam, assignments, quizzes

See entry for MATH3076 Mathematical Computing.

MATH3977
Lagrangian & Hamiltonian Dynamics (Adv)

Credit points: 6 **Teacher/Coordinator:** Dr. Leon Poladian **Session:** Semester 1 **Classes:** Three 1 hour lectures and one 1 hour tutorial per week. **Prerequisites:** 12 credit points of Intermediate Mathematics with at least Credit average **Prohibitions:** MATH2904, MATH2004, MATH3917 **Assessment:** One 2 hour exam and assignments and/or quizzes

This unit provides a comprehensive treatment of dynamical systems using the mathematically sophisticated framework of Lagrange and Hamilton. This formulation of classical mechanics generalizes elegantly to modern theories of relativity and quantum mechanics. The unit develops dynamical theory from the Principle of Least Action using the calculus of variations. Emphasis is placed on the relation between the symmetry and invariance properties of the Lagrangian and Hamiltonian functions and conservation laws. Coordinate and canonical transformations are introduced to make apparently complicated dynamical problems appear very simple. The unit will also explore connections between geometry and different physical theories beyond classical mechanics.

Students will be expected to solve fully dynamical systems of some complexity including planetary motion and to investigate stability using perturbation analysis. Hamilton-Jacobi theory will be used to elegantly solve problems ranging from geodesics (shortest path between two points) on curved surfaces to relativistic motion in the vicinity of black holes.

This unit is a useful preparation for units in dynamical systems and chaos, and complements units in differential equations, quantum theory and general relativity.

MATH3078
PDEs and Waves

Credit points: 6 **Session:** Semester 2 **Classes:** Three 1 hour lectures and one 1 hour tutorial per week. **Prerequisites:** 12 credit points of Intermediate Mathematics **Prohibitions:** MATH3978, MATH3018, MATH3921 **Assumed knowledge:** MATH(2061/2961) and MATH(2065/2965) **Assessment:** One 2 hour exam, one lecture quiz

This unit of study introduces Sturm-Liouville eigenvalue problems and their role in finding solutions to boundary value problems. Analytical solutions of linear PDEs are found using separation of variables and integral transform methods. Three of the most important equations of mathematical physics - the wave equation, the diffusion (heat) equation and Laplace's equation - are treated, together with a range of applications. There is particular emphasis on wave phenomena, with an introduction to the theory of sound waves and water waves.

Textbooks
Powers, DL. Boundary Value Problems. Harcourt-Brace 4th Edition. 1999.

MATH3978
PDEs and Waves (Advanced)

Credit points: 6 **Session:** Semester 2 **Classes:** Three 1 hour lectures and one 1 hour tutorial per week. **Prerequisites:** 12 credit points of Intermediate Mathematics with at least Credit average **Prohibitions:** MATH3078, MATH3018, MATH3921 **Assumed knowledge:** MATH(2061/2961) and MATH(2065/2965) **Assessment:** One 2 hour exam, one lecture quiz

As for MATH3078 PDEs & Waves but with more advanced problem solving and assessment tasks. Some additional topics may be included.

Textbooks
Powers, DL. Boundary Value Problems. Harcourt-Brace 4th Edition. 1999.

Statistics Intermediate units of study

The School of Mathematics and Statistics provides Intermediate units of study, each worth 6 credit points, in Statistics. A normal Intermediate load in a discipline is 12 credit points and students intending to specialise in Senior Statistics should take 2 units of study (12 credit points) of Intermediate Statistics.Topics are offered at Normal and Advanced levels and may not be counted together. Further information follows, whilst details of units of study structure, content and assessment procedures are provided in the Intermediate Year Unit of Study Handbook available from the School at the time of enrolment.The units of study (each 6 credit points) are listed below:

First semester

Statistical Models STAT2011; Probability and Statistical Models (Adv) STAT2911

Second semester

Statistical Tests STAT2012; Statistical Tests (Advanced) STAT2912

Relation to other units of study and recommendations

Students should note that all Senior Statistics units of study have statistics prerequisites and some require MATH1003 or 1903 or MATH1002 or 1902. MATH2061 or MATH2961 is also desirable. If your major interest is statistics, then you are encouraged to enrol in 2 units of study (12 credit points) in Intermediate Statistics. If you are considering doing Honours in Statistics, these units of study should be the Advanced units of study, and choices from Intermediate Mathematics should include at least MATH2061 or 2961. If you do not intend to major in Statistics but want a solid introduction to Applied Statistics, you should take STAT2012 in your second semester.

STAT2011
Statistical Models

Credit points: 6 **Session:** Semester 1 **Classes:** Three 1 hour lectures, one 1 hour tutorial and one 1 hour computer laboratory week. **Prerequisites:** MATH (1001 or 1901 or 1906 or 1011) and [MATH (1005 or 1905 or 1015) or STAT1021] **Prohibitions:** STAT2901, STAT2001, STAT2911 **Assessment:** One 2 hour exam, assignments and/or quizzes, and computer practical reports.

This unit provides an introduction to univariate techniques in data analysis and the most common statistical distributions that are used to model patterns of variability. Common discrete random models like the binomial, Poisson and geometric and continuous models including the normal and exponential will be studied. The method of moments and maximum likelihood techniques for fitting statistical distributions to data will be explored. The unit will have weekly computer classes where candidates will learn to use a statistical computing package to perform simulations and carry out computer intensive estimation techniques like the bootstrap method.

STAT2911
Probability and Statistical Models (Adv)

Credit points: 6 **Session:** Semester 1 **Classes:** Three 1 hour lectures, one 1 hour tutorial and one 1 hour computer laboratory per week. **Prerequisites:** MATH (1903 or 1907 or Credit in 1003) and MATH (1905 or 1904 or Credit in 1005) **Prohibitions:** STAT2001, STAT2011, STAT2901 **Assessment:** One 2 hour exam, assignments and/or quizzes, and computer practical reports.

This unit is essentially an advanced version of STAT2011, with an emphasis being on the mathematical techniques used to manipulate random variables and probability models. Common random variables including the Poisson, normal, beta and gamma families are introduced. Probability generating functions and convolution methods are used to understand the behaviour of sums of random variables. The method of moments and maximum likelihood techniques for fitting statistical distributions to data will be explored. The unit will have weekly computer classes where candidates will learn to use a statistical computing package to perform simulations and carry out computer intensive estimation techniques like the bootstrap method.

STAT2012
Statistical Tests

Credit points: 6 **Session:** Semester 2 **Classes:** Three 1 hour lectures, one 1 hour tutorial and one 1 hour computer laboratory per week. **Prerequisites:** MATH (1005 or 1905 or 1015) **Prohibitions:** STAT2004, STAT2912 **Assessment:** One 2 hour exam, assignments and/or quizzes, and computer practical reports.

This unit provides an introduction to the standard methods of statistical analysis of data: Tests of hypotheses and confidence intervals, including t-tests, analysis of variance, regression - least squares and robust methods, power of tests, non-parametric tests, non-parametric smoothing, tests for count data, goodness of fit, contingency tables. Graphical methods and diagnostic methods are used throughout with all analyses discussed in the context of computation with real data using an interactive statistical package.

STAT2912
Statistical Tests (Advanced)

Credit points: 6 **Session:** Semester 2 **Classes:** Three 1 hour lectures, one 1 hour tutorial and one 1 hour computer laboratory per week. **Prerequisites:** MATH1905 or Credit in MATH1005 **Prohibitions:** STAT2004, STAT2012 **Assumed knowledge:** STAT (2911 or 2901) **Assessment:** One 2 hour exam, assignments and/or quizzes, and computer practical reports.

This unit is essentially an advanced version of STAT2012 with an emphasis on both methods and the mathematical derivation of these methods: Tests of hypotheses and confidence intervals, including t-tests, analysis of variance, regression - least squares and robust methods, power of tests, non-parametric methods, non-parametric smoothing, tests for count data, goodness of fit, contingency tables. Graphical methods and diagnostic methods are used throughout with all analyses discussed in the context of computation with real data using an interactive statistical package.

Statistics senior units of study

The School of Mathematics and Statistics provides several Senior units of study, each worth 6 credit points, in Statistics. Students wishing to major in Statistics should take 4 units of study (24 credit points) of Senior Statistics.Some topics are offered at Normal and Advanced levels and may not be counted together. Entry to some Advanced

units of study requires a Credit or better in a Normal level prerequisite or a Pass or better in an Advanced level prerequisite. Further information follows, whilst details of unit of study structure, content, and assessment procedures are provided in the Senior Units of Study Handbook available from the School at the time of enrolment. The units of study (each 6 credit points) are listed below:

First semester

STAT3011 Stochastic Processes and Time Series; STAT3911 Stochastic Processes and Time Series Adv; STAT3012 Applied Linear Methods; STAT3912 Applied Linear Methods Advanced

Second semester

STAT3013 Statistical Inference; STAT3913 Statistical Inference Advanced; STAT3014 Applied Statistics; STAT3914 Applied Statistics Advanced

Relation to other units of study and recommendations

In general 4 units of study (24 credit points) are required in order to major in Statistics, and a Credit average is required to progress to an Honours year. Potential Honours students are expected to include at least two Advanced level units of study. Students intending to major in Statistics should choose 2 units of study of Senior Statistics each semester, making 24 credit points in total.

STAT3011
Stochastic Processes and Time Series

Credit points: 6 **Session:** Semester 1 **Classes:** Three 1 hour lectures and one 1 hour tutorial per week; ten 1 hour computer laboratories per semester. **Prerequisites:** STAT (2011 or 2911 or 2001 or 2901) and MATH (1003 or 1903 or 1907). **Prohibitions:** STAT3911, STAT3003, STAT3903, STAT3005, STAT3905 **Assessment:** One 2 hour exam, assignments and/or quizzes, and computer practical reports.

Section I of this course will introduce the fundamental concepts of applied stochastic processes and Markov chains used in financial mathematics, mathematical statistics, applied mathematics and physics. Section II of the course establishes some methods of modeling and analysing situations which depend on time. Fitting ARMA models for certain time series are considered from both theoretical and practical points of view. Throughout the course we will use the S-PLUS (or R) statistical packages to give analyses and graphical displays.

STAT3911
Stochastic Processes and Time Series Adv

Credit points: 6 **Session:** Semester 1 **Classes:** Three 1 hour lecture, one 1 hour tutorial per week, plus an extra 1 hour lecture per week on advanced material in the first half of the semester. Seven 1 hour computer laboratories (on time series) in the second half of the semester (one 1 hour class per **Prerequisites:** (STAT2911 or credit in STAT2011) and MATH(1003 or 1903 or 1907). **Prohibitions:** STAT3011, STAT3003, STAT3903, STAT3005, STAT3905 **Assessment:** One 2 hour exam, assignments and/or quizzes, and computer practical reports.

This is an Advanced version of STAT3011. There will be 3 lectures in common with STAT3011. In addition to STAT3011 material, theory on branching processes and birth and death processes will be covered. There will be more advanced tutorial and assessment work associated with this unit.

STAT3012
Applied Linear Methods

Credit points: 6 **Session:** Semester 1 **Classes:** Three 1 hour lectures, one 1 hour tutorial and one 1 hour computer laboratories per week. **Prerequisites:** STAT(2012 or 2912 or 2004) and MATH(1002 or 1014 or 1902). **Prohibitions:** STAT3912, STAT3002, STAT3902, STAT3004, STAT3904 **Assessment:** One 2 hour exam, assignments and/or quizzes, and computer practical reports.

This course will introduce the fundamental concepts of analysis of data from both observational studies and experimental designs using classical linear methods, together with concepts of collection of data and design of experiments. First we will consider linear models and regression methods with diagnostics for checking appropriateness of models. We will look briefly at robust regression methods here. Then we will consider the design and analysis of experiments considering notions of replication, randomization and ideas of factorial designs. Throughout the course we will use the R statistical package to give analyses and graphical displays.

STAT3912
Applied Linear Methods Advanced

Credit points: 6 **Session:** Semester 1 **Classes:** Three 1 hour lectures, one 1 hour tutorial and one 1 hour computer laboratory per week. **Prerequisites:** (STAT2912 or Credit in STAT2004 or Credit in STAT2012) and MATH(2061 or 2961 or 1902). **Prohibitions:** STAT3012, STAT3002, STAT3902, STAT3004, STAT3904 **Assessment:** One 2 hour exam, assignments and/or quizzes, and computer practical reports.

This unit is essentially an Advanced version of STAT3012, with emphasis on the mathematical techniques underlying applied linear models together with proofs of distribution theory based on vector space methods. There will be 3 lectures per week in common with STAT3012 and some advanced material given in a separate advanced tutorial together with more advanced assessment work.

STAT3013
Statistical Inference

Credit points: 6 **Session:** Semester 2 **Classes:** Three 1 hour lectures, one 1 hour tutorial and one 1 hour computer laboratory per week. **Prerequisites:** STAT(2012 or 2912 or 2003 or 2903) and STAT (2011 or 2911) **Prohibitions:** STAT3913, STAT3001, STAT3901 **Assessment:** One 2 hour exam, assignments and/or quizzes, and computer practical reports.

In this course we will study basic topics in modern statistical inference. This will include traditional concepts of mathematical statistics: likelihood estimation, method of moments, properties of estimators, exponential families, decision-theory approach to hypothesis testing, likelihood ratio test as well as more recent approaches such as Bayes estimation, Empirical Bayes and nonparametric estimation. During the computer classes (using R software package) we will illustrate the various estimation techniques and give an introduction to computationally intensive methods like Monte Carlo, Gibbs sampling and EM-algorithm.

STAT3913
Statistical Inference Advanced

Credit points: 6 **Session:** Semester 2 **Classes:** Three 1 hour lectures, one 1 hour tutorial and one 1 hour computer laboratory per week. **Prerequisites:** STAT(2911 or 2903). **Prohibitions:** STAT3013, STAT3001, STAT3901 **Assessment:** One 2 hour exam, assignments and/or quizzes, and computer practical reports.

This unit is essentially an Advanced version of STAT3013, with emphasis on the mathematical techniques underlying statistical inference together with proofs based on distribution theory. There will be 3 lectures per week in common with some material required only in this advanced course and some advanced material given in a separate advanced tutorial together with more advanced assessment work.

STAT3014
Applied Statistics

Credit points: 6 **Session:** Semester 2 **Classes:** Three 1 hour lectures, one 1 hour tutorial and one 1 hour computer laboratory per week. **Prerequisites:** STAT(2012 or 2912 or 2004). **Prohibitions:** STAT3914, STAT3002, STAT3902, STAT3006 **Assumed knowledge:** STAT(3012 or 3912). **Assessment:** One 2 hour exam, assignments and/or quizzes, and computer practical reports.

This unit has three distinct but related components: Multivariate analysis; sampling and surveys; and generalised linear models. The first component deals with multivariate data covering simple data reduction techniques like principal components analysis and core multivariate tests including Hotelling's T^2, Mahalanobis' distance and Multivariate Analysis of Variance (MANOVA). The sampling section includes sampling without replacement, stratified sampling, ratio estimation, and cluster sampling. The final section looks at the analysis of categorical data via generalized linear models. Logistic regression and log-linear models will be looked at in some detail along with special techniques for analyzing discrete data with special structure.

STAT3914
Applied Statistics Advanced

Credit points: 6 **Session:** Semester 2 **Classes:** Three 1 hour lectures and one 1 hour computer laboratory per week plus an extra hour each week which will alternate between lectures and tutorials. **Prerequisites:** STAT2912 or credit or better in (STAT2004 or STAT2012). **Prohibitions:** STAT3014, STAT3002, STAT3902, STAT3006, STAT3907 **Assumed knowledge:** STAT3912 **Assessment:** One 2 hour exam, assignments and/or quizzes, and computer practical reports.

This unit is an Advanced version of STAT3014. There will be 3 lectures per week in common with STAT3014. The unit will have extra lectures focusing on multivariate distribution theory developing results for the multivariate normal, partial correlation, the Wishart distribution and Hotelling's T^2. There will also be more advanced tutorial and assessment work associated with this unit.

BIOM3006
Statistics for the Natural Sciences

Credit points: 6 **Teacher/Coordinator:** Dr Thomas Bishop **Session:** Semester 2 **Classes:** (2x1 hr workshops, 1x3 hr practical)/wk **Prerequisites:** BIOM2001 or STAT3012 **Assessment:** 1x3 hour exam (40%), 1 major report (20%), weekly practical assignments (40%)

This unit of study is designed to introduced students to the analysis of data they may face in their future careers, in particular data that are not well behaved, they may be non-normal, there may be missing observations or they may be correlated in space and time. It is a core unit for students in BLWSc and is a prerequisite for those in BScAgr wishing to specialise in Environmetrics. It is also offered to BSc students wishing to complete an applied statistics unit. In the first part, students will learn about the generalisation of the linear regression and ANOVA model to accommodate non-normal data, mixtures of categorical and continuous data and non-linearities in the relationship between the response and predictor variables. In the second part, students will learn about stochastic processes and how to analyse (i) data that is correlated in space and time (ii) designed experiments with REML. At the end of this unit, students will have learnt a range of advanced statistical methods and be equipped to apply this knowledge to analyse data that they may encounter in their future studies and careers. The students will gain research and inquiry skills through completion of weekly computer assignments and a major report where they will analyse a 4th year research project. Information literacy and communication skills will be developed through weekly computer work and an oral presentation of the results from the major report.

Medical Science units of study

Bachelor of Medical Science junior units of study

All prerequisite and corequisite units of study, details of staff, examinations, units of study delivery and descriptions are as described under the appropriate Department or School entry in this chapter.

Bachelor of Medical Science Intermediate Core units of study

BMED2801
Cell Structure and Function

Credit points: 6 **Teacher/Coordinator:** Dr Vladimir Balcar **Session:** Semester 1 **Classes:** Two 1 hour lectures per week; five hours of tutorials or practicals every fortnight. **Prerequisites:** 42 credit points of Junior Bachelor of Medical Science units of study **Prohibitions:** All Intermediate level units offered by the Schools of Molecular and Microbial Biosciences, Medical Sciences and BIOL(2006/2906) and BIOL(2016/2916) **Assessment:** One 2 hour theory exam; three in-semester assessments

This unit of study begins with a discussion of the unique morphology of unicellular prokaryotic organisms (bacteria, fungi and viruses) followed by the structure and function of human cells. A strong understanding of cellular structures is essential for an appreciation of whole body function. Basic cell structure is examined by focussing on cell specialisation and tissue organisation in humans. The structure and function of excitable cells such as nerve and muscle will lead to a discussion of membrane potential, synaptic transmission and neuromuscular junction. The unit of study then gives an introduction into how gene expression is regulated during development, and how the cell cycle is controlled to coordinate programmed events such as differentiation and cell death. This allows discussion of the consequences and treatment of abnormal tissue growth (cancer).

Practical classes not only complement the lecture material but also introduce students to a wide range of technical skills, tissue processing and bacterial cultivation. In addition, the sessions are also designed to provide students with generic skills such as record keeping, data collection and presentation, protocol planning and written communication.

BMED2802
Molecular Basis of Medical Sciences

Credit points: 6 **Teacher/Coordinator:** A/Prof Robin Allan **Session:** Semester 1 **Classes:** Two 1 hour lectures per week; five hours of tutorials or practicals every fortnight. **Prerequisites:** 42 credit points of Junior Bachelor of Medical Science units of study **Prohibitions:** All Intermediate level units offered by the Schools of Molecular and Microbial Biosciences, Medical Sciences and BIOL(2006/2906) and BIOL(2016/2916) **Assessment:** One 2 hour theory exam; three in-semester assessments.

This unit of study extends pre-existing understanding of the way in which genetic information is stored, transmitted and expressed. Students will be introduced to the role of enzymes in the catalysis of cellular reactions and the pharmacological strategies employed to exploit our knowledge of these mechanisms is then discussed. Intracellular signalling cascades, cell to cell signalling and pharmacological intervention in these processes is covered. The molecular basis of drug action and the use of DNA technology in drug design will be discussed. Students will then cover the application of medical genetics to the study of advanced gene expression, recombinant technology, cloning and gene products, transgenics and the linkage and mapping of genes including reference to DNA fingerprinting and the human genome project and gene therapy.

The technical skills taught in the practical classes include the use of restriction enzymes, the separation of DNA molecules using electrophoresis, the inspection of chromosomes, linkage mapping, gene transfer and the measurement of gene expression. In addition to nurturing the skills involved in the design and execution of experiments, the practical sessions will formally teach students report writing skills and will give students practice at articulating feedback to their peers.

Textbooks
Genes IX (9th edition, Jones & Bartlett, 2008)

BMED2803
Cardiac, Respiratory and Renal Function

Credit points: 6 **Teacher/Coordinator:** Dr Suzanne Ollerenshaw **Session:** Semester 1 **Classes:** Two 1 hour lectures per week; five hours of tutorials or practicals every fortnight. **Prerequisites:** 42 credit points of Junior Bachelor of Medical Science units of study **Prohibitions:** All Intermediate level units offered by the Schools of Molecular and Microbial Biosciences, Medical Sciences and BIOL(2006/2906) and BIOL(2016/2916) **Assessment:** One 2hr theory exam; three in-semester assessments

The maintenance of constant conditions in the human body is dependent on thousands of intricate control mechanisms. This unit of study examines many of those homeostatic processes with specific reference to major apparatus such as the respiratory, cardiovascular and renal. The structure and function of the cardiovascular system is discussed and cardiac output, blood pressure and blood flow are studied. Discussion of the respiratory system embraces the structure of the respiratory organs and description of the mechanism of the transport of gases to and from cells. Similar treatment of the renal system involves anatomical and histological investigation of kidney structure and a physiological description of kidney function.

Practical classes are designed to nurture the same generic attributes taught in BMED2801 and BMED2802 but, in addition, students are introduced to a wide range of anatomical and physiological technical skills. Specifically, students will investigate the structure and function of the heart and blood vessels, the components of the respiratory

system and the kidney - all at the cellular and organ level. Students will also conduct experiments (often on themselves) which show how heart rate and blood pressure are controlled, how breathing is regulated and how urine output is modulated in response to both physiological and pharmacological stimuli.

BMED2804
Digestion, Absorption and Metabolism

Credit points: 6 **Teacher/Coordinator:** Dr Kim Bell-Anderson **Session:** Semester 2 **Classes:** Two 1 hour lectures per week; five hours of tutorials or practicals every fortnight. **Prerequisites:** 42 credit points of Junior Bachelor of Medical Science units of study **Prohibitions:** All Intermediate level units offered by the Schools of Molecular and Microbial Biosciences, Medical Sciences and BIOL(2006/2906) and BIOL(2016/2916) **Assessment:** One 2 hour theory exam; three in-semester assignments.

This unit of study gives an introduction to the structures used to digest and absorb fuels, at both the anatomical and histological level. This is then followed by discussion of the utilisation and fate of absorbed nutrients. After an overview of the alimentary tract and associated organs, the detailed anatomy of the oral cavity, oesophagus, stomach, intestines, liver, etc is considered. This is complemented by description of the specialised cell types in the digestive system, discussion of the transport mechanisms employed to absorb nutrients, and consideration of the control systems used to regulate activity of the digestive process. The role of intestinal microflora in the gastrointestinal tract, contributing to both beneficial digestion and absorption of nutrients, as well as to pathogenic disruption, is also discussed in this unit of study. The fundamentals of metabolism are introduced, in particular, the chemical reactions that are responsible for fuel processing. The pharmacokinetic angle is explored further with discussion of the metabolism and absorption of drugs including the detoxification and excretion of xenobiotic compounds.

Practical classes give students extensive experience with inspection of the digestive system at both the cellular and gross anatomical level. The peristaltic reflex and pharmacological influences are explored. These sessions are designed to nurture observation, data analysis, record keeping and report writing skills.

BMED2805
Hormones, Reproduction and Development

Credit points: 6 **Teacher/Coordinator:** Dr Miriam Frommer **Session:** Semester 2 **Classes:** Two 1 hour lectures per week; five hours of tutorials or practicals every fortnight. **Prerequisites:** 42 credit points of Junior Bachelor of Medical Science units of study **Prohibitions:** All Intermediate level units offered by the Schools of Molecular and Microbial Biosciences, Medical Sciences and BIOL(2006/2906) and BIOL(2016/2916) **Assessment:** One 2 hr theory exam; three in-semester assessments

This unit of study examines hormonal control of human body processes. Specifically, students will investigate the structure and function of endocrine glands: such as the pituitary, thyroid and pancreas - all at the cellular and organ level. Examples of the influence of hormones on metabolic processes are provided by consideration of fuel selection during exercise and starvation, and in diabetes and obesity. The fate of the macronutrients (carbohydrate, fat and protein) is then considered by reference to their uptake, disposal and reassembly into storage fuels and cellular structures. Biochemical pathways involved in the extraction of energy from the macronutrient fuels are then covered, with particular emphasis on the whole body integration and regulation of these metabolic processes. This leads on to discussion of performance enhancing drugs and also provides a solid background for the understanding of pharmacological intervention in these conditions. The hormones involved in reproduction, contraception, fertilisation and pregnancy are also discussed, leading on to foetal-new-born transition and the development of the human embryo and cell differentiation.

In the practical classes, students are introduced to a wide range of technical skills. Specifically, students will investigate the structure and function of the important endocrine glands - all at the cellular and organ level. Students will design a biochemical kit for the evaluation of blood glucose and will perform a glucose tolerance test to investigate how glucose levels are regulated and modulated in response to a glucose load. In addition, sessions are designed to nurture oral presentation skills, hypothesis testing, data analysis, troubleshooting, instruction writing and feedback skills.

BMED2806
Sensory and Motor Functions

Credit points: 6 **Teacher/Coordinator:** Dr Richard Ward **Session:** Semester 1 **Classes:** Two 1 hour lectures per week; five hours of tutorials or practicals every fortnight. **Prerequisites:** 42 credit points of Junior Bachelor of Medical Science units of study **Prohibitions:** All Intermediate level units offered by the Schools of Molecular and Microbial Biosciences, Medical Sciences and BIOL(2006/2906) and BIOL(2016/2916) **Assessment:** One 2 hour theory exam; three in-semester assessments

This unit of study examines how neural and motor systems are adapted to sense and respond to changes in the external environment. After consideration of the basic anatomical organisation of the nervous and sensory systems, the way in which nerve signals are integrated and coordinated in response to external stimuli are covered in more detail. Various senses such as vision, touch and hearing are studied, together with a discussion on motor reflexes. The receptors involved in normal modes of communications are discussed before specific examples such as the fright and flight and stress responses are considered. This is complemented by discussion of the effects of drugs on the nervous system, with special reference to pain and analgesics. An appreciation is gained of how toxins and infections can perturb the normal neuromuscular co-ordination. Thus, pharmacological and pathological considerations, such as the use of poisoned arrows and muscle paralysis and viral and tetanus infections, are studied in concert with relevant physiological concepts.

In practical classes, students perform experiments (often on themselves) to illustrate the functioning of the senses and motor control and coordination involving both stretch and flexor reflexes. In addition, students extend their anatomical expertise by examining the structure and function of the nervous system and the skeleton (especially the vertebral column, the thorax and the limbs). Practical sessions also include the effects of analgesics on experimental pain and case studies of tetanus and botulism. The practical sessions draw widely on, and nurture, the generic skills taught in preceding units of study but particularly in BMED2804 and BMED2805.

BMED2807
Microbes and Body Defences

Credit points: 6 **Teacher/Coordinator:** Dr Allison Abendroth **Session:** Semester 2 **Classes:** Two 1 hour lectures per week; five hours of tutorials or practicals every fortnight. **Prerequisites:** 42 credit points of Junior Bachelor of Medical Science units of study **Prohibitions:** All Intermediate level units offered by the Schools of Molecular and Microbial Biosciences, Medical Sciences and BIOL(2006/2906) and BIOL(2016/2916) **Assessment:** One 2hr theory exam; three in-semester assessments.

This unit of study begins by introducing the concepts of disease transmission, pathogenicity and virulence mechanisms of microbes. How the body deals with injury and infection is discussed by exploring host defences. Sections on wound healing, clotting and inflammation cover the response to physical damage and this is complemented by discussion of the pharmacological basis of anti-inflammatory agents and anti-coagulants.

For a full understanding of the process of infection, it is necessary to have an appreciation of the range of pathogens and injuries with which the body must cope. Therefore this unit of study examines the structure and function of pathogenic microorganisms (including bacteria, fungi, protists, and viruses, etc). The response of the body to pathogen invasion is studied by discussion of both molecular and cellular immune responses. In particular, this gives students an appreciation of the structure, production and diversity of antibodies, the processing of antigens, operation of the complement system and recognition and destruction of invading cells. This allows students to appreciate the basis of derangements of the immune system and the mechanism of action of immuno-modulatory drugs.

Practical classes allow students to obtain experience in, and an understanding of, a range of techniques in classical and molecular virology, bacteriology and immunology. In addition, the practical

sessions draw widely on, and nurture, the generic skills taught in preceding units of study.

BMED2808
Disease in Society

Credit points: 6 **Teacher/Coordinator:** Helen Agus **Session:** Semester 2 **Classes:** Two 1 hour lectures per week; five hours of tutorials or practicals every fortnight. **Prerequisites:** 42 credit points of Junior Bachelor of Medical Science units of study **Prohibitions:** All Intermediate level units offered by the Schools of Molecular and Microbial Biosciences, Medical Sciences and BIOL(2006/2906) and BIOL(2016/2916) **Assessment:** One 2hr theory exam; three in-semester assessments.

Disease in Society seeks to integrate basic knowledge of important diseases, ranging from metabolic diseases through airways and heart disease and cancer to infections. About half the unit considers infectious diseases: viral, bacterial, fungal and parasitic. The other half looks at inherited disorders, cardio-respiratory disorders such as angina, heart failure and asthma. Society's approaches to dealing with these diseases - whether by pharmacological intervention, counselling or lifestyle change are discussed. Putting the disease in the relevant social context is emphasized in all aspects of the unit.

The impact of bacteria and viruses on individuals and society is taught with reference to specific infectious diseases (eg influenza, polio, herpes, STDs, etc) and this leads into an introduction of epidemiology. Included in the discussion of the way in which these organisms cause and transmit disease is a consideration of how antibiotics and anti-viral drugs work and how microbes can become drug resistant.

Practical classes are designed to complement the lectures and provide a 'hands-on' experience in investigating disease. Also included are tutorial sessions in which hospital microbiologists guide students though clinical case studies and in an integrated session, students examine the infection, immunity and pathology of tuberculosis. These sessions are designed to nurture an appreciation of the importance of an integrative approach to the study of disease in today's society. The generic skills taught in preceding units of study are further reinforced.

Bachelor of Medical Science Senior Core units of study

Students are required to complete at least 36 credit points of Senior units of study chosen from the core subject areas of Anatomy and Histology, Biology (Genetics), Biochemistry, Cell Pathology, Immunology, Infectious diseases, Microbiology, Pharmacology and Physiology, as listed in Table IV. Descriptions are listed here and under the relevant department headings in this chapter where the units are offered by other Schools/Departments in the faculty.

INFD3012
Infectious Diseases

Credit points: 6 **Teacher/Coordinator:** A/Prof. Colin Harbour **Session:** Semester 2 **Classes:** One 1 hour lecture and one 1 hour tutorial and one 2 hour practical and one 2 hour case study or theme session a week. **Prerequisites:** 42 cedit points of intermediate BMED units including BMED2807. **Assumed knowledge:** Intermediate microbiology, immunology, molecular biology and genetics. **Assessment:** Formal examination: one 2 hour exam, 60% Progressive assessment: includes: 2000w essay, tutorial case presentation, poster presentation, 40%.

Note: The completion of MICR3011 is strongly recommended prior to undertaking this course.

Infectious diseases occur as a result of interactions between a host and a microbial parasite. This unit of study will explain how infectious agents interact with human hosts at the molecular, cellular, individual patient and community levels to cause diseases and how the hosts attempt to combat these infections. The unit will be taught by the discipline of Infectious Diseases and Immunology of the Department of Medicine within the Central Clinical School, Faculty of Medicine with involvement of associated clinical and research experts who will contribute lectures and theme sessions on their own special interests. The primary learning vehicle in this unit will be the case study involving three or four cases per week on the diseases theme of the week, e.g. Pneumonia in week 1, wound infections in week 2 etc. Students are strongly recommended to complete MICR3011 before enrolling in this unit.

Textbooks
Medical Microbiology. Edited by Cedric Mims et al. Mosby, 2004. ISBN 07234-3260-0

Bachelor of Medical Science Honours

The Bachelor of Medical Science Honours degree is governed by regulations of the Senate and of the Faculty of Science as described in chapter 5. An Honours degree may be taken by students of sufficient merit in any of the Departments offering Senior level core units. Entry to Honours units is regulated by individual Departments and the exact detail of Honours programs also varies from Department to Department. Students interested in undertaking Honours should consult the relevant Department for further details.

Medical Science Honours - Infectious Diseases Honours

The Honours program in Infectious Diseases provides the opportunity for full-time research on a proposed project supervised by a staff member expert in that field. Experimental research, a seminar and a thesis constitute the major part of the program and of assessment. Guidance in research techniques is given in training programs covering experimental design, data analysis, written and oral communication and critical appraisal of the literature. Student contributions to this program are also assessed. In addition, a supplementary seminar program keeps students informed and abreast of wider issues in infectious diseases.

Applying for admission to Infectious Diseases Honours

Students are invited to apply for Honours enrolment during semester two of the year preceding Honours. Applicants should consult the Honours coordinator in the first instance. A list of possible research topics is provided, and students select projects of interest, speak with prospective supervisors and apply for permission to enrol, before the end of semester two. Within the constraints of availability, an attempt is made to assign students to the project of their choice. Usually Honours candidates will have achieved a Credit in the senior unit Infectious Diseases and will also have successfully completed Senior study in Biochemistry, Microbiology, or Virology. Usually Honours candidates will have an overall SCIWAM of 65 or greater. Departmental permission is required for enrolment.

Medicinal Chemistry

Medicinal Chemistry is an interdisciplinary major offered within the BSc. It is concerned with the chemistry underpinning the design, discovery and development of new pharmaceuticals, and is jointly administered by the School of Chemistry and the Department of Pharmacology. Medicinal Chemistry examines why some types of chemical compounds are toxic, why some have therapeutic value, and the mode of drug action at the molecular level. A major in Medicinal Chemistry includes the study of natural and synthetic compounds of biological and medicinal importance, how molecules interact with each other and how specific molecules can influence metabolic pathways in living organisms. A student seeking to complete this major will study Junior and Intermediate Chemistry, and also Intermediate Pharmacology, as prerequisites for the Senior units of study. Refer to Table 1 for an enrolment guide and to entries under the contributing schools and departments for unit descriptions.

Microbiology

The discipline of Microbiology in the School of Molecular and Microbial Biosciences offers units of study that equip students for a career in Microbiology in fields of health, industry and basic research.In addition, it provides introductory units of study to students of agriculture, pharmacy and science. These units of study will help students who wish to specialise in related fields where microorganisms are often used in studying life processes, e.g. biochemistry, genetics and botany.

Microbiology Intermediate units of study

MICR2021
Microbial Life

Credit points: 6 **Teacher/Coordinator:** Deborah Blanckenberg **Session:** Semester 1 **Classes:** Two 1 hour lectures per week, plus an additional six 1 hour tutorials per semester. Eleven 3 hour practicals per semester. **Prerequisites:** 6cp of Junior Biology and (6cp of MBLG (1001 or 1901) or MBLG2901 or PLNT2001 or PLNT2901) and 6cp of Junior Chemistry **Prohibitions:** MICR2921, MICR2024, MICR2001, MICR2901, MICR2003, MICR2007, MICR2011, MICR2909 **Assessment:** One 2 hour theory exam, continuous assessment in practicals, two assignments, two quizzes, practical assignment excercises.

Note: Students are very strongly recommended to complete MICR (2021 or 2921 or 2024) before enrolling in MICR2022 in Semester 2. For progression on to Senior Microbiology units, students must also complete MBLG (1001 or 1901) or PLNT (2001 or 2901).

Microorganisms are by far the most ubiquitous organisms on the planet, and underpin healthy ecosystems through nutrient recycling and biodegradation, as well as providing many aspects of plant and animal nutrition. They are used in many industrial processes such as producing enzymes, vitamins and antibiotics, and in the manufacture of some foods and beverages. Microorganisms can also cause problems, however, such as human, animal and plant diseases, poisoning, pollution and spoilage. The small size of most microrganisms means special techniques are required to view, measure, classify and identify them.

In this unit of study, the diversity of microbial life, including viruses, bacteria, fungi, algae and protozoa, and their importance to humans, are introduced. The course is designed for the students wishing to major in microbiology as well as those requiring microbial skills while specializing in related fields, such as molecular biology.

Theoretical aspects of microbiology are supplemented with laboratory classes that teach the safe handling and viewing of microrganisms, and draw on research in microbiology laboratories.

Textbooks
Willey et al. (2007) Prescott, Harley, and Klein's Microbiology. 7th ed, WCB/McGraw-Hill

MICR2921
Microbial Life (Advanced)

Credit points: 6 **Session:** Semester 1 **Classes:** Two 1 hour lectures per week, plus an additional six 1 hour tutorials and three 1 hour seminars per semester. Eleven 3 hour practicals per semester. **Prerequisites:** (6 credit points of Junior Biology) and (6 credit points of MBLG (1001 or 1901) or MBLG2901 or PLNT2001 or PLNT2911) and 6 credit points of Junior Chemistry. Distinction grade required in at least one of Junior Biology or MBLG1001 or MBLG1901 or PLNT2001 or PLNT2911. **Prohibitions:** MICR2021, MICR2024, MICR2001, MICR2901, MICR2003, MICR2007, MICR2011, MICR2909 **Assessment:** One 2 hour theory exam, continuous assessment in practical, two assignments, two quizzes, practical assignment excercises, essay.

Note: Students are very strongly advised to complete MICR (2021 or 2921 or 2024) before enrolling in MICR2022 or 2922 in Semester 2. For progression on to Senior Microbiology units, students must also complete MBLG (1001 or 1901) or PLNT(2001 or 2901).

This unit of study is based on MICR2021 with three additional seminars on advanced aspects of the material covered in MICR2021. The content and nature of this component may vary from year to year.

Textbooks
As for MICR2021

MICR2022
Microbes in Society

Credit points: 6 **Teacher/Coordinator:** Dr Deborah Blackenberg **Session:** Semester 2 **Classes:** Two 1 hour lectures per week, plus an additional four 1 hour tutorials per semester. Eleven 3 hour practicals per semester **Prerequisites:** 6 of Junior Biology and (6 of MBLG (1001 or 1901) or PLNT2001 or PLNT2911) and 6 of Junior Chemistry **Prohibitions:** MICR2922, MICR2002, MICR2902, MICR2004, MICR2008, MICR2012, MICR2909 **Assumed knowledge:** MICR (2021 or 2921 or 2024 or 2026) **Assessment:** One 2 hour theory exam, continuous assesment in practicals, assignment, two quizzes, practical assessment exercises.

Note: Students are very strongly advised to complete MICR (2021 or 2921 or 2024) before enrolling in MICR2022 in Semester 2. For progression on to Senior Microbiology units, students must also complete MBLG (1001 or 1901) or PLNT (2001 or 2901).

Pathogenic microbes cause infectious diseases of humans, animals and plants, and inflict enormous suffering and economic losses. Beneficial microbes are important contributors to food production, agriculture, biotechnology, and environmental processes. The aims of MICR2022/2922 are to explore the impacts and applications of microbes in human society and in the environment at large, and to teach skills and specialist knowledge in several key areas of microbiology. Medical Microbiology lectures will cover bacterial, viral, and fungal pathogens, and will introduce the concepts of epidemiology, transmission, pathogenicity, virulence factors, host/parasite relationships, host defences, prevention of disease, and antibiotic types, functions, and resistance. Lecture topics in other areas include Food (preservation, spoilage, poisoning, industrial context), Industrial (fermentation, traditional and recombinant products, bioprospecting), Environmental (nutrient cycles, atmosphere, wastewater, pollution, biodegradation) and Agricultural (nitrogen fixation, plant pathogens, biocontrols). The laboratory sessions are integrated with the lecture series and are designed to give students practical experience in isolating, identifying and manipulating microorganisms. BSc or BSc (Advanced) students who have completed MICR2021/2921 and MICR2022/2922 may be offered the opportunity to undertake work experience for approx one month in a local microbiology laboratory (hospital, industrial, university etc) subject to availability of places.

Textbooks
Willey et al. (2007) Prescott, Harley and Klein's Microbiology. 7th ed, WCB/McGraw-Hill.

MICR2922
Microbes in Society (Advanced)

Credit points: 6 **Teacher/Coordinator:** Dr Deborah Blanckenberg **Session:** Semester 2 **Classes:** Two 1 hour lectures per week, plus an additional four 1 hour tutorials and four 1 hour seminars per semester per semester. Eleven 3 hour practicals per semester. **Prerequisites:** 6 credit points of Junior Biology and (6 credit points of MBLG1001 or MBLG1901 or PLNT2001 or PLNT2901) and 6 credit points of Junior Chemistry. Distinction grade required in at least one of Junior Biology or MBLG1001 or MBLG1901 or PLNT2001 or PLNT2911 **Prohibitions:** MICR2022, MICR2002, MICR2902, MICR2004, MICR2008, MICR2012, MICR2909 **Assumed knowledge:** MICR (2021 or 2921 or 2024 or 2026) **Assessment:** One 2 hour theory exam, continuous assessment in practicals, assignment, two quizzes, practical assessment excercises, essay

Note: Students are very strongly advised to complete MICR (2021 or 2921 or 2024) before enrolling in MICR2922 in Semester 2. For progression on to Senior Microbiology units, students must also complete MBLG (1001 or 1901) or PLNT (2001 or 2901).

This unit of study is based on MICR2022 with four additional seminars on advanced aspects of the material covered in MICR2022. The content and nature of this component may vary from year to year.

Textbooks
As for MICR2022

MICR2024
Microbes in the Environment

Credit points: 6 **Teacher/Coordinator:** Dr Andrew Holmes **Session:** Semester 2 **Classes:** Two 1 hour lectures and one 3 hour practical per week. **Prerequisites:** 30 credit points of Junior Science or Faculty of Agriculture, Food and Natural Resource units including 6 credit points of Junior Biology. **Prohibitions:** MICR2021, MICR2921, MICR2001, MICR2901, MICR2003, MICR2007, MICR2011, MICR2909 **Assessment:** One 2 hour exam, fortnightly practical quiz, project report and continuous practical assessment.

Note: Students are very strongly recommended to complete MICR (2021 or 2921 or 2024) before enrolling in MICR2922 in Semester 2. For progression on to Senior Microbiology units, students must also complete MBLG(1001 or 1901) or PLNT (2001 or 2901).

This unit introduces the diversity of microbes found in soil, water, air, plant and animal environments. Through an examination of their physiology and genetics it explores their interactions with plants, animals and each other, and their roles as decomposers and recyclers in the environment. The soil is a rich microbial environment, and the concept of soil health and its relationship to plant growth is discussed. Practical classes introduce techniques and skills in isolating, quantifying and culturing microbes, designing and interpreting experiments to study microbial growth, and in preparing and presenting

data. Students will complete a short project that is relevant to agricultural microbiology.

Textbooks

Atlas RM and Bartha R (1997) Microbial Ecology: Fundamentals and applications. 4th Edition. Benjamin/Cummings Scientific Publishing, Menlo Park, CA

Microbiology Senior units of study

MICR3011
Microbes in Infection

Credit points: 6 **Teacher/Coordinator:** Helen Agus **Session:** Semester 1 **Classes:** Two 1 hour lectures per week eight 3 hour practical sessions and three 2 hour clinical tutorials per semester **Prerequisites:** At least 6 credit points of MBLG units and MICR (2022 or 2922 or 2002 or 2902). For BMedSc students: 42 credit points of Intermediate BMED units including BMED (2807 and 2808). For BScAgr students: PLNT (2001 or 2901) and MICR (2022 or 2922). **Prohibitions:** MICR3911, MICR3001, MICR3901 **Assessment:** One 2 hour exam, continuous assessment, practical work

This unit is designed to further develop an interest in, and understanding of, medical microbiology from the introduction in Intermediate Microbiology. Through an examination of microbial structure, virulence, body defences and pathogenesis, the process of acquisition and establishment of disease is covered. The unit is divided into three themes: 1. Clinical Microbiology: host defences, infections, virulence mechanisms; 2. Public health microbiology: epidemiology, international public health, transmission, water and food borne outbreaks; 3. Emerging and re-emerging diseases: the impact of societal change with respect to triggering new diseases and causing the re-emergence of past problems, case studies. The practical component is designed to enhance students' practical skills and to complement the lecture series. Clinical tutorial sessions underpin and investigate the application of the material covered in the practical classes.

Textbooks

Murray PR et al. Medical Microbiology. 5th ed., Mosby, 2005.

MICR3911
Microbes in Infection (Advanced)

Credit points: 6 **Teacher/Coordinator:** Helen Agus **Session:** Semester 1 **Classes:** Two 1 hour lectures per week, plus an additional six 1 hour tutorials per semester; eight 3 hour practical sessions and three 2 hour clinical tutorials per semester. **Prerequisites:** At least 6 credit points of MBLG units and Distinction in MICR (2022 or 2922 or 2002 or 2902). For BMedSc students: 42 credit points of Intermediate BMED units including in BMED (2807 or 2808) with a Distinction in one of these two. For BScAgr students: PLNT (2001 or 2901) and MICR (2022 or 2922) including one Distinction. **Prohibitions:** MICR3011, MICR3001, MICR3901 **Assessment:** One 2 hour exam, continuous assessment, practical work, choice of one essay or one oral presentation.

This unit is available to students who have performed well in Intermediate Microbiology. MICR3911 is based on MICR3011 with a series of additional tutorials to extend students beyond the core material. Consequently, the unit of study content may vary from year to year.

Textbooks

Murray PR.et al. Medical Microbiology. 5th ed., Mosby, 2005.

MICR3012
Molecular Biology of Pathogens

Credit points: 6 **Teacher/Coordinator:** A/Prof Dee Carter **Session:** Semester 2 **Classes:** Two 1 hour lectures per week, six 5 hour practicals plus two practical-based tutorials per semester. **Prerequisites:** At least 6 credit points of MBLG units and MICR (2022 or 2922 or 2002 or 2902). For BMedSc students: 42 credit points of Intermediate BMED units including BMED (2802, 2807 and 2808). For BScAgr students: PLNT (2001 or 2901) and MICR2024. **Prohibitions:** MICR3912, MICR3002, MICR3902, MICR3003, MICR3903, MICR3004, MICR3904 **Assessment:** One 2 hour exam, continuous assessment, practical report.

This unit of study is designed to provide an understanding of the virulence mechanisms underlying microbial disease at the molecular level. The following topics will be covered: pathogenic processes and the molecular basis of adhesion, toxin production, cell invasion and immune evasion in bacteria; the molecular basis of antibiotic action and resistance and modern techniques used in the study of microbial diseases.

The complementary practical course teaches fundamental techniques in molecular microbiology through a molecular epidemiological investigation of a food poisoning outbreak.

Textbooks

Salyers AA and Whitt DD Bacterial Pathogenesis. A Molecular Approach. 2nd ed. ASM. 2002

MICR3912
Molecular Biology of Pathogens (Adv)

Credit points: 6 **Teacher/Coordinator:** A/Prof Dee Carter **Session:** Semester 2 **Classes:** Two 1 hour lectures per week plus two additional 1 hour lectures per semester. Six 5 hour practicals plus two practical-based tutorials. **Prerequisites:** At least 6 credit points of MBLG units and Distinction in MICR (2022 or 2922 or 2002 or 2902). For BMedSc students: 42 credit points of Intermediate BMED units including BMED (2802 or 2807 or 2808) with a Distinction in one of these three. For BScAgr students: PLNT (2001 or 2901) and MICR2024 including one Distinction. **Prohibitions:** MICR3012, MICR3002, MICR3902, MICR3003, MICR3903, MICR3004, MICR3904 **Assessment:** One 2 hour exam, continuous assesment, practical report, essay on advanced lecture topics.

This unit is available to students who have performed well in Intermediate Microbiology and is based on MICR3012 with two additional advanced lectures related to the research interests in the Discipline of Microbiology that are relevant to the molecular biology of pathogens. The assessment component specific to MICR3922 is an essay researched from the scientific literature on a topic introduced in the advanced lecture course.

Students taking both MICR3922 and MICR3912 may be eligible to undertake a research project (~60 h) in a Microbiology lab (School of MMB) to replace the practical component of both courses. Research projects are assessed by lab performance, lab books and an oral presentation. Allocation to a research project is based on academic merit as places are limited.

Textbooks

Salyers AA and Whitt DD Bacterial Pathogenesis. A Molecular Approach. 2nd ed. ASM. 2002 ISBM 155581-171-X

MICR3022
Microbial Biotechnology

Credit points: 6 **Teacher/Coordinator:** Dr Nick Coleman **Session:** Semester 2 **Classes:** Two 1 hour lectures per week and seven 4 hour practicals. **Prerequisites:** At least 6 credit points of MBLG units and 6 credit points of Intermediate MICR units. For BMedSc students: 42 credit points of Intermediate BMED units including BMED (2802 and 2807). For BScAgr students: PLNT (2001 or 2901) and MICR2024. **Prohibitions:** MICR3922, MICR3002, MICR3902 **Assessment:** One 2 hour theory exam, practical reports, lab book and skills assessment.

Microbes are central to biotechnology as chemical factories, as sources of enzymes, as cloning hosts, and as providers of cloning vectors. The lecture and prac courses in MICR3022/3922 aim to teach basic principles and methods in microbiology in the context of applications in biotechnology - including industrial, medical and environmental biotech. A special focus will be on the importance of microbial diversity as a source of enzyme diversity for biotechnology. The course revolves around three themes, summarized as metabolites, enzymes, and communities. Topic areas to be covered in lectures include production of small molecules (alcohols and antibiotics), production of macromolecules (protein expression, recombinant DNA), and management of microbial proeteins in plants and animals (principles, methods, risks), and management of microbial communities (gut microbes, wastewater treatment, bioprospecting). Techniques covered in lectures include fermentation, mutation, making and screening clone libraries, directed evolution, heterologous expression, metabolic engineering, environmental metagenomics, microarrays, and high throughput screening. In one pract project, students will purify (DNa polymerase) from recominant E.coli cells, and test the enzyme for its ability to catalyze polymerase chain reaction (PCR). In the second prac project, students will isolate hydrocarbon-oxidizing bacteria from soil, and assess their ability to produce a useful metabolite (the blue dye indigo).

MICR3922
Microbial Biotechnology (Advanced)

Credit points: 6 **Teacher/Coordinator:** Dr N Coleman **Session:** Semester 2 **Classes:** Two 1 hour lectures per week, plus two additional 1 hour lectures per semester. Eight 4 hour practicals per semester. **Prerequisites:** At least 6 credit points of MBLG units and Distinction in 6 credit points of Intermediate MICR units. For BMedSc students: 42 credit points of Intermediate BMED units including BMED (2802 and 2807) with a Distinction in at least one of these two. For BScAgr students: PLNT (2001 or 2901) and MICR2024 including one Distinction. **Prohibitions:** MICR3022, MICR3002, MICR3902 **Assessment:** One 2 hour exam, practical report, lab book, prac skills (continuous), essay on advanced lecture topic.

This unit is available to students who have performed well in Intermediate Microbiology and has the same core components as MICR3022. In addition, MICR3922 includes two advanced lectures related to the research interest in the Discipline of Microbiology that are relevant to microbial biotechnology. The assessment component specific to MICR3922 is an essay researched from the scientific literature on a topic introduced in the advanced lecture course. Students taking both MICR3922 and MICR3912 may be eligible to undertake a research project (~60h) in a Microbiology lab (School of MMB) to replace the practical component of both courses. Research projects are assessed by lab peformance, lab book and an oral presentation. Allocation to a research project is based on academic merit as places are limited.

VIRO3001
Virology

Credit points: 6 **Teacher/Coordinator:** Dr Tim Newsome **Session:** Semester 1 **Classes:** Two 1 hour lectures per week, five 2 hour tutorials and six 4 hour practicals per semester. **Prerequisites:** At least 6 credit points of MBLG units and at least 6 credit points in Intermediate MICR or BCHM or BIOL or IMMU or PCOL or PHSI or PLNT units. For BMedSc students: 42 credit points of Intermediate BMED units including BMED2802. For BScAgr students: PLNT (2001 or 2901) and MICR2024. **Prohibitions:** VIRO3901 **Assumed knowledge:** MICR (2021 or 2921 or 2022 or 2922) **Assessment:** One 2 hour exam, practical work, group presentations

Note: Students are very strongly advised to complete VIRO (3001 or 3901) before enrolling in VIRO3002 Medical and Applied Virology in Session 2.

Viruses are some of the simplest biological machinery known, being completely dependent on hosts for their replication, yet they are also the etiological agents for some of the most important diseases in humans. New technologies that have revolutionised the discovery of new viruses are also revealing a hitherto unappreciated abundance and diversity in the ecosphere, and a wider role in human health and disease. Developing gene technologies have enabled the use of viruses as therapeutic agents, in novel vaccine approaches, gene delivery and in the treatment of cancer. This unit of study is designed to introduce students who have a basic understanding of molecular biology to the rapidly evolving field of virology. Viral infection in plant and animal cells and bacteria is covered by an examination of virus structure, genomes, gene expression and replication. Building upon these foundations, this unit then progresses to examine host-virus interactions, pathogenesis, cell injury, the immune response and the prevention and control of infection. The structure and replication of sub-viral agents: viroids and prions, and their role in disease are also covered. The practical component provides hands-on experience in current diagnostic and research techniques such as molecular biology, cell culture, ELISA and immunoblot and is designed to enhance the students' practical skills and complement the lecture series. Tutorials and case studies cover a range of topical issues and provide a forum for students to develop their communication skills.

Textbooks
Will be advised

VIRO3901
Virology (Advanced)

Credit points: 6 **Teacher/Coordinator:** Dr Tim Newsome **Session:** Semester 1 **Classes:** Two 1 hour lectures per week, plus an additional five 1 hour lectures per semester; five 2 hour tutorials and six 4 hour practicals per semester. **Prerequisites:** At least 6 credit points of MBLG units and at least 6 credit points including one Distinction in Intermediate MICR or BCHM or BIOL or IMMU or PCOL or PHSI or PLNT units. For BMedSc students: 42 credit points of Intermediate BMED units including Distinction in BMED2802. For BScAgr students: PLNT (2001 or 2901) and MICR2024 including one Distinction. **Prohibitions:** VIRO3001 **Assumed knowledge:** MICR (2021 or 2921 or 2022 or 2922) **Assessment:** One 2.5 hour exam, continuous assessment, practical work, group presentations.

Note: Students are very strongly advised to complete VIRO (3001 or 3901) before enrolling in VIRO3002 Medical and Applied Virology in Session 2.

This unit is available to students who have performed well in Intermediate Microbiology and is based on VIRO3001 with a series of additional lectures related to the research interests in the Discipline. Consequently, the unit of study content may change from year to year.

Textbooks
Will be advised

VIRO3002
Medical and Applied Virology

Credit points: 6 **Teacher/Coordinator:** Dr Belinda Herring **Session:** Semester 2 **Classes:** One 2 hour lecture per week; one 2 hour tutorial and one 4 hour practical per fortnight. **Prerequisites:** 6 CP MBLG units and at least 6 CP from Intermediate MICR or BCHM or BIOL or IMMU or PCOL or PHSI units. For BMedSc Students: 42 credit points of Intermediate BMED units including BMED2807. **Assumed knowledge:** Intermediate microbiology, immunology, molecular biology and genetics. **Assessment:** Formal examination, progressive assessment, presentation, 2000 word essay, practical assignment.

Note: Students are very strongly recommended to complete VIRO(3001 or 3901) before enrolling in VIRO3002 Medical and Applied Virology in Semester 2.

This unit of study explores the way viruses invade cells, infect individual patients and spread in the community. Host/Virus interactions will also be described with a focus on the viral mechanisms that have evolved to combat and/or evade host defence systems. These features will be used to explain the symptoms, spread and control of particular human diseases ranging from the common cold to HIV. The unit will be taught by the Infectious Diseases and Immunology Unit of the Department of Medicine with the involvement of associated clinical and research experts who will contribute lectures on their own special interests and with contributions from the discipline of Microbiology. In the practical classes students will have the opportunity to develop their skills in performing and interpreting the methods currently used in diagnostic and research virology. In the tutorials emerging problems as diverse as SARS and liver cancer will be analysed in the light of the concepts and knowledge being studied in the course.

Textbooks
FLINT, SJ et al. Principles of Virology. ASM Press. 2004. ISBN 1-55581-259-7

Microbiology Honours

During the Honours year, students will be involved in a research program to produce a thesis under the direction of a supervisor. A seminar at the end of the year will also be given to provide a summary of the research project. Students are also expected to broaden their general knowledge of Microbiology through attendance at research seminars and through a coursework component consisting of six tutorials during their first semester which will cover diverse aspects of the subject and an exam based on the critical evaluation of scientific manuscripts. An expression of interest in Honours is required from students before the Honours year, on a form to be lodged with the Honours Coordinator. Entry into the Honours year is usually dependent on an average of Credit level performance in Senior Microbiology units of study. Additionally, strong students with related training may be admitted by permission of the Head of School.

Molecular Biology and Genetics

Molecular Biology and Genetics units of study in at Junior and Intermediate level will be taught by staff from the School of Molecular and Microbial Biosciences and the School of Biological Sciences. The Junior unit, MBLG1001, and the Intermediate unit, MBLG2071/2971, are coordinated by the School of Molecular and Microbial Biosciences, while MBLG 2072/2972 is coordinated by the School of Biological Sciences.

MBLG1001
Molecular Biology and Genetics (Intro)

Credit points: 6 **Teacher/Coordinator:** Dr Dale Hancock **Session:** Semester 2 **Classes:** Two 1 hour lectures per week; one 1 hour tutorial and one 4 hour

practical per fortnight. **Prohibitions:** AGCH2001, BCHM2001, BCHM2101, BCHM2901, MBLG2101, MBLG2901, MBLG2001, MBLG2111, MBLG2771, MBLG2871, MBLG1901 **Assumed knowledge:** 6 credit points of Junior Biology and 6 cp of Junior Chemistry **Assessment:** One 2.5 hour exam, in-semester skills test and assignments

The lectures in this unit of study introduce the "Central Dogma" of molecular biology and genetics -i.e., the molecular basis of life. The course begins with the information macro-molecules in living cells: DNA,RNA and protein, and explores how their structures allow them to fulfill their various biological roles. This is followed by a review of how DNA is organised into genes leading to discussion of replication and gene expression (transcription and translation). The unit concludes with an introduction to the techniques of molecular biology and, in particular, how these techniques have led to an explosion of interest and research in Molecular Biology. The practical component complements the lectures by exposing students to experiments which explore the measurement of enzyme activity, the isolation of DNA and the 'cutting' of DNA using restriction enzymes. However, a key aim of the practicals is to give students higher level generic skills in computing, communication, criticism, data analysis/evaluation and experimental design.

Textbooks
Clarke, D. Molecular Biology. Elsevier 2005.

MBLG1999
Molecular Biology & Genetics Seminar A

Session: Semester 2 **Classes:** Four 1 hour seminars per semester. **Corequisites:** MBLG1001 or MBLG1901 **Assessment:** There will be no assessment for this unit.

Note: Only available in the BSc(MBG) and MBLG1901

This unit consists of four introductory molecular biology and genetics research based seminars.

MBLG2071
Molecular Biology and Genetics A

Credit points: 6 **Teacher/Coordinator:** Ms Vanessa Gysbers **Session:** Semester 1 **Classes:** Two 1 hour lectures per week; one 1 hour tutorial and one 4 hour practical per fortnight. **Prerequisites:** MBLG1001 or MBLG1901 and 12 CP of Junior Chemistry. **Prohibitions:** MBLG2971, MBLG2771, MBLG2871, MBLG2001, MBLG2101, MBLG2901, MBLG2111, PLNT2001, AGCH2001, BCHM2001, BCHM2101, BCHM2901 **Assessment:** One 2.5 hour exam, practical work, laboratory reports.

Note: Students enrolled in the combined BAppSc (Exercise and Sport Science)/BSc(Nutrition) must have completed all Junior units for this course prior to enrolling in this unit.

This unit of study extends the basic concepts introduced in MBLG1001/1901 and provides a firm foundation for students wishing to continue in the molecular biosciences as well as for those students who intend to apply molecular techniques to other biological or medical questions. The unit explores the regulation of the flow of genetic information in both eukaryotes and prokaryotes. The central focus is on the control of replication, transcription and translation and how these processes can be studied and manipulated in the laboratory. The processes of DNA mutation and repair are also discussed. Experiments in model organisms are presented to illustrate current advancements in the field, together with discussion of work carried out in human systems and the relevance to human genetic diseases. The tools of molecular biology are taught within the context of recombinant DNA-cloning - with an emphasis on essential knowledge required to use plasmid vectors. The methods of gene introduction (examples of transgenic plants and animals) are also discussed. Other techniques include PCR methodology and its use for cloning specific genes and detection of polymorphisms, separating DNA fragments by gel electrophoresis and analysis of macromolecules by Southern, Northern & Western blotting. In the genomics section, topics include assigning genes to specific chromosomes, high resolution chromosome mapping, DNA markers, physical mapping of genomes as well as DNA and genome sequencing methods and international projects in genome mapping.

The practical course complements the theory and builds on the skills learnt in MBLG1001. Specifically students will: use spectrophotometry for the identification and quantification of nucleic acids, explore the lac operon system for the investigation of gene expression control, perform PCR analysis. As with MBLG1001, strong emphasis is placed on the acquisition of generic and technical skills.

Textbooks
Watson, J et al. Molecular Biology of the Gene. 5th edition. Pearson. 2004 or 6th edition Pearson, 2008

MBLG2971
Molecular Biology and Genetics A (Adv)

Credit points: 6 **Teacher/Coordinator:** Ms. Vanessa Gysbers **Session:** Semester 1 **Classes:** Two 1 hour lectures per week; one 1 hour tutorial and one 4 hour practical per fortnight. **Prerequisites:** 12 credit points of Junior Chemistry and Distinction in MBLG (1001 or 1901) **Prohibitions:** MBLG2071, MBLG2771, MBLG2871, MBLG2001, MBLG2101, MBLG2901, MBLG2111, PLNT2001, AGCH2001, BCHM2001, BCHM2101, BCHM2901 **Assessment:** One 2.5 hour exam, practical work, laboratory reports.

Note: Students enrolled in the combined BAppSc (Exercise and Sport Science)/BSc(Nutrition) must have completed all Junior units for this course prior to enrolling in this unit.

Extension of concepts presented in MBLG2071 which will be taught in the context of practical laboratory experiments.

Textbooks
Watson, J et al. Molecular Biology of the Gene. 5th edition. Pearson. 2004.

MBLG2072
Molecular Biology and Genetics B

Credit points: 6 **Session:** Semester 2 **Classes:** Two 1 hour lectures per week; one 2-3 hour practical per week. One tutorial every second week. **Prerequisites:** BIOL (1001 or 1101 or 1901 or 1911) and MBLG (1001 or 1901) and 12 credit points of Junior Chemistry **Prohibitions:** MBLG2972, MBLG2102, MBLG2002, MBLG2902 **Assumed knowledge:** One of MBLG2071, MBLG2771, MBLG2001, MBLG2871, MBLG2971, MBLG2901 **Assessment:** One 2 hour exam (50%), laboratory reports and quizzes (50%).

This unit of study builds on the concepts introduced in MBLG2071 and shows how modern molecular biology is being applied to the study of the genetics of all life forms from bacteria through to complex multicellular organisms including plants, animals and humans. Lecture topics include classical Mendelian genetics with an emphasis on its molecular basis, cytogenetics, bacterial genetics and evolution, molecular evolution, bioinformatics and genomics, developmental genetics and the techniques and applications of molecular genetics. Practical: In laboratory exercises you will use a variety of prokaryotic and eukaryotic organisms to illustrate aspects of the lecture material, while developing familiarity and competence with equipment used in molecular techniques, microscopes, computers and statistical tests. Generic skills are developed in report writing, oral presentation, problem solving and data analysis. This is a core Intermediate unit of study in the BSc (Molecular Biology and Genetics) degree program.

MBLG2972
Molecular Biology and Genetics B (Adv)

Credit points: 6 **Session:** Semester 2 **Classes:** Two 1 hour lectures per week; one 2-3 hour practical per week. One tutorial every second week. **Prerequisites:** Distinction in one of MBLG2071, MBLG2771, MBLG2001, MBLG2871, MBLG2971, MBLG2901 **Prohibitions:** MBLG2072, MBLG2102, MBLG2002, MBLG2902 **Assessment:** One 2 hour exam (50%), laboratory reports and quizzes (50%).

Qualified students will participate in alternative components of MBLG2072, Molecular Biology and Genetics B. The content and nature of these components may vary from year to year.

MBLG3999
Molecular Biology & Genetics Seminar B

Session: Semester 2 **Classes:** Four 1 hour seminars (available by invitation only from MBLG program chair) **Assessment:** There will be no assessment for this unit.

Note: Only available to students enrolled in the BSc(MBG) degree or the BCHM3972 course

This unit consists of four advanced molecular biology and genetics research based seminars.

Molecular Biotechnology

The following units of study are only available to students in the Bachelor of Science (Molecular Biotechnology) degree. Please consult degree information in chapter 4, and the relevant Departments/Schools entries in this chapter for descriptions of other units of study required for this degree.

MOBT2102
Molecular Biotechnology 2

Credit points: 6 **Teacher/Coordinator:** Dr Matthew Todd **Session:** Semester 2 **Classes:** Three 1 hour lectures and one 1 hour tutorial per week. **Prerequisites:** 12 credit points of Junior Biology and 12 credit points of Junior Chemistry **Prohibitions:** MOBT2001 **Assessment:** One 2 hour theory exam (70%) and in-semester assessments (30%). NB Students must pass the theory exam to pass the unit overall.

Note: This unit of study is only available to students in enrolled the BSc (Molecular Biotechnology) degree.

The main purpose of this unit of study is to introduce students to the core concepts of modern molecular biotechnology and build a base for future study in this discipline. It assumes students will have knowledge of Molecular Biology and Genetics through previous study of MBLG1001 and MBLG2771/2871 and concurrent study of MBLG2072/2972. It commences with an introduction to the biotechnology revolution and its impact worldwide. Students are then introduced to how large biomolecules are exploited in drug discovery with discussions of structural diversity in macromolecules, the construction of synthetic peptide and oligonucleotide combinatorial libraries, the uses and screening of such libraries in drug discovery together with examples from industry. This unit proceeds with considerations of the chemical synthesis of pharmaceuticals to specific drug targets. Structure-activity relationships, the use of biomolecules such as proteins versus natural products in drug design, the role of DNA as a drug target, and the importance of metals ions are all discussed together with case studies from industry. Issues associated with pharmaceutical stability and metabolism are then described. The unit concludes with an overview of the commercialization of discoveries in science with consideration given to the role of researchers, university and industry interactions, and regulatory and patent issues. This is followed by an appreciation of the societal impact and ethics of biotechnology, including how the industry and researchers interact with, and inform, the public. Guest lecturers will contribute to these presentations to help students develop an appreciation of emerging areas in molecular biotechnology from a broad perspective.

Textbooks
Glick, BR and Pasternak, JJ. Molecular Biotechnology: Principles and Applications of Recombinant DNA. 3rd Edition. ASM Press, Washington.2003. ISBN 1-55581-224-4 (hardcover) or ISBN 1-55581-269-4 (paperback)

MOBT3101
Molecular Biotechnology 3A

Credit points: 6 **Teacher/Coordinator:** Dr. Neville Firth **Session:** Semester 1 **Classes:** Three 1 hour lectures and one 1 hour tutorial per week. **Prerequisites:** MOBT2102 **Prohibitions:** MOBT2002 **Assumed knowledge:** MBLG (2072 or 2972). **Assessment:** One 2 hour theory exam (70%) and in-semester assessments (30%). Students must pass the theory exam to pass the unit overall.

Note: NB: This unit of study is only available to students enrolled in the BSc (Molecular Biotechnology) degree.

This unit of study builds on MOBT2102 and to expand concepts and applications of modern molecular biotechnology. It assumes students have previously been taught molecular biology and genetics through MBLG2072/2972. It commences with the synthesis of commercial products by recombinant microorganisms, including small biological molecules, antibiotics, polymers, nucleic acids and proteins, then leads onto large-scale production of proteins from recombinant microorganisms. Students will be introduced to scaled-up microbial growth and bioreactors, combined with typical large-scale fermentation systems and downstream processing. This will be broadened to an appreciation of yeast and mammalian cells in large-scale production. Examples of major protein-based therapeutics will be examined in detail. The unit introduces students to genome sequencing and technologies, and follows with the impact of proteomics in identifying new drug targets and therapeutics, its interplay with genomics, disease states, quantitative vs. qualitative profiles, and the role of bioinformatics in data and database management. The role of protein structure on function and the engineering of protein structures in briefly described. Agricultural and environmental biotechnology is introduced with a focus on promoting plant growth, the utilisation of starch and cellulose, the application of enzymes in food processing, bioremediation strategies and green manufacturing technologies and the impact heavy metals and pesticides on the environment. Issues facing start-up companies and the commercialisation of discoveries complete the unit.

Textbooks
Glick, BR and Pasternak, JJ. Molecular Biotechnology: Principles and Applications of Recombinant DNA. 3rd Edition, 2003, ASM Press, Washington, ISBN 1-55581-224-4 (hardcover) or ISBN 1-55581-269-4 (paperback)

MOBT3202
Molecular Biotechnology 3B Project

Credit points: 6 **Teacher/Coordinator:** A/Prof Kevin Downard **Session:** Semester 2 **Classes:** 75 hours industry related project over the semester **Prerequisites:** MOBT2002 or MOBT3101 **Prohibitions:** MOBT3002, MOBT3102 **Assessment:** Presentation, project report and essay

Note: This unit of study is only available to students enrolled in the BSc (Molecular Biotechnology) degree.

This Senior unit of study builds on the knowledge gained in earlier units of modern molecular biotechnology. It emphasises applications of molecular biotechnology including product design, research and development, and the importance of recognising industry trends. This will typically involve an industry placement or a detailed industry case study, on-site visits, and interactions with industry partners in association with university staff. To maximize future opportunities, students will learn about funding and research and development. As well as industry-relevant experience, students will research biotechnology kits and technologies.

Textbooks
Glick, BR and Pasternak, JJ. Molecular Biotechnology: Principles and Applications of Recombinant DNA. 3rd Edition, 2003, ASM Press, Washington, ISBN 1-55581-224-4 (hardcover) or ISBN 1-55581-269-4 (paperback)

School of Molecular and Microbial Biosciences

The School brings together the disciplines of Biochemistry, Microbiology, Molecular Biotechnology and Nutrition , with separate study codes BCHM, MICR, MOBT [see Table IE for details of the BSc (Molecular Biotechnology)] and NUTR [see Table IF for details of the BSc (Nutrition)]. Significant contributions are also made to the Intermediate faculty units of study in Molecular Biology and Genetics with study code MBLG [see Table ID for details of the BSc (Molecular Biology and Genetics)] and to the units of study in Molecular Biotechnology [see Table IE for details of the BSc (Molecular Biotechnology)].

Location of unit descriptions

Unit descriptions are located under separate headings in this chapter: Biochemistry (BCHM); Microbiology (MICR); Molecular Biology and Genetics (MBLG); Molecular Biotechnology (MOBT); Molecular Biology and Genetics; Nutrition (NUTR).

Location

The School is located in the Biosciences Biochemistry and Microbiology Building (G08), across near City Road in the Darlington area behind the Wentworth Building.

Nanoscience and Technology

Nanoscience and Technology is an interdisciplinary major offered within the BSc. It is directed at students interested in understanding the emerging science of working and building at and near the molecular level. It incorporates study of the fundamental sciences in order to understand the structure of matter, as well as technological elements of the mechanical properties of materials. Students undertaking this major are strongly encouraged to take suitable units

from the Faculty of Engineering in combination with Physics and Chemistry.

Majoring in Nanoscience and Technology

A student seeking to complete this major should study Physics and Chemistry in their Junior and Intermediate years together with some Engineering and Mathematics. In the Senior year it is possible to focus on two of the three discipline areas, or to continue to study elements of all three. This major may also be seen as a complement to a traditional major in Chemistry or Physics. Refer to Table 1 for an enrolment guide and to entries under the contributing schools and departments for unit descriptions. Engineering units are described in the Engineering Handbook.

Neuroscience

Neuroscience encompasses a diverse range of disciplines that cross traditional subject boundaries. The study of Neuroscience ranges from anatomy to neuronal function; the cellular and molecular biology of the neuron to the complex phenomena of perception; emotion and memory; from the regulation of breathing and blood pressure to movement; developing to ageing; normal cognition to neurodegeneration.

Majoring in Neuroscience

A major in Neuroscience is designed to provide a foundation in the basic biology of the brain as well as the fundamentals of cognition. Students are able to focus their cross-disciplinary studies with a molecular, cellular, anatomical and behavioural concentration. Refer to Table I for an enrolment guide and to entries in specific subject areas for Unit of Study descriptions. A cross-disciplinary major requires careful selection of subjects to fulfill the requirements of the major. Research in Neuroscience is vibrant and an international priority area.

Research in Neuroscience

There are many opportunities for high-achieving students to undertake honours study within the field of Neuroscience. Honours projects are typically undertaken within individual departments: Physiology, Anatomy, Pharmacology, Psychology, Pathology and associated institutes. Students should canvass respective departments during their senior studies for details of projects, admission criteria and enrolment details.

Neuroscience Coordinator

Dr Karen Cullen (Anatomy) is the coordinator for the Neuroscience major. Email: kcullen@anatomy.usyd.edu.au.

Nutrition

The Human Nutrition Unit in the School of Molecular and Microbial Biosciences offers units of study to students enrolled in the Bachelor of Science (Nutrition) degree. Please consult degree information in chapter 4 and Table 1F entries. Check the relevant Department/school entries in this chapter for descriptions of other units of study required for this degree.

NUTR2911
Food Science Introductory (Advanced)

Credit points: 6 **Teacher/Coordinator:** Dr Kim Bell-Anderson **Session:** Semester 1 **Classes:** Three 1 hour lectures and one 2.5 hour practical per week. **Prerequisites:** MBLG(1001 or 1901) and CHEM (1001 or 1101 or 1901 or 1903 or 1108) and CHEM (1002 or 1102 or 1902 or 1904 or 1109) and BIOL (1001 or 1911) and BIOL (1002 or 1003 or 1902 or 1903). For Combined BAppSc (Exercise and Sport Science)/BSc(Nutrition) degree completion of all Junior units in the table of units for this course. **Prohibitions:** NUTR2901 **Assessment:** One 3 hour exam, one 1 hour theory of practical exam, one assignment and 5 quizzes.

This unit of study aims to give a broad appreciation of foods as commodities; that is, the origin, history, cultural and nutritional importance of the major foods for human use. Further, aspects of food processing and cooking that affect the nutritional quality of these foods will be discussed. Food groups covered include animal foods, seafood, cereals, sugars, fats and oils, dairy products, legumes, nuts, vegetables, fruits, herbs and spices and alcohol.

Topics in food science and technology include the principles of food preservation, aspects of the preparation and processing of cereals, dairy products, fats and oils, sugars and starches and meats. Food legislation is discussed as well as food additives, naturally occurring toxicants in foods, food pollutants, food safety, food hygiene and food microbiology. Practical classes investigate the nutritional and physical composition of food commodities, and demonstrate their behaviour and functional properties during normal culinary processes.

Textbooks
Charley H & Weaver C, Foods: A Scientific Approach 3rd Edition, Prentice Hall Inc.: New Jersey, 1998.
English R & Lewis J. Nutritional values of Australian Foods, AGPS: Canberra.
Mann J & Truswell AS. Essentials of Human Nutrition, Oxford University Press: Oxford. 3rd Edition 2007

NUTR2912
Nutritional Science Introductory (Adv)

Credit points: 6 **Teacher/Coordinator:** Dr Kim Bell-Anderson **Session:** Semester 2 **Classes:** Three 1 hour lectures and one 2.5 hour practical per week. **Prerequisites:** MBLG(1001 or 1901) and CHEM (1001 or 1101 or 1901 or 1903 or 1108) and CHEM (1002 or 1102 or 1902 or 1904 or 1109) and BIOL (1001 or 1911) and BIOL (1002 or 1003 or 1902 or 1903). For Combined BAppSc (Exercise and Sport Science)/BSc(Nutrition) degree completion of all Junior units in the table of units for this course. **Prohibitions:** NUTR2902 **Assumed knowledge:** NUTR2911 **Assessment:** One 3 hour exam, one 1 hour theory of practical exam, one assignment.

Information about the major nutrients, vitamins, the major and trace elements is presented with respect to food sources, consumption patterns, requirements for health, absorption, metabolism, nutritional/disease significance, deficiency states and the consequences of excess intakes.

Practical classes cover aspects of food analysis of the student's own diet. The practicals are designed to give students hands-on experience in the determination of major and minor nutrients in foods using procedures and instrumentation used in food research and analytical laboratories. The data obtained in the laboratory will be compared with that obtained with reference to published data in food composition tables. Students will gain an appreciation of the limitations of both methods of data collection and will become competent in the use and interpretation of food composition software packages.

Textbooks
Proudlove RK. The Science and Technology of Foods, Forbes: London, 1985.
English R and Lewis J. Nutritional values of Australian Foods, AGPS: Canberra.
Mann J and Truswell AS. Essentials of Human Nutrition, Oxford University Press: Oxford. 3rd Edition, 2007.

NUTR3911
Nutritional Assessment Methods

Credit points: 6 **Teacher/Coordinator:** Dr Karen Webb, Dr Vicki Flood **Session:** Semester 1 **Classes:** One 2 hour lecture, one 1 hour tutorial and one 2 hour practical per week. **Prerequisites:** Credit average in NUTR2911 and NUTR2912 **Prohibitions:** NUTR3901 **Assessment:** 1 assignment, 3 practical reports, 3 tutorial papers

Basic concepts in nutritional status assessment; develop skills in using three classic methods of dietary assessment in individuals and populations, advantages, limitations and application of each method; computerised nutrient analysis; limitations of food composition data; validity of dietary assessment methods and sources of measurement error; using reference standards to assess food and nutrient intakes of individuals and poulations. Overview of nutritional assessment of individuals through anthropometric assessment, clinical examination and commonly used laboratory biochemical tests.

Textbooks
Gibson, RS. Principles of Nutritional Assessment. 2nd ed. Oxford University Press. New York. 2005.
Webb K, Course Manual for Nutritional Assessment Methods. 2008.

NUTR3912
Community and Public Health Nutrition

Credit points: 6 **Teacher/Coordinator:** Ms Soumela Amanatidis. **Session:** Semester 2 **Classes:** Two 1 hour lectures and one 3 hour workshop and tutorial

per week. **Prerequisites:** Credit average in NUTR2911 and NUTR2912 **Prohibitions:** NUTR3902 **Assessment:** One 2 hour exam, 2-3 assignments

This unit of study covers topics such as nutrition through the Life cycle from infancy to old age; nutrition in vulnerable groups such as low income groups, indigenous populations and homeless youth and theories of food habits It helps students gain skills and knowledge in planning, implementing and evaluating nutrition health promotion programs for various population groups. Topics covered include, principles of health promotion, effective nutrition promotion strategies, program evaluation and program planning. It also looks at current public health nutrition strategies for promoting health and preventing diet related diseases. The delivery of material involves lectures, tutorials and workshops.

Textbooks

Lawrence M & Worsley T (Editors) Public Health Nutrition - From Principles to Practice. Allen & Unwin, 2007. ISBN 978 174175 102 47.
Hawe P, Degeling D and Hall J. Evaluating Health Promotion: A health worker's guide. McLennan and Petty, 1990. ISBN 086 4330677.
Mann J & Truswell AS. Essentials of Human Nutrition. Oxford University Press. Oxford. 3rd edition 2007.

NUTR3921

Methods in Nutrition Practice

Credit points: 6 **Teacher/Coordinator:** Ms Soumela Amanatidis **Session:** Semester 1 **Classes:** One 2 hour lecture and one 3 hour tutorial per week. **Prerequisites:** Credit average in NUTR2911 and NUTR2912 **Prohibitions:** NUTR3901 **Assessment:** One 2.5 hour exam and 2-3 assignments

This course covers basic concepts in nutritional epidemiology; advantages and limitations of epidemiological methods; use of statistics in nutrition; critical interpretation of published data; survey questionnaire design and statistics and designing nutrition databases.

Textbooks

Bonita, R, Beaglehole, R, Kjellstrom, T, Basic Epidemiology (2nd Edition), World Health Organisation, Geneva, 2006, ISBN 924154465.
Lawrence M & Worsley T (Editors), Public Health Nutrition - From Principles to Practice, Allen & Unwin, 2007, ISBN 978 174175 102 4.

NUTR3922

Nutrition and Chronic Disease

Credit points: 6 **Teacher/Coordinator:** Ms Soumela Amanatidis **Session:** Semester 2 **Classes:** Two 1 hour lectures and one 3 hour workshop/tutorial per week. **Prerequisites:** Credit average in NUTR2911 and NUTR2912 **Prohibitions:** NUTR3902 **Assessment:** One 2.5 hour exam, two assignments

This unit of study examines the relationship and evidence for the role of nutrition in the etiology of chronic diseases such as cancer, coronary heart disease, hypertension, obesity,dental caries and osteoporosis. It also investigates the current nutrition policies and guidelines that are aimed at preventing these diseases at a population level. These include National Dietary Guidelines, Nutrition Reference Values, food legislation and Commonwealth and State food policies. Students will also get an opportunity to examine the current popular fad diets on the market. There is also a section on developing communication skills for promoting positive nutrition messages using the media. The delivery of material involves lectures, tutorials and workshops.

Textbooks

Mann J & Truswell AS. Essentials of Human Nutrition. Oxford University Press. Oxford. 3rd edition 2007.
Bauer K and Sokokil C. Basic Nutrition Counselling Skills. Wadsworth, 2002. ISBN: 0727 916645.
Lawrence M & Worsley T (Editors). Public Health Nutrition - From Principles to Practice. Allen & Unwin, 2007. ISBN 978 174175 102 4.

Nutrition Honours

The coordinators for Nutrition Honours are Ms Beth Rohrlach and Ms Margaret Nicholson. Students who have completed the three year Bachelor (Nutrition) may complete an honours year in either the clinical strand, or by research. Students who want accreditation as a dietitian will need to complete the clinical strand.

Clinical Strand

Students in this strand enrol in and complete: NUTR4001 Clinical Nutritional Science A; NUTR4002 Clinical Nutritional Science B (Practical Placement). The contact hours per week are a minimum of 15 and during intensive practicals will be 35. With problem based learning it is expected that a student will need to spend minimum of 20 h in self-directed learning. At the completion of this course students will be able to describe the pathophysiology and biochemistry of disease processes where nutrition is an important part of prevention and/or treatment and will be able to construct appropriate treatment regimes and prevention strategies for these diseases using their nutritional science knowledge.

Research Strand

Students in this strand enrol in and complete: NUTR 4101 Nutrition Research A; NUTR 4102 Nutrition Research B; NUTR 4103 Nutrition Research C; NUTR 4103 Nutrition Research D; Students will be involved in full-time research under the supervision of a staff member within the Human Nutrition Unit or a cognate department. During the year, students will be required to: (i) carry out a supervised research project; (ii) present a written project proposal and present orally a brief literature survey and aims of the project; (iii) write an essay based on the project; and (iv) deliver a seminar on the project. Students will prepare a project proposal, which should outline the aims, significance and background of the project, including an indication of the relationship of the project to the work of others, citing key references (not to be included in the 1000 word limit) where appropriate and a brief outline of methods and techniques to be used.

Pharmacology

This Department offers a general training in Pharmacology to students in the Faculty of Science. It provides three intermediate 6-credit point units of study and eight senior 6-credit point units of study.

PCOL2011

Pharmacology Fundamentals

Credit points: 6 **Session:** Semester 1 **Classes:** Two 1 hour lectures per week; tutorials and laboratory sessions. **Prerequisites:** (6 credit points of Junior Chemistry) and (6 credit points of Junior Biology or MBLG (1001 or 1901)). **Prohibitions:** PCOL2001 **Assessment:** One 2 hour exam, in semester quizzes and reports.

This unit of study examines four basic areas in Pharmacology: (1) principles of drug action (2) pharmacokinetics and drug metabolism (3) autonomic and endocrine pharmacology, and (4) drug design. The delivery of material involves lectures, practicals, computer-aided learning and problem-based tutorials. Practical classes provide students with the opportunity of acquiring technical experience and teamwork skills. Problem-based tutorials are based on real-life scenarios of drug use in the community. These tutorials require students to integrate information obtained in lectures in order to provide solutions to the problems. Online quizzes accompany each module for self assessment.

Textbooks

Rang HP, Dale MM, Ritter JM & Moore PK, Pharmacology. 5th edn, Churchill Livingstone, 2003.
Study aid:
Neal MJ, Medical Pharmacology at a Glance. 4th edn, Blackwell Science, 2002
Reference books
Goodman and Gilman's The Pharmacological Basis of Therapeutics 10th edn, editors JG Hardman,
LE Limbird, 2001.
Patrick GL, An Introduction to Medicinal Chemistry 2nd edn, Oxford Uni press, 2001.

PCOL2012

Pharmacology: Drugs and People

Credit points: 6 **Teacher/Coordinator:** Dr B McParland **Session:** Semester 2 **Classes:** Two 1 hour lectures per week; tutorials and laboratory sessions. **Prerequisites:** (6 credit points of Junior Chemistry) and (6 credit points of Junior Biology or MBLG (1001 or 1901)). **Prohibitions:** PCOL2002, PCOL2003 **Assumed knowledge:** PCOL2011 **Assessment:** One 2 hour exam, in semester quizzes, reports.

This unit of study examines four important areas of Pharmacology: (1) drug action in the nervous system (2) drug discovery and development (3) pharmacotherapy of inflammation, allergy and gut disorders, and

(4) drugs of recreation, dependence and addiction. The delivery of material involves lectures, practicals, computer-aided learning and problem-based tutorials. Practical classes provide students with the opportunity of acquiring technical experience and teamwork. Problem-based tutorials are based on real-life scenarios of drug use in the community. These tutorials require students to integrate information obtained in lectures in order to provide solutions to the problems. Online quizzes accompany each module.

Textbooks
Rang HP, Dale MM, Ritter JM & Moore PK, Pharmacology. 5th edn, Churchill Livingstone, 2003.
Study aid:
Neal MJ, Medical Pharmacology at a Glance. 4th edn, Blackwell Science, 2002
Reference books
Goodman and Gilman's The Pharmacological Basis of Therapeutics 10th edn, editors JG Hardman,
LE Limbird, 2001.

PCOL2555
Essentials of Pharmacology

Credit points: 6 **Session:** Summer Main **Classes:** On-line lectures and face-to-face tutorial and laboratory classes. **Prohibitions:** PCOL2011, PCOL2012 **Assumed knowledge:** 6cp of Junior Biology, 6 cp of junior Chemistry. **Assessment:** on-line quizzes and a final examination

This unit of study introduces students to the principles of drug action and allows them to develop an understanding of the therapeutic applications of drugs based on their underlying pharmacodynamic properties. It covers cardiovascular and renal drugs, chemotherapy, analgesics and anti-inflammatory agents, respiratory and gastro-intestinal drugs, drugs affecting peripheral and central neurotransmission and the principles of chemotherapy.

PCOL3011
Toxicology

Credit points: 6 **Session:** Semester 1 **Classes:** Two 1 hour lectures and one 3 hour tutorial/practical per week. **Prerequisites:** PCOL2001 or PCOL2011 and PCOL2012 or 36 credit points from Intermediate BMED units of study. **Prohibitions:** PCOL3001, PCOL3901, PCOL3911 **Assessment:** One 2 hour exam, in class quizzes, assignments.

This unit of study is designed to introduce students with a basic understanding of pharmacology to the discipline of toxicology. The unit considers the toxicology associated with therapeutic drugs (adverse drug reactions) and the associated issue of drug interactions. The pharmacogenetic basis of adverse reactions is also considered. The unit also considers aspects of environmental toxicology, particularly toxic reactions to environmental agents such as asbestos and pesticides. As part of the unit students are introduced to basic ideas about the collection and analysis of data from human populations, both in the structured situation of clinical trials and in analysis of retrospective data.

Textbooks
Klaasen, Curtis D. (2001) Casarett and Doull's Toxicology. 6th edition. McGraw Hill.

PCOL3911
Toxicology (Advanced)

Credit points: 6 **Session:** Semester 1 **Classes:** Two 1 hour lectures and one 3 hour tutorial/practical per week. **Prerequisites:** Distinction average in PCOL2011 and PCOL2012 or Distinction average in 36 credit points from Intermediate BMED units of study. **Prohibitions:** PCOL3001, PCOL3901, PCOL3011 **Assessment:** One 2 hour exam, in class quizzes, assignments.

This unit will consist of the lecture and practical components of PCOL3011. Students will be set special advanced assignments related to the material covered in core areas. These may also involve advanced practical work or detailed investigation of a theoretical problem.

Textbooks
Klaasen, Curtis D. (2001) Casarett and Doull's Toxicology. 6th edition. McGraw Hill.

PCOL3012
Drug Design and Development

Credit points: 6 **Session:** Semester 1 **Classes:** Two 1 hour lectures and one 3 hour tutorial/practical per week. **Prerequisites:** PCOL2001 or PCOL2011 and PCOL2012 or 36 credit points from Intermediate BMED units of study. **Prohibitions:** PCOL3001, PCOL3901, PCOL3912 **Assessment:** One 2 hour exam, in class quizzes, assignments.

This unit of study is designed to introduce students with a basic understanding of pharmacology to the field of medicinal chemistry associated with drug design, development and registration. It covers the main aspects of drug discovery and development by outlining the main considerations, and illustrates these using examples which include COX-2 inhibitors, statins, and viagra. The role of computers in drug design is emphasised by classwork and assignments on molecular modelling and structure-activity relationships. The course also extends to a section on the design of diverse pharmacological agents which include compounds for imaging by positron emission tomography (PET), as well as chemical and biological warfare agents, and riot control agents.

Textbooks
Patrick, Graham L. (2005) An Introduction to Medicinal Chemistry. 3rd edition. Oxford University Press.

PCOL3912
Drug Design and Development (Adv)

Credit points: 6 **Session:** Semester 1 **Classes:** Two 1 hour lectures and one 3 hour tutorial/practical per week. **Prerequisites:** Distinction average in PCOL2011 and PCOL2012 or Distinction average in 36 credit points from Intermediate BMED units of study. **Prohibitions:** PCOL3001, PCOL3901, PCOL3012 **Assessment:** One 2 hour exam, in class quizzes, assignments.

This unit will consist of the lecture and practical components of PCOL3012. Students will be set special advanced assignments related to the material covered in core areas. These may also involve advanced practical work or detailed investigation of a theoretical problem.

Textbooks
Patrick, Graham L. (2005) An Introduction to Medicinal Chemistry. 3rd edition. Oxford University Press.

PCOL3021
Drug Therapy

Credit points: 6 **Session:** Semester 2 **Classes:** Two 1 hour lectures and one 3 hour tutorial/practical per week. **Prerequisites:** PCOL2011 and PCOL2012 or 36 credit points from Intermediate BMED units of study **Prohibitions:** PCOL3002, PCOL3902, PCOL3921 **Assessment:** One 2 hour exam, in class quizzes, assignments

This unit of study is designed to introduce students with a basic understanding of pharmacology to the theory and practice of drug therapy in the treatment of major disorders such as asthma, cancer and hypertension.

Textbooks
Rang, HP. Dale, MM. Ritter, JM and Moore, PK: Pharmacology, 5th ed. Churchill Livingstone. 2003.

PCOL3921
Drug Therapy (Advanced)

Credit points: 6 **Session:** Semester 2 **Classes:** Two 1 hour lectures and one 3 hour tutorial/practical per week. **Prerequisites:** Distinction average in PCOL2011 and PCOL2012 or in 36 credit points from Intermediate BMED units of study **Prohibitions:** PCOL3002, PCOL3902, PCOL3021 **Assessment:** One 2 hour exam, in class quizzes, assignments

Advanced students will complete the same core lecture material as students in PCOL3021 but carry out advanced level elective projects, practicals and tutorials.

Textbooks
H.P. Rang, M.M. Dale, J.M. Ritter and P.K. Moore: Pharmacology, 5th edn (Churchill Livingstone, 2003)

PCOL3022
Neuropharmacology

Credit points: 6 **Session:** Semester 2 **Classes:** Two 1 hour lectures and one 3 hour tutorial/practical per week. **Prerequisites:** PCOL2011, PCOL2012 or 36 credit points from Intermediate BMED units of study **Prohibitions:** PCOL3002,

PCOL3902, PCOL3922 **Assessment:** One 2 hour exam, in-classes quizzes, assignments.

This unit of study is designed to introduce students with a basic understanding of pharmacology to the theory and practice of neuropharmacology in the treatment of neurological disorders such as Alzheimer's disease, epilepsy, depression, insomnia, pain, schizophrenia and stroke.

Textbooks
Rang, HP. Dale, MM. Ritter, JM and Moore, PK: Pharmacology, 5th ed. Churchill Livingstone. 2003.

PCOL3922
Neuropharmacology (Advanced)

Credit points: 6 **Session:** Semester 2 **Classes:** Two 1 hour lectures and one 3 hour tutorial/practical per week. **Prerequisites:** Distinction average in PCOL2011 and PCOL2012 or in 36 credit points from Intermediate BMED units of study **Prohibitions:** PCOL3002, PCOL3902, PCOL3022 **Assessment:** 2 lectures per week, 3 tutorials/practicals per week

Advanced students will complete the same core lecture material as PCOL3022 Neuropharmacology but carry out advanced level elective projects, practicals and tutorials.

Textbooks
As for PCOL3022

Pharmacology Honours

Subject to a satisfactory standard being attained in Pharmacology, a student may arrange to read for the Honours degree in this subject area. Much of the work will be arranged to suit the interest of the individual. The student will participate in a research project in progress in the Discipline. A research plan, literature review and a 50-page thesis on the research project must be prepared. Seminars on the literature review, the project and another chosen topic will be given by the student.

Physics

The School of Physics provides undergraduate units of study in Physics at Junior, Intermediate, Senior and Honours levels. Appropriate unit of study choices are available for candidates who wish to major in Physics, to proceed to Honours in Physics, or to combine Physics with a major in another subject area. Several other Faculties and Departments within the Faculty of Science require that Junior Physics be taken as part of the students' preparation for later studies in their more specialised fields. Similarly, Intermediate Physics units of study are taken by many Faculty of Engineering students, as well as by many Faculty of Science students who intend to major in other subjects. The School of Physics also provides units of study in Computational Science at Junior and Senior levels. For details see the Computational Science entry.

Location

Physics Junior units of study: lectures in Physics Building, laboratories in Carslaw Building. Physics Intermediate, Senior and Honours units of study: Physics Building.

Information

On the School of Physics website: www.physics.usyd.edu.au and on noticeboards outside the Physics Student Support Office (Room 202, ground floor, Physics Building).

Registration

Junior units of study: In assigned laboratory sessions during the second week of each semester. Intermediate units of study: At first laboratory, in the Physics Building. Senior units of study: At first lecture, in the Physics Building.

Advice on units of study

A member of the Physics staff is normally present among Faculty advisers during enrolment week to advise students. The Physics Student Support Office, Room 202, Physics Building, will arrange for students to meet advisers at other times. Further information about the School of Physics and its teaching program are available at www.physics.usyd.edu.au and on unit of study eLearning sites.

Physics junior units of study

Coordinator

Dr Joe Khachan

Units of Study

There are seven different semester length units of study offered at the Junior level. Completion of one unit of study in each semester provides a solid foundation for further studies in Physics in higher years. PHYS1500 Astronomy cannot be counted towards the 12 credit points of Junior Physics needed as a prerequisite for Intermediate Physics. Each unit of study has a laboratory component. The first semester laboratory work provides an introduction to experimental techniques while reinforcing concepts of physics introduced in lectures. In second semester the laboratory work provides an introduction to electrical circuits and offers students the opportunity to design and undertake short experimental projects.

First semester

PHYS1001 (Regular); PHYS1002 (Fundamentals); PHYS1901 (Advanced)

Second semester

PHYS1003 (Technological); PHYS1004 (Environmental and Life Sciences); PHYS1902 (Advanced); PHYS1500 (Astronomy)

Information Booklet

Further information about Junior Physics units of study is contained in a booklet for intending commencing students available at enrolment or during O-Week or from the Physics Student Support Office (Room 202, ground floor, Physics Building (A28)). It is also available on the School of Physics website at www.physics.usyd.edu.au

Progression to Intermediate Physics

Students intending to continue into Intermediate Physics are encouraged to take PHYS1003 or PHYS1902 in semester 2. Students taking PHYS1004 may continue into Intermediate Physics but are recommended to undertake supplementary reading as additional preparation.

PHYS1001
Physics 1 (Regular)

Credit points: 6 **Session:** Semester 1 **Classes:** Three 1 hour lectures, one 3 hour laboratory and one 1 hour tutorial per week. **Corequisites:** Recommended concurrent Units of Study: MATH (1001/1901, 1002/1902) **Prohibitions:** PHYS1002 , PHYS1901 **Assumed knowledge:** HSC Physics **Assessment:** 3 hour exam plus laboratories, tutorials, assignments and mid-semester tests

This unit of study is for students who gained 65 marks or better in HSC Physics or equivalent. The lecture series contains three modules on the topics of mechanics, thermal physics, and oscillations and waves.

Textbooks
Young & Freedman. University Physics. 12th edition, with Mastering Physics, Addison-Wesley. 2008
Experimental Physics Laboratory Manual - School of Physics Publication.

PHYS1002
Physics 1 (Fundamentals)

Credit points: 6 **Session:** Semester 1 **Classes:** Three 1 hour lectures, one 3 hour laboratory and one 1 hour tutorial per week. **Corequisites:** Recommended concurrent Units of Study: MATH (1001/1901, 1002/1902) **Prohibitions:** PHYS1001, PHYS1901 **Assumed knowledge:** No assumed knowledge of Physics **Assessment:** 3 hour exam plus laboratories, tutorials, assignments and mid-semester tests

This unit of study is designed for students who have not studied Physics previously or scored below 65 in HSC Physics. The lecture series contains modules on the language of physics, mechanics, and oscillations and waves.

Textbooks

College Physics: A Strategic Approach by Knight, Jones and Field, including Mastering Physics access key.

PHYS1003
Physics 1 (Technological)

Credit points: 6 **Session:** Semester 2 **Classes:** Three 1 hour lectures, one 3 hour laboratory, one 1 hour tutorial per week. **Corequisites:** Recommended concurrent Units of Study: MATH (1003/1903), MATH (1005/1905). **Prohibitions:** PHYS1004, PHYS1902 **Assumed knowledge:** HSC Physics or PHYS (1001 or 1002 or 1901) or equivalent. **Assessment:** 3 hour exam plus laboratories, tutorials, and assignments

Note: It is recommended that PHYS (1001 or 1002 or 1901) be completed before this unit

This unit of study is designed for students majoring in physical and engineering sciences and emphasis is placed on applications of physical principles to the technological world. The lecture series contains modules on the topics of fluids, electromagnetism, and quantum physics.

Textbooks
Young & Freedman. University Physics. 12th edition, with Mastering Physics, Addison-Wesley. 2008
Experimental Physics Laboratory Manual - School of Physics Publication.

PHYS1004
Physics 1 (Environmental & Life Science)

Credit points: 6 **Session:** Semester 2 **Classes:** Three 1 hour lectures, one 3 hour laboratory and one 1 hour tutorial per week. **Corequisites:** Recommended concurrent Units of Study: MATH (1003/1903), MATH (1005/1905). **Prohibitions:** PHYS1003, PHYS1902 **Assumed knowledge:** HSC Physics or PHYS (1001 or 1002 or 1901) or equivalent. **Assessment:** 3 hour exam plus laboratories, tutorials, and assignments

Note: It is recommended that PHYS (1001 or 1002 or 1901) be completed before this unit

This unit of study has been designed specifically for students interested in further study in environmental and life sciences. The lecture series contains modules on the topics of properties of matter, electromagnetism, and radiation and its interactions with matter.

Textbooks
College Physics: A Strategic Approach by Knight, Jones and Field, including Mastering Physics access key.

PHYS1500
Astronomy

Credit points: 6 **Session:** Semester 2 **Classes:** Three 1 hour lectures, one 2 hour laboratory and one 1 hour tutorial per week. **Assumed knowledge:** No assumed knowledge of Physics. **Assessment:** 2 hour exam plus laboratories, assignments and night-viewing project

This unit of study provides a broad understanding of the structure, scale and diversity of the universe and an appreciation of the scientific methods used to achieve this understanding. Current areas of investigation, new ideas and concepts which often receive wide media attention will be used to demonstrate how science attempts to understand new and remote phenomena and how our ideas of our place in the universe are changing. The range of topics includes the planets, the solar system and its origin, spacecraft discoveries, stars, supernovas, black holes, galaxies, quasars, cosmology and the Big Bang. It also includes day and night sky observing sessions. This unit of study cannot be counted as part of the 12 credit points of Junior Physics necessary for enrolment in Intermediate Physics.

Textbooks
Bennett, JO. et al. The Essential Cosmic Perspective. 4th edition, with Mastering Astronomy. Addison Wesley. 2006

PHYS1901
Physics 1A (Advanced)

Credit points: 6 **Session:** Semester 1 **Classes:** Three 1 hour lectures, one 3 hour laboratory and one 1 hour tutorial per week. **Prerequisites:** UAI of at least 96, or HSC Physics result in Band 6, or PHYS1902, or Distinction or better in PHYS (1003 or 1004) or an equivalent unit. **Corequisites:** Recommended concurrent Units of Study: MATH (1001/1901,1002/1902). **Prohibitions:** PHYS1001, PHYS1002 **Assessment:** 3 hour exam plus laboratories, tutorials, assignments and mid-semester tests

This unit of study is intended for students who have a strong background in Physics and an interest in studying more advanced topics. It proceeds faster than Physics 1 (Regular), covering further and more difficult material. The lecture series contains modules on the topics of mechanics, thermal physics, oscillations and waves and chaos. The laboratory work also provides an introduction to computational physics using chaos theory as the topic of study.

Textbooks
Young and Freedman. University Physics, 12th edition, with Mastering Physics. Addison-Wesley. 2008.
Experimental Physics Laboratory Manual - School of Physics Publication.

PHYS1902
Physics 1B (Advanced)

Credit points: 6 **Session:** Semester 2 **Classes:** Three 1 hour lectures, one 3 hour laboratory and one 1 hour tutorial per week. **Prerequisites:** UAI of at least 96, or HSC Physics result in Band 6, or PHYS1901, or Distinction or better in PHYS (1001 or 1002) or an equivalent unit. **Corequisites:** Recommended concurrent unit of study: MATH (1003/1903), MATH (1005/1905). **Prohibitions:** PHYS1003, PHYS1004 **Assessment:** 3 hour exam plus laboratories, tutorials, and assignments

Note: It is recommended that PHYS (1001 or 1002 or 1901) be completed before this unit

This unit of study is a continuation of the more advanced treatment of Physics 1A (Advanced). Students who have completed PHYS1001 or PHYS1002 at Distinction level may enrol. It proceeds faster than Physics 1 (Technological), covering further and more difficult material. The lecture series contains modules on the topics of fluids, electricity and magnetism, and quantum physics.

Textbooks
Young & Freedman. University Physics, 12th edition, with Mastering Physics. Addison-Wesley. 2008.
Experimental Physics Laboratory Manual - School of Physics Publication.

Physics intermediate units of study

Coordinator

Dr Manjula Sharma

Units of Study

There are three units at the Normal level and three at the Advanced level: PHYS2011/2911 Physics 2A (Normal/Advanced) - Semester 1; PHYS2012/2912 Physics 2B (Normal/Advanced) - Semester 2; PHYS2013/2913 Astrophysics and Relativity (Normal/Advanced) - Semester 2.

Students intending to major in Physics

Students intending to major in Physics are strongly encouraged to take all three. The Advanced versions can be taken by students who have achieved a Credit or better in their previous Physics units.

Progression to senior Physics

The prerequisites for Senior Physics units are PHYS2011/2911 and PHYS2012/2912. Students intending to major in Physics are strongly encouraged to take PHYS2013/2913 as well. Full details of Intermediate Physics unit of study structures, content and assessment policies are provided in the unit of study handbooks available at the start of semester on the School of Physics website at www.physics.usyd.edu.au and also on unit of study eLearning sites.

PHYS2011
Physics 2A

Credit points: 6 **Session:** Semester 1 **Classes:** Two 1 hour lectures per week for 11 weeks; one 2 hour computational laboratory and one 3 hour laboratory per week for 9 weeks. **Prerequisites:** 12 credit points of Junior Physics (excluding PHYS1500) **Prohibitions:** PHYS2001, PHYS2901, PHYS2911, PHYS2101, PHYS2103, PHYS2213, PHYS2203 **Assumed knowledge:** MATH (1001/1901 and 1002/1902 and 1003/1903). MATH (1005/1905) would also be useful **Assessment:** One 2 hour exam, one 1 hour computational test, practical work, practical report and oral presentation

In combination with two semesters of Junior Physics, this unit of study continues a first pass through the major branches of classical and modern physics, providing students with a sound basis for later Physics units or for studies in other areas of science or technology. Hence, this unit suits students continuing with the study of physics at the

general Intermediate level, and those wishing to round out their knowledge of physics before continuing in other fields.

The major topics in this unit of study are:

Optics: The wave nature of light, and its interactions with matter. Applications including spectroscopy and fibre optics.

Nuclear Physics: The fundamental structure of matter.

Computational Physics: In a PC-based computing laboratory students use simulation software to conduct virtual experiments in optics, which illustrate and extend the relevant lectures. Students also gain experience in the use of computers to solve problems in physics. An introductory session is held at the beginning of semester for students who are not familiar with personal computers.

Practical: Experimental Physics is taught as a laboratory module and includes experiments in the areas of optics, nuclear decay and particles, properties of matter, and other topics. Assessment is based on mastery of each attempted experiment. At the end of the semester students prepare a short report on one experiment and make an oral presentation on it.

Textbooks
Young and Freedman, University Physics, 12th edition. Addison-Wesley. 2008

PHYS2012
Physics 2B

Credit points: 6 **Session:** Semester 2 **Classes:** Three 1 hour lectures per week; one 2 hour computational laboratory per week for 11 weeks. **Prerequisites:** PHYS (1003 or 1004 or 1902) and PHYS (1001 or 1002 or 1901 or 2001 or 2901 or 2011 or 2911) **Prohibitions:** PHYS2102, PHYS2104, PHYS2902, PHYS2002, PHYS2912, PHYS2213, PHYS2203 **Assumed knowledge:** MATH (1001/1901 and 1002/1902 and 1003/1903). MATH (1005/1905) would also be useful **Assessment:** One 3 hour exam, one 1 hour computational test

This unit of study is designed for students continuing with the study of physics at the general Intermediate level, and represents the beginning of a more in-depth study of the main topics of classical and modern physics. The lecture topics are:

Quantum physics: The behaviour of matter and radiation at the microscopic level, modelled by the Schroedinger equation. Application to 1-dimensional systems including solid state physics.

Electromagnetic properties of matter: Electric and magnetic effects in materials; the combination of electric and magnetic fields to produce light and other electromagnetic waves; the effects of matter on electromagnetic waves.

Computational Physics: The computational physics component is similar to that of PHYS2011, except that the material illustrates topics in the quantum physics module.

Textbooks
Serway, Moses and Moyer 'Modern Physics'. Brooks/Cole

PHYS2013
Astrophysics and Relativity

Credit points: 6 **Session:** Semester 2 **Classes:** Two 1 hour lectures per week for 11 weeks and one 3 hour laboratory per week for 12 weeks. **Prerequisites:** PHYS (1003 or 1004 or 1902) and PHYS (1001 or 1002 or 1901 or 2011 or 2911) **Corequisites:** PHYS (2012 or 2912) **Prohibitions:** PHYS2001, PHYS2901, PHYS2913, PHYS2101, PHYS2103 **Assumed knowledge:** MATH (1001/1901 and 1002/1902 and 1003/1903). MATH 1005/1905 would also be useful **Assessment:** One 2 hour exam, practical work, practical report and oral presentation

This unit of study builds on the foundation provided by Junior Physics and first semester of Intermediate Physics, to provide an introduction to Astrophysics (Structure and evolution of stars), and Special Relativity (Space and time at high velocities).

Practical: Experimental Physics is taught as a laboratory module and includes experiments in the areas of analysis of stellar images, electromagnetic phenomena, electronic instrumentation, quantum physics, and other topics. Assessment is based on mastery of each attempted experiment. At the end of the semester students may work in teams on a project. Students prepare a written report and oral presentation on their project or one experiment.

Textbooks
Young and Freedman, University Physics, 11th 12th edition. Addison-Wesley. 2004 2008

PHYS2911
Physics 2A (Advanced)

Credit points: 6 **Session:** Semester 1 **Classes:** Two 1 hour lectures per week for 11 weeks; one 2 hour computational laboratory and one 3 hour laboratory per week for 9 weeks. **Prerequisites:** Credit or better in PHYS (1901 or 1001 or 1002) and Credit or better in PHYS (1902 or 1003 or 1004). **Prohibitions:** PHYS2901, PHYS2001, PHYS2011, PHYS2101, PHYS2103, PHYS2213, PHYS2203 **Assumed knowledge:** MATH (1901/1001 and 1902/1002 and 1903/1003). MATH (1905/1005) would also be useful **Assessment:** One 2 hour exam, one 1 hour computational test, practical work, practical report and oral presentation

This unit of study is designed for students with a strong interest in Physics. The lecture topics are as for PHYS2011. They are treated in greater depth and with more rigorous attention to derivations than in PHYS2011. The assessment reflects the more challenging nature of the material presented.

Computational Physics: As for PHYS2011, but at a more advanced level.

Practical: As for PHYS2011.

Textbooks
Young and Freedman, University Physics, 12th edition. Addison-Wesley. 2008

PHYS2912
Physics 2B (Advanced)

Credit points: 6 **Session:** Semester 2 **Classes:** Three 1 hour lectures per week, one 2 hour computational laboratory per week for 11 weeks. **Prerequisites:** Credit or better in PHYS (1003 or 1004 or 1902) and Credit or better in PHYS (1001 or 1002 or 1901 or 2001 or 2901 or 2011 or 2911). **Prohibitions:** PHYS2102, PHYS2104, PHYS2902, PHYS2002, PHYS2012, PHYS2213, PHYS2203 **Assumed knowledge:** MATH (1001/1901 and 1002/1902 and 1003/1903). MATH 1005/1905 would also be useful **Assessment:** One 3 hour exam, one 1 hour computational test

Refer to PHYS2911 for an overall description of the Advanced Intermediate Physics program. The lecture topics are as for PHYS2012 with some advanced content. Computational Physics: As for PHYS2012, but at a more advanced level.

Textbooks
Young and Freedman, University Physics, 12th edition. Addison-Wesley. 2008

PHYS2913
Astrophysics and Relativity (Advanced)

Credit points: 6 **Session:** Semester 2 **Classes:** Two 1 hour lectures per week for 11 weeks; one 3 hour laboratory per week for 12 weeks. **Prerequisites:** Credit or better in PHYS (1003 or 1004 or 1902) and Credit or better in PHYS (1001 or 1002 or 1901 or 2011 or 2911) **Corequisites:** PHYS (2912 or 2012). **Prohibitions:** PHYS2001, PHYS2901, PHYS2013, PHYS2101, PHYS2103 **Assumed knowledge:** MATH (1001/1901 and 1002/1902 and 1003/1903). MATH 1005/1905 would also be useful. **Assessment:** One 3 hour exam, practical work, practical report and oral presentation

Refer to PHYS2911 for an overall description of the Advanced Intermediate Physics program. The lecture topics are as PHYS2013 with some advanced content. Practical: as for PHYS2013.

Textbooks
Young and Freedman, University Physics, 12th edition. Addison-Wesley. 2008

Physics senior units of study

Coordinator

Professor Tim Bedding

Majoring in Physics

Students intending to major in Physics, or to proceed to Physics Honours, must take at least 24 credit points of Senior Physics, which must include a Semester 1 Core unit (PHYS3040, 3940 or 3941); a Semester 2 Core unit (PHYS3060, 3960 or 3961); two Options units (usually one in each semester). Further information concerning Senior Physics is available via www.physics.usyd.edu.au and also on unit of study eLearning sites.

PHYS3015
Topics in Senior Physics A

Credit points: 6 **Session:** Semester 1 **Classes:** 40 hours per semester. **Prerequisites:** 12 credit points of Intermediate Physics **Assumed knowledge:** 6 credit points of Intermediate Mathematics **Assessment:** Exams and/or practical reports.

Note: Department permission required for enrolment.

This unit is normally restricted to students not majoring in Physics, giving them the flexibility to take a combination of modules that is not offered in the standard units. Please obtain permission from the Senior Physics Coordinator.

PHYS3915
Topics in Senior Physics A (Advanced)

Credit points: 6 **Session:** Semester 1 **Classes:** 40 hours per semester **Prerequisites:** 12 credit points of Intermediate Physics. **Assumed knowledge:** 6 credit points of Intermediate Mathematics **Assessment:** Exams and/or laboratory reports.

Note: Department permission required for enrolment.

This unit of study covers the same topics as PHYS3015, with some more challenging material.

PHYS3025
Topics in Senior Physics B

Credit points: 6 **Session:** Semester 2 **Classes:** 40 hours per semester. **Prerequisites:** 12 credit points of Intermediate Physics **Assumed knowledge:** 6 credit points of Intermediate Mathematics **Assessment:** Exams and/or practical reports.

Note: Department permission required for enrolment.

This unit is normally restricted to students not majoring in Physics, giving them the flexibility to take a combination of modules that is not offered in the standard units. Please obtain permission from the Senior Physics Coordinator.

PHYS3925
Topics in Senior Physics B (Advanced)

Credit points: 6 **Session:** Semester 2 **Classes:** 40 hours per semester **Prerequisites:** 12 credit points of Intermediate Physics with a Credit average and 6 credit points of Intermediate Mathematics. **Assessment:** Exams and/or laboratory reports.

Note: Department permission required for enrolment.

This unit of study covers the same topics as PHYS3025, with some more challenging material.

PHYS3040
Electromagnetism & Physics Lab

Credit points: 6 **Session:** Semester 1 **Classes:** Nineteen 1 hour lectures and twelve 4 hour practicals. **Prerequisites:** PHYS(2011 or 2911 or 2001 or 2901), PHYS(2012 or 2912 or 2002 or 2902), MATH(2061 or 2961 or 2067) **Prohibitions:** PHYS3940, PHYS3941, PHYS3011, PHYS3014, PHYS3016, PHYS3017, PHYS3911, PHYS3914, PHYS3916, PHYS3917 **Assessment:** One 1.5 hour exam, practical reports and oral presentation

The lectures cover the theory of electromagnetism, one of the cornerstones of classical physics. They introduce Maxwell's equations in their differential form, using the power of vector calculus. The main application will be to electromagnetic waves, including reflection and absorption, which have application in fields such as optics, plasma physics and astrophysics. In the practical laboratory classes, students will choose from a range of experiments that aim to give them an appreciation of the analytical, technical and practical skills required to conduct modern experimental work.

Textbooks
Griffiths, DJ. Introduction to Electrodynamics. Third Edition.

PHYS3940
Electromagnetism & Physics Lab (Adv)

Credit points: 6 **Session:** Semester 1 **Classes:** Nineteen 1 hour lectures and twelve 4 hour practicals. **Prerequisites:** PHYS (2011 or 2911 or 2001 or 2901) with a grade of at least Credit; PHYS (2012 or 2912 or 2002 or 2902) with a grade of at least Credit; MATH (2061 or 2961 or 2067) **Prohibitions:** PHYS3040, PHYS3941, PHYS3011, PHYS3014, PHYS3016, PHYS3017, PHYS3911, PHYS3914, PHYS3916, PHYS3917 **Assessment:** One 1.5 hour exam, practical reports and oral presentation

This unit covers the same topics as PHYS3040, but with greater depth and some more challenging material.

Textbooks
Griffiths, DJ. Introduction to Electrodynamics. Third Edition.

PHYS3941
Electromagnetism & Special Project (Adv)

Credit points: 6 **Session:** Semester 1 **Classes:** Nineteen 1 hour lectures, 4 hours per week with a research group. **Prerequisites:** PHYS (2011 or 2911 or 2001 or 2901) with at least Credit; PHYS (2012 or 2912 or 2002 or 2902) with at least Credit; MATH (2061 or 2961 or 2067) **Prohibitions:** PHYS3040, PHYS3940, PHYS3961, PHYS3011, PHYS3911, PHYS3918, PHYS3928 **Assessment:** One 1.5 hour exam, project report and talk

Note: Department permission required for enrolment. Note: Approval for this unit must be obtained from the School of Physics Senior Coordinator.

The lectures cover the theory of electromagnetism, one of the cornerstones of classical physics. They introduce Maxwell's equations in their differential form, using the power of vector calculus. The main application will be to electromagnetic waves, including reflection and absorption, which have application in fields such as optics, plasma physics and astrophysics. The project is carried out in a research group within the School of Physics, working on a research experiment or theoretical project supervised by a researcher. The aim is for students to acquire an understanding of the nature of research, to apply their knowledge of physics and scientific practice, and to serve as preparation for a research project at Honours level and beyond.

Textbooks
Griffiths, DJ. Introduction to Electrodynamics. Third Edition.

PHYS3051
Thermodynamics/Biol. Physics & Lab

Credit points: 6 **Session:** Semester 1 **Classes:** Thirty-eight 1 hour lectures and six 4 hour practicals. **Prerequisites:** PHYS (2011 or 2911 or 2001 or 2901); PHYS (2012 or 2912 or 2002 or 2902) **Prohibitions:** PHYS3951, PHYS3052, PHYS3952, PHYS3053, PHYS3953, PHYS3055, PHYS3955, PHYS3056, PHYS3956, PHYS3057, PHYS3957, PHYS3058, PHYS3958, PHYS3059, PHYS3959 **Assessment:** One 2 hour exam, practical reports

The lectures on Thermodynamics provide an introduction to the subject, emphasising the use of entropy, chemical potential, and free energy. They also introduce statistical mechanics, including the classical Boltzmann distribution and some quantum statistical mechanics. The Biological Physics component will cover applications of physics to biological systems, including topics such as molecular biology, structure and properties of polymers and proteins, thermodynamics of cells, transport of biomolecules, excitation of nerve impulses, and computer simulations of biological systems. In the practical laboratory classes, students will choose from a range of experiments that aim to give them an appreciation of the analytical, technical and practical skills required to conduct modern experimental work.

Textbooks
Schroeder, DV. An Introduction to Thermal Physics. Addison-Wesley. 2000

PHYS3951
Thermodynamics/Biol. Physics & Lab (Adv)

Credit points: 6 **Session:** Semester 1 **Classes:** Thirty-eight 1 hour lectures and six 4 hour practicals. **Prerequisites:** PHYS (2011 or 2911 or 2001 or 2901) with at least Credit; PHYS (2012 or 2912 or 2002 or 2902) with at least Credit **Prohibitions:** PHYS3951, PHYS3052, PHYS3952, PHYS3053, PHYS3953, PHYS3055, PHYS3955, PHYS3056, PHYS3956, PHYS3057, PHYS3957, PHYS3058, PHYS3958, PHYS3059, PHYS3959 **Assessment:** One 2 hour exam, practical reports

This unit covers the same topics as PHYS3051, but with greater depth and some more challenging material.

Textbooks
Schroeder, DV. An Introduction to Thermal Physics. Addison-Wesley. 2000

PHYS3052
Nanoscience/Thermodynamics & Lab

Credit points: 6 **Session:** Semester 1 **Classes:** Thirty-eight 1 hour lectures and six 4 hour practicals **Prerequisites:** PHYS (2011 or 2911 or 2001 or 2901); PHYS (2012 or 2912 or 2002 or 2902) **Prohibitions:** PHYS3952, PHYS3050, PHYS3051, PHYS3053, PHYS3056, PHYS3950, PHYS3951, PHYS3953, PHYS3956, PHYS3013, PHYS3021, PHYS3913, PHYS3921, PHYS3057, PHYS3957, PHYS3058, PHYS3958 **Assessment:** One 2 hour exam, practical reports

Nanoscience is the study of the behaviour of light and matter as they interact with structures that have features on nanometre scales. This part of the course will cover the fundamental physics of nanoscience and the methods used for manipulating matter and creating structures on these scales. The lectures on Thermodynamics provide an introduction to the subject, emphasising the use of entropy, chemical potential, and free energy. They also introduce statistical mechanics, including the classical Boltzmann distribution and some quantum statistical mechanics. In the practical laboratory classes, students will choose from a range of experiments that aim to give them an appreciation of the analytical, technical and practical skills required to conduct modern experimental work.

Textbooks
Schroeder, DV. An Introduction to Thermal Physics. Addison-Wesley. 2000

PHYS3952
Nanoscience/Thermodynamics & Lab (Adv)

Credit points: 6 **Session:** Semester 1 **Classes:** Thirty-eight 1 hour lectures and six 4 hour practicals **Prerequisites:** PHYS (2011 or 2911 or 2001 or 2901) with at least Credit; PHYS (2012 or 2912 or 2002 or 2902) with at least Credit **Prohibitions:** PHYS3052, PHYS3050, PHYS3051, PHYS3053, PHYS3056, PHYS3950, PHYS3951, PHYS3953, PHYS3956, PHYS3013, PHYS3021, PHYS3913, PHYS3921, PHYS3057, PHYS3957, PHYS3058, PHYS3958 **Assessment:** One 2 hour exam, practical reports

This unit covers the same topics as PHYS3052, but with greater depth and some more challenging material.

Textbooks
Schroeder, DV. An Introduction to Thermal Physics. Addison-Wesley. 2000

PHYS3054
Nanoscience/Plasma Physics & Physics Lab

Credit points: 6 **Session:** Semester 1 **Classes:** Thirty-eight 1 hour lectures and six 4 hour practicals. **Prerequisites:** PHYS (2011 or 2911 or 2001 or 2901); PHYS (2012 or 2912 or 2002 or 2902) **Prohibitions:** PHYS3954, PHYS3050, PHYS3950, PHYS3052, PHYS3952, PHYS3055, PHYS3955, PHYS3056, PHYS3956, PHYS3057, PHYS3957, PHYS3059, PHYS3959, PHYS3070, PHYS3970, PHYS3072, PHYS3972, PHYS3073, PHYS3973, PHYS3076, PHYS3976, PHYS3077, PHYS3977, PHYS3078, PHYS3978 **Assumed knowledge:** Electromagnetism at Senior Physics level; MATH (2061 or 2961 or 2067) **Assessment:** One 2 hour exam, practical reports

Nanoscience is the study of the behaviour of light and matter as they interact with structures that have features on nanometre scales. This part of the course will cover the fundamental physics of nanoscience and the methods used for manipulating matter and creating structures on these scales. Plasma Physics is the study of ionised gases, which are collections of charged and neutral particles and form the main constituent of the Universe. The lectures cover the properties of plasmas and their applications, including nuclear fusion energy, materials synthesis and modification, environmental remediation, aerospace, nano and biomedical technologies. In the practical laboratory classes, students will choose from a range of experiments that aim to give them an appreciation of the analytical, technical and practical skills required to conduct modern experimental work.

PHYS3954
Nanoscience/Plasma Physics & Lab (Adv)

Credit points: 6 **Session:** Semester 1 **Classes:** Thirty-eight 1 hour lectures and six 4 hour practicals. **Prerequisites:** PHYS (2011 or 2911 or 2001 or 2901) with at least Credit; PHYS (2012 or 2912 or 2002 or 2902) with at least Credit **Prohibitions:** PHYS3054, PHYS3050, PHYS3950, PHYS3052, PHYS3952, PHYS3055, PHYS3955, PHYS3056, PHYS3956, PHYS3057, PHYS3957, PHYS3059, PHYS3959, PHYS3070, PHYS3970, PHYS3072, PHYS3972, PHYS3073, PHYS3973, PHYS3076, PHYS3976, PHYS3077, PHYS3977, PHYS3078, PHYS3978 **Assumed knowledge:** Electromagnetism at Senior Physics level; MATH (2061 or 2961 or 2067) **Assessment:** One 2 hour exam, practical reports

This unit covers the same topics as PHYS3054, but with greater depth and some more challenging material.

PHYS3055
Nanoscience/Plasma/Thermodynamics

Credit points: 6 **Session:** Semester 1 **Classes:** Fifty-seven 1 hour lectures. **Prerequisites:** PHYS (2011 or 2911 or 2001 or 2901); PHYS (2012 or 2912 or 2002 or 2902) **Prohibitions:** PHYS3955, PHYS3050, PHYS3950, PHYS3051, PHYS3951, PHYS3052, PHYS3952, PHYS3053, PHYS3953, PHYS3054, PHYS3954, PHYS3056, PHYS3956, PHYS3057, PHYS3957, PHYS3058, PHYS3958, PHYS3059, PHYS3959, PHYS3070, PHYS3970, PHYS3072, PHYS3972, PHYS3073, PHYS3973, PHYS3076, PHYS3976, PHYS3077, PHYS3977, PHYS3078, PHYS3978 **Assumed knowledge:** Electromagnetism at Senior Physics level; MATH (2061 or 2961 or 2067) **Assessment:** One 3 hour exam

Nanoscience is the study of the behaviour of light and matter as they interact with structures that have features on nanometre scales. This part of the course will cover the fundamental physics of nanoscience and the methods used for manipulating matter and creating structures on these scales. Plasma Physics is the study of ionised gases, which are collections of charged and neutral particles and form the main constituent of the Universe. The lectures cover the properties of plasmas and their applications, including nuclear fusion energy, materials synthesis and modification, environmental remediation, aerospace, nano and biomedical technologies. The lectures on Thermodynamics provide an introduction to the subject, emphasising the use of entropy, chemical potential, and free energy. They also introduce statistical mechanics, including the classical Boltzmann distribution and some quantum statistical mechanics.

Textbooks
Schroeder, DV. An Introduction to Thermal Physics. Addison-Wesley. 2000

PHYS3955
Nanoscience/Plasma/Thermodynamics (Adv)

Credit points: 6 **Session:** Semester 1 **Classes:** Fifty-seven 1 hour lectures. **Prerequisites:** PHYS (2011 or 2911 or 2001 or 2901) with at least Credit; PHYS (2012 or 2912 or 2002 or 2902) with at least Credit **Prohibitions:** PHYS3055, PHYS3050, PHYS3950, PHYS3051, PHYS3951, PHYS3052, PHYS3952, PHYS3053, PHYS3953, PHYS3054, PHYS3954, PHYS3056, PHYS3956, PHYS3057, PHYS3957, PHYS3058, PHYS3958, PHYS3059, PHYS3959, PHYS3070, PHYS3970, PHYS3072, PHYS3972, PHYS3073, PHYS3973, PHYS3076, PHYS3976, PHYS3077, PHYS3977, PHYS3078, PHYS3978 **Assumed knowledge:** Electromagnetism at Senior Physics level; MATH (2061 or 2961 or 2067) **Assessment:** One 3 hour exam

This unit covers the same topics as PHYS3055, but with greater depth and some more challenging material.

Textbooks
Schroeder, DV. An Introduction to Thermal Physics. Addison-Wesley. 2000

PHYS3057
Nanoscience/Thermodynamic/Biol.Phys

Credit points: 6 **Session:** Semester 1 **Classes:** Fifty-seven 1 hour lectures. **Prerequisites:** PHYS (2011 or 2911 or 2001 or 2901); PHYS (2012 or 2912 or 2002 or 2902) **Prohibitions:** PHYS3957, PHYS3050, PHYS3950, PHYS3051, PHYS3951, PHYS3052, PHYS3952, PHYS3053, PHYS3953, PHYS3054, PHYS3954, PHYS3055, PHYS3955, PHYS3056, PHYS3956, PHYS3058, PHYS3958, PHYS3059, PHYS3959 **Assessment:** One 3 hour exam

Nanoscience is the study of the behaviour of light and matter as they interact with structures that have features on nanometre scales. This part of the course will cover the fundamental physics of nanoscience and the methods used for manipulating matter and creating structures on these scales. The lectures on Thermodynamics provide an introduction to the subject, emphasising the use of entropy, chemical potential, and free energy. They also introduce statistical mechanics, including the classical Boltzmann distribution and some quantum statistical mechanics. The Biological Physics component will cover applications of physics to biological systems, including topics such as molecular biology, structure and properties of polymers and proteins, thermodynamics of cells, transport of biomolecules, excitation of nerve impulses, and computer simulations of biological systems.

Textbooks
Schroeder, DV. An Introduction to Thermal Physics. Addison-Wesley. 2000.

PHYS3957
Nanoscience/Thermodynamic/Biol.Phys(Adv)

Credit points: 6 **Session:** Semester 1 **Classes:** Fifty-seven 1 hour lectures. **Prerequisites:** PHYS (2011 or 2911 or 2001 or 2901) with at least Credit; PHYS (2012 or 2912 or 2002 or 2902) with at least Credit **Prohibitions:** PHYS3057, PHYS3050, PHYS3950, PHYS3051, PHYS3951, PHYS3052, PHYS3952, PHYS3053, PHYS3953, PHYS3054, PHYS3954, PHYS3055, PHYS3955, PHYS3056, PHYS3956, PHYS3058, PHYS3958, PHYS3059, PHYS3959 **Assessment:** One 3 hour exam

This unit covers the same topics as PHYS3057, but with greater depth and some more challenging material.

Textbooks
Schroeder, DV. An Introduction to Thermal Physics. Addison-Wesley. 2000

PHYS3059
Plasma/Thermodynamics/Biol. Physics

Credit points: 6 **Session:** Semester 1 **Classes:** Fifty-seven 1 hour lectures. **Prerequisites:** PHYS (2011 or 2911 or 2001 or 2901); PHYS (2012 or 2912 or 2002 or 2902) **Prohibitions:** PHYS3959, PHYS3051, PHYS3951, PHYS3052, PHYS3952, PHYS3053, PHYS3953, PHYS3054, PHYS3954, PHYS3055, PHYS3955, PHYS3056, PHYS3956, PHYS3057, PHYS3957, PHYS3058, PHYS3958, PHYS3070, PHYS3970, PHYS3072, PHYS3972, PHYS3073, PHYS3973, PHYS3076, PHYS3976, PHYS3077, PHYS3977, PHYS3078, PHYS3978 **Assumed knowledge:** Electromagnetism at Senior Physics level; MATH (2061 or 2961 or 2067) **Assessment:** One 3 hour exam

Plasma Physics is the study of ionised gases, which are collections of charged and neutral particles and form the main constituent of the Universe. The lectures cover the properties of plasmas and their applications, including nuclear fusion energy, materials synthesis and modification, environmental remediation, aerospace, nano and biomedical technologies. The lectures on Thermodynamics provide an introduction to the subject, emphasising the use of entropy, chemical potential, and free energy. They also introduce statistical mechanics, including the classical Boltzmann distribution and some quantum statistical mechanics. The Biological Physics component will cover applications of physics to biological systems, including topics such as molecular biology, structure and properties of polymers and proteins, thermodynamics of cells, transport of biomolecules, excitation of nerve impulses, and computer simulations of biological systems.

Textbooks
Schroeder, DV. An Introduction to Thermal Physics. Addison-Wesley. 2000

PHYS3959
Plasma/Thermodynamics/Biol.Physics (Adv)

Credit points: 6 **Session:** Semester 1 **Classes:** Fifty-seven 1 hour lectures. **Prerequisites:** PHYS (2011 or 2911 or 2001 or 2901) with at least Credit; PHYS (2012 or 2912 or 2002 or 2902) with at least Credit **Prohibitions:** PHYS3059, PHYS3051, PHYS3951, PHYS3052, PHYS3952, PHYS3053, PHYS3953, PHYS3054, PHYS3954, PHYS3055, PHYS3955, PHYS3056, PHYS3956, PHYS3057, PHYS3957, PHYS3058, PHYS3958, PHYS3070, PHYS3970, PHYS3072, PHYS3972, PHYS3073, PHYS3973, PHYS3076, PHYS3976, PHYS3077, PHYS3977, PHYS3078, PHYS3978 **Assumed knowledge:** Electromagnetism at Senior Physics level; MATH (2061 or 2961 or 2067) **Assessment:** One 3 hour exam

This unit covers the same topics as PHYS3059, but with greater depth and some more challenging material.

Textbooks
Schroeder, DV. An Introduction to Thermal Physics. Addison-Wesley. 2000

PHYS3060
Quantum Mechanics & Physics Lab

Credit points: 6 **Session:** Semester 2 **Classes:** Nineteen 1 hour lectures and six 4 hour practicals. **Prerequisites:** PHYS(2011 or 2911 or 2001 or 2901); PHYS(2012 or 2912 or 2002 or 2902); MATH(2061 or 2961 or 2067) **Prohibitions:** PHYS3960, PHYS3961, PHYS3011, PHYS3024, PHYS3026, PHYS3027, PHYS3911, PHYS3924, PHYS3926, PHYS3927 **Assessment:** One 1.5 hour exam, practical reports and oral presentation

The lectures cover the fundamental concepts and formalism of quantum dynamics, and the application to angular momentum and symmetry in quantum mechanics. In the practical laboratory classes, students will choose from a range of experiments that aim to give them an appreciation of the analytical, technical and practical skills required to conduct modern experimental work.

Textbooks
Eisberg, R and Resnick, R. Quantum Physics of Atoms, Molecules, Solids, Nuclei, and Particles. Second Edition.

PHYS3960
Quantum Mechanics & Physics Lab (Adv)

Credit points: 6 **Session:** Semester 2 **Classes:** Nineteen 1 hour lectures and twelve 4 hour practicals **Prerequisites:** PHYS (2011 or 2911 or 2001 or 2901) with at least Credit; PHYS (2012 or 2912 or 2002 or 2902) with at least Credit; MATH (2061 or 2961 or 2067) **Prohibitions:** PHYS3060, PHYS3961, PHYS3011, PHYS3024, PHYS3026, PHYS3027, PHYS3911, PHYS3924, PHYS3926, PHYS3927 **Assessment:** One 1.5 hour exam, practical reports and oral presentation

This unit covers the same topics as PHYS3060, but with greater depth and some more challenging material.

Textbooks
Liboff, RL. Introductory Quantum Mechanics. Fourth Edition.

PHYS3961
Quantum Mechanics & Special Project(Adv)

Credit points: 6 **Session:** Semester 2 **Classes:** Nineteen 1 hour lectures and 4 hours per week with a research group. **Prerequisites:** PHYS (2011 or 2911 or 2001 or 2901) with at least Credit; PHYS (2012 or 2912 or 2002 or 2902) with at least Credit; MATH (2061 or 2961 or 2067) **Prohibitions:** PHYS3060, PHYS3960, PHYS3941, PHYS3011, PHYS3911, PHYS3918, PHYS3928 **Assessment:** One 1.5 hour exam, project report and oral presentation

Note: Department permission required for enrolment. Note: Approval for this unit must be obtained from the School of Physics Senior Coordinator

The lectures cover the fundamental concepts and formalism of quantum dynamics, and the application to angular momentum and symmetry in quantum mechanics. The project is carried out in a research group within the School of Physics, working on a research experiment or theoretical project supervised by a researcher. The aim is for students to acquire an understanding of the nature of research, to apply their knowledge of physics and scientific practice, and to serve as preparation for a research project at Honours level and beyond.

Textbooks
Liboff, RL. Introductory Quantum Mechanics. Fourth Edition.

PHYS3062
Quantum/Cond Matter Physics & Lab

Credit points: 6 **Session:** Semester 2 **Classes:** Thirty-eight 1 hour lectures plus six 4 hour practicals **Prerequisites:** PHYS2012 or PHYS2912 **Prohibitions:** PHYS3060, PHYS3960, PHYS3961, PHYS3962, PHYS3068, PHYS3968, PHYS3070, PHYS3970, PHYS3074, PHYS3974, PHYS3075, PHYS3975, PHYS3076, PHYS3976, PHYS3077, PHYS3977, PHYS3079, PHYS3979, PHYS3080, PHYS3980, PHYS3081, PHYS3981 **Assessment:** one 1.5 hour exam, one 1hour exam, practical reports

This unit of study is intended for students majoring in Nanoscience and Technology. It should not be taken by students majoring in Physics. The lectures on Quantum Mechanics cover the fundamental concepts and formalism of quantum dynamics, and the application to angular momentum and symmetry in quantum mechanics. The lectures on Condensed Matter Physics cover the theoretical underpinning and properties of condensed matter, specifically the physics of solids. Semiconductors are investigated in detail, considering recent discoveries and new developments in nanotechnology and lattice dynamics. In the practical laboratory classes, students will choose from a range of experiments that aim to give them an appreciation of the analytical, technical and practical skills required to conduct modern experimental work.

Textbooks
Eisberg, R and Resnick, R. Quantum Physics of Atoms, Molecules, Solids, Nuclei, and Particles. Second Edition.

PHYS3962
Quantum/Cond Matter Physics & Lab (Adv)

Credit points: 6 **Session:** Semester 2 **Classes:** Thirty-eight 1 hour lectures plus six 4 hour practicals **Prerequisites:** PHYS2012 or PHYS2912 with result of credit or better **Prohibitions:** PHYS3060, PHYS3960, PHYS3961, PHYS3062, PHYS3068, PHYS3968, PHYS3070, PHYS3970, PHYS3074, PHYS3974, PHYS3075, PHYS3975, PHYS3076, PHYS3976, PHYS3077, PHYS3977, PHYS3079, PHYS3979, PHYS3080, PHYS3980, PHYS3081, PHYS3981 **Assessment:** One 1.5 hour exam, one 1 hour exam, practical reports

This unit of study is intended for students majoring in Nanoscience and Technology. It should not be taken by students majoring in Physics. This unit of study covers the same topics as PHYS3062, but with greater depth and some more challenging material.

Textbooks
Liboff, RL. Introductory Quantum Mechanics. Fourth Edition.

PHYS3068
Optics/Cond. Matter & Lab

Credit points: 6 **Session:** Semester 2 **Classes:** Thirty-eight 1 hour lectures and six 4 hour practicals. **Prerequisites:** PHYS (2011 or 2911 or 2001 or 2901); PHYS (2012 or 2912 or 2002 or 2902) **Prohibitions:** PHYS3968, PHYS3050, PHYS3950, PHYS3053, PHYS3953, PHYS3056, PHYS3956, PHYS3058, PHYS3958, PHYS3062, PHYS3962, PHYS3069, PHYS3969, PHYS3070, PHYS3970, PHYS3074, PHYS3974, PHYS3075, PHYS3975, PHYS3076, PHYS3976, PHYS3077, PHYS3977, PHYS3079, PHYS3979, PHYS3080, PHYS3980, PHYS3081, PHYS3981, PHYS3082, PHYS3982 **Assumed knowledge:** Electromagnetism and Quantum Mechanics at Senior Physics level; MATH (2061 or 2961 or 2067) **Assessment:** One 2 hour exam, practical reports

The lectures on Optics introduce students to modern optics, using the laser to illustrate the applications in studying the properties of matter and many important optical phenomena. The lectures on Condensed Matter Physics cover the theoretical underpinning and properties of condensed matter, specifically the physics of solids. Semiconductors are investigated in detail, considering recent discoveries and new developments in nanotechnology and lattice dynamics. In the practical laboratory classes, students will choose from a range of experiments that aim to give them an appreciation of the analytical, technical and practical skills required to conduct modern experimental work.

PHYS3968
Optics/Cond. Matter & Lab (Adv)

Credit points: 6 **Session:** Semester 2 **Classes:** Thirty-eight 1 hour lectures and six 4 hour practicals **Prerequisites:** PHYS (2011 or 2911 or 2001 or 2901) with at least Credit; PHYS (2012 or 2912 or 2002 or 2902) with at least Credit **Prohibitions:** PHYS3068, PHYS3050, PHYS3950, PHYS3053, PHYS3953, PHYS3056, PHYS3956, PHYS3058, PHYS3958, PHYS3062, PHYS3962, PHYS3069, PHYS3969, PHYS3070, PHYS3970, PHYS3074, PHYS3974, PHYS3075, PHYS3975, PHYS3076, PHYS3976, PHYS3077, PHYS3977, PHYS3079, PHYS3979, PHYS3080, PHYS3980, PHYS3081, PHYS3981, PHYS3082, PHYS3982 **Assumed knowledge:** Electromagnetism and Quantum Mechanics at Senior Physics level; MATH (2061 or 2961 or 2067) **Assessment:** One 2 hour exam, practical reports

This unit covers the same topics as PHYS3068, but with greater depth and some more challenging material.

PHYS3069
Optics/High Energy Physics & Lab

Credit points: 6 **Session:** Semester 2 **Classes:** Thirty-eight 1 hour lectures and six 4 hour practicals **Prerequisites:** PHYS (2011 or 2911 or 2001 or 2901); PHYS (2012 or 2912 or 2002 or 2902); PHYS (2013 or 2913 or 2001 or 2901) **Prohibitions:** PHYS3969, PHYS3050, PHYS3950, PHYS3053, PHYS3953, PHYS3056, PHYS3956, PHYS3058, PHYS3958, PHYS3068, PHYS3968, PHYS3071, PHYS3971, PHYS3073, PHYS3973, PHYS3074, PHYS3974, PHYS3076, PHYS3976, PHYS3078, PHYS3978, PHYS3079, PHYS3979, PHYS3080, PHYS3980, PHYS3081, PHYS3981, PHYS3082, PHYS3982 **Assumed knowledge:** Electromagnetism at Senior Physics level; MATH (2061 or 2961 or 2067) **Assessment:** One 2 hour exam, practical reports

The lectures on Optics introduce students to modern optics, using the laser to illustrate the applications in studying the properties of matter and many important optical phenomena. The lectures on High Energy Physics cover the basic constituents of matter, such as quarks and leptons, examining their fundamental properties and interactions, and their origin at the creation of the universe. In the practical laboratory classes, students will choose from a range of experiments that aim to give them an appreciation of the analytical, technical and practical skills required to conduct modern experimental work.

PHYS3969
Optics/High Energy Physics & Lab (Adv)

Credit points: 6 **Session:** Semester 2 **Classes:** Thirty-eight 1 hour lectures and six 4 hour practicals **Prerequisites:** PHYS (2011 or 2911 or 2001 or 2901) with at least Credit; PHYS (2012 or 2912 or 2002 or 2902) with at least Credit; PHYS (2013 or 2913 or 2001 or 2901) with at least Credit **Prohibitions:** PHYS3069, PHYS3050, PHYS3950, PHYS3053, PHYS3953, PHYS3056, PHYS3956, PHYS3058, PHYS3958, PHYS3068, PHYS3968, PHYS3071, PHYS3971, PHYS3073, PHYS3973, PHYS3074, PHYS3974, PHYS3076, PHYS3976, PHYS3078, PHYS3978, PHYS3079, PHYS3979, PHYS3080, PHYS3980, PHYS3081, PHYS3981, PHYS3082, PHYS3982 **Assumed knowledge:** Electromagnetism at Senior Physics level; MATH (2061 or 2961 or 2067) **Assessment:** One 2 hour exam, practical reports

This unit covers the same topics as PHYS3069, but with greater depth and some more challenging material.

PHYS3071
High Energy/Astrophysics & Lab

Credit points: 6 **Session:** Semester 2 **Classes:** Thirty-eight 1 hour lectures and six 4 hour practicals **Prerequisites:** PHYS (2011 or 2911 or 2001 or 2901); PHYS (2012 or 2912 or 2002 or 2902); PHYS (2013 or 2913 or 2001 or 2901) **Prohibitions:** PHYS3971, PHYS3069, PHYS3969, PHYS3072, PHYS3972, PHYS3073, PHYS3973, PHYS3074, PHYS3974, PHYS3075, PHYS3975, PHYS3076, PHYS3976, PHYS3077, PHYS3977, PHYS3078, PHYS3978, PHYS3079, PHYS3979, PHYS3080, PHYS3980, PHYS3081, PHYS3981, PHYS3082, PHYS3982 **Assessment:** One 2 hour exam, practical reports

The lectures on High Energy Physics cover the basic constituents of matter, such as quarks and leptons, examining their fundamental properties and interactions, and their origin at the creation of the universe. The lectures on Astrophysics explore astrophysical environments inside stars and beyond (e.g. the interstellar medium, the intergalactic medium and galaxies themselves) and focus on one of the most important physical processes in astrophysics: the transport of radiative energy. In the practical laboratory classes, students will choose from a range of experiments that aim to give them an appreciation of the analytical, technical and practical skills required to conduct modern experimental work.

PHYS3971
High Energy/Astrophysics & Lab (Adv)

Credit points: 6 **Session:** Semester 2 **Classes:** Thirty-eight 1 hour lectures and six 4 hour practicals **Prerequisites:** PHYS (2011 or 2911 or 2001 or 2901) with at least Credit; PHYS (2012 or 2912 or 2002 or 2902) with at least Credit; PHYS (2013 or 2913 or 2001 or 2901) with at least Credit **Prohibitions:** PHYS3071, PHYS3069, PHYS3969, PHYS3072, PHYS3973, PHYS3973, PHYS3074, PHYS3974, PHYS3075, PHYS3975, PHYS3076, PHYS3976, PHYS3077, PHYS3977, PHYS3078, PHYS3978, PHYS3079, PHYS3979, PHYS3080, PHYS3980, PHYS3081, PHYS3981, PHYS3082, PHYS3982 **Assessment:** One 2 hour exam, practical reports

This unit covers the same topics as PHYS3071, but with greater depth and some more challenging material.

PHYS3074
High Energy/Cond. Matter Physics & Lab

Credit points: 6 **Session:** Semester 2 **Classes:** Thirty-eight 1 hour lectures and six 4 hour practicals **Prerequisites:** PHYS (2011 or 2911 or 2001 or 2901); PHYS (2012 or 2912 or 2002 or 2902); PHYS (2013 or 2913 or 2001 or 2901) **Prohibitions:** PHYS3974, PHYS3062, PHYS3962, PHYS3068, PHYS3968, PHYS3069, PHYS3969, PHYS3070, PHYS3970, PHYS3071, PHYS3971, PHYS3073, PHYS3973, PHYS3075, PHYS3975, PHYS3076, PHYS3976, PHYS3077, PHYS3977, PHYS3078, PHYS3978, PHYS3079, PHYS3979, PHYS3080, PHYS3980, PHYS3081, PHYS3981, PHYS3082, PHYS3982 **Assumed knowledge:** Quantum Mechanics at Senior Physics level; MATH (2061 or 2961) **Assessment:** One 2 hour exam, practical reports

Plasma Physics is the study of ionized gases, which are collections of charged and neutral particles and form the main constituent of the Universe. The lectures cover the properties of plasmas and their applications, including nuclear fusion energy, materials synthesis and modification, environmental remediation, aerospace, nano- and biomedical technologies. The lectures on High Energy Physics cover the basic constituents of matter, such as quarks and leptons, examining their fundamental properties and interactions, and their origin at the creation of the universe. In the practical laboratory classes, students will choose from a range of experiments that aim to give them an appreciation of the analytical, technical and practical skills required to conduct modern experimental work.

PHYS3974
High Energy/Cond. Matter Phys.& Lab(Adv)

Credit points: 6 **Session:** Semester 2 **Classes:** Thirty-eight 1 hour lectures and six 4 hour practicals. **Prerequisites:** PHYS (2011 or 2911 or 2001 or 2901) with at least Credit; PHYS (2012 or 2912 or 2002 or 2902) with at least Credit

; PHYS (2013 or 2913 or 2001 or 2901) with at least Credit **Prohibitions:** PHYS3074, PHYS3062, PHYS3962, PHYS3068, PHYS3968, PHYS3069, PHYS3969, PHYS3070, PHYS3970, PHYS3071, PHYS3971, PHYS3073, PHYS3973, PHYS3075, PHYS3975, PHYS3076, PHYS3976, PHYS3077, PHYS3977, PHYS3078, PHYS3978, PHYS3079, PHYS3979, PHYS3080, PHYS3980, PHYS3081, PHYS3981, PHYS3082, PHYS3982 **Assumed knowledge:** Quantum Mechanics at Senior Physics level; MATH (2061 or 2961) **Assessment:** One 2 hour exam, practical reports

This unit covers the same topics as PHYS3074, but with greater depth and some more challenging material.

PHYS3079
Cond. Matter/High Energy/Astrophysics

Credit points: 6 **Session:** Semester 2 **Classes:** Fifty-seven 1 hour lectures **Prerequisites:** PHYS (2011 or 2911 or 2001 or 2901); PHYS (2012 or 2912 or 2002 or 2902); PHYS (2013 or 2913 or 2001 or 2901) **Prohibitions:** PHYS3979, PHYS3062, PHYS3962, PHYS3068, PHYS3968, PHYS3069, PHYS3969, PHYS3070, PHYS3970, PHYS3071, PHYS3971, PHYS3072, PHYS3972, PHYS3073, PHYS3973, PHYS3074, PHYS3974, PHYS3075, PHYS3975, PHYS3076, PHYS3976, PHYS3077, PHYS3977, PHYS3078, PHYS3978, PHYS3080, PHYS3980, PHYS3081, PHYS3981, PHYS3082, PHYS3982 **Assumed knowledge:** Quantum Mechanics at Senior Physics level; MATH (2061 or 2961) **Assessment:** One 3 hour exam

The lectures on Condensed Matter Physics cover the theoretical underpinning and properties of condensed matter, specifically the physics of solids. Semiconductors are investigated in detail, considering recent discoveries and new developments in nanotechnology and lattice dynamics. The lectures on High Energy Physics cover the basic constituents of matter, such as quarks and leptons, examining their fundamental properties and interactions, and their origin at the creation of the universe. The lectures on Astrophysics explore astrophysical environments inside stars and beyond (e.g. the interstellar medium, the intergalactic medium and galaxies themselves) and focus on one of the most important physical processes in astrophysics: the transport of radiative energy.

PHYS3979
Cond. Matter/High Energy/Astrophys (Adv)

Credit points: 6 **Session:** Semester 2 **Classes:** Fifty-seven 1 hour lectures **Prerequisites:** PHYS (2011 or 2911 or 2001 or 2901) with at least credit; PHYS (2012 or 2912 or 2002 or 2902) with at least Credit; PHYS (2013 or 2913 or 2001 or 2901) with at least Credit **Prohibitions:** PHYS3079, PHYS3062, PHYS3962, PHYS3068, PHYS3968, PHYS3069, PHYS3969, PHYS3070, PHYS3970, PHYS3071, PHYS3971, PHYS3072, PHYS3972, PHYS3073, PHYS3973, PHYS3074, PHYS3974, PHYS3075, PHYS3975, PHYS3076, PHYS3976, PHYS3077, PHYS3977, PHYS3078, PHYS3978, PHYS3080, PHYS3980, PHYS3081, PHYS3981, PHYS3082, PHYS3982 **Assumed knowledge:** Quantum Mechanics at Senior Physics level; MATH (2061 or 2961) **Assessment:** One 3 hour exam

This unit covers the same topics as PHYS3079, but with greater depth and some more challenging material.

PHYS3080
Optics/Cond.Matter/High Energy Physics

Credit points: 6 **Session:** Semester 2 **Classes:** Fifty-seven 1 hour lectures **Prerequisites:** PHYS (2011 or 2911 or 2001 or 2901); PHYS (2012 or 2912 or 2002 or 2902); PHYS (2013 or 2913 or 2001 or 2901) **Prohibitions:** PHYS3980, PHYS3050, PHYS3950, PHYS3053, PHYS3953, PHYS3056, PHYS3956, PHYS3058, PHYS3958, PHYS3062, PHYS3962, PHYS3068, PHYS3968, PHYS3069, PHYS3969, PHYS3070, PHYS3970, PHYS3071, PHYS3971, PHYS3073, PHYS3973, PHYS3074, PHYS3974, PHYS3075, PHYS3975, PHYS3076, PHYS3976, PHYS3077, PHYS3977, PHYS3078, PHYS3978, PHYS3079, PHYS3979, PHYS3081, PHYS3981, PHYS3082, PHYS3982 **Assumed knowledge:** Electromagnetism and Quantum Mechanics at Senior Physics level; MATH (2061 or 2961 or 2067) **Assessment:** One 3 hour exam

The lectures on Optics introduce students to modern optics, using the laser to illustrate the applications in studying the properties of matter and many important optical phenomena. The lectures on Condensed Matter Physics cover the theoretical underpinning and properties of condensed matter, specifically the physics of solids. Semiconductors are investigated in detail, considering recent discoveries and new developments in nanotechnology and lattice dynamics. The lectures on High Energy Physics cover the basic constituents of matter, such as quarks and leptons, examining their fundamental properties and interactions, and their origin at the creation of the universe.

PHYS3980
Optics/Cond.Matter/High Energy Phys(Adv)

Credit points: 6 **Session:** Semester 2 **Classes:** Fifty-seven 1 hour lectures **Prerequisites:** PHYS (2011 or 2911 or 2001 or 2901) with at least Credit; PHYS (2012 or 2912 or 2002 or 2902) with at least Credit; PHYS (2013 or 2913 or 2001 or 2901) with at least Credit **Prohibitions:** PHYS3080, PHYS3050, PHYS3950, PHYS3053, PHYS3953, PHYS3056, PHYS3956, PHYS3058, PHYS3958, PHYS3062, PHYS3962, PHYS3068, PHYS3968, PHYS3069, PHYS3969, PHYS3070, PHYS3970, PHYS3071, PHYS3971, PHYS3073, PHYS3973, PHYS3074, PHYS3974, PHYS3075, PHYS3975, PHYS3076, PHYS3976, PHYS3077, PHYS3977, PHYS3078, PHYS3978, PHYS3079, PHYS3979, PHYS3081, PHYS3981, PHYS3082, PHYS3982 **Assumed knowledge:** Electromagnetism and Quantum Mechanics at Senior Physics level; MATH (2061 or 2961 or 2067) **Assessment:** One 3 hour exam

This unit covers the same topics as PHYS3080, but with greater depth and some more challenging material.

PHYS3081
Optics/Cond. Matter/Astrophysics

Credit points: 6 **Session:** Semester 2 **Classes:** Fifty-seven 1 hour lectures **Prerequisites:** PHYS (2012 or 2912 or 2002 or 2902); PHYS (2013 or 2913 or 2001 or 2901) **Prohibitions:** PHYS3981, PHYS3050, PHYS3950, PHYS3053, PHYS3953, PHYS3056, PHYS3956, PHYS3058, PHYS3958, PHYS3062, PHYS3962, PHYS3068, PHYS3968, PHYS3069, PHYS3969, PHYS3070, PHYS3970, PHYS3071, PHYS3971, PHYS3072, PHYS3972, PHYS3074, PHYS3974, PHYS3075, PHYS3975, PHYS3076, PHYS3976, PHYS3077, PHYS3977, PHYS3078, PHYS3978, PHYS3079, PHYS3979, PHYS3080, PHYS3980, PHYS3082, PHYS3982 **Assumed knowledge:** Electromagnetism and Quantum Mechanics at Senior Physics level; MATH (2061 or 2961 or 2067) **Assessment:** One 3 hour exam

The lectures on Optics introduce students to modern optics, using the laser to illustrate the applications in studying the properties of matter and many important optical phenomena. The lectures on Condensed Matter Physics cover the theoretical underpinning and properties of condensed matter, specifically the physics of solids. Semiconductors are investigated in detail, considering recent discoveries and new developments in nanotechnology and lattice dynamics. The lectures on Astrophysics explore astrophysical environments inside stars and beyond (e.g. the interstellar medium, the intergalactic medium and galaxies themselves) and focus on one of the most important physical processes in astrophysics: the transport of radiative energy.

PHYS3981
Optics/Cond. Matter/Astrophysics (Adv)

Credit points: 6 **Session:** Semester 2 **Classes:** Fifty-seven 1 hour lectures **Prerequisites:** PHYS (2012 or 2912 or 2002 or 2902) with at least Credit; PHYS (2013 or 2913 or 2001 or 2901) with at least Credit **Prohibitions:** PHYS3081, PHYS3050, PHYS3950, PHYS3053, PHYS3953, PHYS3056, PHYS3956, PHYS3058, PHYS3958, PHYS3062, PHYS3962, PHYS3068, PHYS3968, PHYS3069, PHYS3969, PHYS3070, PHYS3970, PHYS3071, PHYS3971, PHYS3072, PHYS3972, PHYS3074, PHYS3974, PHYS3075, PHYS3975, PHYS3076, PHYS3976, PHYS3077, PHYS3977, PHYS3078, PHYS3978, PHYS3079, PHYS3979, PHYS3080, PHYS3980, PHYS3082, PHYS3982 **Assumed knowledge:** Electromagnetism and Quantum Mechanics at Senior Physics level; MATH (2061 or 2961 or 2067) **Assessment:** One 3 hour exam

This unit covers the same topics as PHYS3081, but with greater depth and some more challenging material.

PHYS3082
Optics/High Energy/Astrophysics

Credit points: 6 **Session:** Semester 2 **Classes:** Fifty-seven 1 hour lectures **Prerequisites:** PHYS (2011 or 2911 or 2001 or 2901); PHYS (2012 or 2912 or 2002 or 2902); PHYS (2013 or 2913 or 2001 or 2901) **Prohibitions:** PHYS3982, PHYS3050, PHYS3950, PHYS3053, PHYS3953, PHYS3056, PHYS3956, PHYS3058, PHYS3958, PHYS3068, PHYS3968, PHYS3069, PHYS3969, PHYS3071, PHYS3971, PHYS3072, PHYS3972, PHYS3073, PHYS3973, PHYS3074, PHYS3974, PHYS3075, PHYS3975, PHYS3076, PHYS3976, PHYS3077, PHYS3977, PHYS3078, PHYS3978, PHYS3079, PHYS3979, PHYS3080, PHYS3980, PHYS3081, PHYS3981 **Assumed knowledge:** Electromagnetism at Senior Physics level; MATH (2061 or 2961 or 2067) **Assessment:** One 3 hour exam

The lectures on Optics introduce students to modern optics, using the laser to illustrate the applications in studying the properties of matter and many important optical phenomena. The lectures on High Energy Physics cover the basic constituents of matter, such as quarks and leptons, examining their fundamental properties and interactions, and

their origin at the creation of the universe. The lectures on Astrophysics explore astrophysical environments inside stars and beyond (e.g. the interstellar medium, the intergalactic medium and galaxies themselves) and focus on one of the most important physical processes in astrophysics: the transport of radiative energy.

PHYS3982
Optics/High Energy/Astrophysics (Adv)

Credit points: 6 **Session:** Semester 2 **Classes:** Fifty-seven 1 hour lectures **Prerequisites:** PHYS (2011 or 2911 or 2001 or 2901) with at least Credit; PHYS (2012 or 2912 or 2002 or 2902) with at least Credit; PHYS (2013 or 2913 or 2001 or 2901) with at least Credit **Prohibitions:** PHYS3082, PHYS3050, PHYS3950, PHYS3053, PHYS3953, PHYS3056, PHYS3956, PHYS3058, PHYS3958, PHYS3068, PHYS3968, PHYS3069, PHYS3969, PHYS3071, PHYS3971, PHYS3072, PHYS3972, PHYS3073, PHYS3973, PHYS3074, PHYS3974, PHYS3075, PHYS3975, PHYS3076, PHYS3976, PHYS3077, PHYS3977, PHYS3078, PHYS3978, PHYS3079, PHYS3979, PHYS3080, PHYS3980, PHYS3081, PHYS3981 **Assumed knowledge:** Electromagnetism at Senior Physics level; MATH (2061 or 2961 or 2067) **Assessment:** One 3 hour exam

This unit covers the same topics as PHYS3082, but with greater depth and some more challenging material.

Physics Honours

Honours Coordinator

Dr Stephen Bartlett

Qualifying

To be considered for admission to the Honours program, students need 24 credit points of senior Physics units of study or equivalent with a SciWAM as specified in the degree resolutions.

Classes

Six lecture courses and a research project

Assessment

Coursework examinations, a 40-page Research report and oral presentation of the Research project. Physics Honours comprises formal coursework (weight 50%) and a research project (weight 50%).

Undertaking an Honours year in Physics

The Honours program in Physics provides students with an opportunity to undertake an original research project as well as attend advanced lecture courses to give students a broad understanding of modern physics at a high level. All students satisfying the qualifying requirements as set out above and in the Science Faculty Honours section of this handbook are strongly encouraged to apply for entry into Physics Honours. Fulltime enrolment is equivalent to 48 credit points for the year. Students are offered an opportunity to carry out independent research as a member of one of the active research groups in the School of Physics, under the supervision of a member of staff. Students may also study with staff from complementary disciplines, subject to the approval of the Honours coordinator. Honours students join a research group in the School of Physics and are encouraged to participate with staff and research students in activities within the School.They are provided with office accommodation, and are expected to attend colloquia and seminars. They may be employed for several hours per week in Junior teaching. Further information is available from the Physics Student Support Office, the Honours coordinator or from the website www.physics.usyd.edu.au/current/hons.shtml.

Physiology

The Department of Physiology provides introductory general Intermediate units of study and for those wishing to major in the subject, in-depth Senior units of study. For Senior units the February semester offers Neuroscience and Human Cellular Physiology, and the July semester offers Heart and Circulation as well as further study in Neuroscience.

PHSI2005
Integrated Physiology A

Credit points: 6 **Teacher/Coordinator:** Dr Meloni Muir **Session:** Semester 1 **Classes:** Five 1 hour lectures, one 3 hour practical and one 3 hour tutorial per fortnight. **Prerequisites:** 6 credit points of Junior Chemistry plus 30 credit points from any Junior Chemistry, Physics, Mathematics, Biology, Psychology units of study **Prohibitions:** PHSI2905, PHSI2001, PHSI2101, PHSI2901 **Assessment:** Two written exams; group and individual written and oral presentations.

Note: The completion of 6 credit points of MBLG units of study is highly recommended for progression to Senior Physiology. Students taking combined degrees or with passes in units not listed should consult a coordinator if they do not meet the prerequisites.

This unit of study offers a basic introduction to the functions of the nervous system, including excitable cell (nerve and muscle) physiology, sensory and motor systems and central processing. It also incorporates haematology and cardiovascular physiology. The practical component involves experiments on humans and isolated tissues, with an emphasis on hypothesis generation and data analysis. Inquiry-based learning tutorial sessions develop critical thinking and generic skills while demonstrating the integrative nature of physiology. Oral and written communication skills are emphasized, as well as group learning and team work.

Textbooks
Lauralee Sherwood: Human Physiology: From Cells to Systems 6th edition 2007.

PHSI2905
Integrated Physiology A (Advanced)

Credit points: 6 **Teacher/Coordinator:** Dr Atomu Sawatari **Session:** Semester 1 **Classes:** Five 1 hour lectures, one 3 hour practical and one 3 hour tutorial per fortnight. Advanced students will be required to attend the designated Advanced Practical and Tutorial sessions. Students will also be exempt from all Inquiry-based learning tutorial **Prerequisites:** 6 credit points of Junior Chemistry plus 30 credit points from any Junior Chemistry, Physics, Mathematics, Biology, Psychology units of study, approval of Coordinator **Prohibitions:** PHSI2005, PHSI2901, PHSI2001, PHSI2101 **Assessment:** One written exam; individual and group oral presentations, 2 practical reports (reports will replace some other assessment items from regular course)

Note: Department permission required for enrolment. Note: Permission from the coordinators is required for entry into this course. It is available only to selected students who have achieved a WAM of 75 (or higher) in their Junior units of study. Students taking combined degrees or with passes in units not listed should consult a coordinator if they do not meet the prerequisites. The completion of 6 credit points of MBLG units of study is highly recommended for progression to Senior Physiology

This unit of study is an extension of PHSI2005 for talented students with an interest in Physiology and Physiological research. The lecture component of the course is run in conjunction with PHSI2005. This unit of study gives a basic introduction to the functions of the nervous system, including excitable cell (nerve and muscle) physiology, sensory and motor systems and central processing. It also incorporates haematology and cardiovascular physiology. The practical component involves experiments on humans, isolated tissues, and computer simulations, with an emphasis on hypothesis generation and data analysis. Both oral and written communication skills are emphasized, as well as group learning. The course will provide an opportunity for students to apply and extend their understanding of physiological concepts by designing and conducting actual experiments. Small class sizes will provide a chance for students to interact directly with faculty members mentoring the practical sessions. Assessment for this stream will be based on oral group presentations and two practical reports. These items will replace some other assessable activities from the regular course.

Textbooks
Lauralee Sherwood: Human Physiology: From Cells to Systems 5th edition 2004

PHSI2006
Integrated Physiology B

Credit points: 6 **Teacher/Coordinator:** Dr Meloni Muir **Session:** Semester 2 **Classes:** Five one hour lectures, one 3 hour practical and one 3 hour tutorial per fortnight. **Prerequisites:** 6 credit points of Junior Chemistry plus 30 credit points from any Junior Chemistry, Physics, Mathematics, Biology, Psychology units of study **Prohibitions:** PHSI2906, PHSI2002, PHSI2102, PHSI2902

Assessment: Two written exams; group and individual written and oral presentations

Note: The completion of Molecular Biology and Genetics A is highly recommended for progression to Senior Physiology. Students taking combined degrees or with passes in units not listed should consult a coordinator if they do not meet the prerequisites.

This unit of study offers a basic introduction to the functions of the remaining body systems: gastrointestinal, respiratory, endocrine, reproductive and renal. The practical component involves experiments on humans and computer simulations, with an emphasis on hypothesis generation and data analysis. Inquiry-based learning tutorial sessions develop critical thinking and generic skills while demonstrating the integrative nature of physiology. Oral and written communication skills are emphasized, as well as group learning and team work.

Textbooks
Sherwood, L. Human Physiology: From Cells to Systems. 6th edition. 2007.

PHSI2906
Integrated Physiology B (Advanced)

Credit points: 6 **Teacher/Coordinator:** Dr Atomu Sawatari **Session:** Semester 2 **Classes:** Five 1 hour lectures, one 3 hour practical and one 3 hour tutorial per fortnight. Advanced students will be required to attend the designated Advanced Practical and Tutorial sessions. Students will also be exempt from all Inquiry-based learning tutorials **Prerequisites:** 6 credit points of Junior Chemistry plus 30 credit points from any Junior Chemistry, Physics, Mathematics, Biology, Psychology units of study, approval of coordinator **Prohibitions:** PHSI2006, PHSI2902, PHSI2002, PHSI2102 **Assessment:** One written exam; individual and group oral presentations, 2 practical reports (reports will replace some other assessment items from regular course)

Note: Department permission required for enrolment. Note: Permission from the coordinators is required for entry into this course. It is available only to selected students who have achieved a WAM of 75 (or higher) in their Junior units of study. Students taking combined degrees or with passes in units not listed should consult a coordinator if they do not meet the prerequisite. The completion of Molecular Biology and Genetics A is highly recommended for progression to Senior Physiology.

This unit of study is an extension of PHSI2006 for talented students with an interest in Physiology and Physiological research. The lecture component of the course is run in conjunction with PHSI2006. This unit of study gives a basic introduction to the remaining of the body systems: gastrointestinal, respiratory, endocrine, reproductive and renal. The practical component involves simple experiments on humans, isolated tissues, and computer simulations, with an emphasis on hypothesis generation and data analysis. Both oral and written communication skills are emphasized, as well as group learning. The course will provide an opportunity for students to apply and extend their understanding of physiological concepts by designing and conducting actual experiments. Small class sizes will provide a chance for students to interact directly with faculty members mentoring the practical sessions. Assessment for this stream will be based on oral group presentations and two practical reports. These items will replace some other assessable activities from the regular course.

Textbooks
Sherwood, L. Human Physiology: From Cells to Systems. 6th edition 2004.

Please note, all NEUR courses are taught and administered jointly by the Disciplines of Physiology and Anatomy & Histology and can form part of a major in Physiology, Anatomy & Histology or Neuroscience. NEUR3001/3901 and 3002/3902 are designed to be taken in conjunction with other. It is also strongly advised that NEUR3003/3903 and 3004/3904 be taken together. For information on NEUR3002 and NEUR3004 refer to the entry under Anatomy in this chapter.

NEUR3001
Neuroscience: Special Senses

Credit points: 6 **Teacher/Coordinator:** Dr Dario Protti **Session:** Semester 1 **Classes:** Two 1 hour lectures per week; one 3 hour practical per fortnight and one 3 hour tutorial per fortnight. **Prerequisites:** For BMedSc students: BMED(2801 or 2503) and BMED(2806 or 2505) For other students: (PHSI(2101 or 2001 or 2901 or 2005 or 2905) or ANAT(2003 or 2010)) and 6 credit points of MBLG. **Prohibitions:** PHSI3001, NEUR3901 **Assumed knowledge:** It is strongly recommended that students also take unit NEUR3002. PHSI2005 and ANAT2010 are assumed knowledge. **Assessment:** Two 1 hour exams, one prac report

The aim of this course is to provide students with an introduction to the structure and function of the nervous system and to the main concepts of processing of sensory information. Understanding basic sensory transduction mechanisms and the function of the sensory systems is necessary to understand how perceptual processes work in normal and disease conditions and provides a gateway to unravel the complexity of the mind. Basic aspects of low and high level sensory processing in all sense modalities will be covered, with a special emphasis in the auditory and visual systems. The relationship between sensory systems, perception and higher cognitive functions will be addressed.

Textbooks
Kandel, Schwartz, Jessel. Principles of Neural Science. 4th Ed, Elsevier, NY, 2000
or
Bear, Connors, Paradiso. Neuroscience: Exploring the brain. Baltimore: Williams & Wilkins, 2001

NEUR3901
Neuroscience: Special Senses (Advanced)

Credit points: 6 **Teacher/Coordinator:** Dr Dario Protti **Session:** Semester 1 **Classes:** Two 1 hour lectures per week; one 3 hour practical per fortnight and one 3 hour tutorial per fortnight. Advanced students may be exempt from attending some of these classes to permit meetings with supervisor. **Prerequisites:** For BMedSc students: Credit average in BMED(2801 or 2503) and BMED(2806 or 2505) For other students: Credit average in (PHSI(2101 or 2001 or 2901 or 2005 or 2905) or ANAT(2003 or 2010)) and 6 credit points of MBLG. **Prohibitions:** NEUR3001, PHSI3001, PHSI3901 **Assumed knowledge:** PHSI2005 and ANAT2010 **Assessment:** Two 1 hour exams, one prac report, tutorial papers, one research or library essay (research essay will replace some other assessment items from regular course).

Note: Permission from the coordinators is required for entry into this course. It is strongly recommended that students also take unit NEUR3002 or NEUR3902.

This unit of study is an extension of NEUR3001 for talented students with an interest in Neuroscience and research in this field. The lecture/practical component of the course is run in conjunction with NEUR3001. The aim of this course is to provide students with an introduction to the structure and function of the nervous system and to the main concepts of processing of sensory information. Understanding basic sensory transduction mechanisms and the function of the sensory systems is necessary to understand how perceptual processes work in normal and disease conditions and provides a gateway to unravel the complexity of the mind. Basic aspects of low and high level sensory processing in all sense modalities will be covered, with a special emphasis in the auditory and visual systems. The relationship between sensory systems, perception and higher cognitive functions will be addressed.

Textbooks
Kandel, Schwartz, Jessel. Principles of Neural Science. 4th Ed, Elsevier, NY, 2000
or
Bear, Connors, Paradiso. Neuroscience: Exploring the brain. Baltimore: Williams & Wilkins, 2001

NEUR3003
Cellular and Developmental Neuroscience

Credit points: 6 **Teacher/Coordinator:** Dr Kevin Keay and Dr Catherine Leamey **Session:** Semester 2 **Classes:** Three 1 hour lectures plus one 1 hour tutorial or one 2 hour practical per week. **Prerequisites:** For BMedSci: 42 credit points of intermediate BMed units. For others: 18 credit points of Intermediate science units of study from Anatomy & Histology, Biochemistry, Biology, Chemistry, Computer Science, Mathematics, Microbiology, Molecular Biology and Genetics, Physiology, Psychology or Statisitics **Prohibitions:** NEUR3903, PHSI3002, PHSI3902 **Assumed knowledge:** Students should be familiar with the material in Bear, Connors & Paradiso Neuroscience: Exploring the Brain. **Assessment:** One 1 hour exam. Major essay/report.

Note: Enrolment in NEUR3004 is HIGHLY RECOMMENDED. Courses are designed to be taken in conjunction with each other.

This second semester unit is designed to introduce students to "cutting edge" issues in the neurosciences. This course is a combination of small lectures on current issues in cellular and developmental neuroscience and a research-based library project. Suitably qualified students may have the option of replacing the library project with a laboratory project. Issues covered in the lecture series will include the role of glial on cerebral blood flow and neural transmission,

neurochemistry and psychiatric disorders and the development of central and peripheral nervous system.

Textbooks
Kandell, Schwartz and Jessell. Principles of Neural Science 4th edition.

NEUR3903
Cellular & Developmental Neurosci. (Adv)

Credit points: 6 **Teacher/Coordinator:** Dr Kevin Keay and Dr Catherine Leamey **Session:** Semester 2 **Classes:** Three 1 hour lectures and one 1 hour tutorial or one 2 hour lab session per week. **Prerequisites:** For BMedSci: 42 credit points of intermediate BMed units. For others: 18 credit points of Intermediate science units of study from Anatomy & Histology, Biochemistry, Biology, Chemistry, Computer Science, Mathematics, Microbiology, Molecular Biology and Genetics, Physiology, Psychology or Statisitics. Plus, students must have a CREDIT (or better) in NEUR3001/3901 and NEUR3002/3902. **Prohibitions:** NEUR3003, PHSI3002, PHSI3902 **Assumed knowledge:** Students should be familiar with the material in Bear, Connors & Paradiso Neuroscience: Exploring the Brain. **Assessment:** One 1 hour exam. Major essay/report. Mini-lecture.

Note: Department permission required for enrolment. Note: Enrollment in NEUR3004/3904 is HIGHLY RECOMMENDED. Courses are designed to be taken in conjunction with each other. Students must receive permission from the coordinators for enrollment.

This unit encompasses the material taught in NEUR3003. Advanced students perform a research project and present a mini-lecture on a current topic in neuroscience.

Textbooks
Kandell, Schwartz and Jessell. Principles of Neural Science. 4th edition.

For other NEUR units of study, see the entry for the Department of Antomy and Histology.

PHSI3005
Human Cellular Physiology: Theory

Credit points: 6 **Teacher/Coordinator:** Dr William Phillips **Session:** Semester 1 **Classes:** Three 1 hour lectures and one 1 hour tutorial per week. **Prerequisites:** Except for BMedSc students: PHSI(2005 or 2905) and PHSI(2006 or 2906) For BMedSc: BMED (2801 and 2802). **Prohibitions:** PHSI3905, PHSI3004, PHSI3904 **Assumed knowledge:** 6 credit points of MBLG **Assessment:** One 2 hour exam and 3-5 quizzes

Note: It is highly recommended that this unit of study be taken in conjunction with PHSI3006.

The aim of this unit of study is to examine key cellular processes involved in the growth, maintenance and reproduction of human life. Processes to be studied include the regulation of cell division and differentiation in developing and adult tissues, the regulation of body fluids through ion transport across epithelia, mechanisms of hormonal and nervous system signaling. Lectures will relate the molecular underpinnings to physiological functions: our current interpretation of how ion channels, hormone receptors and exocytotic complexes mediate tissue function and human life. The significance of these molecular mechanisms will be highlighted by considering how mutations and other disorders affect key proteins and genes and how this might lead to disease states such as cancer, intestinal and lung transport disorders and osteoporosis.

Textbooks
Alberts, B (Ed). Molecular Biology of the Cell 5th Edn. Publ. Garland Science)

PHSI3905
Human Cellular Physiology (Adv): Theory

Credit points: 6 **Teacher/Coordinator:** Dr William D. Phillips **Session:** Semester 1 **Classes:** Three 1 hour lectures and one 1 hour tutorial per week. **Prerequisites:** Credit average in PHSI(2005 or 2905) and PHSI(2006 or 2906) or in BMED (2801 and 2802). Students enrolling in this unit should have a WAM of at least 70. **Prohibitions:** PHSI3005, PHSI3004, PHSI3904 **Assumed knowledge:** 6 credit points of MBLG **Assessment:** One 2 hour exam, one 2000 word report based on a mentored research project.

Note: Department permission required for enrolment. Note: It is highly recommended that this unit of study be taken in combination with PHSI3906

The aim of this unit of study is to examine key cellular processes involved in the growth, maintenance and reproduction of human life. Processes to be studied include the regulation of cell division and differentiation in developing and adult tissues, the regulation of body fluids through ion transport across epithelia, mechanisms of hormonal and nervous system signaling and the regulation of muscle contraction. Lectures will relate the molecular underpinnings to physiological functions: our current interpretation of how ion channels, hormone receptors and exocytotic complexes mediate tissue function and human life. The significance of these molecular mechanisms will be highlighted by considering how mutations and other disorders affect key proteins and genes and how this might lead to disease states such as cancer, intestinal and lung transport disorders and osteoporosis. Please see the Physiology website for details of mentored Advanced research topics.

Textbooks
Alberts, B (Ed). Molecular Biology of the Cell. 5th Edn. Publ. Garland Science.

PHSI3006
Human Cellular Physiology: Research

Credit points: 6 **Teacher/Coordinator:** Dr William D. Phillips **Session:** Semester 1 **Classes:** Two small group PBL and one 1 hour lecture per week; one 3 hour practical in some weeks. **Prerequisites:** Except for BMedSc students: PHSI (2005 or 2905) and PHSI(2006 or 2906) For BMedSc: BMED (2801 and 2802). **Corequisites:** PHSI3005 **Prohibitions:** PHSI3906, PHSI3004, PHSI3904 **Assessment:** One 1.5 hour exam, PBL assessments by oral presentations and paper summaries, prac reports.

This unit of study complements, and should be taken together with PHSI3005. PHSI3006 focuses deeply upon certain areas of cellular physiology that have particular relevance to human health and disease. In the problem-based learning (PBL) sessions groups of students work together with the support of a tutor to develop and communicate an understanding of mechanisms underlying the physiology and patho-physiology of disorders such as cystic fibrosis and vitamin D resistance. Each problem runs over three weeks with two small group meetings per week. Reading lists are structured to help address written biomedical problems. Lectures provide advice on how to interpret scientific data of the type found in the research papers. Practical classes will emphasize experimental design and interpretation. Collectively, the PBL, lectures and practical classes aim to begin to develop skills and outlook needed to deal with newly emerging biomedical science.

Textbooks
Alberts, B (Ed). Molecular Biology of the Cell. 5th Edn Publ. Garland Science.

PHSI3906
Human Cellular Physiology (Ad): Research

Credit points: 6 **Teacher/Coordinator:** Dr William D. Phillips **Session:** Semester 1 **Classes:** Two small group PBL and one 1 hour lecture per week; one 3 hour practical in some weeks. **Prerequisites:** PHSI (2005 or 2905) and PHSI(2006 or 2906) or in BMED (2801 and 2802). Students enroling in this unit should have a WAM of at least 70. **Corequisites:** PHSI3905 **Prohibitions:** PHSI3006, PHSI3004, PHSI3904 **Assumed knowledge:** 6 credit points of MBLG **Assessment:** One 1.5 hour exam, PBL assessments by oral presentations and paper summaries, 1500w research report.

Note: Department permission required for enrolment.

This unit of study complements, and should be taken together with PHSI3905. PHSI3906 focuses deeply upon certain areas of cellular physiology that have particular relevance to human health and disease. In the problem-based learning (PBL) sessions groups of students work together with the support of a tutor to develop and communicate an understanding of mechanism underlying the physiology and patho-physiology of disorders such as cystic fibrosis and vitamin D resistance. Each problem runs over three weeks with two small group meetings per week. Reading lists are structured to help address written biomedical problems. Lectures provide advice on how to interpret scientific data of the type found in the research papers. Practical classes will emphasize experimental design and interpretation. Collectively, the PBL, lectures and practical classes aim to begin to develop skills and outlook needed to deal with newly emerging biomedical science. Please see the Physiology website for details of mentored Advanced research topics.

Textbooks
Alberts, B (Ed). Molecular Biology of the Cell. 5th Edn, Garland Science.

PHSI3007
Heart and Circulation: Normal Function

Credit points: 6 **Teacher/Coordinator:** Dr Steve Assinder **Session:** Semester 2 **Classes:** Two 1 hour lectures and one 3 hour practical or one 2 hour tutorial per week. **Prerequisites:** Except for BMedSc students: PHSI(2005 or 2905) and PHSI(2006 or 2906) plus at least 12 credit points of intermediate Science Units of Study For BMedSc: BMED (2801 and 2803). **Prohibitions:** PHSI3907, PHSI3003, PHSI3903 **Assumed knowledge:** 6 credit points of MBLG **Assessment:** One 2 hour exam, 3 practical assignments

Note: It is recommended that students take PHSI3007 ONLY in combination with PHSI3008.

The aim of this unit of study is to examine in depth the structure and function of the cardiovascular system at the organ system, cellular and molecular levels. There is a particular focus on exercise physiology and the way in which the heart, circulation and skeletal muscles contribute to the limits of sporting achievement. The excitability, contractility and energetics of the heart and blood vessels are studied and the regulation of these organs by local (physical and chemical) factors, hormones and the nervous system are discussed, with emphasis on cellular and molecular mechanisms. At the systemic level, short term (neural) mechanisms controlling the blood pressure and how the system behaves during exercise and other stresses is dealt with. Long term (hormonal) mechanisms regulating blood pressure via the renal control of extracellular fluid volume is also discussed. There is an emphasis in this unit of study on recent advances in cellular and molecular aspects of heart and the blood vessels and the regulation of these organs by local (physical and chemical) factors, hormones and the autonomic nervous system. Lectures will be complemented by practical classes and tutorials that reinforce the theory and emphasize experimental design, data interpretation and presentation.

PHSI3907
Heart & Circulation: Normal Function Adv

Credit points: 6 **Teacher/Coordinator:** Dr Steve Assinder **Session:** Semester 2 **Classes:** Two 1 hour lectures and one 3 hour practical or one 2 hour tutorial per week. **Prerequisites:** Except for BMedSc students: PHSI(2005 or 2905) and PHSI(2006 or 2906) plus at least 12 credit points of intermediate Science Units of Study For BMedSc: BMED (2801 and 2803). **Prohibitions:** PHSI3007, PHSI3003, PHSI3903 **Assumed knowledge:** 6 credit points of MBLG **Assessment:** One 2 hour exam, 2000w report/essay based on a mentored research project, practical assignment

Note: Department permission required for enrolment. Note: Available to selected students who have achieved an average of at least 75 in their prerequisite units of study. It is highly recommended that this unit of study be taken in combination with PHSI3908.

The aim of this unit of study is to examine in depth the structure and function of the cardiovascular system at the organ system, cellular and molecular levels. There is a particular focus on exercise physiology and the way in which the heart, circulation and skeletal muscles contribute to the limits of sporting achievement. The excitability, contractility and energetics of the heart and blood vessels are studied and the regulation of these organs by local (physical and chemical) factors, hormones and the nervous system are discussed, with emphasis on cellular and molecular mechanisms. At the systemic level, short term (neural) mechanisms controlling the blood pressure and how the system behaves during exercise and other stresses is dealt with. Long term (hormonal) mechanisms regulating blood pressure via the renal control of extracellular fluid volume is also discussed. There is an emphasis in this unit of study on recent advances in cellular and molecular aspects of heart and the blood vessels and the regulation of these organs by local (physical and chemical) factors, hormones and the autonomic nervous system. Lectures will be complemented by practical classes and tutorials that reinforce the theory and emphasize experimental design, data interpretation and presentation. Details of mentored Advanced research projects are available on the Physiology website.

PHSI3008
Heart and Circulation: Dysfunction

Credit points: 6 **Teacher/Coordinator:** Dr Steve Assinder **Session:** Semester 2 **Classes:** Two 1 hour lectures and two 1 hour PBL sessions per week. **Prerequisites:** Except for BMedSc students: PHSI(2005 or 2905) and PHSI(2006 or 2906) plus at least 12 credit points of intermediate Science Units of Study For BMedSc: BMED (2801 and 2803) **Prohibitions:** PHSI3908, PHSI3003, PHSI3903 **Assumed knowledge:** 6 credit points of MBLG **Assessment:** One 2 hour exam, PBL presentations, 2000wd essay

Note: It is strongly recommended that students take PHSI3008 ONLY in combination with PHSI3007

This unit of study complements and should be taken together with PHSI3007, which deals with the normal function of the cardiovascular system. This unit of study focuses on cardiovascular disease which is a major cause of death in western society. Lectures provide the background to understanding (a) the disruption of normal physiological processes, (b) recent advances in cellular and molecular aspects, and (c) the physiological basis of modern approaches to treatment. Example of diseases covered include: heart failure, heart attack, cardiac hypertrophy, atheroma and hypertension. In the seminar sessions, students will work in small groups with a tutor to further extend their understanding of cellular and molecular mechanisms underpinning cardiovascular disease. Reading lists are organized into specific topics related to a particular disease. Through analysis and discussion of the readings students develop skills necessary for interpreting and communicating science.

PHSI3908
Heart & Circulation: Dysfunction Adv

Credit points: 6 **Teacher/Coordinator:** Dr Steve Assinder **Session:** Semester 2 **Classes:** Two 1 hour lecture and two 1 hour PBL sessions per week. **Prerequisites:** Except for BMedSc students: PHSI(2005 or 2905) and PHSI(2006 or 2906) plus at least 12 credit points of intermediate Science Units of Study For BMedSc: BMED (2801 and 2803). **Prohibitions:** PHSI3008, PHSI3003, PHSI3903 **Assumed knowledge:** 6 credit points of MBLG **Assessment:** One 2 hour exam, PBL presentations, written assignment on a selected topic

Note: Department permission required for enrolment. Note: Available to selected students who have achieved an average of at least 75 in their prerequisite units of study. It is highly recommended that this unit of study be taken ONLY in combination with PHSI3907 or PHSI3007.

This unit of study complements and should be taken together with PHSI3007, which deals with the normal function of the cardiovascular system. This unit of study focuses on cardiovascular disease which is a major cause of death in western society. Lectures provide the background to understanding (a) the disruption of normal physiological processes, (b) recent advances in cellular and molecular aspects, and (c) the physiological basis of modern approaches to treatment. Example of diseases covered include: heart failure, heart attack, cardiac hypertrophy, atheroma and hypertension. In the seminar sessions, students will work in small groups with a tutor to further extend their understanding of cellular and molecular mechanisms underpinning cardiovascular disease. Reading lists are organized into specific topics related to a particular disease. Through analysis and discussion of the readings students develop skills necessary for interpreting and communicating science. Details of mentored Advanced research projects are available on the Physiology website.

Physiology Honours

During fourth year, no formal series of lectures is provided but students are given a relevant problem to investigate. This problem usually represents a small facet of one of the major current research projects within the Department, and the students work in collaboration with members of the staff. Students write a thesis embodying the results of their work.

Plant Science

The following units of study form part of the Plant Science program, which has been developed jointly by the Faculty of Agriculture, Food and Natural Resources and the School of Biological Sciences.

Intermediate units of study

PLNT2001
Plant Biochemistry and Molecular Biology

Credit points: 6 **Teacher/Coordinator:** Dr Meredith Wilkes, Prof Les Copeland, Dr Rosanne Quinnell **Session:** Semester 1 **Classes:** 2-3 lec/week, 32 hrs total; tutorials: 5 hrs total; laboratories: 36 hrs total **Prerequisites:** 12 credit points

of Junior Chemistry and 12 credit points of Junior Biology (or with the Dean's permission BIOL1201 and BIOL1202) **Prohibitions:** PLNT2901, AGCH2001 **Assessment:** One 2hr exam, practical reports, practical quizzes, theory of practical exam, 400 word writing assignment.

This unit of study is designed to develop an understanding of the molecular principles that underlie the structure and function of plants and how these principles relate to the use of plants by humans as a source of food and fibre.

The unit is a core unit for BScAgr and BHortSc students and an elective for BSc and other degree programs. It recognizes the specialized nature of plant biochemistry and molecular biology and is a platform for students who wish to gain a sound knowledge of plant growth and development.

This unit covers the biochemistry of the main carbohydrate, lipid, protein and nucleic acid constituents of plants , metabolic pathways that regulate plant growth and development, the mobilization and deposition of storage reserves, storage and expression of genetic information and plant responses to environmental influences. The role of molecular biology in the manipulation of plant growth and development will also be explored.

At the completion of this unit students will be able to demonstrate theoretical knowledge of the biochemical structure and function of plants and how molecular biology can enhance our use of plants as food and fibres. Students will also be able to demonstrate abilities in the practice of laboratory methods used to analyse plants and the effective communication of experimental findings.

Students enrolled in this unit will gain research and enquiry skills through attendance at lectures and participation in laboratory classes and tutorials, information literacy and communication skills through the synthesis of information used to prepare practical reports, social and professional understanding by participation in groupwork and assessments that seek to understand the role of agriculture in the broader community.

Textbooks

No recommended text. A study guide/laboratory manual will be available for purchase from the Copy Centre during the first week of semester. Lecture notes and readings will be available through WebCT.

PLNT2901

Plant Biochem & Molecular Biology (Adv)

Credit points: 6 **Teacher/Coordinator:** Dr Meredith Wilkes, Prof Les Copeland, Dr Rosanne Quinnell **Session:** Semester 1 **Classes:** 2-3 lec/week, 32 hrs total; tutorials: 5 hrs total; research project: 36 hrs total **Prerequisites:** A Distinction average in 12 credit points of Junior Chemistry and 12 credit points of Junior Biology (or with the Dean's permission BIOL1201 and BIOL1202) **Prohibitions:** PLNT2001, AGCH2001 **Assessment:** One 2hr exam, practical report, 400 word writing assignment.

This unit of study is designed to develop an understanding of the molecular principles that underlie the structure and function of plants and how these principles relate to the use of plants by humans as a source of food and fibre.

This unit is offered at an advanced level and is available to students in BScAgr, BHortSc, BSc and other degree programs. This unit recognizes the specialized nature of plant biochemistry and is of interest to students who wish to gain a more advanced knowledge of plant growth and development.

This unit covers the biochemistry of the main carbohydrate, lipid, protein and nucleic acid constituents of plants , metabolic pathways that regulate plant growth and development, the mobilization and deposition of storage reserves, storage and expression of genetic information and plant responses to environmental influences. The role of molecular biology in the manipulation of plant growth and development will also be explored.

At the completion of this unit students will be able to demonstrate theoretical knowledge of the biochemical structure and function of plants and how molecular biology can enhance our use of plants as food and fibres. Students will also be able to demonstrate abilities in the practice of laboratory methods used to anaylse plants and the effective communication of experimental findings by completing a short research project.

Students enrolled in this unit will gain research and enquiry skills through attendance at lectures and tutorials and by completing a small research project and information literacy and communication skills through the synthesis of information used to prepare a report on the findings of the research project.

Textbooks

No recommended text. A study guide/laboratory manual will be available for purchase from the Copy Centre during the first week of semester. Lecture notes and readings will be available through WebCT.

PLNT2002

Aust Flora: Ecology and Conservation

Credit points: 6 **Teacher/Coordinator:** Dr Glenda Wardle, Dr Murray Henwood. **Session:** Semester 1 **Classes:** (2 hrs lec & 3 hrs prac)/wk, audiovisual. **Prerequisites:** 6 credit points of a Junior unit of study **Prohibitions:** PLNT2902 **Assessment:** One 2-hr exam (40%), laboratory reports (20%) herbarium (20%), one 2-hr practical exam (20%).

This unit provides a broad understanding of the evolution, classification and diversity of terrestrial plants, and the principles of plant ecology in an Australian context. The major types of Australian vegetation are discussed across a range of temporal and spatial scales, and their current distribution related to their environment and origins. Selected contemporary issues in plant conservation from Australian natural and managed systems are explored. There is a strong emphasis on practical skills such as phylogenetic inference, plant identification and the collection and analysis of ecological data. The practical component of the unit of study uses examples taken from the Australian flora (including plants of horticultural significance) and major crop plants. Important elements of this unit are half-day field trips to the Royal National Park, and the construction of student herbaria. The practical sessions and interactions with staff encourage students to develop their own learning style and enhance a strong sense of self-reliance. Critical thinking, effective communication and other vocational and generic skills are emphasized. The content is well suited to students with interests in botany, plant science and ecology, and is often combined with units of study offered through the School of Biological Sciences and the Faculty of Agriculture, Food and Natural Resources. This unit of study also complements a wide range of units of study from: science (e.g. plant science, earth and environmental science, animal science, bioinformatics, molecular and cell biology, genetics and biotechnology); agriculture (e.g. horticulture, land and water science, and natural resources); and broader disciplines (e.g. education, arts, and environmental law).

Textbooks

A Laboratory Manual for the unit will be available for purchase from the Copy Centre during the first week of Semester.

PLNT2902

Aust Flora: Ecology & Conservation (Adv)

Credit points: 6 **Teacher/Coordinator:** Dr Glenda Wardle, Dr Murray Henwood **Session:** Semester 1 **Classes:** (2 lec & 3 prac)/wk, audiovisual **Prerequisites:** Distinction average in 6 credit points of Junior units of study **Prohibitions:** PLNT2002 **Assumed knowledge:** The contents of BIOL(1002 or 1902) is assumed knowledge. Students wishing to enroll in Intermediate Biology (BIOL) and Plant Science (PLNT) units of study using BIOL(1003 or 1903) will need to do some preparatory reading **Assessment:** One 2-hr exam (40%), laboratory reports (20%) research project (20%), one 2-hr practical exam (20%).

Qualifed students will participate in alternative components of PLNT2002. The content and nature of these components may vary from year to year. See prerequisites for Senior units of study in Biology.

Textbooks

A Laboratory Manual for the unit will be available for purchase from the Copy Centre during the first week of Semester.

PLNT2003

Plant Form and Function

Credit points: 6 **Teacher/Coordinator:** A/Prof Robyn Overall, Dr Lindsay Campbell **Session:** Semester 2 **Classes:** 24 lectures; 10 tutorials; 8 x 2 hr and 2x3hr labs; 2x6 hr field trips **Prohibitions:** PLNT2903, BIOL2003, BIOL2903, CROP2001 **Assumed knowledge:** 12 credit points of Junior Biology, or equivalent eg BIOL (1001 or 1101 or 1901 or 1911) and BIOL (1002 or 1902 or 1003 or 1903) **Assessment:** One 2hr theory exam (40%), prac exam (20%), anatomy project (10%), quizzes (5%), physiology report (10%), field report (15%).

This unit of study investigates the structure of cells, tissues and organs of flowering plants and relates them to function. Topics include; how photosynthesis, translocation, water transport and nutrition relate to the structures that carry out these processes. Most of the information on plant structure will be provided in self-instructional audio-visual sessions augmented by small group discussions. This is integrated with experiments carried out in the laboratory or on field excursions to investigate the physiological aspects of plant structures. There is a focus on recent advances in plant molecular biology where they have been critical in enhancing our understanding of the form and function of plants. The physiological and anatomical responses of plants to extreme environments such as drought and salinity will also be addressed. Attention will be paid to the anatomy and physiology of crop, horticultural and Australian native plants. This unit of study complements Plant Biochemistry and Molecular Biology, Australian Flora: ecology and conservation and Cell Biology and leads onto senior units of study in plant sciences, including Plant Growth and Development. It is essential for those seeking a career in plant molecular biology.

Textbooks

Taiz L, Zeiger E (2006) Plant Physiology 4th ed. Sunderland, Mass Sinauer
Recommended reading:
Atwell B, Kriedemann P, Turnbull C (1999) Plants in Action. Macmillan, South Yarra.
Buchanan BB, Gruissem W, Jones RL (2000) Biochemistry and Molecular Biology of Plants, ASPP, Rockvill, Maryland
A Study Guide for the unit will be available for purchase from the Copy Centre during the first week of semester.

PLNT2903

Plant Form and Function (Advanced)

Credit points: 6 **Teacher/Coordinator:** A/Prof Robyn Overall, Dr Lindsay Campbell **Session:** Semester 2 **Classes:** 24 lectures; 10 tutorials; 8 x 2 hr and 2x3hr labs; 2x6 hr field trips **Prohibitions:** PLNT2003, BIOL2003, BIOL2903, CROP2001 **Assumed knowledge:** 12 credit points of Junior Biology, or equivalent eg BIOL (1001 or 1101 or 1901 or 1911) and BIOL (1002 or 1902 or 1003 or 1903) **Assessment:** One 2hr theory exam (40%), prac exam (20%), research project oral and written presentation (25%), field report (15%).

The content will be based on PLNT2003 but qualified students will participate in alternative components at a more advanced level. The content and nature of these components may vary from year to year.

Textbooks

Taiz L, Zeiger E (2006) Plant Physiology 4th ed. Sunderland, Mass Sinauer
Recommended reading:
Atwell B, Kriedemann P, Turnbull C (1999) Plants in Action. Macmillan, South Yarra.
Buchanan BB, Gruissem W, Jones RL (2000) Biochemistry and Molecular Biology of Plants, ASPP, Rockvill, Maryland
A Study Guide for the unit will be available for purchase from the Copy Centre during the first week of semester.

Senior units of study

PLNT3001

Plant, Cell and Environment

Credit points: 6 **Teacher/Coordinator:** Dr Rosanne Quinnell, A/Prof Robyn McConchie, Dr Charles Warren **Session:** Semester 2 **Classes:** Workshops and discussions 2 hr/wk; laboratories: alternate weeks 30 hr total (6 pracs; 5 hr each) **Prerequisites:** 12 credit points of Intermediate Biology, Plant Science, Molecular Biology and Genetics or equivalent **Prohibitions:** PLNT3901 **Assessment:** One 2hr exam, 3 reports.

This unit of study of comprises workshops and practical sessions that will be guided largely by current directions in plant science research in Australia. Three theme areas will be identified and used to direct the workshops and discussions conducted throughout the semester. We expect students to be able to span levels of plant organisation: molecular, cellular, tissues, organs, whole organism physiology and ecology. Theme areas for discussion will consider the Australian flora and the areas currently under investigation at the University of Sydney such as post-harvest physiology. Students will need to draw on knowledge from Intermediate units of study and will be expected to explore in the published literature in order to successfully integrate information from areas unfamiliar to themselves so as to participate in workshops and discussions. This unit of study provides opportunities for students to develop their skills in research and enquiry, information literacy, and communication.

The practical component of this unit of study has sufficient flexibility for students to design their own group experiments to answer questions raised during the workshops. A range of equipment for student experiments will be available including: pulse amplitude modulated (PAM) fluorometer; oxygen electrodes; Scholander bomb, gel electrophoresis (PAGE).

The purpose of this Unit of Study is to develop an understanding of current directions in Plant Science at an advanced level.

When you have successfully completed this unit of study, you should be able to:

be familiar with modern approaches of physiology, biophysics and molecular biology in the study of plant function;

understand how domains of knowledge interact to describe plant function;

understand how plants function in stressful environments;

carryout a small research project;

draft a manuscript for publication in a peer-reviewed journal.

Textbooks

Students will be drawing on the current research literature for content.
A Study Guide for the unit will be available for purchase during the first week of semester from the Copy Centre at a cost to be advised.

PLNT3901

Plant, Cell and Environment (Advanced)

Credit points: 6 **Teacher/Coordinator:** Dr Rosanne Quinnell, A/Prof Robyn McConchie, Dr Charles Warren **Session:** Semester 2 **Classes:** Workshops and discussions 2 hr/wk; laboratories: alternate weeks 30 hr total (6 pracs; 5 hr each) **Prerequisites:** 12 credit points of Intermediate Biology, Plant Science, Molecular Biology and Genetics or equivalent with average grade of distinction **Prohibitions:** PLNT3001 **Assessment:** One 2hr exam, one advance student project report.

Note: Department permission required for enrolment.

This unit of study of comprises workshops and practical sessions that will be guided largely by current directions in plant science research in Australia. Three theme areas will be identified and used to direct the workshops and discussions conducted throughout the semester. We expect students to be able to span levels of plant organisation: molecular, cellular, tissues, organs, whole organism physiology and ecology. Theme areas for discussion will consider the Australian flora and the areas currently under investigation at the University of Sydney such as post-harvest physiology. Students will need to draw on knowledge from Intermediate units of study and will be expected to explore in the published literature in order to successfully integrate information from areas unfamiliar to themselves so as to participate in workshops and discussions. This unit of study provides opportunities for students to develop their skills in research and enquiry, information literacy, and communication.

The practical component of this unit of study has sufficient flexibility for students to design their own group experiments to answer questions raised during the workshops. A range of equipment for student experiments will be available including: pulse amplitude modulated (PAM) fluorometer; oxygen electrodes; Scholander bomb, gel electrophoresis (PAGE).

The purpose of this unit of study is to develop an understanding of current directions in Plant Science

When you have successfully completed this unit of study, you should be able to:

be familiar with modern approaches of physiology, biophysics and molecular biology in the study of plant function;

understand how domains of knowledge interact to describe plant function;

understand how plants function in stressful environments.

Textbooks

Students will be drawing on the current research literature for content.
A Study Guide for the unit will be available for purchase during the first week of semester from the Copy Centre at a cost to be advised.

PLNT3002
Plant Growth and Development

Credit points: 6 **Teacher/Coordinator:** Dr Jan Marc (Executive Officer), Prof Robyn Overall, Prof David Guest, Dr Lindsay Campbell **Session:** Semester 2 **Classes:** 2-3 lec per wk, one 4 hr practical (6 weeks only), one 3 hr presentation of research project in week 13 **Prerequisites:** 12 credit points of intermediate PLNT, BIOL, AGCH or CROP units of study including at least one of PLNT2001, PLNT2901, PLNT2003, PLNT2903, BIOL2016, BIOL2916, BIOL2003, BIOL2903, BIOL2006, BIOL2906, CROP2001, AGCH2002 or equivalent **Prohibitions:** PLNT3902, BIOL3021, BIOL3931 **Assessment:** One 2 hr exam (60%), project presentation and report (20%), laboratory quizzes, report and book (20%).

This unit explores the fundamental mechanisms underlying plant growth and development from seed to maturity. It builds on the knowledge gained in intermediate units in biology and plant sciences. The unit covers the process of building the plant body from embryogenesis, development and operation of meristems, polarity, patterning, control of flowering and fruit development to programmed cell death and senescence. Students will investigate the role of hormonal signals in coordinating plant growth and development, and the cellular and molecular mechanisms underlying plant responses to environmental signals such as gravity, light, and salinity. Students will explore aspects of recent plant molecular biology that have been critical in enhancing our current understanding of plant growth and development, using examples from crop, horticultural and native plants as well as the model plant Arabidopsis. Lectures are augmented by experimental work in which students will identify fundamental mechanisms in plant development using plant tissue culture, protoplast production and modern cell biological techniques. Students will be able to articulate novel findings by conducting an independent research project. An excursion to the ANU and the CSIRO Plant Industry in Canberra will provide an opportunity to explore world-class research facilities for plant molecular biology. The students will gain research and inquiry skills through individual and group-based projects, communication skills through group discussions and laboratory reports, and presentation skills and personal and intellectual autonomy through working in groups. This unit of study complements other senior units of study in the Plant Science Major and is essential for those seeking a career in plant molecular biology.

Textbooks
Taiz L, Zeiger E (2006) Plant Physiology 4th ed. Sinauer Associates, Sunderland, Massachusetts
Recommended reading:
Atwell B, Kriedemann P, Turnbull C (1999) Plants in Action. Macmillan, South Yarra.
Buchanan BB, Gruissem W, Jones RL (2000) Biochemistry and Molecular Biology of Plants, ASPP, Rockville, Maryland
A Study Guide for the unit will be available for purchase from the Copy Centre during the first week of semester.

PLNT3902
Plant Growth and Development (Advanced)

Credit points: 6 **Teacher/Coordinator:** Dr Jan Marc (Executive Officer), Prof Robyn Overall, Prof David Guest, Dr Lindsay Campbell **Session:** Semester 2 **Classes:** 2-3 lec per wk, one 4 hr practical (6 weeks only), one 3 hr presentation of research project in week 13 **Prerequisites:** 12 credit points of intermediate PLNT, BIOL, AGCH or CROP units of study including at least one of PLNT2001, PLNT2901, PLNT2003, PLNT2903, BIOL2016, BIOL2916, BIOL2003, BIOL2903, BIOL2006, BIOL2906, CROP2001, AGCH2002 or equivalent. These requirements may be varied and students with lower averages should consult the unit Executive Officer. **Prohibitions:** PLNT3002, BIOL3021, BIOL3931 **Assessment:** One 2 hr exam (60%), project presentation and report (20%), laboratory quizzes and book (20%).

Qualified students will participate in alternative components of PLNT3002 Plant Growth and Development, representing 30% of the total assessment, as follows: the students will be exempt from one standard laboratory report and the standard independent group project. Instead, the students will conduct an advanced independent individual practical or theoretical research project under the supervision of a member of the academic staff. The program includes a formal presentation of the results of the project in verbal and written reports.

Textbooks
Taiz L, Zeiger E (2006) Plant Physiology 4th ed. Sinauer Associates, Sunderland, Massachusetts
Recommended reading:
Atwell B, Kriedemann P, Turnbull C (1999) Plants in Action. Macmillan, South Yarra.
Buchanan BB, Gruissem W, Jones RL (2000) Biochemistry and Molecular Biology of Plants, ASPP, Rockville, Maryland
A Study Guide for the unit will be available for purchase from the Copy Centre during the first week of semester.

PLNT3003
Systematics and Evolution of Plants

Credit points: 6 **Teacher/Coordinator:** Dr Murray Henwood **Session:** Semester 1 **Classes:** 2 lectures, one 3 hour practical per week, 2-day field-trip. **Prerequisites:** 6 credit points of any Intermediate unit of study from BIOL, PLNT, LWSC, HORT, GEOS, GEOG, ENVI, SOIL. **Prohibitions:** PLNT3903, BIOL3015/3915. **Assessment:** One 2 hr take-home exam (45%), oral presentation (5%), nomenclature exercise (15%), research project (35%).

This unit of study introduces students to the practical aspects of Plant Systematics and Evolution. Students will gain a working knowledge of the general techniques and approaches used in Plant Systematics (including an understanding of plant taxonomy, phylogenetics and evolutionary processes). A range of data sources (nucleotide sequences and morphology) will be used to address questions concerning the evolution, classification and historical biogeography of various plant groups. A two-day field trip will provide tuition in plant identification and an opportunity to acquire skills in field-botany . This unit of study is recommended for students with an interest in the areas of: botany, plant science, horticulture, fungal biology (including plant pathology), environmental science, bioinformatics and ecology. It is often combined with units of study offered through the School of Biological Sciences and the Faculty of Agriculture, Food and Natural Resources.

Textbooks
Jud, WS, Campbell, CS, Kellog, EA, Stevens, PF and Donohuge, MJ. 2002. Plant Systematics: A Phylogenetic Approach.

PLNT3903
Systematics and Evolution of Plants Adv

Credit points: 6 **Teacher/Coordinator:** Dr Murray Henwood **Session:** Semester 1 **Classes:** 2 lectures & 1 practical per week. **Prerequisites:** Distinction average in 6 credit points of any Intermediate unit of study from BIOL, PLNT, LWSC, HORT, GEOS, GEOG, ENVI, SOIL. These requirements may be varied and students with lower averages should consult the Unit Executive Officer. **Prohibitions:** PLNT3003, BIOL3015/3915. **Assessment:** One 2 hr take-home exam (45%), oral presentation (5%), nomenclature exercise (15%), research project (35%).

Qualified students will participate in alternative components of PLNT3003 Systematics and Evolution of Plants. The content and nature of these components may vary from year to year.

Textbooks
Same as PLNT3003.

BIOL3009
Terrestrial Field Ecology

Credit points: 6 **Teacher/Coordinator:** Dr Glenda Wardle **Session:** S2 Intensive **Classes:** One 6 day field trip held in the pre-semester break, and 4 practical classes during weeks 1-4 in Semester 2. **Prerequisites:** 12 credit points of Intermediate Biology or ANSC2004 and BIOM2001. **Prohibitions:** BIOL3909 **Assumed knowledge:** BIOL (3006 or 3906). Prior completion of one of these units is very strongly recommended. **Assessment:** Discussions and quiz (10%), research project proposal and brief presentation (10%), sampling project report (20%), specimen collection (10%), research project report (50%).
Note: One 6 day field trip held in the pre-semester break (19 - 24 July 2009) and 4 practical classes during weeks 1-4 in Semester 2.

This field course provides practical experience in the experimental analysis of terrestrial populations and assemblages. Students learn a broad range of ecological sampling techniques and develop a detailed understanding of the logical requirements necessary for manipulative ecological field experiments. The field work incorporates survey techniques for plants, small mammals and invertebrates and thus provides a good background for ecological consulting work. Students attend a week-long field course and participate in a large-scale research project as well as conducting their own research project. Invited experts contribute to the lectures and discussions on issues relating to the ecology, conservation and management of Australia's terrestrial flora and fauna.

BIOL3909
Terrestrial Field Ecology (Advanced)

Credit points: 6 **Teacher/Coordinator:** Dr Glenda Wardle. **Session:** S2 Intensive **Classes:** 6 day field trip held in the pre-semester break and 4 practical classes during weeks 1-4 in Semester 2. **Prerequisites:** Distinction average in 12 credit points of Intermediate Biology or ANSC2004 and BIOM2001 **Prohibitions:** BIOL3009. **Assumed knowledge:** BIOL (3006 or 3906). Prior completion of one of these units is very strongly recommended. **Assessment:** Discussions and quiz (10%), research project proposal and brief presentation (10%), sampling project report (20%), specimen collection (10%), research project report (50%).

Note: One 6 day field trip held in the pre-semester break (19 - 24 July 2009) and 4 practical classes during weeks 1-4 in Semester 2.

This unit has the same objectives as BIOL3009 Terrestrial Field Ecology, and is suitable for students who wish to pursue certain aspects in greater depth. Entry is restricted, and selection is made from applicants on the basis of previous performance. Students taking this unit of study will complete an individual research project on a topic negotiated with a member of staff. It is expected that much of the data collection will be completed during the field trip but some extra time may be needed during semester 2. Specific details of this unit of study and assessment will be announced in meetings with students at the beginning of the unit. This unit of study may be taken as part of the BSc (Advanced) program.

BIOL3017
Fungi in the Environment

Credit points: 6 **Teacher/Coordinator:** Dr Peter McGee **Session:** S1 Intensive **Classes:** 40 hours of practicals in a two week intensive program held immediately prior to semester one (laboratory componet each morning from 16-27 February 2009), plus the equivalent of 30 hours self-guided study during the semester. **Prerequisites:** 12 credit points of Intermediate Biology, or 6 credit points of Intermediate Biology and 6 Intermediate credit points of either Microbiology or Geography. **Prohibitions:** BIOL3917 **Assessment:** One 2 hour take home exam, laboratory and written assignments.

Note: Dates: 16-27 February 2009. The completion of 6 credit points of MBLG units is highly recommended.

The unit is designed to develop understanding of fungal ecology in relation to environmental and rehabilitation biology, biological control of pests and pathogens, and soil microbiology. Emphasis will be placed on the function of fungi, and the benefit provided by fungi in symbiotic interactions with plants, including mycorrhizal fungi and shoot-borne endophytes. Physiological and ecological implications of the interactions will also be considered. Each student will design and implement a research project. Analytical thinking and research-led activity will be encouraged. Using broad scientific approaches, each student will gain the capacity to work cooperatively to find and analyse information from primary sources, develop approaches to test their understanding, and to present their work in a scientifically acceptable manner. Students will develop a deeper understanding of one area of fungal biology through independent study. Part of the learning material will be available on the internet.

BIOL3917
Fungi in the Environment (Advanced)

Credit points: 6 **Teacher/Coordinator:** Dr Peter McGee **Session:** S1 Intensive **Classes:** 40 hours of practical work in a two week intensive program immediately prior to semester one (labs run from 16 - 27 February 2009), plus the equivalent of 30 hours self-guided study during the semester. **Prerequisites:** Distinction average in 12 credit points of Intermediate Biology, or 6 credit points of Intermediate Biology and 6 Intermediate credit points of either Microbiology or Geography. **Prohibitions:** BIOL3017 **Assessment:** One 2 hour take home exam, research project, laboratory and written assignments.

Note: The completion of 6 credit points of MBLG units is highly recommended.

Qualified students will be encouraged to develop a research project under supervision. The content and nature of the research will be agreed on with the executive officer.

PPAT3003
Plant Disease

Credit points: 6 **Teacher/Coordinator:** Prof David Guest **Session:** Semester 1 **Classes:** (2 lec, 3 hr prac)/wk **Prerequisites:** MICR2024 **Assessment:** One 2hr end of semester exam (60%), one prac exam (25%), six take-home quizzes (15%).

This unit introduces plant disease and the pathogens that limit agricultural and horticultural production. The unit is core to the BScAgr and BHortSc degrees and is available as an elective to BLWS and BSc students. It builds on the material introduced in MICR2024. The lecture component of the unit discusses the aetiology of plant disease and symptom development; diagnosis of plant disease; the biology, epidemiology and management of fungi and other microbes that cause plant disease; breeding for disease resistance; plant-parasite relationships; and disease resistance in plants. The practical component introduces techniques used in handling and identifying fungi and in studying plant disease, and develops skills in experimental design, execution and interpretation of experimental data. At the completion of this unit, students will be able to exercise problem-solving skills (developed through practical experiments and lecture discussions), think critically, and organise knowledge (from consideration of the lecture material and preparation of practical reports), expand from theoretical principles to practical explanations (through observing and reporting on practical work), use certain computer software for analysing data and reporting on laboratory projects. Students learn to work in a research team, plan effective work schedules (to meet deadlines for submission of assessable work), use statistical analysis in research, keep appropriate records of laboratory research, work safely in a research laboratory and operate a range of scientific equipment. Students will gain research and inquiry skills through research based group projects, information literacy and communication skills through assessment tasks and personal and intellectual autonomy through working in groups.

Textbooks

Schumann GL & Darcy CJ 2006. Essential Plant Pathology. APS Press, St Paul, Minn., USA.

HORT3005
Production Horticulture

Credit points: 6 **Teacher/Coordinator:** Dr Jenny Jobling **Session:** Semester 1 **Classes:** (2 lec; 1x3hr prac/workshop)/wk **Prerequisites:** Two of PLNT2001, PLNT2901, PLNT2002, PLNT2902, PLNT2003, PLNT2903. **Assumed knowledge:** ((AFNR1001 and AFNR1002) or (HORT1001 and HORT1002)) and HORT2002. **Assessment:** One 3 hr exam (55%), three assignments (45%).

This unit of study covers topics on the production of perennial fruit crops, wine grapes, the sustainable production of vegetables and it also covers the key aspects of the postharvest handling and quality assurance of fresh produce. At the end of this unit students are expected to have a detailed understanding of these areas of horticulture and be able to discuss related literature and the physiological principles underlying the commercial success of these horticultural enterprises. Students will also gain research and enquiry skills through research based practical sessions and assignments.

Textbooks

Reference Books:
Loius Glowinski (1991) The complete Book of Fruit Growning in Australian. Lothian Books
Baxter, P. (1997) Growing Fruit In Australia. MacMillan Australia
Westwood, M.N. (1993) Temperate-Zone Pomology. Timber Press Inc.

Psychology

Psychology is the study of behaviour and it is approached on a scientific basis, with provision for professional training at the postgraduate level. The research activities of the School cover almost all of the main branches of the discipline. Extensive information about the subject and the School is available on the School web-site: www.psych.usyd.edu.au. A major in Psychology that is accredited by the Australian Psychological Society and can lead to registration as a Psychologist in NSW (upon completion of further studies) can be gained through a number of degree programs: Bachelor of Science, Bachelor of Psychology, Bachelor of Arts, Bachelor of Arts (Psychology), Bachelor of Arts and Science, Bachelor of Liberal Studies and Bachelor of Economics (Social Science). A normal three year sequence required for a major in Psychology is: PSYC 1001, 1002, 2011, 2012, 2013, 2014, and at least four Senior units of study selected from PSYC3010*, 3011, 3012, 3013, 3014, 3015, 3016, 3017, 3018, 3020, and HPSC3023. The senior units must include at least

one of PSYC 3011, 3012, 3013 and 3014. Mid-year entry is possible and involves modification of this sequence. *Required for entry to Honours.

Registration and noticeboards

Students in all years must register during the orientation period. PSYC1001 students register by going to the Carslaw Building during orientation and collecting a personalised computer generated timetable, or by obtaining their timetables through MyUni, which will indicate the lecture times and the tutorial group to which they have been allocated. Further information will be posted at the Enrolment Centre and on the Junior Psychology noticeboard on the 4th floor of the Old Teachers College building.

Enquiries

The main enquiry office of the School is Room 325, Level 3 Brennan MacCallum Building, A18 (tel. 9351 2872). Staff members available to discuss particular courses may be contacted directly or through this office.

Honours

In order to be eligible to enter Psychology Honours, it is necessary (except as provided in the by-laws or resolutions) to gain a year average of at least Pass with Credit in Intermediate and in Senior Psychology units of study constituting a major in Psychology, and must include PSYC3010. Students wishing to graduate with Honours in Psychology are urged to discuss their choice of other subjects with a Faculty adviser as soon as practicable. There is currently a quota on entry to Psychology Honours.

Examinations

Undergraduate units of study are examined at the end of each semester and include classwork by way of essays, reports or practical/laboratory work. At the beginning of each unit of study students are advised of the contributions of exam and classwork for assessment purposes.

Summer School: January-February

PSYC1001 and PSYC1002 are offered in the Sydney Summer School. Consult the Sydney Summer School website for more information: www.summer.usyd.edu.au.

PSYC1001
Psychology 1001

Credit points: 6 **Session:** Semester 1, Summer Main **Classes:** Three 1 hour lectures and one 1 hour tutorial per week, plus 1 hour per week of additional web-based (self-paced) material related to the tutorial. **Assessment:** One 2.5hr exam, one 1000w essay, multiple tutorial tests, experimental participation.

Psychology 1001 is a general introduction to the main topics and methods of psychology, and is the basis for advanced work as well as being of use to those not proceeding with the subject. Psychology 1001 covers the following areas: language; science and statistics in psychology; behavioural neuroscience; applied psychology; social psychology; personality theory.

This unit is also offered in the Sydney Summer School. Consult the web site:

http://www.usyd.edu.au/summerschool/

for more information.

Textbooks

Psychology 1001 manual,
Weiten, W. Psychology. Themes and variations. 7th Ed. Belmont, CA: Thomson Wadsworth. 2007

PSYC1002
Psychology 1002

Credit points: 6 **Session:** Semester 2, Summer Main **Classes:** Three 1 hour lectures and one 1 hour tutorial per week, plus 1 hour per week of additional web-based (self-paced) material related to the tutorial. **Assessment:** One 2.5 hour exam, one 1250 word research report, multiple tutorial tests, experimental participation.

Psychology 1002 is a further general introduction to the main topics and methods of psychology, and it is the basis for advanced work as well as being of use to those not proceeding with the subject. Psychology 1002 covers the following areas: human development; human mental abilities; learning, motivation and emotion; visual perception; cognitive processes.

This unit is also offered in the Sydney Summer School. Consult the web site:

http://www.usyd.edu.au/summerschool/

for more information.

Textbooks

Psychology 1002 manual
Weiten, W. Psychology. Themes and variations. 7th Ed. Belmont, CA: Thomson Wadsworth. 2007

Intermediate units of study

PSYC2011
Brain and Behaviour

Credit points: 6 **Teacher/Coordinator:** Prof Iain McGregor **Session:** Semester 1 **Classes:** Three 1 hour lectures and one 1 hour tutorial per week. **Prerequisites:** PSYC (1001 and 1002). **Prohibitions:** PSYC2111 **Assessment:** One 2 hour exam, major assignment (1500-2000 word essay/report), minor assignment (short written practical excercise and/ or tutorial quizzes)

This unit of study examines a range of phenomena and principles in learning and perception and their relations to underlying neural substrates. The emphasis in learning is on instrumental conditioning and the principle of reinforcement, ranging from applications of this principle to its neural substrates. Also covered are analyses of aversive-based learning, such as punishment and avoidance, and anxiety, together with related neurochemical mechanisms and the effects of various psychopharmacological agents on these processes. A number of perceptual phenomena will be studied (e.g., motion detection, recognition of faces, identification of emotion). A series of practical classes and demonstrations allow students to gain hands-on experience of how some of these principles and phenomena may be studied experimentally.

Textbooks

See school website

PSYC2012
Statistics & Research Methods for Psych

Credit points: 6 **Teacher/Coordinator:** Dr Margaret Charles **Session:** Semester 1 **Classes:** Two 1 hour lectures and one 1 hour tutorial per week, plus one 1 hour lecture and one 1 hour tutorial per fortnight. **Prerequisites:** PSYC (1001 and 1002). **Prohibitions:** PSYC2112 **Assumed knowledge:** Recommended: HSC Mathematics, any level **Assessment:** One 2 hour exam, class tests, online quizzes, one 1500 word group project, one 45 minute mid-semester exam.

The aim is to introduce students to fundamental concepts in statistics as applied to psychological research. These include summary descriptive statistics, an introduction to the principles and practice of research design, and the use of inferential statistics. Building upon this framework, the unit of study aims to develop each student's expertise in understanding the rationale for, and application of, a variety of statistical tests to the sorts of data typically obtained in psychological research.

Textbooks

See school website

PSYC2013
Cognitive and Social Psychology

Credit points: 6 **Teacher/Coordinator:** Dr Bruce Burns **Session:** Semester 2 **Classes:** Three 1 hour lectures and one 1 hour tutorial per week. **Prerequisites:** PSYC (1001 and 1002). **Prohibitions:** PSYC2113 **Assessment:** One 2 hour exam, major assignment (1500-2000 word essay/report), minor assignment (short written practical exercise and/or tutorial quizzes).

This unit expands the depth and range of topics introduced in the first year lectures on Cognitive Processes, Developmental Psychology and Social Psychology. The first section (16 lectures) on Cognitive Processes focuses on current theories of memory, attention, problem solving and decision making and discusses the methods and issues

involved in investigating these processes in both healthy individuals and people with cognitive dysfunctions. The second section (6 lectures) on Developmental Psychology presents and evaluates evidence about the early influences on children's social and cognitive development. The final section (16 lectures) on Social Psychology continues an examination of social development across the lifespan from adolescence to late adulthood, followed by an examination of salient social constructs such as prejudice, group processes, altruism, affiliation and attraction.

Textbooks
Cognitive: See School website
Social: White, Hayes & Livesey (2005). Developmental Psychology from Infancy to Adulthood.

PSYC2014
Personality and Differential Psychology

Credit points: 6 **Teacher/Coordinator:** Dr Niko Tiliopoulos **Session:** Semester 2 **Classes:** Three 1 hour lectures and one 1 hour tutorial per week. **Prerequisites:** PSYC (1001 and 1002) **Prohibitions:** PSYC2114 **Assessment:** One 2 hour exam, major assignment (1500-2000 word essay/report), minor assignment (short written practical exercise and/or tutorial quizzes)

PSYC2014 is made up of two conceptual components: Theories of Personality and Differential Psychology (Individual Differences). The aim of the Personality component is to introduce students to a number of influential theories of personality. Students will be exposed to some conceptual analysis and expected to examine critically the various theories covered. The aim of the Differential Psychology component is to introduce key topics in the study and assessment of individual differences in personality and intelligence. Students are expected to gain an understanding about the major theories of intelligence, associated research methods, and the traditional areas of group differences.

Textbooks
Theories of personality component:
Sollard CF, & Monte, RN (2006). Beneath the mask (8th Ed). NJ: John Wiley & Sons.
Differential Psychology component:
See School website

Senior units of study

PSYC3010
Advanced Statistics for Psychology

Credit points: 6 **Teacher/Coordinator:** Dr Sabina Kleitman **Session:** Semester 2 **Classes:** Two 1 hour lectures and one 2 hour tutorial per week. **Prerequisites:** PSYC (2012 or 2112) plus at least one other Intermediate Psychology Unit of Study from PSYC (2011 or 2111), PSYC (2013 or 2113), PSYC (2014 or 2114). **Prohibitions:** PSYC3201 **Assessment:** One 2 hour exam, class test, 1500 word assignment, practical exercises.

This unit of study expands upon students' knowledge of the general linear model and its applications in the analysis of data from psychological research. The first half of the course is focused on research for which analysis of variance would be appropriate, and develops students' ability to test more focused questions than can be answered by omnibus F tests. Issues that arise in testing contrasts, such as inflation of Type I error, will also be considered. In the second half of the course, students will further their understanding of multivariate techniques, such as multiple regression analysis.

Textbooks
See School website

PSYC3011
Learning and Behaviour

Credit points: 6 **Teacher/Coordinator:** Dr Justin Harris **Session:** Semester 1 **Classes:** Two 1 hour lectures and one 2 hour tutorial per week. **Prerequisites:** PSYC (2011 or 2111) and at least one other Intermediate Psychology Unit from PSYC (2012 or 2112), PSYC (2013 or 2113), PSYC (2014 or 2114). **Prohibitions:** PSYC3209 **Assumed knowledge:** PSYC (2012 or 2112) **Assessment:** One 2 hour exam, one 2000 word prac report, tutorial assessment.

This unit addresses the fundamental concepts and more important research findings related to contemporary theories of associative learning in animals and humans. It examines the application of such fundamental research to issues such as drug use, food choice, and learned helplessness. It is designed to foster skills in reading primary sources in this area, and provide the opportunity for hands-on experience in carrying out a research project.

Textbooks
See School webpage

PSYC3012
Cognition, Language and Thought

Credit points: 6 **Teacher/Coordinator:** Dr Karen Croot **Session:** Semester 1 **Classes:** Two 1 hour lectures and one 2 hour practical per week. **Prerequisites:** PSYC (2013 or 2113) and at least one other Intermediate Psychology unit from PSYC (2011 or 2111), PSYC (2012 or 2112), PSYC (2014 or 2114). **Prohibitions:** PSYC3205 **Assumed knowledge:** PSYC (2012 or 2112) **Assessment:** One 2 hour exam, 2000 word prac report, practical exercise(s).

This unit extends the theories and methods of investigating memory and attentional processes discussed in PSYC2013 to consider a number of domains of higher cognitive processing. One strand of the course will focus on language processing and consider how children learn language, the processes involved in speech perception and production, language comprehension and reading. The remainder of the course will deal with the cognitive processes involved in reasoning and decision-making. The practical program will expose students to a variety of the research methods used to investigate higher cognitive processes, develop their understanding of how these methods can be used to investigate hypotheses about mental processes and consider applications of cognitive research to real-world problems and issues.

Textbooks
See School website

PSYC3013
Perceptual Systems

Credit points: 6 **Teacher/Coordinator:** Dr Alex Holcombe **Session:** Semester 2 **Classes:** Two 1 hour lectures and one 2 hour tutorial per week. **Prerequisites:** PSYC (2011 or 2111) and at least one other Intermediate Psychology Unit from PSYC (2012 or 2112), PSYC (2013 or 2113), PSYC (2014 or 2114) or ANAT2010 **Prohibitions:** PSYC3210 **Assumed knowledge:** PSYC2012 **Assessment:** One 2 hour exam, one 2500 word report, tutorial quiz, group presentation.

The unit covers at an advanced level selected topics in perception from the psychophysical, physiological and neuropsychological perspectives. Students are expected to gain an understanding of developing knowledge at current frontiers of research, appreciate the significance of basic perceptual research for perception in the office and on the pitch, and be able to evaluate the empirical and conceptual worth of research contributions. Topics covered include spatial and temporal limits of vision, form completion and the resolution of ambiguity, multisensory integration and neural mechanisms.

Textbooks
See School website

PSYC3014
Behavioural and Cognitive Neuroscience

Credit points: 6 **Teacher/Coordinator:** Dr Ian Johnston **Session:** Semester 2 **Classes:** Two 1 hour lectures and one 2 hour practical per week. **Prerequisites:** (PSYC (2011 or 2111) and at least one other Intermediate Psychology Unit from PSYC (2012 or 2112), PSYC (2013 or 2113), PSYC (2014 or 2114)) OR (ANAT2010 plus PCOL2011) **Prohibitions:** PSYC3204, PSYC3215 **Assumed knowledge:** PSYC (2113 or 2013) **Assessment:** One 2 hour exam, one major essay/report 2000-2500 words, tutorial quiz and participation.

This unit of study will focus on approaches to studying neurosciences incorporating molecular, pre-clinical and clinical models of brain function. These biological models of brain function will be linked with behavioural, affective and cognitive function and dysfunction. The implications of focal cognitive deficits in neurological patients for models of normal cognitive function will also be explored. Specific topics to be covered will be selected from the following areas: appetite psychoneuroimmunology, sensorimotor integration, and the neural and molecular basis of learning and memory, attention, language, visual cognition and praxis. In addition to lectures, a practical component will cover basic neuroanatomy, histology and

neuropharmacology, and will introduce students to experimental and case-study approaches to studying neurosciences.

Textbooks
See School website

PSYC3015
Intelligence and Differential Psychology

Credit points: 6 **Teacher/Coordinator:** Dr Damian Birney **Session:** Semester 1 **Classes:** Two 1 hour lectures and one 2 hour tutorial per week. **Prerequisites:** PSYC(2014 or 2114) and PSYC(2011 or 2111 or 2012 or 2112 or 2013 or 2113) **Assumed knowledge:** PSYC(2012 or 2112); PSYC(2013 or 2113) **Assessment:** One 2 hour exam; one 2000 word essay; tutorial quizzes.

The aim of this unit of study is to provide an overview of different perspectives on the construct of personality, intelligence, and metacognitive abilities to build a critical platform from which both empirical evidence and theoretical propositions can be evaluated. Two broad methodological approaches will be considered, compared, and contrasted in relation to cognitive and non-cognitive attributes and their potential overlap. (a) The individual differences approach to the study of personality and intelligence broadly defined which serves as the basis of much of contemporary psychological assesment in clinical, educational, and organizational settings and (b) the experimental approach to cognitive abilities which use experimental methods to study the information-processing components that underlie intellectual performance. Metacognitive abilities will be studied through differential psychology and decision-making paradigms.

Textbooks
See school website.

PSYC3016
Developmental Psychology

Credit points: 6 **Teacher/Coordinator:** Dr Pauline Howie **Session:** Semester 1 **Classes:** Two 1 hour lectures and one 2 hour tutorial per week. **Prerequisites:** PSYC (2013 or 2113) and at least one other Intermediate Psychology unit from PSYC (2011 or 2111), PSYC (2012 or 2112), PSYC (2014 or 2114). **Prohibitions:** PSYC3206 **Assessment:** One 2 hour exam, one 2000 word report.

This unit examines various theoretical approaches to human development and selected issues within Developmental Psychology. The major issues/controversies in developmental theory are examined in relation to a number of the more influential theoretical approaches. Students are expected to gain an understanding of the main theoretical influences upon current developmental research and to be able to compare and contrast theories of development. The unit introduces students to a range of issues in selected areas of contemporary Developmental Psychology. Students are expected to gain knowledge of these areas, and to develop a critical approach to the analysis of current research and theoretical issues. They are also expected to apply their knowledge in practical exercises involving observations of children.

Textbooks
White, Hayes & Livesey (2005) Developmental Psychology. Pearson Edn.

PSYC3017
Social Psychology

Credit points: 6 **Teacher/Coordinator:** Dr Lisa Zadro **Session:** Semester 1 **Classes:** Two 1 hour lectures and one 2 hour tutorial per week. **Prerequisites:** PSYC (2013 or 2113) and at least one other Intermediate Psychology Unit of Study from PSYC (2011 or 2111), PSYC (2012 or 2112), PSYC (2014 or 2114). **Prohibitions:** PSYC3212 **Assumed knowledge:** PSYC (2012 or 2112). **Assessment:** One 2 hour exam, one 2500 word research report, tutorial presentation.

This unit continues the coverage of topics in Social Psychology begun in PSYC1001 and PSYC2013. The unit is divided into topic areas, where the emphasis is on evaluating theories and the relevant evidence. Topics areas include social relationships, antisocial behaviours, applied social psychology (effects of the physical environment on social behaviour; jury decision making), social cognition, leadership, and cross cultural psychology. Tutorials provide first hand experience of research by involving students in a range of research projects on the topics covered in the lectures. The tutorials also provide an opportunity for discussion of issues associated with these topics.

Textbooks
See School website.

PSYC3018
Abnormal Psychology

Credit points: 6 **Teacher/Coordinator:** Dr Marianna Szabo **Session:** Semester 2 **Classes:** Two 1 hour lectures and one 2 hour tutorial per week. **Prerequisites:** PSYC (2014 or 2114) and at least one other Intermediate Psychology unit of study from PSYC (2011 or 2111), PSYC (2012 or 2112), PSYC (2013 or 2113). **Prohibitions:** PSYC3203 **Assumed knowledge:** PSYC2012 **Assessment:** One 2 hour exam, one 2000 word essay, quiz, tutorial presentation.

This unit of study critically examines core issues in Abnormal Psychology, concerning the description, explanation and treatment of psychological disorders. The unit of study will include topics such as:

(a) Adult abnormal psychology: Anxiety disorders (specific phobias, panic disorder, generalised anxiety disorder, OCD); Addictive disorders (drug, alcohol, gambling); Eating disorders (anorexia nervosa, bulimia nervosa); Mood disorders (dysthymia, major depressive disorder, cyclothymia, bipolar disorder); Schizophrenia, Personality disorders.

(b) Child abnormal psychology: Attention Deficit Hyperactivity disorder; Conduct disorder; Anxiety disorders, Depression.

Textbooks
See School website.

PSYC3020
Applications of Psychological Science

Credit points: 6 **Teacher/Coordinator:** Dr Barbara Mullan **Session:** Semester 2 **Classes:** two 1 hour lectures and one 2 hour tutorial per week **Prerequisites:** 12 credit points of junior psychology and 12 credit points in Intermediate Psychology **Prohibitions:** PSYC3019 **Assessment:** one 2 hour examination and one 2500 word written assignment

The main focus of this unit will be on Health Psychology, but other applied areas such as Forensic and Organizational Psychology will also be introduced. The aim of the Health Psychology component is to define health within a biopsychosocial framework and to present some of the current issues in the area. It will provide an introduction to key areas in health psychology, and demonstrate how they relate to other disciplines. Issues such as the context within which treatment takes place, the psychosocial factors involved in dealing with physical disease, the application of psychological theory to illness and preparation for hospitalization, the management of adverse psychological sequelae arising from hospitalisation and rehabilitation will be considered. Also considered are the key models and theories in health Psychology which are seen by many to be the foundations of the subject area.

Textbooks
Morrison, Bennett, Butow, Mullan and White. An Introduction to Health Psychology: An Australian perspective. Pearson Education, Australia. 2007

HPSC3023 Psychology & Psychiatry History & Phil

HPSC3023 Psychology & Psychiatry History & Phil can be counted towards a Psychology Major. Successful completion of this unit of study is essential for students intending to take the Theoretical Thesis option in Psychology Honours.

Psychology Honours

Prerequisites for admission

A Major in Psychology with a minimum Credit average or better across both the Intermediate and Senior Psychology* Units of Study comprising the 48 credit points of Intermediate and Senior Psychology Units that constitute the minimum required for the major. PSYC (3010 or 3201) must be included in the Senior Units. BPsych students should consult resolutions in chapter 6. School permission required. Due to restricted resources for research supervision, the intake to Psychology Honours will be limited to approximately 80 students and will be determined by academic merit in Intermediate and Senior Psychology.

Assessment

Formal exams in Ethics and Issues in Psychology and in Research Methods; report of empirical research project; theoretical thesis or assessment in two Special Fields modules. Students are required to (a) devise, conduct and report upon an empirical research project (research area dependent on interests and specialities of staff members); (b) write a theoretical thesis or attend two Special Fields seminars and complete required assessment tasks; and (c) attend one lecture series in Ethics and Issues in Psychology and two series of lectures in Research Methods.

Virology

Details for Virology units can be found under the Microbiology entry.

10. Honours in the Faculty of Science

This chapter is intended to give enrolment advice to undergraduate students in the Faculty of Science.

Honours in the Faculty of Science

Honours in the BSc (including all streams and combined degrees), BMedSc, BST

Admission

To qualify to enrol in an honours course, students shall:

- have qualified for the award of a relevant pass degree from the Faculty of Science, or
- be a pass graduate of the Faculty of Science, or
- be a pass graduate holding an equivalent qualification from another institution
- have achieved either

1. a SCIWAM of at least 65 (or equivalent at another institution);or
2. a credit average in 48 credit points in relevant intermediate and senior science units of study;

and

- satisfy any additional criteria set by the Head of Department concerned.

- have completed a minimum of 24 credit points of Senior units of study relating to the intended honours course (or equivalent at another institution)

You should also note the following:

- Students shall complete the requirements for the honours course full-time over two consecutive semesters. If the faculty is satisfied that a student is unable to attempt the honours course on a full-time basis and if the Head of Department concerned so recommends, permission may be granted to undertake honours half-time over four consecutive semesters.
- Not all departments offer students part time enrolment in honours, or honours enrolment commencing in the July semester. Students considering these types of honours enrolments are urged to contact the department concerned.
- A student may not re-attempt an honours course in a single subject area. A student who is qualified to enrol in two honours courses may either complete the honours courses in the two subject areas separately and in succession, or complete a joint honours course, equivalent to an honours course in a single subject area, in the two subject areas.
- A joint honours course shall comprise such parts of the two honours courses as may be decided by the Dean.
- An interdisciplinary honours course shall comprise such parts as determined by the Coordinating Committee for the interdisciplinary course.

SCIWAM for all degrees

SCIWAM means the weighted average mark calculated by the faculty from the results for all intermediate and senior units of study with a weighting of 2 for intermediate units and 3 for senior units.

The SCIWAM is calculated by summing the products of the marks achieved and the weighted credit point values of the units of study taken in the degree and then dividing by the sum of the weighted credit point values, with all attempts at units of study being included in the calculation, except where units of study are discontinued with permission; the formula used is:

Calculating SCIWAMs	
SCIWAM =	$\frac{\text{sum(Wc x Mc)}}{\text{sum(Wc)}}$

where Wc is the weighted credit point value, ie, the product of the credit point value and level of weighting of 2 for 2000–2999 units of study and 3 for 3000–3999 units of study; where Mc is the mark out of 100 for the unit of study.

In calculating the SCIWAM for a student transferring from another university, units of study are assigned level weightings and credit point values consistent with their equivalent units of study at the University of Sydney.

A mark is assigned to each unit of study credited based on the results provided on a validated academic transcript from the University. Where no mark is provided by the institution an appropriate estimate is used. Students are encouraged to obtain actual marks from departments at those universities that do not issue formal marks.

Ranking for postgraduate scholarships

For the purposes of ranking for APAs and UPAs at the University of Sydney the final ranking mark consists of the SCIWAM and/or Honours 1 (or Honours 1 equivalent) mark and Research Potential Indicator.

The use of these components is based on whether the applicant has attained an Honours 1 degree, has completed his/her most recent studies within the last five years by the time the scholarship is being awarded, and the extent of any relevant research/professional experience. A greater weight is given to the Honours 1 (or H1E) mark. More information can be found on the Research Office's website.

Honours units of study

Honours units of study are listed in Table VI: Honours units of study or in the tables associated with the relevant degree (all tables appear in chapter 3).

Please note that enrolment in Honours requires both Faculty and Departmental permission, and students intending to attempt an Honours year should read the relevant sections of chapters 3 and 5 for further information.

Honours in the BPsych

Admission

To qualify to enrol in the honours course, students shall have completed 144 credit points as specified in Resolution 5 (1) of the BPsych including completion of all intermediate and senior units of study in Psychology with an average grade of Distinction or better.

You should also note the following:

- Students shall complete the requirements for the honours course full-time over two consecutive semesters. If the faculty is satisfied that a student is unable to attempt the honours course on a full-time basis and if the Head of School of Psychology so recommends, permission may be granted to undertake honours half-time over four consecutive semesters. A student may not re-attempt an honours course.

Determination of marks and grades

To qualify for the award of an honours degree, students shall complete 48 credit points of honours units of study in the table of honours units of study, as prescribed by the Head of Department concerned.

The grade of honours and the honours mark are determined by performance in the honours course.

Departments and schools are required to make recommendations concerning honours marks and grades of honours for consideration by the faculty. Final marks and grades of honours are determined by biannual honours meetings of department and school representatives of the faculty to ensure consistency across the faculty. Therefore final results for individual students may differ from those recommended.

The faculty is aware that, because the honours units of study in some departments are wholly or predominantly formal course work and in others a research project, and because some subjects are not taught until well into the undergraduate program, the way in which departments take cognisance of performance in the honours year in arriving at a recommendation for a grade of honours must be left to their discretion. However the faculty has established a set of guidelines for departments to use in determining their recommendations.

The faculty has adopted the following guidelines for assessment of student performance in honours:

95–100

Outstanding First Class quality of clear Medal standard, demonstrating independent thought throughout, a flair for the subject, comprehensive knowledge of the subject area and a level of achievement similar to that expected by first rate academic journals. This mark reflects an exceptional achievement with a high degree of initiative and self-reliance, considerable student input into the direction of the study, and critical evaluation of the established work in the area.

90–94

Very high standard of work similar to above but overall performance is borderline for award of a Medal. Lower level of performance in certain categories or areas of study above.

Note that in order to qualify for the award of a university medal, it is necessary but not sufficient for a candidate to achieve a SCIWAM of 80 or greater and an honours mark of 90 or greater. Faculty has agreed that more than one medal may be awarded in the subject of an honours course.

The relevant Senate Resolution reads: "A candidate with an outstanding performance in the subject of an honours course shall, if deemed of sufficient merit by the Faculty, receive a bronze medal."

Students with an honours mark of 90 or greater and a SCIWAM of 77 to 79 inclusive may be considered for the award of a university medal only if it can be demonstrated that their WAM was affected by sickness, misadventure, unusual workload or choice of units of study.

80–89

Clear First Class quality, showing a command of the field both broad and deep, with the presentation of some novel insights. Student will have shown a solid foundation of conceptual thought and a breadth of factual knowledge of the discipline, clear familiarity with and ability to use central methodology and experimental practices of the discipline, and clear evidence of some independence of thought in the subject area.

Some student input into the direction of the study or development of techniques, and critical discussion of the outcomes.

75–79

Second class honours, first division – student will have shown a command of the theory and practice of the discipline. They will have demonstrated their ability to conduct work at an independent level and complete tasks in a timely manner, and have an adequate understanding of the background factual basis of the subject. Student shows some initiative but is more reliant on other people for ideas and techniques and project is dependent on supervisor's suggestions. Student is dedicated to work and capable of undertaking a higher degree.

70–74

Second class honours, second division – student is proficient in the theory and practice of their discipline but has not developed complete independence of thought, practical mastery or clarity of presentation. Student shows adequate but limited understanding of the topic and has largely followed the direction of the supervisor.

65–69

Third class honours – performance indicates that the student has successfully completed the work, but at a standard barely meeting honours criteria. The student's understanding of the topic is extremely limited and they have shown little or no independence of thought or performance.

0–64

The student's performance in fourth year is not such as to justify the award of honours.

Honours

Examiners are also asked to return their recommendation for the grade of honours to be awarded bearing in mind the honours mark and the faculty's guidelines for the award of honours which are listed below.

The examiners' recommendations are to be indicated on the examination result sheets by the use of the following valid symbols:

H1	Honours Class I	80+
H21	Honours Class II (Division 1)	75–79
H22	Honours Class II (Division 2)	70–74
H3	Honours Class III	65–69
F	Fail *	below 65
AF	Absent Fail	

** In these cases the award of the Pass degree is recommended.*

Note:

1. The biannual honours meetings of the department and school representatives of the faculty shall consider a motion that those recommendations from the departments and schools which accord with the faculty's guidelines for the award of Honours and medal, be approved. Cases where the recommendations do not accord with the guidelines will be considered individually; and departments and schools will be required to have a representative present with the authority to make revised recommendations if requested to do so at the biannual honours meetings of departmental and school representatives of the faculty.
2. In order to qualify for the award of a University medal, it is necessary but not sufficient for a candidate to achieve a WAM of 80 or greater and an honours mark of 90 or greater. Faculty has agreed that more than one medal may be awarded in the subject of an honours course. The relevant Senate Resolution reads "A candidate with an outstanding performance in the subject of an Honours course shall, if deemed of sufficient merit by the Faculty, receive a bronze medal". Students with an honours mark of 90 or greater and a WAM of 77 to 79 inclusive may be considered for the award of a University medal only if it can be demonstrated that their WAM was affected by sickness, misadventure, unusual workload or choice of units of study.
3. In order to qualify for Honours Class 1, a candidate must achieve an honours mark of 80 or greater.
4. The rolling five year average mark difference (student honours mark minus SCIWAM) for each department and school should fall within the range 10 plus or minus 2. A department or school whose rolling five year average mark difference in any year falls above or below this range is required to justify its recommended marks for that year to the July Semester honours meetings of

departmental and school representatives of the faculty. Each department or school should each year present a plot of SCIWAM versus honours mark for its honours student cohort. It is not acceptable to balance inflated marks for some students with low marks for other students.

5. Equivalent honours grades are not awarded to Graduate Diploma in Science students by the biannual honours meetings of departmental and school representatives of the faculty but can be determined by the Scholarships Ranking Meeting if the student qualifies for an equivalent grade and applies for an APA scholarship.

Biannual honours meetings of Departmental and School representatives of the Faculty

Biannual honours meetings of Departmental and School representatives of the Faculty will be called to consider the results.

Register of results

Departments and Schools are required to make recommendations concerning marks for consideration by the biannual honours meeting of departmental and school representatives of the faculty. Final marks are determined by the biannual honours meetings of departmental and school representatives of the faculty so as to ensure consistency across the faculty. Therefore final results for individual students may differ from those recommended.

A register and copies of the honours ranking report are produced by the faculty for use by the biannual honours meetings of departmental and school representatives of the faculty.

Other important policies

See chapter 1 for important policy information.

Honours units of study

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
Agricultural Chemistry Honours			
AGCH4021 **Agricultural Chemistry Honours A**	12	*Note: Department permission required for enrolment*	Semester 1 Semester 2
AGCH4022 **Agricultural Chemistry Honours B**	12	**C** AGCH4021	Semester 1 Semester 2
AGCH4023 **Agricultural Chemistry Honours C**	12	**C** AGCH4022	Semester 1 Semester 2
AGCH4024 **Agricultural Chemistry Honours D**	12	**C** AGCH4023	Semester 1 Semester 2
Anatomy and Histology Honours			
ANAT4011 **Anatomy Honours A**	12	*Note: Department permission required for enrolment*	Semester 1 Semester 2
ANAT4012 **Anatomy Honours B**	12	**C** ANAT4011	Semester 1 Semester 2
ANAT4013 **Anatomy Honours C**	12	**C** ANAT4012	Semester 1 Semester 2
ANAT4014 **Anatomy Honours D**	12	**C** ANAT4013	Semester 1 Semester 2
Biochemistry Honours			
BCHM4011 **Biochemistry Honours A**	12	*Note: Department permission required for enrolment* *Entry into the School Honours program normally requires a credit average in a major relevant to the chosen project or relevant 24 credit points of senior study. The School will consider entry to students who do not have this requirement if their overall academic performance indicates an equivalent performance in other subject areas or if their SCIWAM exceeds 65.*	Semester 1 Semester 2
BCHM4012 **Biochemistry Honours B**	12	**C** BCHM4011 *Entry into the School Honours program normally requires a credit average in a major relevant to the chosen project or relevant 24 credit points of senior study. The School will consider entry to students who do not have this requirement if their overall academic performance indicates an equivalent performance in other subject areas or if their SCIWAM exceeds 65.*	Semester 1 Semester 2
BCHM4013 **Biochemistry Honours C**	12	**C** BCHM4012 *Entry into the School Honours program normally requires a credit average in a major relevant to the chosen project or relevant 24 credit points of senior study. The School will consider entry to students who do not have this requirement if their overall academic performance indicates an equivalent performance in other subject areas or if their SCIWAM exceeds 65.*	Semester 1 Semester 2
BCHM4014 **Biochemistry Honours D**	12	**C** BCHM4013 *Entry into the School Honours program normally requires a credit average in a major relevant to the chosen project or relevant 24 credit points of senior study. The School will consider entry to students who do not have this requirement if their overall academic performance indicates an equivalent performance in other subject areas or if their SCIWAM exceeds 65.*	Semester 1 Semester 2
Biology Honours			
BIOL4015 **Scientific Research in Biology**	6	**P** Pass degree in an area of Life Sciences or Equivalent **C** BIOL4016 **N** BIOL4009, BIOL4010 *Note: Department permission required for enrolment*	Semester 1 Semester 2
BIOL4016 **Biology Honours A**	6	**C** BIOL4015 **N** BIOL4011 *Note: Department permission required for enrolment*	Semester 1 Semester 2
BIOL4012 **Biology Honours B**	12	**C** BIOL4011 or (BIOL4015 and BIOL4016)	Semester 1 Semester 2
BIOL4013 **Biology Honours C**	12	**C** BIOL4012	Semester 1 Semester 2

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
BIOL4014 **Biology Honours D**	12	**C** BIOL4013 *Note: Department permission required for enrolment*	Semester 1 Semester 2
Chemistry Honours			
CHEM4011 **Chemistry Honours A**	12	*Note: Department permission required for enrolment*	Semester 1 Semester 2
CHEM4012 **Chemistry Honours B**	12	**C** CHEM4011	Semester 1 Semester 2
CHEM4013 **Chemistry Honours C**	12	**C** CHEM4012	Semester 1 Semester 2
CHEM4014 **Chemistry Honours D**	12	**C** CHEM4013	Semester 1 Semester 2
Computational Science Honours			
COSC4001 **Computational Science Honours A**	12	*Note: Department permission required for enrolment*	Semester 1 Semester 2
COSC4002 **Computational Science Honours B**	12	**C** COSC4001	Semester 1 Semester 2
COSC4003 **Computational Science Honours C**	12	**C** COSC4002	Semester 1 Semester 2
COSC4004 **Computational Science Honours D**	12	**C** COSC4003	Semester 1 Semester 2
Computer Science Honours			
COMP4011 **Computer Science Honours A**	12	*Note: Department permission required for enrolment*	Semester 1 Semester 2
COMP4012 **Computer Science Honours B**	12	*Note: Department permission required for enrolment*	Semester 1 Semester 2
COMP4013 **Computer Science Honours C**	12	*Note: Department permission required for enrolment*	Semester 1 Semester 2
COMP4014 **Computer Science Honours D**	12	*Note: Department permission required for enrolment*	Semester 1 Semester 2
Cell Pathology Honours			
CPAT4011 **Cell Pathology Honours A**	12	*Note: Department permission required for enrolment*	Semester 1 Semester 2
CPAT4012 **Cell Pathology Honours B**	12	**C** CPAT4011	Semester 1 Semester 2
CPAT4013 **Cell Pathology Honours C**	12	**C** CPAT4012	Semester 1 Semester 2
CPAT4014 **Cell Pathology Honours D**	12	**C** CPAT4013	Semester 1 Semester 2
Environmental Studies Honours			
ENVI4011 **Environmental Studies Honours A**	12	*Note: Department permission required for enrolment*	Semester 1 Semester 2
ENVI4012 **Environmental Studies Honours B**	12	**C** ENVI4011	Semester 1 Semester 2
ENVI4013 **Environmental Studies Honours C**	12	**C** ENVI4012	Semester 1 Semester 2
ENVI4014 **Environmental Studies Honours D**	12	**C** ENVI4013	Semester 1 Semester 2
Geography Honours			
GEOG4011 **Geography Honours A**	12	*Note: Department permission required for enrolment*	Semester 1 Semester 2
GEOG4012 **Geography Honours B**	12	**C** GEOG 4011	Semester 1 Semester 2
GEOG4013 **Geography Honours C**	12	**C** GEOG 4012	Semester 1 Semester 2
GEOG4014 **Geography Honours D**	12	**C** GEOG 4013	Semester 1 Semester 2
Geology Honours			
GEOL4011 **Geology Honours A**	12	*Note: Department permission required for enrolment*	Semester 1 Semester 2
GEOL4012 **Geology Honours B**	12	**C** GEOL4011	Semester 1 Semester 2
GEOL4013 **Geology Honours C**	12	**C** GEOL4012	Semester 1 Semester 2
GEOL4014 **Geology Honours D**	12	**C** GEOL4013	Semester 1 Semester 2

Unit of study	Credit points	A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition	Session
Geophysics Honours			
GEOP4011 **Geophysics Honours A**	12	*Note: Department permission required for enrolment*	Semester 1 Semester 2
GEOP4012 **Geophysics Honours B**	12	**C** GEOP 4011	Semester 1 Semester 2
GEOP4013 **Geophysics Honours C**	12	**C** GEOP 4012	Semester 1 Semester 2
GEOP4014 **Geophysics Honours D**	12	**C** GEOP 4013	Semester 1 Semester 2
History and Philosophy of Science Honours			
All students must enrol in HPSC4999. Honours students must complete 48 credit points from the following units:			
HPSC4101 **Philosophy of Science**	6	**P** Available only to students admitted to HPS Honours, Graduate Diploma in Science (History and Philosophy of Science) and Graduate Certificate in Science (History and Philosophy of Science), or by special permission. *Note: Department permission required for enrolment*	Semester 1
HPSC4102 **History of Science**	6	**P** Available only to students admitted to HPS Honours, Graduate Diploma in Science (History and Philosophy of Science) and Graduate Certificate in Science (History and Philosophy of Science), or by special permission. *Note: Department permission required for enrolment*	Semester 1 Semester 2
HPSC4103 **Sociology of Science**	6	**P** Available only to students admitted to HPS Honours, Graduate Diploma in Science (History and Philosophy of Science) and Graduate Certificate in Science (History and Philosophy of Science), or by special permission. *Note: Department permission required for enrolment*	Semester 2
HPSC4104 **Recent Topics in HPS**	6	**P** Available only to students admitted to HPS Honours, Graduate Diploma in Science (History and Philosophy of Science) and Graduate Certificate in Science (History and Philosophy of Science), or by special permission. *Note: Department permission required for enrolment*	Semester 1 Semester 2
HPSC4105 **HPS Research Methods**	6	**P** Available only to students admitted to HPS Honours, Graduate Diploma in Science (History and Philosophy of Science) and Graduate Certificate in Science (History and Philosophy of Science), or by special permission. *Note: Department permission required for enrolment*	Semester 1 Semester 2
HPSC4108 **Core topics: History & Philosophy of Sci**	6	**P** Available only to students admitted to HPS Honours, Graduate Diploma in Science (History and Philosophy of Science) and Graduate Certificate in Science (History and Philosophy of Science), or by special permission **N** Not available to students who have completed a major in History and Philosophy of Science or an equivalent program of study at another institution. *Note: Department permission required for enrolment*	Semester 1 Semester 2
HPSC4201 **HPS Research Project 1**	6	**A** HPSC (2001 and 2002) or HPSC (2100 and 2101) **P** Available only to students admitted to HPS Honours and Graduate Diploma or Certificate in Science (History and Philosophy of Science). **N** HPSC4106, HPSC4107 *Note: Department permission required for enrolment*	Semester 1 Semester 2
HPSC4202 **HPS Research Project 2**	6	**A** HPSC (2001 and 2002) or HPSC (2100 and 2101) **P** Available only to students admitted to HPS Honours and Graduate Diploma or Certificate in Science (History and Philosophy of Science). **N** HPSC4106 and HPSC4107 *Note: Department permission required for enrolment*	Semester 1 Semester 2
HPSC4203 **HPS Research Project 3**	6	**A** HPSC (2001 and 2002) or HPSC (2100 and 2101) **P** Available only to students admitted to HPS Honours and Graduate Diploma or Certificate in Science (History and Philosophy of Science). **N** HPSC4106, HPSC4107 *Note: Department permission required for enrolment*	Semester 1 Semester 2
HPSC4204 **HPS Research Project 4**	6	**A** HPSC (2001 and 2002) or HPSC (2100 and 2101) **P** Available only to students admitted to HPS Honours and Graduate Diploma or Certificate in Science (History and Philosophy of Science). **N** HPSC4106, HPSC4107 *Note: Department permission required for enrolment*	Semester 1 Semester 2
HPSC4999 **History & Philosophy of Science Honours**		**P** Available only to students admitted to HPS Honours. *Note: Department permission required for enrolment*	Semester 1 Semester 2
Immunology Honours			
IMMU4011 **Immunology Honours A**	12	**N** BMED4011 *Note: Department permission required for enrolment*	Semester 1 Semester 2
IMMU4012 **Immunology Honours B**	12	**C** IMMU4011 **N** BMED4012	Semester 1 Semester 2
IMMU4013 **Immunology Honours C**	12	**C** IMMU4012 **N** BMED4013	Semester 1 Semester 2
IMMU4014 **Immunology Honours D**	12	**C** IMMU4013 **N** BMED4014	Semester 1 Semester 2
Information Systems Honours			
ISYS4301 **Information Systems Honours A**	12	*Note: Department permission required for enrolment*	Semester 1 Semester 2
ISYS4302 **Information Systems Honours B**	12	**C** ISYS4301	Semester 1 Semester 2
ISYS4303 **Information Systems Honours C**	12	**C** ISYS4302	Semester 1 Semester 2

Unit of study	Credit points	A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition	Session
ISYS4304 **Information Systems Honours D**	12	**C** ISYS4303	Semester 1 Semester 2
Marine Sciences Honours			
MARS4011 **Marine Sciences Honours A**	12	*Note: Department permission required for enrolment*	Semester 1 Semester 2
MARS4012 **Marine Sciences Honours B**	12	**C** MARS4011	Semester 1 Semester 2
MARS4013 **Marine Sciences Honours C**	12	**C** MARS4012	Semester 1 Semester 2
MARS4014 **Marine Sciences Honours D**	12	**C** MARS4013	Semester 1 Semester 2
Pure Mathematics Honours			
MATH4301 **Pure Mathematics Honours A**	12	*Note: Department permission required for enrolment*	Semester 1 Semester 2
MATH4302 **Pure Mathematics Honours B**	12	**C** MATH4301	Semester 1 Semester 2
MATH4303 **Pure Mathematics Honours C**	12	**C** MATH4302	Semester 1 Semester 2
MATH4304 **Pure Mathematics Honours D**	12	**C** MATH4303	Semester 1 Semester 2
Applied Mathematics Honours			
MATH4401 **Applied Mathematics Honours A**	12	*Note: Department permission required for enrolment*	Semester 1 Semester 2
MATH4402 **Applied Mathematics Honours B**	12	**C** MATH4401	Semester 1 Semester 2
MATH4403 **Applied Mathematics Honours C**	12	**C** MATH4402	Semester 1 Semester 2
MATH4404 **Applied Mathematics Honours D**	12	**C** MATH4403	Semester 1 Semester 2
Microbiology Honours			
MICR4011 **Microbiology Honours A**	12	*Note: Department permission required for enrolment* *Entry into the School Honours program normally requires a credit average in a major relevant to the chosen project or relevant 24 credit points of senior study. The School will consider entry to students who do not have this requirement if their overall academic performance indicates an equivalent performance in other subject areas or if their SCIWAM exceeds 65.*	Semester 1 Semester 2
MICR4012 **Microbiology Honours B**	12	**P** Department permission required for enrolment **C** MICR4011 *Entry into the School Honours program normally requires a credit average in a major relevant to the chosen project or relevant 24 credit points of senior study. The School will consider entry to students who do not have this requirement if their overall academic performance indicates an equivalent performance in other subject areas or if their SCIWAM exceeds 65.*	Semester 1 Semester 2
MICR4013 **Microbiology Honours C**	12	**C** MICR4012 *Entry into the School Honours program normally requires a credit average in a major relevant to the chosen project or relevant 24 credit points of senior study. The School will consider entry to students who do not have this requirement if their overall academic performance indicates an equivalent performance in other subject areas or if their SCIWAM exceeds 65.*	Semester 1 Semester 2
MICR4014 **Microbiology Honours D**	12	**C** MICR4013 *Entry into the School Honours program normally requires a credit average in a major relevant to the chosen project or relevant 24 credit points of senior study. The School will consider entry to students who do not have this requirement if their overall academic performance indicates an equivalent performance in other subject areas or if their SCIWAM exceeds 65.*	Semester 1 Semester 2
Molecular Biotechnology Honours			
Students enrolled in the Bachelor of Molecular Biotechnology (Honours) degree enrol in units in the School/Department in which they are undertaking Honours.			
Pharmacology Honours			
PCOL4011 **Pharmacology Honours A**	12	*Note: Department permission required for enrolment*	Semester 1 Semester 2
PCOL4012 **Pharmacology Honours B**	12	**C** PCOL4011	Semester 1 Semester 2
PCOL4013 **Pharmacology Honours C**	12	**C** PCOL4012	Semester 1 Semester 2
PCOL4014 **Pharmacology Honours D**	12	**C** PCOL4013	Semester 1 Semester 2
Physiology Honours			
PHSI4011 **Physiology Honours A**	12	*Note: Department permission required for enrolment*	Semester 1 Semester 2
PHSI4012 **Physiology Honours B**	12	**C** PHSI4011	Semester 1 Semester 2
PHSI4013 **Physiology Honours C**	12	**C** PHSI4012	Semester 1 Semester 2
PHSI4014 **Physiology Honours D**	12	**C** PHSI4013	Semester 1 Semester 2

Unit of study	*Credit points*	*A: Assumed knowledge P: Prerequisites C: Corequisites N: Prohibition*	*Session*
Physics Honours			
PHYS4011 **Physics Honours A**	12	*Note: Department permission required for enrolment*	Semester 1 Semester 2
PHYS4012 **Physics Honours B**	12	**C** PHYS4011	Semester 1 Semester 2
PHYS4013 **Physics Honours C**	12	**C** PHYS4012	Semester 1 Semester 2
PHYS4014 **Physics Honours D**	12	**C** PHYS4013	Semester 1 Semester 2
Psychology Honours			
PSYC4011 **Psychology Honours A**	12	*Note: Department permission required for enrolment*	Semester 1 Semester 2
PSYC4012 **Psychology Honours B**	12	**C** PSYC4011	Semester 1 Semester 2
PSYC4013 **Psychology Honours C**	12	**C** PSYC4012	Semester 1 Semester 2
PSYC4014 **Psychology Honours D**	12	**C** PSYC4013	Semester 1 Semester 2
Soil Science Honours			
SOIL4021 **Soil Science Honours A**	12	*Note: Department permission required for enrolment*	Semester 1 Semester 2
SOIL4022 **Soil Science Honours B**	12	**C** SOIL4021	Semester 1 Semester 2
SOIL4023 **Soil Science Honours C**	12	**C** SOIL4022	Semester 1 Semester 2
SOIL4024 **Soil Science Honours D**	12	**C** SOIL4023	Semester 1 Semester 2
Mathematical Statistics Honours			
STAT4201 **Mathematical Statistics Honours A**	12	*Note: Department permission required for enrolment*	Semester 1 Semester 2
STAT4202 **Mathematical Statistics Honours B**	12	**C** STAT 4201	Semester 1 Semester 2
STAT4203 **Mathematical Statistics Honours C**	12	**C** STAT 4202	Semester 1 Semester 2
STAT4204 **Mathematical Statistics Honours D**	12	**C** STAT 4203	Semester 1 Semester 2

11. Talented Student Program

Overview

The Talented Student Program (TSP) is a special program of study intended for students 'of exceptional merit' who are enrolled in degrees administered by the Faculty of Science (BST, BSc, BMedSc, BPsych and their specialist streams or combined degrees).

It is also available for the science component of the BLibStud. If other faculties grant permission, TSP options may be taken for science components that are part of other degree programs. The aim of the program is to offer students of exceptional merit additional challenging material to enable them to maximise their intellectual growth and potential.

A major benefit of participation in the Talented Student Program is that students receive special supervision by academic staff and often engage in studies with small numbers of fellow students, all of whom have particular interest in the subject. In general, the TSP caters for students whose talent is broad-based across science.

There are two main aspects of a student's involvement in the TSP. Students can have greater flexibility in their choice of study (beyond that normally allowed by degree rules), and they have a mentor, a member of the academic staff who assists them in choosing from the great range of possibilities.

Participation in the Talented Student Program is recorded separately on the student's academic transcript, as are TSP units of study, so that all potential employers are aware that the student has completed challenging courses of study.

Further information on the operation of the Talented Student Program may be obtained from the departmental coordinators listed below or from the Undergraduate Adviser, Faculty of Science.

Selection

Entry to the Talented Student Program is by invitation from the Dean. Invitations to participate in the TSP are made each year for that year. The following guidelines apply generally, although departments may have additional (and more stringent) requirements for entry to the activities they offer in the program:

- To be considered for the program in their **first year**, students should normally have a UAI (or equivalent) of 99.00 or higher and a result in band 6 in at least one HSC science subject area a mark of 95 or better in HSC Mathematics Extension 2. The Dean may consider slight variations to these requirements where a student has demonstrated exceptional performance in scientific study (eg, at the level of membership of a team which represents Australia in an International Science or Mathematics Olympiad).
- To be considered for entry into the program in their **second and third years**, students should normally have AAMs of 85 or over and a high distinction grade in an appropriate Science subject area. Intermediate level entry to TSP is available only to students who have been enrolled full-time in units of study totaling at least 48 credit points.

Students who feel that they satisfy these criteria, but who have not received an invitation to participate in the TSP that year, should contact the Dean.

Range of TSP structures

The relevant Faculty Resolutions (for example, Section 2.2 of the BSc degree) authorises the Dean to give approval for students of exceptional merit to enrol in units of study or in combinations of units of study not normally available within the degree.

In very exceptional cases, particularly for students who have excelled in Olympiad programs, application of these Resolutions may permit accelerated progress toward the completion of the BSc degree. Faculty policy in relation to the Talented Student Program is described in this chapter.

Students will arrange a suitable pattern of study for the year, in consultation with their mentor (who will also consider the entire degree program). For some students, the TSP activities will be in a single discipline, for others there will be separate TSP activities in several disciplines. Still others will choose interdisciplinary activities that relate several fields to one another. Some students choose TSP activities that involve additional work beyond the normal amount for a student in the degree; for others, the TSP activities replace prescribed work, giving a normal total credit point load.

Many disciplines have an organised activity for a whole group of TSP students studying that field, such as a weekly seminar or group project. In other disciplines, TSP activity involves participation by each TSP student in a research group of staff and postgraduates. Every student is treated individually; however, there are some common patterns that we describe below.

For many TSP students who are interested in several fields, (especially if they aren't really sure about their eventual direction), a suitable arrangement might be for them to join in separate TSP activities of each discipline. Students might elect to study a broader range of fields than usual, by studying more than the normal load of 24 credit points per semester.

Another pattern is to accelerate a student who (say through Olympiad participation) has already learnt most of the topics in the usual first-year units in a discipline. Such a student can go directly to second year study in that field and in related fields, when they begin their degree. By studying more than the usual workload each semester, they may be able to complete their honours degree in less than 4 years full-time.

Some students have particular interests that can best be served by specially planned activities combining different disciplines.

Constraints on TSP structure

When a TSP activity replaces normal activity within a unit of study, the student will enrol in that unit, but the transcript will be annotated to reflect the TSP activity. When a TSP activity differs from the normal workload, the student will be enrolled in specially designated TSP units.

The maximum number of credit points from TSP activities that can be credited towards the degree is normally 40 credit points designated as TSP units of study that are not listed in the faculty handbook.

This 40-credit point total covers all three years of study, and perhaps several different disciplines, so it is important to plan carefully to leave enough TSP possibilities in later years. It is also important that the student meets all the usual degree requirements, involving numbers of credit points at various levels and in a range of disciplines.

Each TSP activity is assigned a number of credit points, a level (Junior, Intermediate or Senior) and a Discipline area, so it can contribute to meeting the degree requirements.

The TSP process

At the start of each year, the Dean chooses students to be invited to participate in the TSP. A welcome is held in Orientation week, and at that time, each student who is new to the TSP will meet briefly with the faculty TSP coordinator, who assigns a mentor for the student.

The mentor is usually a departmental TSP coordinator, from a department closest to the student's interest(s). The mentor and the student then plan special activities for the year, covering all fields (this may involve discussions with coordinators from other departments).

A proposal is put to the Dean, who can approve enrolment in special TSP units of study. During the year the student will meet several times with the mentor, to make sure that everything is going well. Whatever TSP activities have been arranged will be carried out by the student with others (staff and possibly students too).

Assessment will be through the mentor and the staff involved in the activities. At the end of the semester the TSP coordinator will report results.

TSP coordinators

Faculty of Science

Coordinator: Associate Professor Anthony Masters

Senior Agricultural Chemistry

Coordinator: Dr Robert Caldwell
Students may undertake, in addition to normal coursework, a special research project directly supervised by a member of the academic staff.

Anatomy and Histology

Coordinator: Dr Vladimir Balcar
The Department of Anatomy and Histology offers individual projects related to research in the department (for example Neuroscience, Developmental Biology, Forensic Anatomy, Structure and Function of Muscle Tissue) as well as a more structured program in cooperation with other departments in the School of Medical Sciences.

Biochemistry

See Molecular and Microbial Biosciences

Biology

Coordinator: Dr Jan Marc
Students may undertake additional seminars and/or special project work.

Chemistry

Coordinator: Professor Scott Kable
The Chemistry School offers Junior TSP students a challenging program based on the 'Chemistry 1 (Special Studies Program)'. The program comprises the Junior Chemistry (Advanced) lecture series, special tutorials, and special project-based laboratory exercises. Admission to Chemistry 1 (SSP) is by invitation only, and is limited to 40 students each year. Intermediate and senior Chemistry students may undertake a special research project.

The possibility of intermediate students taking senior units and junior students taking intermediate units also exists. Students should discuss options with Dr Rendina.

Electron Microscope Unit

Coordinator: Dr Lillian Soon
The department will make special arrangements for individual students throughout their studies. Interested students should contact the TSP coordinator as soon as possible.

Geosciences

Intermediate Geography
Coordinator: Professor Phil Hirsch
In lieu of some of the normal coursework, students may undertake special project work on an environmental problem. Particular emphasis will be given to the enhancement of student capabilities in the areas of problem identification, problem formulation, data gathering, and analysis and reporting.

Geology and Geophysics
Coordinator: Dr Derek Wyman
Students will be offered extra seminars and/or special project work.

History and Philosophy of Science

Coordinator: Dr Charles Wolfe
The unit will make special arrangements for individual students throughout their studies. Interested students should contact the TSP coordinator as soon as possible. Topics offered include History, Philosophy, and Sociology of Science; Science and Ethics; and Public Communication/Understanding of Science.

From first year onwards TSP students may enrol in advanced HPS for entry into the HPS Honours program. A 'distinction' grade in one advanced Intermediate UOS, one Senior UOS and HPSC4104 is required. Students who successfully complete the requirements will be awarded a special certifcate from the school of HPS.

Immunology

Coordinator: Dr Allison Abendroth
Students may undertake a special research project.

Information Technologies

Coordinator: Dr James Curran
The department will make special arrangements for individual students throughout their studies. Interested students should contact the TSP coordinator as soon as possible.

Mathematics and Statistics

Coordinators: Dr Daniel Daners
Students admitted to the program have the following options:

- First-year students in the Talented Student Program are invited to apply for entry to the Mathematics Special Studies Program. In addition to covering standard material, students in the Special Studies Program will participate in their own seminars on specially chosen advanced topics. Second and third year students are encouraged to tailor their own programs, in consultation with the coordinators.
- Students in the Talented Student Program have access to Mathematics units of study in higher years. For example, a first-year student may take selected second or even third-year units.
- Second and third-year students have access to special projects, which can be inter-disciplinary, according to the interests of the individual student. Second and third-year students are encouraged to tailor their own programs, in consultation with the coordinators.

Medical Science

Coordinator: Dr Brent McParland

Molecular and Microbial Bioscience

Biochemistry, Molecular Biology and Genetics, Molecular Biotechnology and Microbiology
Coordinator: Dr Andrew Holmes
A special program of study will be developed for individual students enrolled in Intermediate and Senior Biochemistry, Molecular Biology and Genetics, Molecular Biotechnology and Microbiology.

Pathology

Coordinator: Dr Bob Bao

Pharmacology

Coordinator: Dr Brent McParland
The department will make special arrangements for individual students throughout their studies.

Physics

Coordinators: Professor Dick Hunstead

The Physics TSP program extends the physics course by special seminars and project work, together with an excursion to locations of interest in the July semester break. The special project work in the July semester replaces part of the laboratory program and is available to first and second year TSP students. It introduces students to the diversity of research activities in the School. The aim is to broaden students' knowledge of physics, and give an insight into how physicists think and how a real research project is tackled.

Physiology

Coordinator: Dr Margot Day

Students may undertake, in addition to normal coursework, a special research project.

Psychology

Coordinator: Dr Irina Harris

The program is available in Intermediate and Senior Psychology. Students admitted to the program have the following options, or various combinations of these options, available to them:

- additional options in Psychology either in lieu of, or in addition to, other units of study in Science
- a combination of additional Psychology options combined with special studies in another science discipline (for example, Biochemistry, Computer Science, Mathematics and Statistics)
- a special research project in lieu of, or in addition to, normal practical or classwork components.

Senior Soil Science

Coordinator: Dr Balwant Singh

Students may undertake, in addition to normal coursework, a special research project.

12. Information for students on Outbound Exchange

This chapter is intended for students in the Faculty of Science who wish to take up the opportunity to study overseas at an exchange-partner institution for part of their University of Sydney degree.

The University of Sydney has exchange agreements with Universities throughout the Asia Pacific, Europe, Canada, the USA and South America. Each year a number of students in the Faculty of Science choose to participate in Exchange programs and have found them to be an exciting and challenging way of globalising their academic experience and enriching their personal experience in different environments and cultures.

When a student is on exchange they are enrolled full-time at the University of Sydney and pay all relevant fees to the University of Sydney (i.e. Commonwealth Supported). Students from Sydney may be required to pay some minor administrative charges and health insurance; however they are not normally required to pay any other tuition fees to the host institution.

Eligibility

All students should check with the Faculty of Science to ensure there are no restrictions on their program of study before applying for the exchange. If there are none, the following eligibility criteria normally apply for the University-wide student exchange programs:

- Undergraduate students must have completed 48 credit points at the University of Sydney at the time of application (you can apply in the second semester of first year to depart in the second semester of second year). Students who have transferred from another university and received credit for previous study must have completed at least one semester of full-time (24 credit points) study at the University of Sydney before they can apply for the exchange program.
- Postgraduate coursework students will usually need to have completed one semester of full-time postgraduate study at the University of Sydney at the time of application.
- Postgraduate research students must have completed one semester of full-time postgraduate study before they can go on exchange.
- You must have achieved at least a credit average (65 per cent or higher) over your academic record at the University of Sydney and should have passed all subjects. A failure may be overlooked if you can demonstrate extenuating circumstances.
- You must be enrolled as a full-time student at the University of Sydney while away on exchange taking classes that will count as credit towards your normal Sydney enrolment i.e. you cannot study classes overseas for recreation or personal interest.
- You must have sufficient funding for the exchange period.
- Exchange programs are not available to honours students.

Applying to go on Exchange

The deadlines for collecting application forms are 15 May for programs commencing in the first half of the following year and 15 October for programs commencing in the second half of the following year. The deadline for the submission of completed applications is 31 May or 31 October.

Please note that the application is quite complex and it is essential that you plan to commence the process 4 to 6 weeks before the deadline. Details on the application process, as well as information about scholarships and loans, can be obtained from the International Study Abroad and Exchange Office at the University of Sydney or on the University of Sydney website.

Students enrolled in combined degree programs are required to get endorsement from both faculties. All students must submit their exchange paperwork to their administering/home faculty regardless of which units are being taken overseas.

Students are required to obtain the following academic information prior to lodging the application at the Study Abroad and Exchange Office:

- *Academic Study Plan*: University of Sydney unit of study equivalences for all of the possible subjects of choice – for your three preferred exchange destinations to be submitted (one form per destination). These forms are available from the International Study Abroad and Exchange Office. These *Academic Study Plans* are a guide to what you intend to study overseas but do not guarantee credit at this stage. These are used by the International Office to assess the viability of your destination choices based on your proposed areas of study. While there is no need to seek approval for the *Academic Study Plans* from the faculty at this stage of the process, you may wish to consult with your school for guidance about suitable units of study to meet the requirements of your major.
- *Faculty Permission*: This approval needs to be recorded on the faculty endorsement of exchange study plan provided by the International Study Abroad and Exchange Office

The *Academic Study Plans* are submitted to the International Office along with all other application documentation by the submission deadlines at the end of May and October. If your application is successful, you will then be required to complete the *Academic Approval for Nominated Exchange Student* form which will require official written approval from the Faculty of Science. This form is provided by the International Study Abroad and Exchange Office and should be completed by contacting the nominated Exchange Unit of Study coordinator in each school of interest. You will need to provide course outlines from the overseas institution. Completed *Academic Approval for Nominated Exchange Student* forms must be submitted to the International Office to confirm your place in the International Exchange Program. These forms confirm the credit arrangements you will receive for your exchange units of study.

Students need to ensure that a copy of the final approval is lodged at the Faculty of Science prior to departure.

In many instances the unit of study availability at the overseas institution can vary. Students need to ensure that the University of Sydney enrolment correctly reflects the enrolment at the overseas institution. If units of study at the overseas institution become unavailable, students are required to obtain written equivalents and faculty approval for any subsequent changes prior to the HECS census dates each semester.

Results

After completion of the exchange semester(s), your original transcript will be forwarded to the Faculty of Science office (via the International Study Abroad and Exchange Office). Exchange results appear on your University of Sydney transcript on a pass/fail basis.

13. Overview of postgraduate study

This chapter gives an overview of postgraduate study in the Faculty of Science. Following is a brief outline of the types of postgraduate degrees offered by the Faculty of Science, a list of degrees available and an outline of the layout of the postgraduate section of the Faculty of Science handbook.

Degree types

The Faculty of Science offers a range of postgraduate coursework and research degrees in a variety of disciplines.

Coursework programs

Coursework programs usually involve the completion of a required series of units of study as detailed in the subsequent chapters of this handbook. A coursework program normally requires attendance at lectures and tutorials. Although coursework programs may sometimes include a component of original work in the form of a research project; other forms of instruction and learning will normally be dominant.

Graduate certificate

Graduate certificates usually require the completion of at least 24 credit points of study, and take one semester of full-time study or the equivalent duration of part-time study. The entry requirement is normally a bachelor's degree.

Graduate diploma

Graduate diplomas usually require the completion of at least 36 credit points of study, and take two semesters of full-time study or the equivalent of part-time study. The entry requirement is also usually a bachelor's degree or equivalent.

Coursework master's

Coursework master's degrees usually require the completion of at least one to two years of full-time study or the equivalent of part-time study. The entry requirement is also usually a bachelor's degree or its equivalent.

Students who complete a research project that is worth a minimum of 25 per cent of a coursework master's are eligible to apply for admission to a research degree (Master of Science or Doctor of Philosophy).

Articulated degree programs

Many of the coursework programs available in the Faculty of Science are articulated master's programs. This means that students may enter a program at a range of levels, including graduate certificate, graduate diploma or master's level. This also means that students can exit a program on completion of a particular level. Please see individual course information for more details.

Research degrees

Students in research degrees in the Faculty of Science undertake supervised research leading to the writing of a thesis or other piece of written work.

Research master's

A research master's degree usually requires one to two years of full-time study or the equivalent of part-time study during which a candidate undertakes supervised research and a thesis, or in some cases coursework and an essay. The entry requirement is usually a bachelor's degree with first or second class honours or equivalent.

Doctor of Philosophy

The degree of Doctor of Philosophy is a research degree awarded for a thesis considered to be a substantially original contribution to the subject concerned. Some coursework may be required, but in no case is it a major component. Applicants should normally hold a master's degree or a bachelor's degree with first class honours. The usual minimum period of candidature is three years of full-time study, or the equivalent of part-time study.

Admission requirements

Admission requirements vary according to degree. Applicants must consult the individual admission requirements for each degree given in the relevant resolutions.

Degrees offered

This is introductory part of chapter 13 - overview of postgraduate study

Postgraduate degrees, graduate diplomas and graduate certificates

The postgraduate degrees in the Faculty of Science are:

1. Degrees of Doctor

1.1 Doctor of Philosophy (PhD)
1.2 Doctor of Science (DSc)
1.3 Doctor of Clinical Psychology/Master of Science DCP/MSc

2. Degrees of Master

2.1 Master of Science (MSc)
2.2 Master of Science (Environmental Science) (MSc(EnvironSc))
2.3 Master of Environmental Science and Law (MEnvSciLaw)
2.4 Master of Medical Physics (MMedPhys)
2.5 Master of Nutrition and Dietetics (MNutrDiet)
2.6 Master of Bioethics (MBEth)
2.7 Master of Bioethics (Honours) (MBEthHon)
2.8 Master of Photonics and Optical Science
2.9 Master of Applied Nuclear Science (MApplNucSci)
2.10 Master of Applied Science (MApplSc), which shall also incorporate the streams:
2.10.1 Master of Applied Science (Bioinformatics) (MApplSc(Bioinf))
2.10.2 Master of Applied Science (Environmental Science) (MApplSc(EnvSc))
2.10.3 Master of Applied Science (Health Psychology) (MApplSc(HlthPsych)
2.10.4 Master of Applied Science (Microscopy and Microanalysis) (MApplSc (Microsc & Microanal))
2.10.5 Master of Applied Science (Molecular Biotechnology) (MAppSc(MBT))
2.10.6 Masterof Applied Science (Psychology of Coaching) (MApplSc(PsycCoach))
2.10.7 Master of Applied Science (Spatial Information Science) (MApplSc(SIS))
2.10.8 Master of Applied Science (Wildlife Health and Population Management) (MAppSc(Wild Hlth Pop Man))

3. Graduate Diplomas

The diplomas in the Faculty of Science shall be:
3.1 Graduate Diploma in Science (GradDipSc)

3.2 Graduate Diploma in Photonics and Optical Science (GradDipPhotOptSci)
3.3 Graduate Diploma in Psychology (GradDipPsych)
3.4 Graduate Diploma in Science (Microscopy and Microanalysis) (GradDipSc(Microsc & Microanal))
3.5 Graduate Diploma in Medical Physics (GradDipMedPhys)
3.6 Graduate Diploma in Bioethics (GradDipBEth)
3.7 Graduate Diploma in Applied Nuclear Science (GradDipApplNucSci)
3.8 Graduate Diploma in Applied Science (GradDipApplSc), which shall also incorporate the streams:
3.8.1 Graduate Diploma in Applied Science (Bioinformatics) (GradDipApplSc(Bioinf))
3.8.2 Graduate Diploma in Applied Science (Environmental Science) (GradDipApplSc(EnvSc))
3.8.3 Graduate Diploma in Applied Science (Health Psychology) (GradDipApplSc(HlthPsych))
3.8.4 Graduate Diploma in Applied Science (Microscopy and Microanalysis) (GradDipApplSc (Microsc & Microanal))
3.8.5 Graduate Diploma in Applied Science (Molecular Biotechnology) (GradDipApplSc(MBT))
3.8.6 Graduate Diploma in Applied Science (Psychology of Coaching) (GradDipApplSc(PsychCoach))
3.8.7 Graduate Diploma in Applied Science (Spatial Information Science) (GradDipApplSc(SIS))
3.8.8 Graduate Diploma in Applied Science (Wildlife Health and Population Management)(GradDipApplSc (WildHlthPopMan))

4. Graduate Certificates

The certificates in the Faculty of Science shall be:
4.1 Graduate Certificate in Science (History and Philosophy of Science) (GradCert(HPS))
4.3 Graduate Certificate in Applied Science (GradCertApplSc), which shall also incorporate the streams:
4.3.1 Graduate Certificate in Applied Science (Bioinformatics) (GradCertApplSc (Bioinf))
4.3.2 Graduate Certificate in Applied Science (Environmental Science) (GradCertApplSc (EnvSc))
4.3.3 Graduate Certificate in Applied Science (Health Psychology) (GradCertApplSc (HlthPsych))
4.3.4 Graduate Certificate in Applied Science (Microscopy and Microanalysis) (GradCertApplSc (Microsc & Microanal))
4.3.6 Graduate Certificate in Applied Science (Molecular Biotechnology) (GradCertApplSc (MBT))
4.3.7 Graduate Certificate in Applied Science (Psychology of Coaching) (GradCertApplSc (PsychCoach))
4.3.8 Graduate Certificate in Applied Science (Spatial Information Science) (GradCertApplSc (SIS))
4.3.9 Graduate Certificate in Applied Science (Applied Positive Psychology) (GradCertApplSc (AppPosPsyc))
4.3.10 Graduate Certificate in Applied Science (Wildlife Health and Population Management) (GradCertApplSc (WildHlthPopMan))
4.4 Graduate Certificate in Bioethics (GradCertBEth), which shall also incorporate the streams:
4.4.1 Graduate Certificate in Bioethics (Biotechnology) (GradCertBEthBTech)
4.4.2 Graduate Certificate in Bioethics (Clinical Ethics) (GradCertBEthClinEth)

Candidates who have commenced qualifications in the past that are no longer offered by the Faculty should make reference to the regulations applicable in their first year of enrolment and consult with the advisers in the Faculty Office.

Organisation of the postgraduate chapters

Chapter 13 contains an overview of postgraduate study within the Faculty of Science and a list of all the degrees offered.

Chapter 14 contains details of doctorates offered by the faculty, including enrolment advice and degree resolutions.

Chapter 15 contains information about master's research degrees, including enrolment advice and degree resolutions.

Chapter 16 outlines the requirements for the graduate diploma in science.

Chapters 17-28 includes enrolment advice and resolutions for the postgraduate coursework degrees offered by the faculty. These chapters also contain unit of study descriptions. The chapters are sorted alphabetically by area of study.

University of Sydney (Coursework) Rule 2000 (as amended)

The Resolutions in the postgraduate section of the handbook must be read in conjunction with the *University of Sydney (Coursework) Rule 2000 (as amended)*, which sets out the requirements for all coursework courses, and the relevant Senate Resolutions, which are available in the University Calendar. The Calendar can also be viewed on the web at www.usyd.edu.au/calendar.

14. Doctorates in the Faculty of Science

This chapter sets out the requirements for research postgraduate degrees offered in the Faculty of Science. Following is a brief description of the research degrees, notes on the presentation of theses and a description of coursework/research degrees.

The information in this chapter is in summary form and is subordinate to the provisions of the relevant degree resolutions, collected variously at the end of the degree descriptions, or in the University of Sydney Calendar. The Calendar is available for sale at the Student Centre, for viewing at the Faculty Office or the Library, or on the website: www.usyd.edu.au/publications/calendar.

Research doctorate degrees

Research degrees offered by the Faculty of Science are listed in this chapter in the following order:

- Doctor of Science (DSc)
- Doctor of Philosophy (PhD)
- Doctor of Clinical Psychology/ Master of Science (DCP/MSc)
- Doctor of Clinical Neuropsychology/ Master of Science (DCN/MSc)

The resolutions of the Senate, Academic Board and Faculty relating to these degrees may be found below and in the Calendar.

Additional valuable resources for intending and current research students are the *Postgraduate Research Studies Handbook*, published by the University of Sydney and the *Thesis Guide and Survival Manual* published by SUPRA (Sydney University Postgraduate Representative Association).

These publications are available from the Faculty Office. The Postgraduate Research Studies Handbook is also on the website: www.usyd.edu.au/study/postgrad.shtml.

Doctor of Science (DSc)

Degree Code: LA000

The degree of Doctor of Science is awarded for published work which has been generally recognised by scholars in the field concerned as a distinguished contribution to knowledge. To be eligible applicants must be graduates of the University of Sydney.

Alternatively they may be graduates of another university or be accepted as having standing equivalent to that required of a graduate of the university and have been either a full-time member of the academic staff of the University of Sydney for at least three years or have had a significant involvement with the teaching or research of the University.

Admission to candidature is subject to a preliminary assessment by the Faculty of the applicant's case. In the first instance, the prospective candidate should send an expression of interest setting out his/her connection with the University of Sydney to the Faculty of Science.

If this is favourable an applicant is required to submit a list of published work, together with a description of the theme of the published work. At least three examiners, of whom at least two are external, are appointed to assess the application and make recommendations.

Faculty resolutions: see end of this chapter.
Resolutions of the Senate: see the University of Sydney Calendar.

Doctor of Philosophy (PhD)

Degree Code: LB000

The degree of Doctor of Philosophy is a research degree awarded for a thesis considered to be a substantially original contribution to the subject concerned. Some coursework may be required (mainly in the form of seminars) but in no case is it a major component. The Resolutions of the Senate and Academic Board relating to the degree of Doctor of Philosophy are printed in University of Sydney Calendar.

Applicants should normally hold a masters degree or a bachelors degree with first or second class honours from the University of Sydney, or an equivalent qualification from another university or institution. The masters degree may be a research masters or a coursework masters which contains a project or thesis component equivalent to half a semester's load.

With permission from the Dean, additional training (coursework) may be undertaken either prior to commencement of candidature or during the first semester of candidature. This coursework may be general research preparation or discipline-specific.

The degree may be taken on either a full-time or part-time basis. In the case of full-time candidates, the minimum period of candidature can, with the permission of the faculty, be two years for candidates holding an MSc degree or equivalent, or shall be three years in the case of candidates holding a bachelors degree with first class or second class honours; the maximum period of candidature is normally four years.

Part-time candidature may be approved for applicants who can demonstrate that they are engaged in an occupation or other activity, which leaves them substantially free to pursue their candidature for the degree. Normally the minimum period of candidature will be determined on the recommendation of the faculty but in any case will be not less than three years; the maximum period of part-time candidature is normally eight years.

Doctor of Philosophy Resolutions: see the University of Sydney Calendar.

Doctor of Clinical Psychology/Master of Science (DCP/MSc)

Degree Code: LB001/LC083

The School of Psychology offers a double degree which trains psychology graduates in the professional specialisation of clinical psychology: the Doctor of Clinical Psychology/Master of Science course.

The Doctor of Clinical Psychology is recognised, in principle, by the New South Wales Department of Health as qualifying the holder for progression to the grade of Clinical Psychologist. The course is accredited by the Australian Psychological Society as a 5th, 6th and 7th year of training, and as an approved qualification for Membership of the APS College of Clinical Psychologists. The Australian Psychology Accreditation Council also accredits the course for the purposes of achieving the required practical experience in psychology for full registration.

The Doctor of Clinical Psychology/Master of Science (DCP/MSc) involves 3 years of full-time study and includes three components: academic course work, supervised clinical internships and research.

The academic coursework involves lectures, workshops, forums and seminars by the University academic staff. Qualified Clinical Psychologists who work in a variety of teaching hospitals and clinics in the Sydney area provide supervised clinical practice.

In some circumstances, internships may also be available in rural and remote areas including Bathurst, Bourke and Lismore. The research component requires students to produce a Research Thesis that fulfils the requirement for a MSc degree.

All students enrol in the DCP degree and in their second year enrol in a MSc degree as well. On completion of all the course requirements at the end of the third year, students will graduate with a DCP and MSc degree.

Students who have made excellent progress and whose projects are of sufficient scope may apply for transfer to a PhD degree during the first semester of their third year of enrolment in the DCP.

Transfer to a PhD is also subject to the satisfactory production of a thesis proposal which outlines how the thesis, on completion, will make a contribution to knowledge in a specialist area of study.

Admission requirements

- Completion of a four year honours degree in Psychology, gaining at least an upper second class (2.1) honours, or equivalent. All qualifications obtained from a non-Australian University must be assessed by the Australian Psychological Society (APS) before an application may be submitted. To determine equivalency visit the APS website.
- English language proficiency. You must provide evidence of English language proficiency if you have not completed a tertiary qualification in Australia or your qualifications were obtained from a university or other institution where the language of instruction was not English.
- Two referee reports.

Selection

Applicants are selected following the evaluation of application forms, supporting documentation and a selection interview. Applicants must meet the admission requirements to be considered for the selection interview (an essential part of the selection process).

Selection interview criteria: Undergraduate academic performance; additional academic qualifications in psychology: MSc or PhD in psychology, publications (published journal articles, published reports, conference presentations); referee reports; and relevant clinical work experience: paid work-experience (psychologist, counsellor, clinically relevant research), voluntary work experience (teaching, research, other). Note: receptionist, shop assistant, baby sitting or similar work is not considered relevant work experience.

Offers of places are dependent upon the ranking of applicants and competition for places.

Clinical relevance for application

Students applying for the DCP are not required to have completed an empirical research project in the area of Abnormal Psychology, Health Psychology, Clinical Psychology or Neuropsychology.

The selection process aims to identify students with a demonstrated interest in abnormal, clinical psychology or clinical neuropsychology, an awareness of clinical issues, and experience related to the area. Note also that clinical relevance can be discussed on the basis of projects in many areas of psychology or relevant work experience.

Application submission

Applications should be sent to:

The Postgraduate Assistant
Faculty of Science
Carslaw Building, F07
University of Sydney
NSW 2006 Australia

International applicants should apply in writing to:

The International Office
Services Building, G12
University of Sydney
NSW 2006 Australia

Provisional registration

All intending candidates are required to apply for and gain provisional registration with the NSW Psychologists Registration Board before commencing their candidature, or if applicable, full registration. Please note the NSW Psychologists Registration Board requires that all overseas qualifications be assessed by the Australian Psychological Society (APS).

PO Box K599
Haymarket
NSW 1238 Australia
Phone: +64 2 9219 0211
Fax: +64 2 9211 9318

Course structure

This program is based on a scientist-practitioner model with a cognitive-behavioural emphasis. It aims to provide students with a high level of expertise in practical, academic and research areas which will enable them to work successfully as professional clinical psychologists in a variety of academic, clinical and community settings.

Our graduates will have a highly developed knowledge base and strong clinical skills necessary for both the practice of professional psychology on the one hand and conducting psychological research on the other.

Course resolutions

See the end of this chapter.

Unit of study descriptions

Doctor of Clinical Psychology/ Master of Science units of study

PSYC6003
Clinical Internship 1

Credit points: 3 **Teacher/Coordinator:** Dr Caroline Hunt and Ms Judy Hyde **Session:** Semester 1 **Classes:** 2 three hour and 4 four hours of core clinical skills training; 13 four hour clinical observation per semester, 6 three hour clinical skills training. **Assessment:** Attendance; Observation report; Clinical log

This unit of study is designed to introduce students to the work of clinical psychologists. The internship will expose students to a range of clients with different mental health needs, both in the Psychology Clinic and in hospital settings. The internship will strengthen theory-practice links, by exposing students to the range of mental health problems faced in clinical settings. In addition, core clinical skills will be developed. Skills in micro-counselling and cognitive-behavioural interviewing are reviewed and practiced. Diagnostic assessment, mental status examination and cognitive behavioural case formulation are taught with a view to developing individual treatment plans.

PSYC6004
Ethics and Professional Practice

Credit points: 3 **Teacher/Coordinator:** Prof Stephen Touyz **Session:** Semester 1 **Classes:** 7 three hour lectures and 1 three hour workshop per semester. **Assessment:** Child protection assignment; clinical viva.

This unit of study will introduce students to the highest standards of ethical and clinical practice and familiarise them with relevant legislation pertaining to contemporary practice in clinical psychology. These wide ranging seminars will cover New South Wales

Psychologists Registration Board, Guardianship Tribunal and College of Clinical Psychologists of the Australian Psychological Society.

PSYC6005
Research 1

Credit points: 3 **Teacher/Coordinator:** Dr David Hawes **Session:** Semester 1 **Classes:** 13 one hour seminars per semester. **Assessment:** Attendance, Research Proforma.

Students will attend the research forum. Students will attend the School Colloquium. During first semester, students should be thinking about the particular area in which they would like to complete their research. Students should approach academic staff in the School of Psychology about potential projects. At the end of semester students must submit the research proforma. We aim to ensure that students are able to undertake research in the area of their choice with a chosen supervisor. However, supervisor availability will affect availability. Students will be informed at the beginning of second semester of the supervisor who they have been allocated.

PSYC6009
Case Seminars 2

Credit points: 3 **Teacher/Coordinator:** Prof Stephen Touyz **Session:** Semester 2 **Classes:** 13 one hour seminars per semester. **Prerequisites:** PSYC6029 **Assessment:** Attendance

This unit of study will continue the seminars introduced in PSYC6029 Case Seminars 1. This unit of study will comprise formal weekly presentations of cases seen in the course of Clinical Internships by Year 3 students. All students are required to attend throughout the semester.

PSYC6010
Research 2

Credit points: 3 **Teacher/Coordinator:** Dr David Hawes **Session:** Semester 2 **Classes:** 13 one hour seminars per semester. **Prerequisites:** PSYC6005 **Assessment:** Attendance, research proposal.

Students will attend the research forum which will feature the presentation of special research-relevant topics. Students will consolidate their research plan and develop a 3-4 page written proposal for their research project. Students will be expected to attend the School of Psychology Colloquium.

PSYC6014
Case Seminars 3

Credit points: 3 **Teacher/Coordinator:** Prof Stephen Touyz **Session:** Semester 1 **Prerequisites:** PSYC6009 **Assessment:** 2 case reports, Attendance

This unit of study builds upon previous semesters where second year students will present a clinical case for discussion. Assessment of this unit of study is by detailed case reports.

PSYC6015
Research 3

Credit points: 3 **Teacher/Coordinator:** Dr David Hawes **Session:** Semester 1 **Prerequisites:** PSYC6010 **Assessment:** Attendance, Research presentation.

Students will attend the research forum. Students will attend the School Colloquium. Students will present the rationale, aims, hypotheses, and plan of their proposed research project at the research forum, which will include research supervisors, staff of the CPU and other School academic staff as appropriate. During this semester, students will be expected to commence the collection of data. Students will also be guided through the process of submitting an Application for Ethical Approval.

PSYC6029
Case Seminars 1

Credit points: 3 **Teacher/Coordinator:** Prof Stephen Touyz **Session:** Semester 1 **Classes:** 13 one hour seminars per semester. **Assessment:** Attendance

Attendance at the case seminars introduces students to history taking, conducting a mental status examination, formulation, diagnosis and treatment. These clinical case conferences will allow students to recognise a wide range of psychiatric diagnoses, the interrelationships between medical illness and psychiatric/psychological symptomatology as well as working within a multidisciplinary framework.

PSYC6031
Family Therapy

Credit points: 3 **Teacher/Coordinator:** Dr Paul Rhodes **Session:** Semester 2 **Classes:** 4 six hour seminars per semester. **Prerequisites:** PSYC6049 **Assessment:** 2 Assignments

This course serves as an introduction to family therapy with an emphasis on practical interviewing and intervention skills from a wide range of models of family therapy including systemic and structural family therapy, and brief solution-focussed and narrative therapy.

PSYC6032
Adult Health Psychology

Credit points: 6 **Teacher/Coordinator:** Dr Catalina Lawsin **Session:** Semester 1 **Classes:** 6 six hour lectures per semester. **Prerequisites:** PSYC6051 **Assessment:** Attendance; presentation

This course aims to understand the relationships between psychological and physical functioning across a range of medical disorders and the way in which cognitive and behavioural factors influence psychological and physical functioning of those with health related problems. The course will be concerned with theories and interventions that promote health related behaviours and improve quality of life for people with medical problems. The course will aim to investigate theories and practice in the areas of adjustment to illness, adherence to medical treatments, working with patients with chronic illness, facilitating doctor-patient communication and dealing with death and dying. In addition, the psychological issues relevant to particular illnesses will be discussed.

PSYC6049
Child Psychological Disorders

Credit points: 6 **Teacher/Coordinator:** Dr David Hawes **Session:** Semester 2 **Classes:** 6 six-hour lectures per semester **Prerequisites:** PSYC6051 **Assessment:** Case study; formal evaluation

This course introduces current perspectives on child and adolescent psychopathology, examining the historical development and current status of theory and practice. Core theories are presented within a developmental-ecological framework, and examined in relation to the etiology and course of common internalising and externalising disorders. Skills training addresses basic family consultation as well as multi-method forms of assessment (e.g., Interviewing, observation, self-report) and intervention (e.g., Parent skills training, individual and group child therapy). Attention is also given to essential aspects of professional practice related to school and community contexts, ethics, and the scientist-practitioner model.

PSYC6051
Adult Psychological Disorders

Credit points: 6 **Teacher/Coordinator:** Dr Maree Abbott **Session:** Semester 1 **Classes:** 13 one hour lectures and 13 three hour practicals per semester. **Assessment:** Formal examination; clinica viva

This course is designed to introduce students to the nature of therapeutic work with common psychological problems of adulthood, through a series of lectures and practical skills based sessions. Skills training in cognitive behavioural strategies are combined with theoretical knowledge about different disorders to form strong theory-practice links. Emphasis is placed upon the learning of strong practical skills in the application of evidence-based therapies to the common psychological disorders encountered in adulthood, such as anxiety disorders, mood disorders and eating disorders.

PSYC6054
Neuropsychopathology

Credit points: 3 **Teacher/Coordinator:** Dr Suncica Sunny Lah and Dr David Horry **Session:** Semester 2 **Classes:** 13 one hour lectures per semester. **Assessment:** Essay; formal examination

This unit of study is concerned with principles of neuropsychology and their clinical applications. It aims to develop students' understanding of functional brain organisation, recovery of function and rehabilitation. In addition, it introduces students to the behavioural and cognitive correlates of a range of neurological and medical conditions (including traumatic brain injury, epilepsy, diabetes, etc.) in children and adults. Students will learn to recognise the cognitive profiles and behavioural disorders associated with a variety of neurological and medical conditions, understand the neurological basis for these profiles and know how to assess patients with these disorders. Lectures will include theoretical components, case presentations and discussions.

PSYC6055
Advanced Adult Psychological Disorders

Credit points: 6 **Teacher/Coordinator:** Dr Maree Abbott **Session:** Semester 2 **Classes:** 7 six hour lectures per semester. **Prerequisites:** PSYC6051 **Assessment:** Formal examination; attendance at and report from mental health tribunal.

The advanced adult therapy component will cover major mental health problems such as schizophrenia, bipolar disorder, anorexia nervosa, drug and alcohol problems and disorders of impulse control. It will also include a workshop on working with older adults and cover issues that relate to the Mental Health Review Tribunal process. Students will gain exposure to the Mental Health Review Tribunal process via direct observation as part of this unit.

PSYC6056
Advanced Seminars

Credit points: 6 **Teacher/Coordinator:** Dr Caroline Hunt **Session:** Semester 2 **Classes:** 6 six hour seminar, 1 four hour seminar per semester **Prerequisites:** PSYC6051 **Assessment:** Attendance; presentation; written assignment; clinica viva

This course is designed to provide interns with advanced level training in psychotherapeutic approaches. The advanced level seminars will include Schema Therapy, Integrated Approaches to Psychotherapy and may include from time to time, seminars by visiting clinical academics with expertise in specific therapeutic approaches.

PSYC6058
Clinical Internship and Case Seminars 6

Teacher/Coordinator: Prof Stephen Touyz and Ms Judy Hyde **Session:** Semester 2 **Classes:** 13 one hour seminars, 24 fourteen hour practicals per semester. **Assessment:** Attendance, practical; 2 case reports; contract; mid-internship review, end of internship review

This course provides students with a range of therapy and assessment experiences in accordance with their clinical and research interests. The specific nature of learning outcomes will depend upon the setting for the internship, the client group and the nature of the clinical work. Students will also attend the clinical case seminars and present for discussion complex clinical cases which pose either diagnostic dilemmas or difficulties in treatment.

PSYC6061
Clinical Internship and Case Seminars 5

Teacher/Coordinator: Prof Stephen Touyz and Ms Judy Hyde **Session:** Semester 1 **Classes:** 13 one hour seminars, 24 fourteen hour practicals per semester. **Assessment:** Attendance, practical; 2 case reports; contract; mid-internship review, end of internship review.

This course provides students with a range of therapy and assessment experiences in accordance with their clinical and research interests. The specific nature of learning outcomes will depend upon the setting for the internship, the client group and the nature of the clinical work. Students will also attend the clinical case seminars and present complex clinical cases for discussion which pose either diagnostic dilemmas or difficulties in treatment.

PSYC6064
Paediatric and Developmental Disorders

Credit points: 6 **Teacher/Coordinator:** Dr Paul Rhodes and Dr David Hawes **Session:** Semester 1 **Classes:** 6 six hour lectures per semester **Prerequisites:** PSYC6049 **Assessment:** One 2500 word essay, Presentation

This unit of study introduces students to specialised fields of paediatric psychology related to 1) Maltreatment (abuse and neglect), 2) Developmental disorders (intellectual disability, autism, tic disorders, metabolic disorders), 3) Acute and chronic illness, and 4) Problems of adolescence (substance abuse, eating disorders, cutting, suicidality). Teaching will address current etiological theories and models for intervention, as well as aspects of professional practice and issues related to the multidisciplinary management of problems in these populations.

PSYC6065
Psychological Assessment

Credit points: 6 **Teacher/Coordinator:** Dr Suncica Sunny Lah and Dr David Horry **Session:** Semester 1 **Classes:** 13 three-four hour lectures per semester. **Assessment:** two practical reports, two clinical skills assessments

This course introduces students to the basic theory and the general practice of neuropsychological assessment in children and adults. It will foster clinical approach that relies on integration of information obtained from a clinical history with results obtained on testing. It will develop conceptual framework for understanding of core developmental disorders and assesment of these disorders. The course will focus on the following components of cognition: intelligence, memory, attention, executive abilities and achievement. Students will be taught how to administer, score and interpret a variety of tests in these areas; and how to report the results in written form.

PSYC6066
Clinical Internship and Case Seminars 4

Teacher/Coordinator: Prof Stephen Touyz and Ms Judy Hyde **Session:** Semester 2 **Classes:** 13 one hour seminars, 24 fourteen hour practicals per semester. **Corequisites:** PSYC6068 **Assessment:** Case presentation; Attendance, practical; 2 case reports; contract; mid-internship review, end of internship review.

Students are introduced to a range of experiences in hospitals and community settings in accordance with their clinical and research interests. One of the three internships will be specifically tied to the student's research project to allow them to specifically develop skills relevant to research with that particular clinical population. One of the three internships should also be with a client group with general psychiatric problems. One of the three internships should be with a child, adolescent or family client group. The specific nature of learning outcomes will depend upon the setting for the internship, the client group and the nature of the clinical work. Choices for internships will be made in collaboration with the unit coordinator, who will work with students to develop individually tailored training plans. Students will also attend the clinical case seminars.

PSYC6067
Clinical Internship 2

Credit points: 6 **Teacher/Coordinator:** Dr Caroline Hunt and Ms Judy Hyde **Session:** Semester 1 **Classes:** 18 seven hour practicals per semester. **Prerequisites:** PSYC6065, PSYC6051, PSYC6003 **Assessment:** Attendance, practical; contract; mid-internship review, end of internship review.

This unit of study is designed to introduce students to therapy and psychological assessment skills for working with adults and with children and their families. Students will be allocated to a supervisor who will oversee their clinical practice closely. This internship will build student's confidence in working with psychological problems in the mild to moderate clinical range. It will allow students to develop skills in the identification of clinical problem, the communication of a formulation and treatment plan and the conduct of the plan. Students may also have the opportunity to develop skills in working with groups.

PSYC6068
Clinical Internship 3

Credit points: 6 **Teacher/Coordinator:** Dr Caroline Hunt and Ms Judy Hyde **Session:** Semester 1 **Classes:** 18 fourteen hour practicals per semester. **Prerequisites:** PSYC6065, PSYC6049 **Assessment:** Attendance, practical; contract; mid-internship review, end of internship review.

This unit of study is designed to further develop students' competence in therapy and psychological assessment skills for working with adults and young people and their families. Students will be allocated to a supervisor who will oversee their clinical practice closely. This internship will expose students to clients with psychological problems in mild to moderate clinical range. Interns will be able to work more independently at this stage of their training.

Doctor of Clinical Neuropsychology/Master of Science (DCN/MSc)

Degree Code: LB005/LC083

This degree is not available to new students in 2009.

For information and course resolutions see the 2006 Faculty of Science Handbook.

Presentation of theses - for research degrees

The following information is presented for the guidance of candidates. It should be regarded as a summary only. Candidates should also consult the University Calendar, the Postgraduate Research Studies Handbook and the Faculty of Science for the most current and detailed advice.

The Postgraduate Research Studies Handbook is available at www.usyd.edu.au/su/ab/committees/committees.html.

Formal requirements

Number of copies to be submitted for the Doctor of Philosophy: 4

The four copies of theses submitted for examination for the degree of Doctor of Philosophy and the three copies of theses submitted for examination for the degree of Master of Science may be bound in either a temporary or a permanent form.

Theses submitted in temporary binding should be strong enough to withstand ordinary handling and postage. Full details of requirements for the Master of Science (Research) may be found in the following chapter.

The degree shall not be awarded until the candidate has submitted a permanently bound copy of the thesis (containing any corrections or amendments that may be required) and printed on acid-free or permanent paper.

The thesis shall be accompanied by a certificate from the supervisor stating whether in the supervisor's opinion the form of presentation of the thesis is satisfactory.

Theses in permanent form shall normally be on International Standard A4 size paper sewn and bound in boards covered with bookcloth or buckram or other binding fabric.

The title of the thesis, the candidate's initials and surname, the title of the degree, the year of submission and the name of the University of Sydney should appear in lettering on the front cover or on the title page.

The lettering on the spine, reading from top to bottom, should conform as far as possible to the above except that the name of the University of Sydney may be omitted and the thesis title abbreviated. Supporting material should be bound in the back of the thesis as an appendix or in a separate sheet of covers.

Additional information

At the request of the Academic Board, the Science Faculty has resolved that a thesis should not normally exceed 80,000 words. With the permission of the Chair of the Faculty of Science's Postgraduate Studies Committee, a thesis may have an absolute upper limit of 100,000 words.

Amendments do not have to involve rekeying if a black ink/biro amendment is clear. Amendments can also be made by way of an appendix to the thesis.

Candidates are advised to consult the SUPRA publication, Practical Aspects of Producing a Thesis at the University of Sydney, for other guidelines and suggestions in addition to the formal requirements above.

Summary

Within the Faculty of Science, there are no formal requirements or guidelines other than those listed above. There are no requirements for single/double spacing or single/double sided presentation, nor font size, figure presentation, format of bibliographic citations, etc.

Candidates should, however, be aware that if the degree is awarded, the thesis becomes a public document, the quality of which reflects on the ability of the candidate. Moreover, utilising a format that will make the examiners' tasks easier is obviously sensible.

Resolutions

Doctor of Science (DSc)

The Resolutions of the Senate relating to the degree of Doctor of Science are printed in the University of Sydney Calendar, the following Resolutions of the Faculty also apply.

1.1 Published work which a candidate for the degree of Doctor of Science submits for examination must, in addition to satisfying the requirements of the resolutions of the Senate relating to the degree, be in a field with which the Faculty is concerned.

1.2 A candidate for the degree is required, by way of an introduction, to describe the theme of the published work submitted and, where there is a large number of publications whose dates range over a period of time and which contain some range of subject matter, to state how these are related to one another and to the theme.

1.3 If a prospective candidate, as a first step, tenders the introduction called for in 1.2 above, together with a list of the published work which it is proposed to submit for examination, the Faculty will endeavour to make an assessment as to whether the published work is in a field with which the Faculty is concerned and, if so, an assessment also of the prima-facie worthiness for examination of the published work.

1.4 A prospective candidate who tenders the introduction together with the list of published work shall not be debarred from subsequently submitting the published work for examination.

Doctor of Philosophy

The Resolutions of the Senate and Academic Board relating to the degree of Doctor of Philosophy are printed in the University of Sydney Calendar.

Doctor of Clinical Psychology/Master of Science

Course rules

1. **Admission**

1.1 The Dean of the Faculty of Science may admit to candidature:

1.1.1 graduates of the University of Sydney with a result of Honours 2.1 or better in Psychology holding the degree of Bachelor

of Psychology, Bachelor of Science (Honours), Bachelor of Arts (Honours), Bachelor of Economics (Social Sciences) (Honours), or Bachelor of Liberal Studies (Honours) or any other equivalent award of the University of Sydney and who have satisfied the Department of their personal suitability for the practice of clinical psychology determined by personal interview and by analysis of units of study completed; or

1.1.2 graduates of other universities who have qualifications equivalent to those specified in subsection 1.1.1; and who have satisfied the Department of their personal suitability for the practice of clinical psychology determined by personal interview and by analysis of units of study completed.

2. Units of study

2.1 The units of study for the combined Doctor of Clinical Psychology/Master of Science, together with

2.1.1 credit point value;

2.1.2 assumed knowledge;

2.1.3 corequisites/prerequisites/assumed learning/assumed knowledge; and

2.1.4 any special conditions;

2.2 are listed in the *Table of units of study* in subsection 5.1.

3. Requirements for the Doctor of Clinical Psychology/Master of Science

3.1 Candidates for the Doctor of Clinical Psychology/Master of Science are required to:

3.1.1 complete satisfactorily all units of study listed in the table of units of study in subsection 5.1. A unit of study shall consist of such lectures, seminars, tutorial instruction, essays, exercises, practical work, or project work as may be prescribed. In these resolutions, 'to complete a unit of study' or any derivative expression means:

3.1.1.1 to attend all the lectures and the meetings, if any, for seminars or tutorial instruction;

3.1.1.2 to complete satisfactorily the essays, exercises, practical and project work if any; and

3.1.1.3 to pass any other examination of the unit of study that may apply;

3.1.2 pursue a course of advanced study and research leading to the submission of a thesis in an area of clinical research;

3.1.3 complete satisfactorily clinical internships in accordance with subsections 6 and 4.1.

4. Method of progression

4.1 A candidate for the Doctor of Clinical Psychology/Master of Science shall proceed by completing units of study, clinical internships, research and thesis in accordance with subsections 7 and 8.

Faculty rules

5. Details of units of study

5.1 The structure of the course is arranged to cover areas from five key topics, namely: Therapy Knowledge and Skills, Assessment Knowledge and Skills, Clinical Internships, Ethics and Professional Practice and Research arranged as shown in the following table:

Unit of study		CP
Year 1, Semester 1		
PSYC6065	Psychological Assessment	6
PSYC6003	Clinical Internship 1	3
PSYC6004	Ethics and Professional Practice	3
PSYC6005	Research 1	3
PSYC6029	Case Seminars 1	3
PSYC6051	Adult Psychological Disorders	6
Year 1, Semester 2		
PSYC6055	Advanced Adult Psychological Disorders	6
PSYC6067	Clinical Internship 2	6
PSYC6009	Case Seminars 2	3
PSYC6010	Research 2	3
PSYC6049	Child Psychological Disorders	6
Year 2, Semester 1		
PSYC6068	Clinical Internship 3	6
PSYC6014	Case Seminars 3	3
PSYC6015	Research 3	3
PSYC6032	Adult Health Psychology	6
PSYC6064	Paediatric and Developmental Disorders	6
Year 2, Semester 2		
PSYC6066	Clinical Internship and Case Seminars 4	0
PSYC6031	Family Therapy	3
PSYC6056	Advanced Seminars	6
PSYC6054	Neuropsychopathology	3
Year 3, Semester 1		
PSYC6061	Clinical Internship and Case Seminars 5	0
Year 3, Semester 2		
PSYC6058	Clinical Internship and Case Seminars 6	0

6. Enrolment in more/less than minimum load

6.1 A candidate may proceed on either a part-time or full-time basis.

7. Cross-institutional study

7.1 Cross-institutional study shall not be available to students enrolled in the Doctor of Clinical Psychology/Master of Science course, except where the University of Sydney has a formal Cooperation Agreement with another University.

8. Restrictions on enrolment

8.1 Admission to candidature may be limited by a quota. In determining the quota, the University will take into account:

8.1.1 availability of resources including space, laboratory and computing facilities; and

8.1.2 availability of adequate and appropriate supervision.

8.2 In considering an application for admission to candidature, the Head of Department, the Director of Clinical Training and the Dean shall take account of the quota and shall select, in preference, applicants who are most meritorious in terms of subsection 1 above.

9. Discontinuation of enrolment

9.1 A student who does not enrol in any semester without first obtaining written permission from the Dean to suspend candidature will be deemed to have discontinued enrolment in the combined course. Students who have discontinued from the combined course will be required to apply for admission to the combined course and be subject to admission requirements pertaining at that time.

10. Suspension of candidature

10.1 A student may seek written permission from the Dean to suspend candidature in the combined course. The Dean of the Faculty of Science in consultation with the Director of Clinical Training shall approve any period of absence. Suspension may be granted for a maximum of one year on any one application.

11. Re-enrolment after an absence

11.1 A student who plans to reenrol after a period of suspension must advise the Faculty of Science Office in writing of their intention by no later than the end of October for First Semester of the following year or the end of May for Second Semester of the same year.

12. Satisfactory progress

12.1 The Dean may:

12.1.1 call upon any candidate to show cause why that candidature should not be terminated by reason of unsatisfactory progress towards the completion of the combined award course; and

12.1.2 terminate the candidature where the candidate does not show good cause.

12.2 Satisfactory progress is prescribed as follows:

12.2.1 a candidate for the combined award course must complete satisfactorily (at a pass level) all units of study;

12.2.2 if a candidate fails to complete satisfactorily a unit of study at the first attempt, they can make a second attempt at completing that unit of study. Clinical Internship units of study should be taken in sequence, but this sequence may be varied with permission from the Director of Clinical Training;

12.2.3 any candidate who fails to complete satisfactorily a unit of study at the second attempt will normally be deemed to have failed to complete the course requirements and their candidature will be terminated by the Dean; and

12.2.4 if a candidate fails to complete satisfactorily two units of study within the same key topic area at the first attempt, they will normally be deemed to have failed to complete the course requirements and their candidature will be terminated by the Dean.

13. Time limit

13.1 A candidate shall complete the requirements for the Doctor of Clinical Psychology/Master of Science in a minimum enrolment of six semesters and a maximum enrolment of twelve semesters, and except with permission of the Dean within nine calendar years of admission to candidature.

14. Assessment policy

14.1 The procedures for the examination and award of the Master of Science shall be prescribed in the Resolutions of the Senate and Faculty relating to that degree.

14.2 On completion of the requirements for the combined award course, the Faculty, on the recommendation of the Head of Department and the Director of Clinical Training, shall determine the results of the candidature.

15. Credit transfer policy

15.1 A candidate who, before admission to candidature, has spent time in graduate study and, within the previous three years, has completed coursework considered by the Dean to be equivalent to units of study prescribed for the combined award course, may receive credit of up to 48 credit points towards the requirements for the Doctor of Clinical Psychology provided that the completed work was not counted toward the requirements of another degree.

16. Transfer to and from Doctor of Philosophy Candidature

16.1 The Director of Clinical Training in consultation with the Head of Department may recommend to the Dean of the Faculty of Science that a candidate withdraw from candidature for the combined award course and complete requirements for the degree of Doctor of Philosophy under such conditions as the University may determine.

16.2 The Dean of the Faculty may readmit to candidature a candidate who has previously withdrawn from the combined award course as provided for in subsection 1 above and who has completed the requirements for the award of the degree of Doctor of Philosophy. Such a candidate shall complete the requirements for the degree of Doctor of Clinical Psychology under such conditions as the Dean may determine but shall not be permitted to continue candidature for the award of the degree of Master of Science.

16.3 The Dean of the Faculty may readmit to candidature a candidate who has previously withdrawn from the combined award course as provided for in subsection 16.1 above and who has not completed the requirements for the award of the degree of Doctor of Philosophy. Such a candidate will complete the requirements for the combined award course under such conditions as the Dean may determine.

16.4 Except in exceptional circumstances, and with the permission of the Dean, readmission to candidature under subsections 17.2 and 17.3 above shall occur within 14 semesters of withdrawal under subsection 17.1 above and within a maximum of nine years from commencement of candidature for the DCP/MSc course.

15. Master's research degrees

This chapter sets out the requirements for master's level research postgraduate degrees offered in the Faculty of Science. Following is a brief description of the research degrees, notes on the presentation of theses, and a description of the master's level research degrees.

The information in this chapter is in summary form and is subordinate to the provisions of the relevant degree Resolutions, collected at the end of this chapter or in the University of Sydney Calendar. The Calendar is available for sale at the Student Centre, for viewing at the faculty office or the Library, or online at www.usyd.edu.au/publications/calendar.

Research degrees

Research master's degrees offered by the faculty are listed in this chapter in the following order:

- Master of Science (MSc)
- Master of Science (Environmental Science)

The resolutions of the Senate, Academic Board and faculty relating to these degrees may be found in this chapter and the Calendar. Additional valuable resources for intending and current research students are found in the Postgraduate Research Studies handbook, published by the University of Sydney, the Thesis Guide and the Survival Manual published by SUPRA (Sydney University Postgraduate Representative Association). These publications are available from the faculty office. The Postgraduate Research Studies handbook is also online at www.usyd.edu.au/study/postgrad.shtml.

Master of Science (MSc)

Degree code: LC080

Graduates of the University of Sydney with first or second class honours and candidates in the final year of an approved honours course in the BSc degree or who have an equivalent qualification from another institution or an equivalent standard of knowledge, may apply for admission to candidature for the MSc degree. Graduates of master's coursework programs which include a minimum 12 credit point Research Project are eligible to apply for admission to the MSc. Once admitted, candidates proceed full-time or part-time, by supervised research and thesis.

With permission from the Dean, additional training (coursework) may be undertaken either prior to commencement of candidature or during the first semester of candidature. This coursework may be general research preparation or discipline-specific. (See next page for a listing of research preparation units.)

An application should be lodged with the faculty. It must be supported by the Head of the Department concerned and approved by the faculty. If an applicant has the prerequisite qualifications, admission to candidature may be approved provided the necessary staff and facilities are available, including adequate accommodation and any special equipment. Some candidates must satisfy a preliminary examination before being admitted to full candidature.

In some circumstances and after one year of full-time candidature, candidates may apply to the faculty to upgrade to a PhD. Time spent enrolled in a master's will count towards the minimum period of candidature of three years for a PhD.

Full-time candidates
Minimum period of candidature: 1 year
Maximum period of candidature: 2 years

Part-time candidates
Minimum period of candidature: 1 year
Maximum period of candidature: 4 years

Master of Science Resolutions: see end of this chapter.

Master of Science (Environmental Science)

Degree code: LC014

The MSc (Environmental Science) is a research degree requiring a minimum of three semesters of full-time study (or equivalent part-time study). This degree is designed to extend the student's knowledge base in environmental matters by providing the student with further training and research experience.

Candidates are required to show proof of a breadth of knowledge in environmental issues, as determined by the Director of Environmental Science. Consequently, as well as the submission of a research thesis, candidates may be required to satisfactorily complete up to a maximum of 24 credit points of coursework study. Prior to the beginning of studies, students must discuss their enrolment details and candidature with the Director of Environmental Science and agree to a program guaranteeing breadth of study and ensuring that all units of coursework cover material new to the student. Such details may only be approved or modified by the Director.

Graduates of the University of Sydney with first or second class honours, or who have completed a Graduate Diploma in Applied Science (with or without an emphasis in Environmental Science) with a grade of credit or above, or who have an equivalent qualification from another institution or an equivalent standard of knowledge, may apply for admission to candidature for the Master of Science (Environmental Science) degree.

An application should be lodged with the Faculty of Science and must include a project proposal and the signature(s) of the prospective supervisor(s). It should also be supported by the Director of Environmental Science. If an applicant has the prerequisite qualifications, admission to candidature may be approved if the necessary staff and facilities are available, including adequate accommodation and any special equipment. Some candidates may need to satisfy a preliminary examination before being admitted to full candidature.

Master of Science (Environmental Science) Resolutions: see end of this chapter.

Presentation of theses for Master of Science (MSc) and Master of Science (Environmental Science)

The following information is presented for the guidance of candidates. It should be regarded as a summary only. Candidates should also consult the University Calendar, the Postgraduate Research Studies handbook and the Faculty of Science for the most current and detailed advice. The Postgraduate Research Studies handbook is available online at www.usyd.edu.au/su/ab/committees/committees.html.

Formal requirements
Number of copies to be submitted:
Master of Science 3
Master of Science (Environmental Science) 3

The three copies of theses submitted for examination for the degree of Master of Science or Master of Science (Environmental Science) may be bound in either a temporary or a permanent form. Theses submitted in temporary binding should be strong enough to withstand ordinary handling and postage.

The degree shall not be awarded until the candidate has submitted a permanently bound copy of the thesis (containing any corrections or amendments that may be required) and printed on acid-free or permanent paper.

The thesis shall be accompanied by a certificate from the supervisor stating whether in the supervisors opinion the form of presentation of the thesis is satisfactory.

Theses in permanent form shall normally be on International Standard A4 size paper sewn and bound in boards covered with bookcloth or buckram or other binding fabric. The title of the thesis, the candidate's initials and surname, the title of the degree, the year of submission and the name of the University of Sydney should appear in lettering on the front cover or on the title page. The lettering on the spine, reading from top to bottom, should conform as far as possible to the above except that the name of the University of Sydney may be omitted and the thesis title abbreviated. Supporting material should be bound in the back of the thesis as an appendix or in a separate sheet of covers.

Additional information
At the request of the Academic Board, the Science faculty has resolved that a thesis should not normally exceed 80,000 words. With the permission of the Chair of the Faculty of Sciences Postgraduate Studies Committee, a thesis may have an absolute upper limit of 100,000 words.

Amendments do not have to involve re-keying if a black ink/biro amendment is clear. Amendments can also be made by way of an appendix to the thesis.

Candidates are advised to consult the SUPRA publication, Practical Aspects of Producing a Thesis at the University of Sydney, for other guidelines and suggestions in addition to the formal requirements above.

Summary
Within the Faculty of Science, there are no formal requirements/ guidelines other than those listed above. There are no requirements for single/double spacing or single/doubled sided presentation, nor point size, figure presentation, format of bibliographic citations, etc. Candidates should however, be aware that, if the degree is awarded, the thesis becomes a public document, the quality of which reflects on the ability of the candidate. Moreover, utilising a format that will make the examiners' tasks easier is obviously sensible.

Research Preparation units

RESP5001
Fundamentals of Research

Credit points: 6 **Teacher/Coordinator:** A/Prof D Dragovich **Session:** Semester 1a, Semester 2a **Assessment:** Three 1000 word reports, oral presentation

This unit will provide research training for students wishing to undertake research at a Masters or PhD level. Students will revise or develop the necessary skills for commencing a research degree, including critical reading, developing the thesis proposal, developing a research plan with timelines and benchmarks, critical writing, library search techniques, use of referencing systems like EndNote, working with a supervisor, and matters relating to intellectual property and authorship.

RESP5002
Scientific Literature Project

Credit points: 6 **Teacher/Coordinator:** A/Prof D Dragovich **Session:** Semester 1, Semester 2 **Assessment:** 1 x 1000 word assignment; 1 x 5000 (max) word assignment

Note: Department permission required for enrolment.

This unit will provide research training for students wishing to undertake research at Masters or PhD level. The unit provides the opportunity for applying the student's existing skills in critical reading, writing, and literature search to produce a critical evaluation of a paper in the literature and a literature review presented in the form of a scholarly paper. Initial readings and direction of the literature review will be arranged with the involvement of the student's research supervisor.

RESP5004
Research Preparation Project

Credit points: 12 **Teacher/Coordinator:** A/Prof D Dragovich **Session:** Semester 1, Semester 2 **Assessment:** 1 x 7000 (max) word assignment; oral presentation

Note: Department permission required for enrolment.

This unit will provide research training for students wishing to undertake a research degree at Masters or PhD level. The student's research supervisor will be involved in developing an appropriate focus for the project which will be relevant to subsequent thesis work.

Resolutions

Master of Science (MSc)

1. **Admission**

1.1 The Faculty of Science may, on the recommendation of the Head of the Department concerned, admit to candidature for the degree of Master of Science an applicant who:

1.1.1 is a graduate of the University of Sydney; and

1.1.2 has, in the opinion of the Faculty, reached a first or second class honours standard:

1.1.2.1 in the final year of an honours program for the degree of Bachelor of Science, or

1.1.2.2 in a program considered by the Faculty to be equivalent to a unit of study referred to in subsection 1.1.2.1, or has, in some other manner, acquired a standard of knowledge considered by the Faculty to be equivalent to a first or second class honours standard in a unit of study referred to in subsection 1.1.2.1.

1.2 Notwithstanding subsection 1, the Academic Board may admit a person to candidature for the degree in accordance with the provisions of Part 9 of the University of Sydney (Amendment Act) Rule 1999.

2. **Requirements for the Master of Science (MSc)**

2.1 A candidate for the degree is required to:

2.1.1 carry out an original investigation on a topic approved by the Head of Department; and

2.1.2 write a thesis embodying the results of this investigation, stating in the thesis the sources from which the work of others has been used, and the proportion of the thesis claimed as original work.

3. **Enrolment in more/less than minimum load**

3.1 Subject to the approval of the Head of the Department, a candidate for the degree shall elect to proceed:

3.1.1 either as a full-time or as a part-time candidate;

3.1.2 either by research and thesis in accordance with subsections 7.1-7.8 or by coursework and essay in accordance with subsection 7.9-7.12; and

3.1.3 except in the case of a candidate proceeding in accordance with Part 9 of the University of Sydney (Amendment Act) Rule, either within The University of Sydney or elsewhere.

4. **Restrictions on enrolment**

4.1 A candidate to be full-time shall not keep the normal semesters but shall pursue candidature continuously throughout the year, except for a period of recreation leave and shall not have any substantial employment during the day.

4.2 A candidate who does not comply with subsection 3.1 shall be regarded as a part-time candidate.

5. **Time Limits**

5.1 A candidate shall not present for examination for the degree earlier than one year after commencement of candidature.

5.2 Except with the permission of the Faculty, a full-time candidate proceeding by research and thesis or any candidate proceeding by coursework and essay shall complete the requirements for the degree not later than two years after the commencement of candidature.

5.3 Except with the permission of the Faculty, a part-time candidate proceeding by research and thesis shall complete the requirements for the degree not later than four years after the commencement of candidature.

5.4 Time spent by a candidate in advanced study in The University of Sydney before admission to candidature may be deemed by the Faculty to be time spent after such admission.

6. **Supervision**

6.1 The Dean of the Faculty, on the recommendation of the Head of the Department concerned, shall appoint a full-time member of the academic staff or research staff of the University to act as supervisor of each candidate.

6.2 Where the supervisor is a member of the research staff, the Dean of the Faculty, on the recommendation of the Head of the Department concerned, shall also appoint a member of the full-time academic staff as associate supervisor. Any person so appointed as associate supervisor must be capable of acting as supervisor in the event that the supervisor is no longer able to act.

6.3 The Dean of the Faculty, on the recommendation of the Head of the Department concerned, may appoint a full-time member of the academic staff of the University or other appropriately qualified person to act as associate supervisor.

6.4 The supervisor shall report annually to the Faculty, through the Head of Department, on the progress towards completion of the requirements for the degree of each candidate under his or her supervision.

7. **Satisfactory Progress**

7.1 The Faculty, on the recommendation of the Head of the Department concerned, may terminate the candidature of any candidate who has not shown evidence of sufficient progress, in the opinion of the Faculty.

8. **Assessment and Examination**

8.1 A candidate proceeding by research and thesis shall:

8.1.1 carry out an original investigation on a topic approved by the Head of the Department concerned;

8.1.2 write a thesis embodying the results of this investigation, and

8.1.3 state in the thesis generally in a preface and specifically in notes, the sources from which the information was taken, the extent to which the work of others has been used, and the proportion of the thesis claimed as original;

8.2 lodge with the Registrar three copies of the thesis, typewritten and bound; and

8.3 if required by the examiners, sit for an examination in the branch or branches of science to which the thesis relates.

8.4 The thesis shall be accompanied by a certificate from the supervisor stating whether in the supervisor's opinion the form of presentation of the thesis is satisfactory.

8.5 The Dean of the Faculty of Science on the recommendation of the Head of Department concerned, shall appoint two, or where the Dean considers it appropriate, more than two examiners of whom at least one shall be external to the University, i.e. not being a member of the staff of the University or holding a clinical academic title, and of whom one may be the person appointed to act as supervisor of the candidate.

8.6 The examiners shall report to the Faculty which shall determine the result of the examination.

8.7 A candidate may not present as the thesis any work which has been presented for a degree or diploma at this or another tertiary institution, but the candidate shall not be precluded from incorporating such work in the thesis, provided that in presenting the thesis the candidate indicates the part of the work which has been so incorporated.

8.8 The Registrar shall lodge one copy of the thesis with the Librarian if the degree is awarded.

Master of Science (Environmental Science)

Course rules

1. **Admission**

1.1 The Dean of the Faculty of Science may admit to candidature:

1.1.1 graduates who have completed an Honours degree majoring in a Science discipline that has a significant environmental emphasis, or in Environmental Science, or equivalent; or

1.1.2 graduates who have completed the requirements for a Graduate Diploma majoring in a Science discipline that has a significant environmental emphasis, or in Environmental Science, or equivalent as provided for by Subsection 1.2; or

1.1.3 graduates who have completed prior postgraduate study in a Science discipline that has a significant environmental emphasis, or in Environmental Science.

1.2 A candidate may seek admission into the MSc (Environmental Science) from any of the Graduate Diploma of Science programs, including those of Applied Science and Environmental Science, as follows:

1.2.1 A candidate who has fully completed the requirements for a Graduate Diploma of Science or Applied Science is eligible to apply for admission into the MSc (Environmental Science). Candidates who are considered not to have the required breadth of knowledge in environmental issues may need to complete some further coursework as provided for by section 4.

1.2.2 A candidate who has completed 24 credit points of Environmental Science coursework at Credit grade or above towards the requirements for a postgraduate qualification in Science or Applied Science may apply for admission into the MSc (Environmental Science). Candidates who gain admission in this manner may still need to complete some further coursework as provided for by section 2 (faculty rules).

2. **Requirements for the Master of Science (Environmental Science)**

2.1 A candidate for the degree is required to:

2.1.1 carry out an original investigation on a topic approved by the Chair of the Program Committee for Environmental Science; and

2.1.2 write a thesis embodying the results of this investigation, stating in the thesis the sources from which the information was taken, the extent to which the work of others has been used, and the proportional of the thesis claimed as original work.

2.2 Candidates for the degree must prove to the satisfaction of the Program Committee for Environmental Science a breadth of knowledge in environmental issues.

2.3 Candidates for the degree must satisfactorily complete any coursework requirements prescribed by the Chair of the Program Committee for Environmental Science. This can include up to 24 credit points of coursework covering material new to the candidate and selected from units of study approved from time to time by the Faculty.

Faculty rules

3. **Enrolment in more/less than minimum load**

3.1 A candidate may proceed on either a full-time or a part-time basis.

4. **Cross-institutional study**

4.1 Cross-institutional study shall not be available to students enrolled in the Master of Science (Environmental Science) course, except where the University of Sydney has a formal Cooperation Agreement with another University.

5. **Restrictions on enrolment**

5.1 Admission to candidature may be limited by a quota. In determining the quota the University will take into account:

5.1.1 availability of resources including space, laboratory and computing facilities; and

5.1.2 availability of adequate and appropriate supervision.

5.2 In considering an application for admission to candidature the Program Committee for Environmental Science and the Faculty shall take account of the quota and will select, in preference, applicants who are most meritorious in terms of section 1 above.

6. **Discontinuation of enrolment**

6.1 A student who does not enrol in any semester without first obtaining written permission from the Dean to suspend candidature will be deemed to have discontinued candidature for the degree. Students who have discontinued candidature will be required to apply for admission to the candidature and be subject to admission requirements pertaining at that time.

7. **Suspension of candidature**

7.1 A student may seek written permission from the Dean to suspend candidature for the degree.

7.2 Suspension may be granted for a maximum of one year.

8. **Re-enrolment after an absence**

8.1 A student who plans to reenrol after a period of suspension must advise the Faculty of Science Office in writing of their intention by no later than the end of October for First Semester of the following year or the end of May for Second Semester of the same year.

9. **Satisfactory progress**

9.1 The Faculty may:

9.1.1 call upon any candidate to show cause why that candidature should not be terminated by reason of unsatisfactory progress towards completion of the degree; and

9.1.2 terminate the candidature where the candidate does not show good cause.

10. **Time limit**

10.1 A full-time candidate shall complete the requirements for the degree not earlier than the end of the third semester and not later than the end of the fourth semester of candidature, except as described in subsection 1 or unless otherwise determined by the Faculty. A full-time candidate shall not keep the normal semesters but shall pursue candidature continuously throughout the year, except for periods of leave approved by the candidate's supervisor, and shall not have any substantial employment during the day.

10.2 A part-time candidate shall complete the requirements for the degree not earlier than the end of the third semester and not later than the end of the eighth semester of candidature, except as described in subsection 8.1 or unless otherwise determined by the Faculty.

10.3 Any candidate who does not comply with subsection 1 shall be deemed to be a part-time candidate.

10.4 For a candidate who gains admission into the MSc (Environmental Science) from a Graduate Diploma of Science or Applied Science, the duration of candidature is as follows:

10.4.1 Where a full-time candidate has completed the requirements for a Graduate Diploma of Science or Applied Science immediately prior to admission into the MSc (Environmental Science), the minimum duration for completion of the requirements of the MSc (Environmental Science) is two semesters.

10.4.2 Where a part-time candidate has completed the requirements for the Graduate Diploma of Science or Applied Science immediately prior to admission into the MSc (Environmental Science), the minimum duration for completion of the requirements of the MSc (Environmental Science) is three semesters.

10.4.3 In these resolutions, the term 'immediately' means that the Graduate Diploma requirements were completed in the previous semester.

11. **Assessment policy**

11.1 A candidate shall:

11.1.1 attend such course of study and pass such examinations in each unit of study as prescribed under subsection 3.3.

11.1.2 carry out an original investigation on a topic approved by Chair of the Program Committee - Environmental Science;

11.1.3 write a thesis embodying the results of this investigation and state in the thesis generally in a preface and specifically in notes, the sources from which the information was taken, the extent to which the work of others has been used, and the proportion of the thesis claimed as original;

11.1.4 lodge with the Registrar three copies of the thesis, typewritten and bound; and

11.1.5 if required by the examiners, sit for an examination in the branch or branches of science to which the thesis relates.

11.2 The thesis shall be accompanied by a certificate from the supervisor stating whether in the supervisor's opinion the form of presentation of the thesis is satisfactory.

11.3 The Dean of the Faculty of Science on the recommendation of the Head of Department concerned, shall appoint two, or where the Dean considers it appropriate, more than two examiners of whom at least one shall be external to the University - ie, not being a member of the staff of the University or holding a clinical academic title, and of whom one may be the person appointed to act as supervisor of the candidate.

11.4 The examiners shall report to the Faculty which shall determine the result of the examination

11.5 A candidate may not present as the thesis any work which has been presented for a degree or diploma at this or any another tertiary institution, but the candidate shall not be precluded from incorporating such work in the thesis, provided that in presenting the thesis the candidate indicates the part of the work which has been so incorporated.

12.6 The Registrar shall lodge one copy of the thesis with the Librarian if the degree is awarded.

12. **Credit transfer policy**

12.1 A candidate who, before admission to candidature, has spent time in graduate study and, within the previous three years, has completed coursework considered by the Dean to be equivalent to units of study prescribed for the combined award course, may receive credit of up to 6 credit points towards the requirements for the Master of Science (Environmental Science) provided that the completed work was not counted toward the requirements of another degree.

16. Graduate Diploma in Science

Graduate Diploma in Science (GradDipSc)

Degree Code: LF008

This chapter sets out the requirements for the Graduate Diploma in Science coursework degree.

Admission requirements

Graduates of the University of Sydney who are holders of a Bachelor of Science, Bachelor of Computer Science and Technology, Bachelor of Liberal Studies, Bachelor of Medical Science or Bachelor of Psychology, or graduates from other universities with an equivalent degree, may apply for admission to candidature for the degree Graduate Diploma in Science.

The Faculty of Science offers Graduate Diplomas in Science in all Science honours areas except Psychology.

Relationship of Graduate Diploma to research degrees

The Graduate Diploma in Science serves as an entry qualification for the degrees of Master of Science or Doctor of Philosophy. It consists of equivalent work to that carried out by candidates enrolled in the fourth year honours courses, and is normally available to candidates who may not be eligible to enrol in those courses. The normal duration of the degree is one year full-time or two years part-time.

Course requirements

Intending students should consult the table of honours units of study in Chapter 12 for the range of disciplines offered. After discussion of your interests with a relevant member of academic staff, an application should be lodged with the Faculty of Science. Entry to the Graduate Diploma is subject to approval by the relevant Head of Department, the faculty, and confirmation that requirements for the award of a relevant bachelor's degree have been met.

Resolutions

Graduate Diploma in Science (GradDipSc)

Course rules

1. **Admission**

1.1 The Faculty may, on the recommendation of the Head of the Department concerned, admit to candidature for the Graduate Diploma in Science, an applicant who is a holder of a bachelor's degree from the Faculty of Science, from the University of Sydney.

1.2 The Academic Board, in accordance with the provisions of Part 9 of the University of Sydney (Amendment Act) Rule 1999, on the recommendation of the relevant Head of Department and of the Faculty, may admit to candidature of the graduate diploma, graduates who have qualifications equivalent, in the opinion of the Academic Board, to those specified in subsection 1.1.

1.3 Admission to the graduate diploma may be limited by quota.

1.3.1 In determining the quota, the University will take into account:

1.3.1.1 availability of resources including space, library, equipment, laboratory and computing facilities; and

1.3.1.2 availability of adequate and appropriate supervision.

1.4 In considering an application for admission to candidature, the Head of Department and the Faculty shall take account of the quota and will select in preference applicants who are most meritorious in terms of subsection 1.1 above.

Faculty rules

2. **Method of progression and time limits**

2.1 A candidate shall engage in a program of work equivalent to that required for completion of the relevant fourth year of a bachelor's degree in the Faculty of Science by completing the honours units of study offered by the department concerned either as a full-time student for a period of one year or, with the approval of the Head of Department concerned, as a part-time student for a period of two years.

3. **Assessment**

3.1 The award of the graduate diploma shall be subject to the completion of the program of work and examinations to the satisfaction of the Faculty.

4. **Progress**

4.1 The Faculty may call upon any candidate to show cause why that candidature should not be terminated by reason of unsatisfactory progress towards completion of the graduate diploma and where, in the opinion of the Faculty, the candidate does not show good cause, terminate the candidature.

17. Bioethics coursework degrees

Master of Bioethics (Honours) (MBEthHon)

Degree code: LC049

Master of Bioethics (MBEth)

Degree code: LC047

Graduate Diploma in Bioethics (GradDipBEth)

Degree code: LF037

Graduate Certificate in Bioethics (GradCertBEth)

Degree code: LG019

Graduate Certificate in Bioethics (Biotechnology) (GradCertBEthBTech)

Degree code: LG020

Graduate Certificate in Bioethics (Clinical Ethics) (GradCertBEthClinEth)

Degree code: LG023

This chapter sets out the requirements for postgraduate degrees offered in the Faculty of Science in the area of Bioethics. A comprehensive guide to the requirements and units of study of the coursework degrees is listed.

The information in this chapter is in summary form and is subordinate to the provisions of the relevant degree Resolutions, collected variously in this chapter, or in the University of Sydney Calendar. The Calendar is available for sale at the Student Centre, for viewing at the faculty office or the Library, or online at www.usyd.edu.au/publications/calendar.

Course overview

The University of Sydney offers several postgraduate degree courses in Bioethics. Increasing levels of expertise are provided through completion of the Graduate Certificate in Bioethics, Graduate Certificate in Bioethics (Biotechnology), Graduate Certificate in Bioethics (Clinical Ethics), Graduate Diploma in Bioethics, Master of Bioethics, and the Master of Bioethics (Honours).

These courses are designed to meet the widely recognised growing need for ethics education for scientists, researchers, and professionals working in medicine, nursing, public health, health law, health policy/administration, public policy, and science communication. They will also be attractive to students with general interests in relationships between science and society or relevant social science disciplines.

Particular units of study – such as Core Concepts in Bioethics (BETH5000), Human and Animal Research Ethics (BETH5202), Ethics and Biotechnology (BETH5201), and Ethics and Public Health (BETH5203) – offered through the postgraduate program in Bioethics will be popular with postgraduate students pursuing degrees in other fields such as medical humanities, law, biology, health sciences, biomedical sciences, public health, and/or any disciplines involving human or animal experimentation.

The discipline of bioethics is concerned with ethical questions arising in contexts of biological and medical science. Social concern about such issues has grown with advances in biomedical technology, as illustrated by contemporary debate over reproductive technologies, genetic engineering, cloning, and stem cell research. Traditional topics in bioethics include abortion, euthanasia, relationships between health care providers and patients, research involving humans and animals, and justice in the distribution of medical resources. Emerging topics include ethical issues related to global public health.

Falling at the intersections of ethics, policy, and biomedical science, bioethics is an inherently interdisciplinary field. The University of Sydney's postgraduate program in Bioethics uniquely addresses this interdisciplinarity head-on.

In addition to the core unit of study (BETH5000), which provides a broad survey of the field of bioethics, our foundational units provide interdisciplinary grounding in ethical philosophy (BETH5101), philosophy of science/medicine (BETH5102), interdisciplinary approaches to the study of medicine and society (BETH5103), and bioethics law (BETH5104).

Specialisation in areas of particular interest is provided via elective units with focus on biotechnology (BETH5201), research ethics (BETH5202), public health (BETH5203), clinical ethics (BETH5204) and mental health (BETH5205). All of these units of study include historical components.

Qualified students admitted to the Master of Bioethics (Honours) degree will obtain further expertise in an area of special interest, and experience necessary for further postgraduate study (ie, PhD), through completion of a research project (BETH5301 and 5302).

The Master of Bioethics degree can be completed in one year by full-time students or over two years by part-time students. Further details on duration of study are provided below.

Course outcomes

The University of Sydney postgraduate Bioethics degree courses provide breadth and depth of coverage of both traditional and alternative/emerging issues in, and approaches to, bioethics.

Our students will gain advanced understanding of the bearing of ethical philosophy, epistemology, law, sociology, linguistics, and history on issues in bioethics. They will develop interdisciplinary appreciation of relationships between values, science, and society. They will become familiar with both the historical and philosophical bases of local and international legislation and regulatory guidelines regarding the ethics of health care and research.

They will develop, and be able to defend, their own reasoned judgements about how ethical issues arising in health care, research, and public policy contexts should be resolved; and they will be able to recognise novel, or previously unappreciated, ethical issues arising in the professional workplace or in social policy contexts.

Our degrees contribute to the professional development of those working in health care and they offer the skills and knowledge base necessary for critical analysis in health policy making or in relevant areas of social science disciplines.

All of our degrees contribute to development of general skills in research, reading, writing, and oral expression. Expertise will vary with level of degree completed.

The program has been designed to enable progression from Graduate Certificate to Graduate Diploma, Master's, and Master's (Honours). The Graduate Certificate (Biotechnology) is specifically designed to provide ethical training for those working in the fields of, or those concerned with recent developments in, genetics and stem cell research.

The Graduate Certificate (Clinical Ethics) is designed to provide training in ethics and associated issues for those engaged in clinical practice in a range of health professions. The Master of Bioethics (Honours) degree provides opportunity for in-depth learning in an area of special interest and research experience necessary for further postgraduate study.

Unit of Study descriptions

Bioethics units of study 2009

Core unit of study

BETH5000
Core Concepts in Bioethics

Credit points: 6 **Session:** Semester 1 **Classes:** The equivalent of two hours of seminars per week and up to 4 hours per week spent on online learning tasks, small group sessions, project work, and consultation with lecturers. **Assumed knowledge:** A three-year undergraduate degree in science, medicine, nursing, allied health sciences, philosophy/ethics, sociology/anthropology, history, or other relevant field, or by special permission. A limited number of students may be granted permission to take this unit during their honours year. **Assessment:** Essays; short written assignments; research project/presentation.

Note: A limited number of students may be granted permission to take this unit during their honours year.

This unit of study provides a broad overview of the primary issues in, and theoretical approaches to, bioethics. Following an introduction to the history of bioethics and review of the major theoretical approaches to applied ethics, central debates in bioethics surrounding doctor-patient relationships, informed consent, privacy/confidentiality, research ethics, abortion, euthanasia, genetics, cloning, stem cell research, justice and distribution of health care resources, etc., are examined. In addition to classical cases and traditional theoretical perspectives, emerging topics and alternative perspectives are explored. The unit concludes with the topic of global public health and socio-political critique(s) of the discipline of bioethics itself. Learning activities will include seminars, small group sessions, and project work. It is recommended, but not required, that BETH5000 is taken during students' first semester in the program.

Foundational units of study

BETH5101
Introduction to Ethical Reasoning

Credit points: 6 **Session:** Semester 1 **Classes:** The equivalent of two hours of seminar/week and up to 4 hours per week spent on online learning tasks, small group sessions, project work, and consultation with lecturers **Assumed knowledge:** A three-year undergraduate degree in science, medicine, nursing, allied health sciences, philosophy/ethics, sociology/anthropology, history, or other relevant field, or by special permission. **Assessment:** Essays; short written assignments; research project/presentation.

Note: A limited number of students may be granted permission to take this unit during their honours year.

This unit prepares students for advanced analysis of issues in bioethics by laying foundations in both critical thinking and ethical theory. Following an introduction to the construction and assessment of arguments, central issues of debate in meta-ethics, normative ethics, and political philosophy are examined. Major traditional (historical, consequential, deontological, contractarian/egalitarian, and communitarian) theoretical frameworks as well as postmodern/continental perspectives are introduced and critically evaluated. The unit concludes with an introduction to applied and professional ethics. It is recommended, but not required, that BETH5101 is taken during students' first semester in the program.

BETH5102
Philosophy of Medicine

Credit points: 6 **Session:** Semester 1 **Classes:** One 2-hour seminar per week with up to 4 hours per week spent on online learning tasks, small group sessions, project work, and consultation with lecturers. **Assumed knowledge:** A three-year degree in science, medicine, nursing, allied health sciences, philosophy/ethics, sociology/anthropology, history, or other relevant field - or by special permission. **Assessment:** Essays, short written assignments, research project/presentation.

Note: A limited number of students may be granted permission to take this unit during their honours year.

This unit of study introduces students to the broader philosophical issues and epistemological structures that underlie medicine and the biomedical sciences. The unit will begin by introducing students to the philosophy of science and medicine, epistemology and the concepts of health, illness and disease. The second part of the unit will review debates regarding disease causation and the social construction of disease. Students will then consider issues relating to the generation and use of knowledge and evidence, and the differences between conventional and alternative/non-Western approaches to illness and healing. The final part of the unit will focus on diagnosis, nosology and classification of disease, with particular reference to mental illness.

BETH5103
Biomedicine and Society

Credit points: 6 **Session:** Semester 2 **Classes:** The equivalent of one 2-hour seminar per week with up to 4 hours per week spent on online learning tasks, small group sessions, project work and consultation with lecturers. **Assumed knowledge:** A three-year undergraduate degree in science, medicine, nursing, allied health sciences, philosophy/ethics, sociology/anthropology, history, or other relevant field, or by special permission. **Assessment:** Essays, short written assignments, presentation/project.

Note: A limited number of students may be granted permission to take this unit during their honours year.

This unit introduces students to the complex relationships between biomedicine and society utilizing several disciplines including philosophy, ethics, sociology, anthropology and linguistics. Students will consider issues such as power in the biomedical professions and industries; the illness experience; the role of the healer; biomedicine and indigenous cultures and non-western notions of illness and care.

BETH5104
Bioethics, Law and Society

Credit points: 6 **Session:** Semester 1 **Classes:** The equivalent of one 2-hour seminar per week presented in an intensive format with up to four hours per week spent on online learning tasks, small group sessions and consultation with lecturers. **Assumed knowledge:** A three-year undergraduate degree in science, medicine, nursing, allied health sciences, philosophy/ethics, sociology/anthropology, history, or other relevant field, or by special permission **Assessment:** Essays, short written assignments.

The unit of study will begin by introducing students to interrelationships between health care, ethics and the law. In particular students will explore the moral basis of law and the means by which law influences moral norms, clinical practice and health policy. Students will be shown how to critically read and analyse primary sources of law relevant to bioethics. Students will then examine a number of areas of law that have particular significance for bioethics and society including the law of tort (consent and standards of care), contract (confidentiality), criminal law (euthanasia and abortion), public health law, administrative law and law reform.

Elective units

BETH5201
Ethics and Biotech: Genes and Stem Cells

Credit points: 6 **Session:** Semester 2 **Classes:** The equivalent of one 2-hour seminar per week presented in flexible mode incorporating seminars and an intensive format. In addition, students will spend up to four hours per week on online learning tasks, small group sessions, project work and consultati **Assumed knowledge:** A three-year undergraduate degree in science, medicine, nursing, allied health sciences, philosophy/ethics, sociology/anthropology, history, or other relevant field, or by special permission. **Assessment:** Essays, short written assignments, presentation/project.

Note: A limited number of students may be granted permission to take this unit during their honours year.

This unit introduces students to the broader social/political, ethical/philosophical and legal/regulatory issues that underlie genetics, stem cell research and the emerging biotechnologies. The unit will provide a brief overview of the relevant science before considering scientific, cultural and religious understandings of life and human identity. The second part of the unit will review the political, regulatory and commercial context of biotechnology and the control of information. Students will then review the history of genetics and eugenics and the ethical issues that arise in clinical and population genetics, stem cell research and cloning. The final part of the unit will explore the boundaries of research and knowledge and the issues raised by emerging biotechnologies, such as nanotechnology and proteomics. Learning activities will include an intensive seminar program, small group sessions and reading. Students will be able to concentrate on stem cell research, clinical or molecular genetics or other biotechnologies according to their clinical and scientific interests and experience.

BETH5202
Human and Animal Research Ethics

Credit points: 6 **Teacher/Coordinator:** Dr Karolyn White **Session:** Semester 2 **Classes:** The equivalent of one 2-hour seminar per week presented in flexible mode incorporating seminars and an intensive format. In addition, students will spend up to four hours per week on online learning tasks, small group sessions, project work and consultati **Assumed knowledge:** A three-year undergraduate degree in science, medicine, nursing, allied health sciences, philosophy/ethics, sociology/anthropology, history, or other relevant field, or by special permission. **Assessment:** Essays, short written assignments, projects/presentations.

Note: A limited number of students may be granted permission to take this unit during their honours year.

This unit introduces students to research ethics in its social context. Students will first analyse the philosophical underpinnings of the research endeavour, including the justifications for engaging in research, research priorities and research integrity. The unit will then review the history of research and research abuses, the evolution of research ethics and the regulation of research in Australia. The second part of the unit will focus on issues arising in the conduct of research including; the protection of research subjects (both human and animal), consent, confidentiality and risk/benefit analysis.

BETH5203
Ethics and Public Health

Credit points: 6 **Session:** Semester 2 **Classes:** The equivalent of one 2-hour seminar per week will be presented in an intensive format. In addition, students will spend up to four hours per week on online learning tasks, small group sessions, project work and consultation with lecturers over the course **Assumed knowledge:** A three-year undergraduate degree in science, medicine, nursing, allied health sciences, philosophy/ethics, sociology/anthropology, history, or other relevant field, or by special permission. **Assessment:** Essays, short written assignments.

Note: A limited number of students may be granted permission to take this unit during their honours year.

This unit will provide students with an overview of the broader philosophical, ethical, sociopolitical and cultural issues that underlie public health and public health research. Students will first review the history of public health and examine the values that underpin health promotion and disease prevention. The second part of the unit will critique the place of facts and values in public health and the construction and use of information, with particular reference to evidence-based-medicine. The third part of the unit will examine the cultural, moral and social context of public health including the social determinants of health, the construction of health services, the determination of research priorities and issues relating to human rights and global health. Learning activities will include 2-hour weekly seminars and readings. Assessment tasks will consist of essays and a presentation/project.

BETH5204
Clinical Ethics

Credit points: 6 **Session:** Semester 1 **Classes:** The equivalent of one 2-hour seminar per week presented in an intensive format. In addition, students will spend up to four hours per week on small group sessions, project work, portfolio development and discussion, and consultation with lecturers. (Stu **Assumed knowledge:** Honours or equivalent degree, or other appropriate terminal undergraduate degree (such as a three-year nursing degree) in science, medicine, nursing, allied health sciences, philosophy/ethics, sociology/anthropology, history, or other relevant field-or by special permission. **Assessment:** Two essays, reflective portfolio/journal via WebCT and a project/presentation on the analysis of a case

Note: A limited number of students may be granted permission to take this unit during their honours year.

This unit will provide students with an overview of the broader philosophical, ethical, sociopolitical, and cultural issues that underlie the delivery of healthcare. Students will first explore major conceptual models for ethical reasoning in the clinical context; the design and delivery of clinical ethics consultation; and issues relating to the role of the professions. The second part of the unit will examine the foundations of clinical practice, including consent, competence, veracity, confidentiality, and decision-making. The third part of the unit will consider specific issues and populations within clinical practice, such as the care of vulnerable populations, mental health, and chronic illness. The next part of the unit will focus on skills associated with clinical ethics including analytic and mediation skills. The unit will conclude with reflections on current debates in the Australian healthcare context, particularly issues associated with healthcare rationing. Learning activities will include lectures (in an intensive format), facilitated discussion, case study presentations, and readings. Assessment tasks will consist of essays, a portfolio/journal, and a presentation/project.

BETH5205
Ethics and Mental Health

Credit points: 6 **Session:** Semester 2 **Classes:** One 2-hour seminar per week with 4 hours per week spent on consultation, on-line work, library work, independent study. **Assessment:** One short essay (1,500 words); one long essay (4,000 words); on-line task, participation

Mental health and mental illness are unique in the field of health care and bioethics. The very nature of psychiatric disorder and its relationship with prevailing social and cultural factors, in addition to the unique status of the mental health patient, necessitate a specific discourse in biomedical ethics in the area of mental health. This course will provide participants with a broad perspective of issues in bioethics applied to mental health and mental illness. Students will examine the history of the psychiatric profession and consider the adequacy of current safeguards against the abuses of power seen in the history of the profession of psychiatry. Other areas considered in the course include the current ethical dilemmas in mental health care, the implications of technological advances in the neurosciences, the philosophical basis of the concept of mental disorder, the relationship between power and the psychiatric profession and the complex relationship between morality, mental health and the law. The course aspires to inform future decision makers in health, public policy, clinical settings and academia in the unique aspects of biomedical ethics in the field of mental health.

Textbooks

Bloch, S; Green, S; Chodoff, P Psychiatric Ethics New York. Oxford University Press (4th Edition will be released late 2007)

Research project units

BETH5301
Research Project A

Credit points: 6 **Session:** Semester 1, Semester 2 **Classes:** Weekly consultation with supervisor(s). **Prerequisites:** Distinction average (or higher) in 24 credit points of BETH units of study. **Assessment:** Research tasks, 15,000 word thesis (in conjunction with BETH 5302).

Note: Only available to students admitted to the Master of Bioethics (Honours) degree. BETH5301 must be taken in conjunction with BETH5302. It is recommended, but not required, that BETH5301 and BETH5302 are taken in separate semesters.

This unit must be taken in conjunction with BETH5302 (Research Project B). These units are only available to students admitted to the Master of Bioethics (Honours) degree track. The Research Project (i.e. parts A and B combined) provides opportunity for research and

in-depth learning in a bioethics topic of special interest or importance to the student. Successful completion of the project may also provide students with the research experience required for the pursuit of a higher degree. This unit involves independent research and regular meetings with (a) supervisor(s). In the process of completing the Research Project (i.e. parts A and B combined), students will produce an original 15,000 word thesis. Choice of thesis topic depends on availability of appropriate supervisor(s). It is recommended, but not required, that BETH5301 and BETH5302 are taken in separate semesters. A mark for both BETH5301 and BETH5302 combined is provided at the completion of BETH5302 (upon submission of thesis). It is possible to take these units in distance mode.

BETH5302

Research Project B

Credit points: 6 **Session:** Semester 1, Semester 2 **Classes:** Weekly consultation with supervisor(s). **Assessment:** Research tasks, 15,000 word thesis (in conjunction with BETH5301).

Note: Only available to students admitted to the Masters of Bioethics (Honours) degree. Must be taken in conjunction with BETH5301. It is recommended, but not required that BETH5301 and BETH5302 are taken in separate semesters.

This unit must be taken in conjunction with BETH5301 (Research Project A). These units are only available to students admitted to the Master of Bioethics (Honours) degree. The Research Project (i.e. parts A and B combined) provides opportunity for research and in-depth learning in a bioethics topic of special interest or importance to the student. Successful completion of the project may also provide students with the research experience required for the pursuit of a higher degree. This unit involves independent research and regular meetings with (a) supervisor(s). In the process of completing the Research Project (i.e. parts A and B combined), students will produce an original 15,000 word thesis. Choice of thesis topic depends on availability of appropriate supervisor(s). It is recommended, but not required, that BETH5301 and BETH5302 are taken in separate semesters. A mark for both BETH5301 and BETH5302 combined is provided at the completion of BETH5302 (upon submission of thesis). It is possible to take these units in distance mode.

Resolutions

Master of Bioethics (MBEth)
Master of Bioethics (Honours) (MBEthHon)
Graduate Diploma in Bioethics (GradDipBEth)
Graduate Certificate in Bioethics (GradCertBEth)
Graduate Certificate in Bioethics (Biotechnology) (GradCertBEthBTech)
Graduate Certificate in Bioethics (Clinical Ethics) (GradCertBethClinEth)

Course rules

1. **Admission**

1.1 The Dean of the Faculty of Science may admit to candidature for:

1.1.1 *the Graduate Certificate in Bioethics, Graduate Certificate in Bioethics (Biotechnology), Graduate Certificate in Bioethics (Clinical Ethics), Graduate Diploma in Bioethics and Master of Bioethics:*

1.1.1.1 an applicant who is the holder of a Bachelor's degree or any equivalent award in science, medicine, nursing, allied health sciences, philosophy/ethics, sociology, anthropology, history, law, or other relevant field;

1.1.2 *the Master of Bioethics (Honours):*

1.1.2.1 an applicant who has completed at least four units of study in the University's Postgraduate Program in Bioethics and who holds at least a distinction average for units of study taken in the University's Postgraduate Program in Bioethics.

2. **Units of study**

2.1 The units of study for these award courses are listed in the tables in subsection 4.1 of these resolutions.

2.2 Credit point value, assumed knowledge, corequisites, prerequisites and any special conditions are included in the description of units of study associated with these resolutions.

3. **Requirements for the Graduate Certificate in Bioethics, Graduate Certificate in Bioethics (Biotechnology), Graduate Certificate in Bioethics (Clinical Ethics), Graduate Diploma in Bioethics, Master of Bioethics, Master of Bioethics (Honours)**

3.1 Candidates for the GradCertBEth are required to complete satisfactorily units of study granting a minimum of 24 credit points selected from units of study approved from time to time by the Faculty.

3.1.2 They must complete BETH5000 and three Foundational units of study.

3.2 Candidates for the GradCertBEth(BTech) are required to complete satisfactorily units of study granting a minimum of 24 credit points selected from units of study approved from time to time by the Faculty.

3.2.1 They must complete BETH5000, BETH5201, BETH5202 and one Foundational unit.

3.3 Candidates for the GradCertBEth(ClinEth) are required to complete satisfactorily units of study granting a minimum of 24 credit points selected from units of study approved from time to time by the Faculty.

3.3.1 They must complete BETH5000 and BETH5204, and two additional units of study (Foundational or Elective).

3.4 Candidates for the GradDipBEth are required to complete satisfactorily units of study granting a minimum of 36 credit points selected from units of study approved from time to time by the Faculty.

3.4.1 They must complete BETH5000, three Foundational units, and two additional units of study (Foundational or elective).

3.5 Candidates for the MBEth are required to complete satisfactorily units of study granting a minimum of 48 credit points selected from units of study approved from time to time by the Faculty.

3.5.1 They must complete BETH5000, four Foundational units, and three Elective units of study.

3.6 Candidates for the MBEthHon are required to complete satisfactorily units of study granting a minimum of 60 credit points selected from units of study approved from time to time by the Faculty.

3.6.1 They must complete the BETH5000, four Foundational units, three Elective units, and two Research Project units of study.

Faculty rules

4. **Details of units of study**

4.1 The units of study for the Graduate Certificate in Bioethics, Graduate Certificate in Bioethics (Biotechnology), Graduate Certificate in Bioethics (Clinical Ethics), Graduate Diploma in Bioethics, Master of Bioethics, Master of Bioethics (Honours) are listed in the tables below:

4.1.1 **Graduate Certificate in Bioethics (GradCertBEth)**

Unit of study		cp	Sem
Compulsory			
BETH5000	Core Concepts in Bioethics	6	1
Foundational			
BETH5101	Introduction to Ethical Reasoning	6	1
BETH5102	Philosophy of Medicine	6	1
BETH5103	Biomedicine and Society	6	2
BETH5104	Bioethics, Law and Society	6	1

Unit of study		cp	Sem
BETH5205	Ethics and Mental Health	6	2

4.1.2 Graduate Certificate in Bioethics (Biotechnology) (GradCertBEthBTech)

Unit of study		cp	Sem
Compulsory			
BETH5000	Core Concepts in Bioethics	6	1
BETH5201	Ethics and Biotechnology: Genes and Stem Cells	6	2
BETH5202	Human and Animal Research Ethics	6	2
Foundational			
BETH5101	Introduction to Ethical Reasoning	6	1
BETH5102	Philosophy of Medicine	6	1
BETH5103	Biomedicine and Society	6	2
BETH5104	Bioethics, Law and Society	6	1
BETH5205	Ethics and Mental Health	6	2

4.1.4 Graduate Diploma in Bioethics (GradDipBEth)

Unit of study		cp	Sem
Compulsory			
BETH5000	Core Concepts in Bioethics	6	1
Foundational			
BETH5101	Introduction to Ethical Reasoning	6	1
BETH5102	Philosophy of Medicine	6	1
BETH5103	Biomedicine and Society	6	2
BETH5104	Bioethics, Law and Society	6	1
Electives			
BETH5201	Ethics and Biotechnology: Genes and Stem Cells	6	2
BETH5202	Human and Animal Research Ethics	6	2
BETH5203	Ethics and Public Health	6	2
BETH5204	Clinical Ethics	6	1

4.1.5 Master of Bioethics (MBEth)

Unit of study		cp	Sem
Compulsory			
BETH5000	Core Concepts in Bioethics	6	1
Foundational			
BETH5101	Introduction to Ethical Reasoning	6	1
BETH5102	Philosophy of Medicine	6	1
BETH5103	Biomedicine and Society	6	2
BETH5104	Bioethics, Law and Society	6	1
Elective			
BETH5201	Ethics and Biotechnology: Genes and Stem Cells	6	2
BETH5202	Human and Animal Research Ethics	6	2
BETH5203	Ethics and Public Health	6	2
BETH5204	Clinical Ethics	6	1

4.1.6 Master of Bioethics (Honours) (MBEthHon)

Unit of study		cp	Sem
Compulsory			
BETH5000	Core Concepts in Bioethics	6	1
BETH5301	Research Project A	6	1 and 2
BETH5302	Research Project B	6	1 and 2
Foundational			
BETH5101	Introduction to Ethical Reasoning	6	1
BETH5102	Philosophy of Medicine	6	1
BETH5103	Biomedicine and Society	6	2
BETH5104	Bioethics, Law and Society	6	1
Elective			
BETH5201	Ethics and Biotechnology: Genes and Stem Cells	6	2
BETH5202	Human and Animal Research Ethics	6	2
BETH5203	Ethics and Public Health	6	2
BETH5204	Clinical Ethics	6	1

4.2 A candidate for the course shall proceed by completing units of study as prescribed by the Faculty.

4.3 A unit of study shall consist of such lectures, seminars, tutorial instruction, essays, exercises, practical work, or project work as may be prescribed.

4.4 In these resolutions, 'to complete a unit of study' or any derivative expression means:

4.4.1 to attend the lectures and the meetings, if any, for seminars or tutorial instruction;

4.4.2 to complete satisfactorily the essays, exercises, practical and project work if any; and

4.4.3 to pass any other examination of the unit of study that may apply.

4.5 All units of study for a particular subject area may not be available every semester.

4.6 The Dean, upon the recommendation of the course coordinator, may allow substitution of any unit of study by another unit of study (up to a maximum of two units of study), for candidates with the appropriate background/experience.

4.6.1 Candidates (for all degrees) with special aims/interests may be permitted to substitute one relevant non-BETH postgraduate unit of study (in History, Medical Humanities, or Law, for example) for specifically required units upon approval of the course coordinator and Dean.

4.7 The Master of Bioethics shall be awarded in two grades, namely Pass and, in the case of an outstanding candidate, Pass with Merit.

5. Enrolment in more/less than minimum load

5.1 A candidate may proceed on either a full-time or a part-time basis.

6. Cross-institutional study

Cross-institutional study shall not be available to students enrolled in the Graduate Certificate in Bioethics, the Graduate Certificate in Bioethics (Biotechnology), the Graduate Certificate in Bioethics (Clinical Ethics), the Graduate Diploma in Bioethics, the Master of Bioethics, and the Master of Bioethics (Honours), except where the University of Sydney has a formal Cooperation Agreement with another University.

7. Restrictions on enrolment

7.1 Admission to candidature may be limited by a quota.

7.2 In determining the quota, the University will take into account:

7.2.1 availability of resources including space, laboratory and computing facilities; and

7.2.2 availability of adequate and appropriate supervision.

7.3 In considering an application for admission to candidature the Dean shall take account of the quota and will select, in preference, applicants who are most meritorious in terms of subsection 1 above.

8. Discontinuation of enrolment

8.1 A student who does not enrol in any semester without first obtaining written permission from the Dean to suspend candidature will be deemed to have discontinued enrolment in the course.

8.2 Students who have discontinued from the course will be required to apply for admission to the course and be subject to admission requirements pertaining at that time.

9. Suspension of candidature

9.1 A student may seek written permission from the Dean to suspend candidature in the course.

9.2 Suspension may be granted for a maximum of one year

10. Re-enrolment after an absence

10.1 A student who plans to re-enrol after a period of suspension must advise the Faculty of Science Office in writing of their intention by no later than the end of October for First Semester of the following year or the end of May for Second Semester of the same year.

11. Satisfactory progress

11.1 Candidates shall be governed by the rules as follows:

11.2 A student who has failed a cumulative total of 12credit points at any stage of enrolment in the Master of Bioethics or Master of Bioethics (Honours) will be required to show good cause why he or she should be allowed to re-enrol and, if good cause has not been established, the student's enrolment will be transferred to the Graduate Diploma in Bioethics;

11.3 A student who has failed a cumulative total of 12 credit points at any stage of enrolment in the Master of Bioethics and/or Master of Bioethics (Honours) and/or the Graduate Diploma in Bioethics will be required to show good cause why he or she should be allowed to re-enrol and, if good cause has not been established, the student's enrolment will be transferred to the Graduate Certificate in Bioethics;

11.4 A student who has failed a cumulative total of more than 18 credit points in the Master of Bioethics and/or Master of Bioethics (Honours) and/or the Graduate Diploma in Bioethics and/or the Graduate Certificate in Bioethics and/or the Graduate Certificate in Bioethics (Biotechnology) and/or the Graduate Certificate in Bioethics (Clinical Ethics) will be required to show good cause why he or she should be allowed to re-enrol and, if good cause has not been established, the student will not be permitted to re-enrol.

12. Time limit

12.1 A candidate for the GradCertBEth shall complete the requirements for the award in a minimum of one semester and a maximum of five semesters, and (in the event of suspension) except with permission of the Dean within three calendar years of admission to candidature.

12.2 A candidate for the GradCertBEth(BTech) shall complete the requirements for the award in a minimum of two semesters and a maximum of five semesters, and (in the event of suspension) except with permission of the Dean within three calendar years of admission to candidature.

12.3 A candidate for the GradCertBEth(ClinEth) shall complete the requirements for the award in a minimum of one semester and a maximum of five semesters, and (in the event of suspension) except with permission of the Dean within three calendar years of admission to candidature.

12.4 A candidate for the GradDipBEth shall complete the requirements for the award in a minimum of two semesters and a maximum of eight semesters, and (in the event of suspension) except with permission of the Dean within five calendar years of admission to candidature.

12.5 A candidate for the MBEth shall complete the requirements for the award in a minimum of two semesters and a maximum of ten semesters, and (in the event of suspension) except with permission of the Dean within six calendar years of admission to candidature.

12.6 A candidate for the MBEthHon shall complete the requirements for the award in a minimum of three semesters and a maximum of twelve semesters, and (in the event of suspension) except with permission of the Dean within seven calendar years of admission to candidature.

13. Assessment policy

13.1 On completion of the requirements for the course, the Faculty shall determine the results of the candidature.

14. Credit transfer policy

14.1 Credit may be available in the GradCertBEth, GradCertBEth(BTech), GradCertBEth(ClinEth), GradDipBEth, MBEth and MBEth(Hon) for postgraduate study which has been undertaken at the University of Sydney (either within the Postgraduate Program in Bioethics or through the University's Professional Master of Medicine Program) within the past three years and for which no award has been conferred.

14.1.2 If an award has been conferred for this study, credit is not available within any of the Bioethics programs.

14.2 A candidate who has qualified for the award of GradCertBEth, GradCertBEth(BTech), or GradCertBEth(ClinEth) may transfer, within three years, to the GradDipBEth, MBEth or MBEth (Hon) and receive credit for up to 24 credit points from the GradCertBEth, GradCertBEth(BTech), or GradCertBEth(ClinEth).

14.3 To transfer to the MBeth(Hon) the candidate must satisfy admission requirements in sub-section 1.1.2 of the Resolutions of Faculty.

14.4 A candidate who has qualified for the award of GradDipBEth may transfer, within three years, to the MBEth or MBEth(Hon) and receive credit for up to 36 credit points from the GradDipBEth.

14.5 A candidate who has qualified for the award of MBEth may transfer, within three years, to the MBEth(Hon) and receive credit for up to 48 credit points from the MBEth.

14.5.1 To transfer to MBeth(Hon) the candidate must satisfy admission requirements in subsection 1.1.2.

18. Bioinformatics coursework degrees

Master of Applied Science (Bioinformatics) (MApplSc(Bioinf))

Degree Code: LC042

Graduate Diploma in Applied Science (Bioinformatics) (GradDipApplSc(Bioinf))

Degree Code: LF030

Graduate Certificate in Applied Science (Bioinformatics) (GradCertApplSc(Bioinf))

Degree Code: LG015

This chapter sets out the requirements for postgraduate degrees offered in the Faculty of Science in the area of Bioinformatics. A comprehensive guide to the requirements and units of study of the coursework degrees is listed.

The information in this chapter is in summary form and is subordinate to the provisions of the relevant degree Resolutions, which can be found at the end of this chapter, or in the University of Sydney Calendar. The Calendar is available for sale at the Student Centre, for viewing at the faculty office or the Library, or online at: www.usyd.edu.au/publications/calendar.

Course overview

The Graduate Certificate in Applied Science (Bioinformatics), Graduate Diploma in Applied Science (Bioinformatics) and Master of Applied Science (Bioinformatics) are articulated award courses that provide a professional qualification to biologists and computer scientists working in industry, research and education.

The award program brings together the disciplines of computer science, statistics and the life sciences, developing and enhancing skills in bioinformatics. Students with little background in molecular biology who want to extend their understanding of the biosciences, statistics and bioinformatics follow Stream A. Students with a strong background in molecular biology who want to study bioinformatics, statistics and computer science follow Stream B.

The program has core and optional units of study to satisfy both of these requirements and will produce graduates with skills in the disciplines that underpin bioinformatics and in bioinformatics itself. Graduates from the Bioinformatics program will be proficient in molecular biology, genetics and bioinformatics. (Biology graduates who want to learn about computer programming are directed to the Graduate Diploma in Computing).

Candidates will normally commence their study in Semester 1, except with the permission of the Dean.

Course outcomes

The aim of this articulated coursework program is to provide students with a coordinated approach to bioinformatics, thus developing expertise to perform and develop the analysis of biological data with underlying competencies in the life sciences, computer science and statistics. Upon completion of the graduate certificate, graduate diploma or master's, graduates will have a broad understanding of the topic of bioinformatics. In addition, the master's will provide the option of experience in carrying out and completing a research project and report.

Unit of Study descriptions

Bioinformatics units of study 2009

For stream A students only (Information Technology Background)

BIOL5001

Molecular Genetics and Inheritance

Credit points: 6 **Teacher/Coordinator:** Dr Jenny Saleeba **Session:** Semester 1 **Classes:** 2-3 tutorials per week. **Prerequisites:** Department permission required for enrolment. **Assessment:** Formal exam, quizzes

Note: Department permission required for enrolment. Note: For Stream A students only (Information Technology background)

The fundamentals of inheritance and applications of molecular genetics will be covered. At the completion of the Unit, students will be able to recognise the most common modes of inheritance, understand the fundamentals of linkage analysis, be familiar with common genome structures, be familiar with modes of transmission and mechanisms of change in genetic material, be familiar with the genetic mechanisms behind complex biological systems, understand basic methods in recombinant DNA technology, be adept at applying genetics to solving problems in biology and understand the fundamentals of quantitative and population genetics.

For stream A and stream B students

BIOL5002

Bioinformatics: Sequences and Genomes

Credit points: 6 **Teacher/Coordinator:** Dr Neville Firth **Session:** Semester 2 **Classes:** 1 lecture or tutorial per week, 1 three hour practical per fortnight. **Corequisites:** BIOL5001 **Prohibitions:** BIOL3027, BIOL3927 **Assessment:** Formal exam, projects.

Note: Department permission required for enrolment. Note: 57Molecular Biotechnology students do not require BIOL5001.

Bioinformatics - the application of computers to life sciences, and genomics - the study of biology at the genome-wide scale, are revolutionising basic and applied biological sciences in the 21st century. The unit focuses on the application of bioinformatics to the storage, retrieval and analysis of biological information, principally in the form of nucleotide and amino acid sequences. An extensive practical component emphasises the development of hands-on skills in the use of bioinformatics technologies. Students will gain an appreciation of the significance and potential of bioinformatics and genomics in contemporary life sciences; an awareness of the breadth of bioinformatics resources and applications, including non-sequence-based biological information; skills and experience in the use of a core set of programs and databases for nucleotide and amino acid sequence analysis and phylogenetic reconstruction; a basic understanding of the theoretical foundation and underlying assumptions of the programs, and their relative strengths/limitations; and, competence in the evaluation of output from the programs in appropriate biological context.

MOBT5201

Applied Molecular Biotech A (Theory)

Credit points: 6 **Teacher/Coordinator:** Dr Neville Firth **Session:** Semester 1 **Classes:** One 2 hour lecture and one 1 hour tutorial per week. **Prohibitions:** BCHM3098, BCHM5001, MOBT5101 **Assessment:** One 2 hour theory exam (70%) and in semester assessments (30%).

Note: For Stream A and Stream B students.

This unit of study comprises the lecture component of MOBT5101.

STAT5001
Applied Statistics for Bioinformatics

Credit points: 6 **Session:** Semester 1 **Classes:** one three hour seminar per week **Assessment:** computer exam and lab reports

This is an introduction to statistics and data analysis used in Bioinformatics and many other areas of Biology. It aims to give an understanding of the concepts and the use of a major scientific statistical package, R. In addition to an introduction to ideas of analysis of data and statistical tests the unit will introduce ideas of simulation in resampling and the methods of clustering and classification of particular importance in Bioinformatics.

For stream B students

COMP5213
Computer and Network Organisation

Credit points: 6 **Session:** Semester 1, Semester 2 **Classes:** One 2 hour lecture and one 1 hour tutorial per week. **Assessment:** Assignments, written exam.

This unit of study provides an overview of hardware and system software infrastructure including: compilers, operating systems, device drivers, network protocols, etc. It also includes user-level Unix skills and network usability. The objectives are to ensure that on completion of this unit students will have developed an understanding of compilers, operating systems, device drivers, network protocols, Unix skills and network usability.

COMP5214
Software Development in Java

Credit points: 6 **Session:** Semester 1, Semester 2 **Classes:** One 2 hour lecture and one 1 hour tutorial per week. **Assessment:** Assignments, written exam.

This unit of study introduces software development methods, where the main emphasis is on careful adherence to a process. It includes design methodology, quality assurance, group work, version control, and documentation. It will suit students who do not come from a programming background, but who want to learn the basics of computer software.

Objectives: This unit of study covers systems analysis, a design methodology, quality assurance, group collaboration, version control, software delivery and system documentation.

Optional Units of Study

For stream A and stream B students

BINF5002
Bioinformatics Research Project A

Credit points: 6 **Teacher/Coordinator:** Dr Jermiin **Session:** Semester 2 **Classes:** meetings by arrangement with the supervisor **Prerequisites:** Department permission required for enrolment **Corequisites:** BINF5003, BIOL5001, BIOL5002, MOBT5201 and STAT5001 **Assessment:** project plan, seminar, final report

Note: Department permission required for enrolment. Note: For Stream A and Stream B students

BINF5002 comprises the commencement of a research project on a topic with significant emphasis on the use of bioinformatics tools to address important questions in the areas of biology, biochemistry, mathematics and statistics, computer science, crop and veterinary sciences, and medical science. Students will be working with an appointed supervisor from the Faculties of Agriculture, Science, Veterinary Science, and Medicine or from industry under the guidelines of the convenor. Students will commence a small research project in an area agreed by the student, the supervisor and the convenor. Research experience is highly valued by prospective employers as it shows a willingness and ability to undertake independent, as well as guided, research in bioinformatics. The project is not conducted in the way of contact hours per week for a semester. Rather, the student is expected to work in a continuous manner throughout the semester.

BINF5003
Bioinformatics Research Project B

Credit points: 6 **Teacher/Coordinator:** A/Prof Jermiin **Session:** Semester 1, Semester 2 **Classes:** meetings by arrangement with the supervisor **Prerequisites:** Department permission required for enrolment. **Corequisites:** BINF5002, BIOL5001, BIOL5002, MOBT5201 and STAT5001 **Assessment:** seminar, final report

Note: Department permission required for enrolment. Note: For Stream A and Stream B students

BINF5003 comprises the continuation of a research project commenced in BINF5002.

COMP5424
Information Technology in Biomedicine

Credit points: 6 **Session:** Semester 1 **Classes:** (Lec 2hrs & Tut 1hr) per week **Assumed knowledge:** Basic programming skills **Assessment:** Assignments, quizzes, written exam.

Information technology (IT) has significantly contributed to the research and practice of medicine, biology and health care. The IT field is growing enormously in scope with biomedicine taking a lead role in utilizing the evolving applications to its best advantage. The goal of this unit of study is to provide students with the necessary knowledge to understand the information technology in biomedicine. The major emphasis will be on the principles associated with biomedical digital imaging systems and related biomedicine data processing, analysis, visualization, registration, modelling, compression, management and communication. Specialist areas such as Picture Archiving and Communication Systems (PACS), computer-aided diagnosis (CAD), image-guided surgery (IGS), content-based medical image retrieval (CBMIR), and ubiquitous m-Health, etc. will be addressed. A broad range of practical integrated clinical applications will be also elaborated.

MCAN5104
Image Analysis

Credit points: 6 **Teacher/Coordinator:** Dr Allan S. Jones **Session:** Semester 1, Semester 2 **Classes:** 10 one hour lectures, 10 two hour practicals over a one week period. **Assessment:** Eight practical reports (50%), 1 three part mathematical assignment (20%), 1 in-depth assignment of 2500 word length on a relevant topic (30%).

Note: Department permission required for enrolment in the following sessions: Semester 1.

This unit of study covers the nature and processing of images and the extraction of quantitative data from them. Participants will develop a sound working knowledge of both traditional stereology techniques and modern digital image processing and analysis. Emphasis is placed on an understanding of both the strengths and the limitations that are inherent in image data, and the technology applied to it. Topics in this module include: a general review of image acquisition, filters and transforms, segmentation methods, calibration of hardware for analysis, extraction of simple features from images, advanced feature extraction from images, limitations of measurement and a general overview of stereology, including geometric probability, density estimation and sampling.

For stream A students

COMP5028
Object-Oriented Analysis and Design

Credit points: 6 **Session:** Semester 1, Semester 2 **Classes:** One 2 hour lecture and one 1 hour tutorial per week. **Assumed knowledge:** Intermediate level of object oriented programming such as Java **Assessment:** Assignments, written exam.

This unit introduces Object-Oriented Analysis and Design especially the principles of modelling through Rational Unified Process and agile processes using Unified Modeling Language (UML), both of which are industry standard. Students work in small groups to experience the process of object-oriented analysis, architectural design,

object-oriented design, implementation and testing by building a real-world application.

Objectives: In this unit students will develop the ability to: identify how the system interacts with its environment; identify appropriate objects and their attributes and methods; identify the relationships between objects; write the interfaces of each object; implement and test the objects; read and write various UML diagrams including use case, class, and sequence diagrams; apply design patterns to standard problems.

COMP5318
Knowledge Discovery and Data Mining

Credit points: 6 **Session:** Semester 1, Semester 2 **Classes:** (Lec 2hrs & Prac 1hr) per week **Assumed knowledge:** COMP5138 and familiarity with basic statistics **Assessment:** Assignments, written exam.

Knowledge discovery is the process of extracting useful knowledge from data. Data mining is a discipline within knowledge discovery that seeks to facilitate the exploration and analysis of large quantities of data, by automatic or semiautomatic means. This subject provides a practical and technical introduction to knowledge discovery and data mining.

Objectives: Topics to be covered include problems of data analysis in databases, discovering patterns in the data, and knowledge interpretation, extraction and visualisation. Also covered are analysis, comparison and usage of various types of machine learning techniques and statistical techniques: clustering, classification, prediction, estimation, affinity grouping, description and scientific visualisation.

COMP5426
Network Based High Performance Computing

Credit points: 6 **Session:** Semester 1 **Classes:** (Lec 2hrs & Prac 1hr) per week. **Assumed knowledge:** Equivalent of COMP5116 **Assessment:** Assignments, written exam.

This unit is intended to introduce and motivate the study of high performance computer systems. The student will be presented with the foundational concepts pertaining to the different types and classes of high performance computers. The student will be exposed to the description of the technological context of current high performance computer systems. Students will gain skills in evaluating, experimenting with, and optimizing the performance of high performance computers. The unit also provides students with the ability to undertake more advanced topics and courses on high performance computing.

For stream B students

COMP5206
Introduction to Information Systems

Credit points: 6 **Session:** Semester 1, Semester 2 **Classes:** One 2 hour lecture and one 1 hour tutorial per week. **Prohibitions:** INFO5210 **Assessment:** Assignments, written exam

This unit provides an introduction to information systems in organisations and the role of database management. It introduces the fundamentals of database management, along with the modeling and analysis that is needed for designing and implementing database solutions. The unit also introduces a database query language.

Objectives: On completion of this unit students will be able to develop an understanding of the role of information systems in organisations, and the value of data and information to organisations. Students will also develop skills in creating database solutions, capturing user requirements, and building process and data models.

COMP5211
Algorithms

Credit points: 6 **Session:** Semester 1, Semester 2 **Classes:** One 2 hour lectures and one 1 hour tutorial per week. **Assessment:** Assignments, written exam.

The study of algorithms is a fundamental aspect of computing. This unit of study covers data structures, algorithms, and gives an overview of the main ways of thinking used in IT from simple list manipulation and data format conversion, up to shortest paths and cycle detection in graphs. The objective of the unit are to teach basic concepts in data structure, algorithm, dynamic programming and program analysis. Students will gain essential knowledge in computer science.

Sample degree structures

The Bioinformatics program allows students from a wide variety of backgrounds to undertake relevant units in Bioinformatics. These are some suggested coursework study plans.

Master of Applied Science (Bioinformatics)
Stream A Coursework Study Plan

Semester 1

- STAT5001 Applied Statistics for Bioinformatics
- MOBT5201 Molecular Biotechnology A (Theory)
- BIOL5001 Molecular Genetics and Inheritance
- COMP5424 Information Technology in Biomedicine

Semester 2

- BIOL5002 Bioinformatics: Sequences and Genomes
- MCAN5104 Image Analysis
- COMP5318 Knowledge Discovery and Data Mining
- COMP5426 Network Based High Performance Computing

Master of Applied Science (Bioinformatics)
Stream B Coursework Study Plan

Semester 1

- STAT5001 Applied Statistics for Bioinformatics
- MOBT5201 Molecular Biotechnology A (Theory)
- COMP5213 Computer and Network Organisation
- COMP5214 Software Development in Java

Semester 2

- COMP5424 Information Technology in Biomedicine
- BIOL5002 Bioinformatics: Sequences and Genomes
- COMP5206 Introduction to Information Systems
- COMP5211 Algorithms

Resolutions

Master of Applied Science (Bioinformatics)
Graduate Diploma in Applied Science (Bioinformatics)
Graduate Certificate in Applied Science (Bioinformatics)

Course rules

1. **Admission**

1.1 The Dean of the Faculty of Science may admit to candidature for:

1.1.1 **the Graduate Certificate in Applied Science:**

1.1.1.1 graduates of the University of Sydney holding the degree of Bachelor of Science or any other equivalent award of the University of Sydney;

1.1.1.2 graduates of other universities or other appropriate institutions who have qualifications equivalent to those specified in subsection 1.1.1.1; or

1.1.1.3 persons who have experience which is considered to demonstrate the knowledge and aptitude required to undertake the units of study;

1.1.2 **the Graduate Diploma in Applied Science:**

1.1.2.1 graduates of the University of Sydney holding the degree of Bachelor of Science or any other equivalent award of the University of Sydney;

1.1.2.2 graduates of other universities or other appropriate institutions who have qualifications equivalent to those specified in subsection 1.1.2.1; or

1.1.2.3 persons who have completed requirements for the Graduate Certificate in Applied Science, or equivalent;

1.1.3 **the Master of Applied Science:**

1.1.3.1 graduates of the University of Sydney holding the degree of Bachelor of Science or any other equivalent award of the University of Sydney;

1.1.3.2 graduates of other universities or other appropriate institutions who have qualifications equivalent to those specified in subsection 1.1.3.1; or

1.1.3.3 persons who have completed requirements for the Graduate Diploma in Applied Science, or equivalent.

2. Units of study

2.1 The units of study for the Graduate Certificate in Applied Science (Bioinformatics), Graduate Diploma in Applied Science (Bioinformatics), and Master of Applied Science (Bioinformatics), are listed in subsection 4.

2.2 Credit point value, assumed knowledge, corequisites, prerequisites and any special conditions are included under units of study description.

3. Requirements for the Graduate Certificate in Applied Science (Bioinformatics) (GradCertApplSc(Bioinf)); Graduate Diploma in Applied Science (Bioinformatics) (GradDipApplSc(Bioinf)); Master of Applied Science (Bioinformatics) (MApplSc(Bioinf))

3.1 Candidates for the Graduate Certificate in Applied Science (Bioinformatics) Stream A are required to complete satisfactorily four core units of study (BIOL5001, BIOL5002, MOBT5201, STAT5001).

3.2 Candidates for the Graduate Certificate in Applied Science (Bioinformatics) Stream B are required to complete satisfactorily four core units of study (BIOL5002, MOBT5201, STAT5001, COMP5213).

3.3 Candidates for the Graduate Diploma in Applied Science (Bioinformatics) Stream A are required to complete satisfactorily four core units of study (BIOL5001, BIOL5002, MOBT5201, STAT5001) and 12 credit points from optional units of study.

3.4 Candidates for the Graduate Diploma in Applied Science (Bioinformatics) Stream B are required to complete satisfactorily five core units of study (BIOL5002, MOBT5201, STAT5001, COMP5213, COMP5214) and 6 credit points from optional units of study.

3.5 Candidates for the Master of Applied Science (Bioinformatics) Stream A are required to complete satisfactorily four core units of study (BIOL5001, BIOL5002, MOBT5201, STAT5001) and 24 credit points from optional units of study.

3.6 Candidates for the Master of Applied Science (Bioinformatics) Stream B are required to complete satisfactorily five core units of study (BIOL5002, MOBT5201, STAT5001, COMP5213, COMP5214) and 18 credit points from optional units of study.

Faculty rules

4. Details of units of study

4.1 The units of study for the Graduate Certificate in Applied Science (Bioinformatics), Graduate Diploma in Applied Science (Bioinformatics), and Master of Applied Science (Bioinformatics), are listed in the following table.

Unit of study		Core
Unless otherwise indicated, all units are worth 6 credit points		
Stream A (Information Technology Background)		
BIOL5001	Molecular Genetics & Inheritance	C*
BIOL5002	Bioinformatics: Sequences & Genomes	C*
MOBT5201	Molecular Biotechnology A (Theory)	C*
STAT5001	Applied Statistics for Bioinformatics	C*
BINF5002	Bioinformatics Research Project A	
BINF5003	Bioinformatics Research Project B	
COMP5028	Object Oriented Analysis and Design	
COMP5318	Knowledge Discovery and Data Mining	
COMP5426	Network Based High Performance Computing	
MCAN5104	Image Analysis	
Stream B (Life Science Background)		
BIOL5002	Bioinformatics: Sequences & Genomes	C*
COMP5213	Computer & Network Organisation	C*
MOBT5201	Molecular Biotechnology A (Theory)	C*
STAT5001	Applied Statistics for Bioinformatics	C*
COMP5214	Software Development in Java	C
BINF5002	Bioinformatics Research Project A	
BINF5003	Bioinformatics Research Project B	
COMP5206	Introduction to Information Systems	
COMP5211	Algorithms	
MCAN5104	Image Analysis	
* Core Units for Graduate Certificate		

4.2 A candidate for the course shall proceed by completing units of study as prescribed by the Faculty.

4.3 A unit of study shall consist of such lectures, seminars, tutorial instruction, essays, exercises, practical work, or project work as may be prescribed.

4.4 In these resolutions, 'to complete a unit of study' or any derivative expression means:

4.4.1 to attend the lectures and the meetings, if any, for seminars or tutorial instruction;

4.4.2 to complete satisfactorily the essays, exercises, practical and project work if any; and

4.4.3 to pass any other examination of the unit of study that may apply.

4.5 All units of study for a particular subject area may not be available every semester.

4.6 The Dean may allow substitution of any unit of study by another unit of study, including units of study from other postgraduate coursework programs in the Faculty or elsewhere in the University.

5. Enrolment in more/less than minimum load

5.1 A candidate may proceed on either a full-time or a part-time basis.

6. Cross-institutional study

6.1 Cross institutional study shall not be available to students enrolled in the Graduate Certificate in Applied Science, Graduate Diploma in Applied Science and Master of Applied Science courses, except where the University of Sydney has a formal Cooperation Agreement with another University.

7. Restrictions on enrolment

7.1 Admission to candidature may be limited by a quota.

7.2 In determining the quota, the University will take into account:

7.2.1 availability of resources including space, laboratory and computing facilities; and

7.2.2 availability of adequate and appropriate supervision.

7.3 In considering an application for admission to candidature the Dean shall take account of the quota and will select, in preference, applicants who are most meritorious in terms of sub-section 1 above.

8. Discontinuation of enrolment

8.1 A student who does not enrol in any semester without first obtaining written permission from the Dean to suspend candidature will be deemed to have discontinued enrolment in the course.

8.2 Students who have discontinued from the course will be required to apply for admission to the course and be subject to admission requirements pertaining at that time.

9. Suspension of candidature

9.1 A student may seek written permission from the Dean to suspend candidature in the course.

9.2 Suspension may be granted for a maximum of one year.

10. Re-enrolment after an absence

10.1 A student who plans to re-enrol after a period of suspension must advise the Faculty of Science Office in writing of their

intention by no later than the end of October for First Semester of the following year or the end of May for Second Semester of the same year.

11. Satisfactory progress

11.1 Candidates for the Master of Applied Science (Bioinformatics), the Graduate Diploma in Applied Science (Bioinformatics), and the Graduate Certificate in Applied Science (Bioinformatics), shall be governed by the rules as follows:

11.1.1 A student who has failed a cumulative total of 12 credit points at any stage of enrolment in the Master of Applied Science (Bioinformatics) will be required to show good cause why he or she should be allowed to re-enrol and, if good cause has not been established, the student's enrolment will be transferred to the Graduate Diploma in Applied Science (Bioinformatics);

11.1.2 A student who has failed a cumulative total of 18 credit points at any stage of enrolment in the Master of Applied Science (Bioinformatics) and/or the Graduate Diploma in Applied Science (Bioinformatics) will be required to show good cause why he or she should be allowed to re-enrol and, if good cause has not been established, the student's enrolment will be transferred to the Graduate Certificate in Applied Science (Bioinformatics);

11.1.3 A student who has failed a cumulative total of 12 credit points at any stage of enrolment in the Graduate Certificate in Applied Science (Bioinformatics) will be required to show good cause why he or she should be allowed to re-enrol and, if good cause has not been established, the student will not be permitted to re-enrol.

11.2 A student who has failed a cumulative total of more than 18 credit points in the Master of Applied Science (Bioinformatics) and/or the Graduate Diploma in Applied Science (Bioinformatics) and/or the Graduate Certificate in Applied Science (Bioinformatics) will be required to show good cause why he or she should be allowed to re-enrol and, if good cause has not been established, the student will not be permitted to re-enrol.

11.3.1 A student who has failed a core unit at the second attempt in the Master of Applied Science (Bioinformatics) and/or the Graduate Diploma in Applied Science (Bioinformatics) and/or the Graduate Certificate in Applied Science (Bioinformatics) will be deemed to have failed to complete course requirements and will be required to show good cause why he or she should be allowed to re-enrol.

11.3.2 If good cause has not been established, the student will not be permitted to re-enrol.

12. Time limit

12.1 A candidate for the Graduate Certificate in Applied Science (Bioinformatics) shall complete the requirements for the award in a minimum enrolment of one semester and a maximum enrolment of four semesters.

12.2 A candidate for the Graduate Diploma in Applied Science (Bioinformatics) shall complete the requirements for the award in a minimum enrolment of two semesters and a maximum enrolment of six semesters.

12.3 A candidate for the Master of Applied Science (Bioinformatics) shall complete the requirements for the award in a minimum of two semesters and a maximum of eight semesters.

13. Assessment policy

13.1 On completion of the requirements for the course, the Faculty shall determine the results of the candidature.

14. Credit transfer policy

14.1 Credit is not available in the Graduate Certificate in Applied Science (Bioinformatics), Graduate Diploma in Applied Science (Bioinformatics) and Master of Applied Science (Bioinformatics) for postgraduate study which has not been undertaken in these award courses within the previous three years.

14.2 A candidate who has qualified for the award of the Graduate Certificate in Applied Science (Bioinformatics) may transfer, within three years, to the Graduate Diploma in Applied Science (Bioinformatics) and receive credit for up to 24 credit points from the Graduate Certificate in Applied Science (Bioinformatics).

14.3 A candidate who has qualified for the award of the Graduate Diploma in Applied Science (Bioinformatics) may transfer, within three years, to the Master of Applied Science (Bioinformatics) and receive credit for up to 36 credit points from the Graduate Diploma in Applied Science.

14.4 A candidate who has completed units of study in the Applied Science program within the previous three years, but has not qualified for an award, may transfer to another award course within the same Applied Science program and receive credit for the units of study completed.

19. Coastal Management coursework degrees

Master of Applied Science (Coastal Management) (MApplSc(CoastalMgt))

Degree Code: LC043

Graduate Diploma in Applied Science (Coastal Management) (GradDipApplSc(CoastalMgt))

Degree Code: LF031

Graduate Certificate in Applied Science (Coastal Management) (GradCertApplSc(CoastalMgt))

Degree Code: LG016

Note that these degrees are not available to new students in 2009.

This chapter sets out the requirements for postgraduate degrees offered in the Faculty of Science in the area of Coastal Management. A comprehensive guide to the requirements and units of study of the coursework degrees is listed.

The information in this chapter is in summary form and is subordinate to the provisions of the relevant degree Resolutions, collected at the end of this chapter, or in the University of Sydney Calendar. The Calendar is available for sale at the Student Centre, for viewing at the faculty office or the Library, or online at www.usyd.edu.au/publications/calendar.

Course overview

The University of Sydney Institute of Marine Science in collaboration with the Department of Environment and Conservation, the NSW Coastal Council and Surf Life Saving Australia, has developed a new and innovative graduate program in Coastal Management. This program is the only one of its kind in Australia, and has been designed and will be taught by leading researchers and practitioners of coastal management.

It will be taught primarily in coastal locations in the Sydney region. It will draw on local coastal management systems, issues and problems as part of the program material. It will also make use of the 2003 NSW Coastal Policy and Coastal Management Manual to provide students with an in-depth understanding of all aspects of coastal management. The program will include units on coastal processes and systems, coastal zone policy and management, beach management and the application of geographical information systems (GIS) to the coastal zone.

The program is ideal for recent graduates who wish to extend their knowledge of coastal and beach management, and for coastal practitioners in local, state, federal and other agencies and in industry who require additional training and knowledge of coastal management policy and issues. The program will provide formal training and also enable students to undertake a supervised coastal management project. A key aspect of all Master's units will be a broad on-site exposure to coastal processes, systems, issues and real management problems in the greater Sydney region, and in some units in regional NSW.

Course outcomes

Upon completion of the graduate certificate graduates will possess a practical and theoretical background in a range of issues related to coastal management. This knowledge can be extended by completion of a graduate diploma, and further extended through course work and research projects as part of a master's program.

Unit of study descriptions

Coastal Management units of study 2009

MARS5006

Coral Reefs, Science and Management

Credit points: 6 **Session:** Semester 1 **Classes:** University base delivery: Prefield trip Tutorial (1 hr), On-line exercises (2 hr) Field based delivery: Lectures (11 x 1 hr), Seminars (4 x 1 hr), Tutorials - individual consultations to develop concepts in research (2 x 1 hr), Independent Research an **Assessment:** Written assignments: essay and project report; oral presentations; seminar and lecture participation.

Note: Department permission required for enrolment.

This unit provides an in - depth overview of the key biological and non-biological processes that make up coral reef ecosystems. There is a focus on the biogeographic, oceanographic and physiological processes underlying the integrity of global tropical reef systems. The Great Barrier Reef is used as a case study to explore emerging concepts on the influence of natural and anthropogenic processes on the integrity of global reef and lagoon systems. Learning activities will include a series of background lectures and research seminars and tutorials in the development of a major research project. A major aspect of this unit is an independent research project conducted under the supervision of the course instructors. The unit concludes with a series of oral presentations based on student research. Assessment tasks will consist of two essays and a research project report and presentation. The curriculum in this unit is based on current research and a course book will be provided. This is a field intensive course held at One Tree Island Research Station or Heron Island Research Station. The course is ex-Gladstone Queensland and students are expected to make their own way there. This unit will be run over 8 days and there will be an additional course fee for food and accommodation, expected to be $600.

NTMP5005

Tropical Coastal Management

Credit points: 6 **Teacher/Coordinator:** Belinda McMillen (course contact) **Session:** Semester 2 **Classes:** Fieldschool 80 hours intensive. **Corequisites:** MARS5002 and MARS5003 **Prohibitions:** NTMP3005 **Assessment:** Presentation, teamwork, assignment, 1 hr exam

Note: Department permission required for enrolment. Note: department permission required for enrolment

This course examines the impacts of human activities on coastal and marine environments. It explores the complex relationships among the ecological and social values of these environments and outlines strategies and tools for their management. This is an intensive course that will be held at the University of Queensland Moreton Bay Research Station, North Stradbroke Island.

Textbooks

Handouts provided.

GEOG5001
Geographic Information Science A

Credit points: 6 **Teacher/Coordinator:** Dr David Chapman **Session:** Semester 1, Semester 2 **Classes:** Six workshops. **Assessment:** Report

This unit of study gives an overview of basic spatial data models, and enables students to understand the import and export of data to and from a geographical information system (GIS). The manipulation of spatial data at a level appropriate to planning or locational applications, and the development of thematic maps from diverse data layers, will be addressed.

GEOG5002
Geographic Information Science B

Credit points: 6 **Teacher/Coordinator:** Dr Eleanor Bruce **Session:** Semester 2 **Classes:** One 2 hour lectures, one 1 hour tutorial, one 3 hour practical per week for 6 weeks. **Assumed knowledge:** GEOG5001 **Assessment:** 2500 word assignment, seminar presentation, tutorial reports, WebCT quiz.

This course will provide the conceptual background to more advanced GIS analysis applications and spatial reasoning methods in the context of contemporary environmental issues. The course is designed to provide an understanding of spatial analysis techniques available within a GIS environment, explore a diversity of both social and physical environmental applications and address emerging issues in GIS research. A range of topics will be introduced including field based capture of spatial information, spatial data structures, surface modelling, visibility analysis, hydrological modeling, network analysis, spatial data uncertainty and social GIS.

Conceptual material presented in lectures and tutorial workshops will be placed in an applied context through a series of laboratory and field sessions designed to strengthen practical understanding and awareness of GIS methods.

ENVI5708
Introduction to Environmental Chemistry

Credit points: 6 **Teacher/Coordinator:** A/Prof Gavin Birch **Session:** Semester 1 **Classes:** Two 1 hour lectures and one practical per week; one field trip per semester. **Assessment:** Assignment, presentation and report

Note: This is a compulsory course for the Grad Dip and Masters levels of the Applied Science (Environmental Science) program.

Introduction to Environmental Chemistry provides the basic chemical knowledge required to be able to understand chemical analysis of air, water and soil samples taken in the field. This is supplemented by a field-based project analysing soil and sediment samples for trace pollutants from locations in and around Sydney. This unit of study involves 4 contact hours per week for one semester as well as some time in the field as arranged with the class.

ENVI5803
Law and the Environment

Credit points: 6 **Teacher/Coordinator:** Dr Gerry Bates **Session:** Semester 1 **Classes:** One 2 hour lectures per week. **Assessment:** Essays

This unit of study provides an overview of Australian and international law as it pertains to the environment. It looks at a number of environmental issues at the various levels of analysis, policy making, implementation of policy and dispute resolution. It also provides a broad background to political and economic issues as they related to the legal issues. This unit of study involves lecture material and an essay on policy issues.

ENVI5809
Environmental Simulation Modelling

Credit points: 6 **Teacher/Coordinator:** Dr David Chapman **Session:** Semester 1 **Classes:** Six workshops. **Assessment:** Report

The concept and use of computer modelling in natural resource management is introduced in this unit of study, which is aimed particularly at non-programmers.

ENVI5903
Sustainable Development

Credit points: 6 **Teacher/Coordinator:** Dr Phil McManus **Session:** Semester 2 **Classes:** Two 2 hour lectures per week for seven weeks. **Assessment:** Essay and presentation

This unit of study demonstrates the history and contested understandings of the concept of sustainable development. It applies these concepts to explore important environmental science issues such as population, water management sustainable cities, rural development, industrial ecology, and energy issues. The unit concludes by presenting a range of future scenarios and encouraging students to develop their own vision of sustainability at the global and other scales, and to communicate their means of achieving this sustainability vision.

ENVI5904
Understanding Environmental Uncertainty

Credit points: 6 **Teacher/Coordinator:** Associate Professor Ross Coleman **Session:** Semester 2 **Classes:** One three hour lecture per week for 8 weeks. **Assessment:** Tutorials, oral presentations and written reports.

No assessment of potential environmental impacts is possible without relevant information about the ecological consequences. This unit is for those without a science degree, to explain the need to quantify and what are relevant measures. Describing and understanding uncertainty will be explained in the context of precautionary principles. Issues about measuring biodiversity and the spatial and temporal problems of ecological systems will be introduced.

ENVI5905
Management of Parks

Credit points: 6 **Teacher/Coordinator:** A/Prof Deirdre Dragovich **Session:** Semester 2 **Classes:** Lectures 2hrs for 6 weeks, Practical work 3 hrs for 3 wks, Fieldwork 21 hrs (2.5 days), Total / week 7 hrs average **Assessment:** A prac report, assignment, one 1hr exam

This unit of study evaluates the reasons for the existence of parks, including National Parks, recreational spaces and reserves, and examines the applied aspects of their management. Topics covered include conservation, ecotourism, plans of management and their implementation (with particular emphasis on the remediation of the impacts of visitor numbers and erosion), fire control practices and resource management. Students will visit various parks within the Sydney region (such as the Royal National Park, the Sydney Harbour Foreshore, Jenolan Caves Reserve and Centennial Park) that highlight the different issues introduced in lectures and which illustrate the practical measures undertaken to manage the parks in a sustainable fashion.

Textbooks
A Course Handbook will be provided.

The following project unit is for masters students only:

MARS5005
Coastal Management Project

This unit of study is not available in 2009

Credit points: 12 **Session:** Semester 2 **Classes:** regular meetings with supervisor to be arranged for mutually convenient times **Prerequisites:** MARS5001, MARS5002, MARS5003 and GEOG5001 **Assessment:** A semester long project offering the opportunity to carry out high level research. The research project is supervised by either a member of academic staff or an approved supervisor from outside the School. Each student must generate an hypothesis and prepare and submit a written report.

Note: Department permission required for enrolment. Note: This is available only to students in the Master of Applied Science (Coastal Management) program

This unit will enable students who have completed earlier coursework to design and undertake a research project related to a coastal management topic under the supervision of an appropriate member of the teaching staff. The unit will be suitable for students who wish to learn how to undertake and complete an original research project, as well as students from industry and government organisations who wish to undertake a project that relates to their professional environment.

Resolutions

Master of Applied Science (Coastal Management)
Graduate Diploma in Applied Science (Coastal Management)
Graduate Certificate in Applied Science (Coastal Management)

Course rules

1. **Admission**

1.1 The Dean of the Faculty of Science may admit to candidature for:

1.1.1 **the Graduate Certificate in Applied Science (Coastal Management):**

1.1.1.1 graduates of the University of Sydney holding the degree of Bachelor of Science or any other equivalent award of the University of Sydney;

1.1.1.2 graduates of other universities or other appropriate institutions who have qualifications equivalent to those specified in subsection 1.1.1.1; or

1.1.1.3 persons who have experience which is considered to demonstrate the knowledge and aptitude required to undertake the units of study;

1.1.2 **the Graduate Diploma in Applied Science (Coastal Management):**

1.1.2.1 graduates of the University of Sydney holding the degree of Bachelor of Science or any other equivalent award of the University of Sydney;

1.1.2.2 graduates of other universities or other appropriate institutions who have qualifications equivalent to those specified in subsection 1.1.2.1; or

1.1.2.3 persons who have completed requirements for the Graduate Certificate in Applied Science, or equivalent;

1.1.3 *the Master of Applied Science (Coastal Management):*

1.1.3.1 graduates of the University of Sydney holding the degree of Bachelor of Science or any other equivalent award of the University of Sydney;

1.1.3.2 graduates of other universities or other appropriate institutions who have qualifications equivalent to those specified in subsection 1.1.3.1; or

1.1.3.3 persons who have completed requirements for the Graduate Diploma in Applied Science, or equivalent.

2. **Units of study**

2.1 The units of study for the Graduate Certificate in Applied Science (Coastal Management), Graduate Diploma in Applied Science (Coastal Management), and Master of Applied Science (Coastal Management), are listed in subsection 4.1.

2.2 Credit point value, assumed knowledge, corequisites, prerequisites and any special conditions are included under unit of study descriptions.

3. **Requirements for the Graduate Certificate in Applied Science (Coastal Management) (GradCertApplSc(Coastal Mgt)); Graduate Diploma in Applied Science (Coastal Management) (GradDiplApplSc(Coastal Mgt)); Master of Applied Science (Coastal Management) (MApplSc(Coastal Mgt))**

3.1 Candidates for the Graduate Certificate in Applied Science (Coastal Management) are required to complete satisfactorily at least two core units of study from: MARS5001, MARS5002, MARS5003, GEOG5001, and 12 credit points from the following optional units of study: MARS5001, MARS5002, MARS5003, GEOG5001, CHEM5001, ENVI5705, ENVI5803, ENVI5808, ENVI5809.

3.2 Candidates for the Graduate Diploma in Applied Science(Coastal Management) are required to complete satisfactorily four core units of study (MARS5001, MARS5002, MARS5003, GEOG5001) and 12 credit points from the following optional units of study: MARS5004, CHEM5001, ENVI5705, ENVI5803, ENVI5808, ENVI5809.

3.3 Candidates for the Master of Applied Science (CoastalManagement) are required to complete satisfactorily four core units of study (MARS5001, MARS5002, MARS5003, GEOG5001) and 24 credit points from the following optional units of study: MARS5004, MARS5005, CHEM5001, ENVI5705, ENVI5803, ENVI5808, ENVI5809.

Faculty rules

4. **Details of units of study**

4.1 The units of study for the Graduate Certificate in Applied Science (Coastal Management), Graduate Diploma in Applied Science (Coastal Management), and Master of Applied Science (Coastal Management), are listed in the following table.

Unit of study	
Unless otherwise indicated, all units are worth 6 credit points	
MARS5001*	Coastal Processes and Systems
NTMP5005	Tropical Coastal Management
MARS5006	Coral Reefs, Science & Management
MARS5007*	Coral Reefs, Energy and Climate
GEOG5001	Geographic Information Science A
GEOG5002	Geographic Information Science B
ENVI5708	Introduction to Environmental Chemistry
ENVI5809	Computer Modelling & Resource Management
ENVI5803	Law and the Environment
ENVI5903	Sustainable Development
ENVI5905	Management of Parks
ENVI5904	Understanding Environmental Uncertainty
MARS5005*	Coastal Management Project (12 credit points) - masters students only
*Not available in 2009	

4.2 A candidate for the course shall proceed by completing units of study as prescribed by the Faculty.

4.3 A unit of study shall consist of such lectures, seminars, tutorial instruction, essays, exercises, practical work, or project work as may be prescribed.

4.4 In these resolutions, 'to complete a unit of study' or any derivative expression means:

4.4.1 to attend the lectures and the meetings, if any, for seminars or tutorial instruction;

4.4.2 to complete satisfactorily the essays, exercises, practical and project work if any; and

4.4.3 to pass any other examination of the unit of study that may apply.

4.5 All units of study for a particular subject area may not be available every semester.

4.6 The Dean may allow substitution of any unit of study by another unit of study, including units of study from other postgraduate coursework programs in the Faculty or elsewhere in the University.

4.7 The Master of Applied Science (Coastal Management) shall be awarded in two grades, namely Pass and, in the case of an outstanding candidate, Pass with Merit.

5. **Enrolment in more/less than minimum load**

5.1 A candidate may proceed on either a full-time or a part-time basis.

6. **Cross-institutional study**

6.1 Cross institutional study shall not be available to students enrolled in the Graduate Certificate in Applied Science, Graduate Diploma in Applied Science and Master of Applied Science courses, except where the University of Sydney has a formal Cooperation Agreement with another University.

7. **Restrictions on enrolment**

7.1 Admission to candidature may be limited by a quota.

7.2 In determining the quota, the University will take into account:

7.2.1 availability of resources including space, laboratory and computing facilities; and

7.2.2 availability of adequate and appropriate supervision.

7.3 In considering an application for admission to candidature the Dean shall take account of the quota and will select, in preference, applicants who are most meritorious in terms of sub-section 1 above.

8. Discontinuation of enrolment

8.1 A student who does not enrol in any semester without first obtaining written permission from the Dean to suspend candidature will be deemed to have discontinued enrolment in the course.

8.2 Students who have discontinued from the course will be required to apply for admission to the course and be subject to admission requirements pertaining at that time.

9. Suspension of candidature

9.1 A student may seek written permission from the Dean to suspend candidature in the course.

9.2 Suspension may be granted for a maximum of one year.

10. Re-enrolment after an absence

10.1 A student who plans to re-enrol after a period of suspension must advise the Faculty of Science Office in writing of their intention by no later than the end of October for First Semester of the following year or the end of May for Second Semester of the same year.

11. Satisfactory progress

11.1 Candidates for the Master of Applied Science (Coastal Management), the Graduate Diploma in Applied Science (Coastal Management), and the Graduate Certificate in Applied Science (Coastal Management), shall be governed by the rules as follows:

11.1.1 A student who has failed a cumulative total of 12 credit points at any stage of enrolment in the Master of Applied Science (Coastal Management) will be required to show good cause why he or she should be allowed to re-enrol and, if good cause has not been established, the student's enrolment will be transferred to the Graduate Diploma in Applied Science (Coastal Management);

11.1.2 A student who has failed a cumulative total of 18 credit points at any stage of enrolment in the Master of Applied Science (Coastal Management) and/or the Graduate Diploma in Applied Science (Coastal Management) will be required to show good cause why he or she should be allowed to re-enrol and, if good cause has not been established, the student's enrolment will be transferred to the Graduate Certificate in Applied Science (Coastal Management);

11.1.3 A student who has failed a cumulative total of 12 credit points at any stage of enrolment in the Graduate Certificate in Applied Science (Coastal Management) will be required to show good cause why he or she should be allowed to re-enrol and, if good cause has not been established, the student will not be permitted to re-enrol.

11.2 A student who has failed a cumulative total of more than 18 credit points in the Master of Applied Science (Coastal Management) and/or the Graduate Diploma in Applied Science (Coastal Management) and/or the Graduate Certificate in Applied Science (Coastal Management) will be required to show good cause why he or she should be allowed to re-enrol and, if good cause has not been established, the student will not be permitted to re-enrol.

11.3.1 A student who has failed a core unit at the second attempt in the Master of Applied Science (Coastal Management) and/or the Graduate Diploma in Applied Science (Coastal Management) and/or the Graduate Certificate in Applied Science (Coastal Management) will be deemed to have failed to complete course requirements and will be required to show good cause why he or she should be allowed to re-enrol.

11.3.2 If good cause has not been established, the student will not be permitted to re-enrol.

12. Time limit

12.1 A candidate for the Graduate Certificate in Applied Science (Coastal Management) shall complete the requirements for the award in a minimum enrolment of one semester and a maximum enrolment of four semesters.

12.2 A candidate for the Graduate Diploma in Applied Science (Coastal Management) shall complete the requirements for the award in a minimum enrolment of two semesters and a maximum enrolment of six semesters.

12.3 A candidate for the Master of Applied Science (Coastal Management) shall complete the requirements for the award in a minimum of two semesters and a maximum of eight semesters.

13. Assessment policy

13.1 On completion of the requirements for the course, the Faculty shall determine the results of the candidature.

14. Credit transfer policy

14.1 Credit is not available in the Graduate Certificate in Applied Science (Coastal Management), Graduate Diploma in Applied Science (Coastal Management) and Master of Applied Science (Coastal Management) for postgraduate study which has not been undertaken in these award courses within the previous three years.

14.2 A candidate who has qualified for the award of the Graduate Certificate in Applied Science (Coastal Management) may transfer, within three years, to the Graduate Diploma in Applied Science (Coastal Management) and receive credit for up to 24 credit points from the Graduate Certificate in Applied Science (Coastal Management).

14.3 A candidate who has qualified for the award of the Graduate Diploma in Applied Science (Coastal Management) may transfer, within three years, to the Master of Applied Science (Coastal Management) and receive credit for up to 36 credit points from the Graduate Diploma in Applied Science (Coastal Management).

14.4 A candidate who has completed units of study in the Applied Science program within the previous three years, but has not qualified for an award, may transfer to another award course within the same Applied Science program and receive credit for the units of study completed.

20. Environmental Science coursework degrees

This chapter sets out the requirements for postgraduate degrees offered in the Faculty of Science in the area of Environmental Science. A comprehensive guide to the requirements and units of study of the coursework degrees is listed.

The information in this chapter is in summary form and is subordinate to the provisions of the relevant degree Resolutions, collected variously in this chapter, or in the University of Sydney Calendar. The Calendar is available for sale at the Student Centre, for viewing at the faculty office or the Library, or online at
www.usyd.edu.au/publications/calendar

Further information can be found on the Environmental Science website: http://www.usyd.edu.au/envisci.

Master of Environmental Science and Law

Degree Code: LC040

Course overview

The Master of Environmental Science and Law program is a novel concept of undertaking dual courses in the fields of both Science and Law. The program is unique and is not available elsewhere. It provides science graduates with the opportunity of extending their scientific knowledge into the area of the environment, as well as acquiring new skills in the field of environmental law. For law graduates, the opportunity is to extend their knowledge into environmental aspects of law, as well as to gain an understanding of some of the concepts underpinning environmental science.

Course outcomes

Upon completion of the Master of Environmental Science and Law graduates will possess a practical and theoretical background in aspects of Environmental Science and Environmental Law. This knowledge includes research and practical skills in these areas. The program is designed to integrate disciplines which are normally considered separately and which would be difficult to study outside of the Master of Environmental Science and Law program.

Units of study

The table lists the units of study available within this degree. Other units are possible with the permission of the Director of Environmental Science.
Note: Law units of study are taught in intensive mode. Units offered change from time to time. Contact the Faculty of Law for a complete and up to date list.

Unit of study descriptions

Environmental Science and Law Units of Study 2009

ENVI5501
Environmental Research Project

Credit points: 12 **Session:** Semester 1, Semester 2 **Classes:** Meetings arranged with supervisor. **Prerequisites:** 24 credit points of study with a credit average or better **Assessment:** Written report and continuous assessment

Note: This unit of study is available only to students enrolled in AppSc(EnvSc)

A valuable opportunity to apply some of the knowledge gained from earlier coursework, ENVI5501 consists of a research project as arranged between you (the student) and an appropriate supervisor. The project topic may contain a field or laboratory component, or may be entirely literature-based. The only requirement is that the topic be of environmental emphasis, meaning that potential topics range from ecotourism to pollution detection and monitoring, erosion to solar power, environmental law to conservation biology. The topic must also be able to be completed within the timeframe of 16 weeks (one semester) of investigation, including the literature survey, sample and data collection, analysis of data and results, and write up of the report. This unit is not conducted by way of a number of contact hours per week for a semester. Instead, the student will work on the project full-time (aside from other study commitments) in a continuous manner for the entire duration (1 semester). Any student interested in taking ENVI5501 should contact the postgraduate advisor for Environmental Science to discuss their project and for help in selecting and appropriate supervisor.

ENVI5705
Ecolog Principles for Environ Scientists

Credit points: 6 **Teacher/Coordinator:** Dr Charlotte Taylor **Session:** Semester 1 **Classes:** One 3 hour lecture per week. **Assessment:** Assignment, presentation.

Note: This is a compulsory course for all levels of the postgraduate Applied Science (Environmental Science) program.

This unit of study introduces fundamental concepts of modern ecology for environmental scientists so as to provide non-biologically trained persons an understanding of the nomenclature of ecology and the physical parameters represented.

ENVI5707
Energy - Sources, Uses and Alternatives

Credit points: 6 **Teacher/Coordinator:** Dr Chris Dey **Session:** Semester 2 **Classes:** Two 1 hour lectures per week and three field trips per semester. **Assessment:** Assignment, presentation and quiz

Environmental impacts of energy generation and use are addressed in this unit of study. Major topics include discussion of the various energy sources, global energy resources, the economics associated with energy production, the politics and culture that surrounds energy use, and the alternative sources of solar thermal and photovoltaic energy and atmospheric systems. This unit of study includes several field trips to energy utilities and industry groups associated with alternate energy sources and generation.

ENVI5708
Introduction to Environmental Chemistry

Credit points: 6 **Teacher/Coordinator:** A/Prof Gavin Birch **Session:** Semester 1 **Classes:** Two 1 hour lectures and one practical per week; one field trip per semester. **Assessment:** Assignment, presentation and report

Note: This is a compulsory course for the Grad Dip and Masters levels of the Applied Science (Environmental Science) program.

Introduction to Environmental Chemistry provides the basic chemical knowledge required to be able to understand chemical analysis of air, water and soil samples taken in the field. This is supplemented by a field-based project analysing soil and sediment samples for trace pollutants from locations in and around Sydney. This unit of study involves 4 contact hours per week for one semester as well as some time in the field as arranged with the class.

ENVI5808
App Ecology for Environmental Scientists

Credit points: 6 **Teacher/Coordinator:** Dr Clare McArthur **Session:** Semester 2 **Classes:** Three 1 hour lectures per week. **Assessment:** Essays and presentations

Note: This is a compulsory unit for all levels of the postgraduate Applied Science (Environmental Science) program

This unit of study complements ENVI5705, and covers in depth the concerns of modern ecology pertaining to both terrestrial and marine ecosystems. An understanding of the complex issues of invasive species, conservation of biodiversity and ecological management of the environment is provided.

ENVI5809
Environmental Simulation Modelling

Credit points: 6 **Teacher/Coordinator:** Dr David Chapman **Session:** Semester 1 **Classes:** Six workshops. **Assessment:** Report

The concept and use of computer modelling in natural resource management is introduced in this unit of study, which is aimed particularly at non-programmers.

GEOG5001
Geographic Information Science A

Credit points: 6 **Teacher/Coordinator:** Dr David Chapman **Session:** Semester 1, Semester 2 **Classes:** Six workshops. **Assessment:** Report

This unit of study gives an overview of basic spatial data models, and enables students to understand the import and export of data to and from a geographical information system (GIS). The manipulation of spatial data at a level appropriate to planning or locational applications, and the development of thematic maps from diverse data layers, will be addressed.

GEOG5002
Geographic Information Science B

Credit points: 6 **Teacher/Coordinator:** Dr Eleanor Bruce **Session:** Semester 2 **Classes:** One 2 hour lectures, one 1 hour tutorial, one 3 hour practical per week for 6 weeks. **Assumed knowledge:** GEOG5001 **Assessment:** 2500 word assignment, seminar presentation, tutorial reports, WebCT quiz.

This course will provide the conceptual background to more advanced GIS analysis applications and spatial reasoning methods in the context of contemporary environmental issues. The course is designed to provide an understanding of spatial analysis techniques available within a GIS environment, explore a diversity of both social and physical environmental applications and address emerging issues in GIS research. A range of topics will be introduced including field based capture of spatial information, spatial data structures, surface modelling, visibility analysis, hydrological modeling, network analysis, spatial data uncertainty and social GIS.

Conceptual material presented in lectures and tutorial workshops will be placed in an applied context through a series of laboratory and field sessions designed to strengthen practical understanding and awareness of GIS methods.

WILD5001
Australasian Wildlife: Introduction

Credit points: 6 **Teacher/Coordinator:** Professor Chris Dickman **Session:** S1 Intensive **Classes:** Intensively taught unit, the remainder of the unit will involve personal study and project activity. See the Wildlife Health and Population Management website for dates. **Assessment:** assessments for each unit may include practical work, field studies, student presentations and written reports

This unit of study provides an introduction to the wildlife of Australasia, an overview of the present status of that wildlife, and an understanding of both conservation problems and management solutions. Issues in wildlife management are exemplified using a broad range of vertebrate species occupying different environments. Emphasis is placed on providing students with a coordinated and interdisciplinary approach to wildlife health and management, and on developing expertise in recognising and solving a broad range of problems in field populations. The unit integrates lectures, practical work and supervised study, and offers students the opportunity to work through real-world wildlife conservation problems relevant to their individual backgrounds.

WILD5002
Australasian Wildlife: Field Studies

Credit points: 6 **Teacher/Coordinator:** Professor Chris Dickman **Session:** S1 Intensive **Classes:** Intensively taught unit. See the Wildlife Health and Population Management website for dates. **Assessment:** Assessments for each unit may include practical work, field studies, student presentations and written reports

This unit of study provides a first-hand introduction to the wildlife of Australasia, a practical overview of the present status of that wildlife, and an understanding of both conservation problems and management solutions. Issues in wildlife management are exemplified using sampling and diagnostic methods on a broad range of vertebrate species occupying different environments. The unit follows on from WILD5001 and provides practical experience via a five day field trip.

LAWS6252
Legal Reasoning & the Common Law System

Credit points: 6 **Teacher/Coordinator:** Prof Terry Carney (S1 Intensive - Group A), Dr Thalia Anthony (S1 Late Int - Group B), TBA (S2 Intensive - Group C) **Session:** S1 Intensive, S1 Late IntB, S2 Late IntA **Classes:** block/intensive **Prohibitions:** LAWS6881 **Assessment:** compulsory attendance/completion of workshops, 2x2500wd assignments (50% each)

Note: International candidates must enrol in the Week 1 intensive session of their first semester of study.

This is a compulsory unit for all postgraduate candidates who do not hold a degree in law entering the: Master of Administrative Law and Policy; Master of Environmental Law; Master of Environmental Science and Law; Master of Health Law; Master of International Business and Law; Master of Labour Law and Relations as well as Graduate Diplomas offered in these programs.

The unit has been designed to equip candidates with the necessary legal skills and legal knowledge to competently apply themselves in their chosen area of law. Instruction will cover the legislative process; the judiciary and specialist tribunals; precedent; court hierarchies; legal reasoning; constitutional law; administrative law; contracts; and torts. Some elements of the unit will be tailored in accordance with the requirements of the particular specialist programs.

LAWS6044
Environmental Law and Policy

Credit points: 6 **Teacher/Coordinator:** Adj Prof Gerry Bates **Session:** S1 Intensive, S2 Intensive **Classes:** block/intensive mode **Corequisites:** LAWS6252 or law degree from a common law jurisdiction **Assessment:** 2x4000wd essays (50% each)

Note: compulsory for all environmental law candidates

The aim of the unit is to introduce candidates to overarching themes in environmental law and policy as a foundation to their more detailed studies for the Environmental Law Program. This is an overview unit addressing a number of environmental issues at various levels of analysis; such as policy making, implementation of policy and dispute resolution. The unit covers the law and policy relating to environmental planning, environmental impact assessment, pollution and heritage. The concept of ecologically sustainable development and its implications for environmental law and policy is a continuing theme. The unit is designed to develop multi-dimensional thinking about environmental issues and the strategies needed to address them. The unit provides a broad background of the political and economic issues in so far as they are related to the legal issues involved.

LAWS6041
Environmental Dispute Resolution

This unit of study is not available in 2009

Credit points: 6 **Teacher/Coordinator:** Assoc Prof Rosemary Lyster, Ms Kate Miles, Ms Nicola Franklin **Session:** S1 Late Int **Classes:** block/intensive mode **Corequisites:** Please refer to the Law Faculty Handbook for requirements specific to your course **Assessment:** 1x7000wd essay (80%) and class participation (20%)

This unit aims to explore the nature of environmental disputes and the means of resolving them. The means examined include judicial review, administrative appeals and public inquiries and non-adjudicative or consensual means such as mediation. Critical evaluation of the forms and limits of dispute resolution strategies, including appropriateness of each means in resolving different types of environmental disputes, will be explored. The unit involves the use of innovative teaching techniques: lectures will be alternated with small group workshops, mediation simulations, a public inquiry and a mock court-hearing. In addition to the lecturers, there are guest lecturers including (subject to availability) a Land and Environment Court judge, Commissioner of Inquiry, Senior Counsel and a trained mediator from the Land and Environment Court. Participation in the practical exercises is a compulsory condition of the unit.

LAWS6043
Environmental Impact Assessment Law

Credit points: 6 **Session:** S2 Late IntB **Classes:** block/intensive **Assessment:** 1x4000wd essay (50%) and 1xtake home exam (50%)

This unit has three fundamental aims. The first is to provide a sound analysis of Environmental Impact Assessment (EIA) procedures in NSW and at the Commonwealth level. The second aim is to develop a critical understanding of EIA as a distinctive regulatory device by examining its historical, ethical and political dimensions as well as relevant aspects of legal theory. The third and ultimate aim is to combine these doctrinal and theoretical forms of knowledge so we can suggest possible improvements to the current practice of EIA in Australia.

LAWS6045
Environmental Planning Law

Credit points: 6 **Teacher/Coordinator:** Ms Nicola Franklin, Dr Andrew Edgar **Session:** S1 Late IntC **Classes:** block/intensive **Assessment:** 1x4000wd essay (50%) and 1x4000wd problem-based assignment (50%)

This unit examines the legal and institutional structures in New South Wales for land-use regulation and the resolution of land-use conflicts. The focus is on environmental planning, development control and environmental impact assessment under the Environmental Planning and Assessment Act 1979 (NSW) and cognate legislation. The unit provides an opportunity to explore contemporary urban issues, such as urban consolidation and infrastructure funding. Federal interest in the cities is also examined. While an important aim of the unit is to provide candidates with an understanding of the New South Wales environmental planning system, the unit also aims to develop the capacity to evaluate environmental policies and programs through exploring theoretical perspectives on the function of environmental planning. The unit will critically evaluate the function and design of environmental planning systems and the legal ambit of planning discretion. Significant influences, such as escalating environmental and social concerns about our cities, will be discussed, together with an evaluation of processes and forums for public involvement in land-use policy and decision making. A good grounding in this area will be of assistance to candidates undertaking other units in the Environmental Law Program.

LAWS6055
Heritage Law

This unit of study is not available in 2009

Credit points: 6 **Teacher/Coordinator:** Prof Ben Boer **Session:** S2 Late Int **Classes:** block/intensive mode **Corequisites:** Please refer to the Law Faculty Handbook for requirements specific to your course **Assessment:** 1x4000wd research paper (50%) and 1xproblem assignment (50%) **Practical field work:** field trip

This unit focuses on the conservation of natural and cultural heritage, including intangible heritage, underwater heritage and Australian Aboriginal heritage. International, national, state and local regimes for heritage conservation are looked at and put into the context of broader environmental decision making. The unit aims to bring together a range of interdisciplinary strands in archaeology, anthropology, cultural and natural history, art, architecture and urban planning, and to weave them into a framework for the legal protection of world, national, state and local heritage. An integral component of the unit is field trip to areas of relevance to cultural and natural heritage conservation, focusing on northern New South Wales. Places to be studied include various towns and sites on the New South Wales State Heritage Register and on local government heritage lists, as well as habitats of threatened species and ecological communities and World Heritage areas listed under the relevant Commonwealth and State legislation. The field trip provides a unique opportunity to understand how principles of international and domestic law are implemented locally. The field trip component will be arranged in conjunction with the field trip for LAWS6165 Biodiversity Law. Candidates are encouraged to take both units of study; they are designed to complement each other closely.

Textbooks
A book of reading materials and a field trip manual will be prepared and distributed

LAWS6061
International Environmental Law

Credit points: 6 **Teacher/Coordinator:** Prof Ben Boer **Session:** S1 Late IntB **Classes:** block/intensive mode **Assessment:** 1x2500wd problem-based assignment (30%) and 1x5500wd essay (70%)

This unit aims to provide candidates with an overview of the development of international environmental law throughout the twentieth century. Attention will primarily be devoted to the international law and policy responses to global and regional environmental and resource management issues. Basic principles will be discussed prior to taking a sectoral approach in looking at the application of international environmental law in specific issue areas. The unit includes material on implementation of international environmental law in the Asia Pacific region. Relevant Australian laws and initiatives will be referred to from time to time. The focus is on law and policy that has been applied to deal with environmental problems in an international and transboundary context.

LAWS6081
Natural Resources Law

This unit of study is not available in 2009

Credit points: 6 **Teacher/Coordinator:** Dr Gerry Bates **Session:** S1 Late Int **Classes:** block/intensive mode 4-5 days (9am-5pm). See timetable. **Corequisites:** LAWS6252 and LAWS6044 for MEL, GradDipEnvLaw and MEnvSciLaw candidates **Assessment:** 1xproblem-based 4000wd assignment (50%) and 1x4000wd essay (50%)

This unit examines the conflicts over the use and conservation of natural resources and how they can be resolved through legal and other mechanisms. Commonwealth and State arrangements on topics such as forestry, mining, agriculture, soil and water use, national parks, Aboriginal land rights, fisheries and tourism are selectively examined, drawing on the international context where necessary. The unit aims to familiarise students with debates over resource management and the role of various government sectors in these debates. The theme of ecologically sustainable development is explored throughout the unit, emphasizing the need to generate specific legal and other strategies to address the concerns of government, the private sector and conservation groups for each specific resource area.

LAWS6082
Pollution Law

This unit of study is not available in 2009

Credit points: 6 **Teacher/Coordinator:** Ms Nicola Franklin (Co-ordinator), Dr Gerry Bates **Session:** S2 Late Int **Classes:** block/intensive mode 4-5 days (9am-5pm). See timetable. **Prerequisites:** (LAWS6252 or LAWS6881 for GradDipPubHL candidates) and (LAWS6252 and LAWS6044 for MEL, GradDipEnvLaw and MEnvSciLaw candidates) **Assessment:** 1xproblem-based 4000wd assignment (50%) and 1x4000wd essay (50%)

This unit examines approaches to pollution prevention and control, with particular emphasis on regulation and enforcement. Compliance, deterrence and incentive strategies are evaluated, as is corporate environmental responsibility and accountability. The unit includes a study of environmental standards, permitting and land-use controls,

administrative and civil enforcement, prosecution discretion and criminal and civil liability. Overarching themes are precaution and prevention, integrated pollution control, and community right to know and participate. The legislative and administrative framework that is studied is that of New South Wales, although comparisons are made with other jurisdictions. The federal dimension, including implementation of the Inter-governmental Agreement on the Environment, in particular Schedule 4, is discussed.

LAWS6141
Asia Pacific Environmental Law

Credit points: 6 **Teacher/Coordinator:** Ms Nicola Franklin, Assoc Prof Heng **Session:** S2 Late IntB **Classes:** block/intensive **Assessment:** 1x7000wd essay (80%) and class participation (20%)

In this unit, the environmental legal systems and environmental management regimes of selected countries and groups of countries in the Asia Pacific will be studied against the background of relevant international and regional environmental law and administration. Unit topics will be divided into four sub-regions: Pacific Island Developing Countries; South East Asia Region (ASEAN and Mekong countries); North Asian Region (Japan, People's Republic of China); West Asian Region (South Asian Association of Regional Cooperation [SAARC] Countries). In relation to each region, the implications of the international and regional environmental law framework will be explored, followed by case studies involving issues such as biodiversity, natural resources and environmental planning; industrial pollution; environmental impact assessment; climate change; legal and institutional arrangements for environmental management.

LAWS6154
Sustainable Development Law in China

Credit points: 12 **Teacher/Coordinator:** Ms Nicola Franklin, Prof Ben Boer **Session:** S1 Late Int **Classes:** block/intensive at Jiaotong University, Shanghai, China **Assessment:** 1x15000wd research paper (100%)

Note: For further travel information, please visit www.law.usyd.edu.au/accel/index.shtml or contact Law.Accel@usyd.edu.au

This 12 credit point unit comprises an intensive series of lectures and field trips in Shanghai, People's Republic of China, followed by supervised research. The location for lectures is Shanghai Jiaotong University. The unit is designed to: introduce the legal and institutional framework of environmental law and policy in China; and encourage comparative and jurisprudential studies of Chinese environmental law and policy.

The lectures and field trips are undertaken over a period of two weeks. The unit is taught principally by Chinese academics at Shanghai Jiaotong University. Candidates are given an introduction to Chinese law and the Chinese legal system before embarking on a study of Chinese environmental law. Field trips are included. It is likely that there will be a visit to the State Environment Protection Authority and to Huangshan, a World Heritage area.

LAWS6163
Energy and Climate Law

Credit points: 6 **Teacher/Coordinator:** Assoc Prof Rosemary Lyster **Session:** S1 Late IntC **Classes:** block/intensive **Prohibitions:** LAWS6863 **Assessment:** class participation (20%) and 1x7000wd essay (80%)

Note: This unit replaced LAWS6163 Energy Law

This unit adopts an inter-disciplinary and integrative approach to understanding the dynamics of one of the most pressing global environmental concerns ecologically sustainable energy use. Working loosely within the framework of the Climate Change Convention, the unit relies on the perspectives of scientists, lawyers and economists to develop an integrated approach to sustainable energy use. The unit identifies current patterns of energy use in Australia and examines Australia's response to the Climate Change Convention. It also analyses the strengths and weaknesses of various political, legal and economic mechanisms for influencing the choice of energy use. The initiatives of the Commonwealth and New South Wales governments, as well as local councils, to promote sustainable energy use and to combat global warming are scrutinised.

LAWS6165
Biodiversity Law

Credit points: 6 **Teacher/Coordinator:** Adj Prof Brian Preston, Ms Susan Shearing **Session:** S2 Late IntB **Classes:** block/intensive **Assessment:** 1x8000wd research paper (100%) **Practical field work:** field trip

The unit takes an interdisciplinary approach to the conservation of biodiversity. Key concepts in ecology are explained to provide a foundation for the legal framework. This framework is examined at international, national, and state levels, in terms of conventions and legislation, as well as policy and organisations. The legal framework is explored both by analysing the proper purpose, scope and effect of the laws, as well as how they work in practice. The latter is achieved by lectures and field exercises assisted by officers of government agencies, including State Forests, the National Parks and Wildlife Service and the Department of Infrastructure, Planning and Natural Resources. An integral component of the unit is a field trip to areas of relevance to biodiversity conservation, focusing on northern New South Wales. Areas to be studied include habitats of threatened species and ecological communities and World Heritage areas listed under the relevant Commonwealth and State legislation. Field studies provide a unique opportunity to understand how principles of international and domestic law are implemented locally. The field trip component will be arranged in conjunction with the field trip for LAWS6055 Heritage Law (if offered). Candidates are encouraged to take both units of study; they are designed to complement each other closely.

Textbooks
a book of reading materials and a field trip manual will be prepared and distributed

LAWS6191
Water Law

Credit points: 6 **Teacher/Coordinator:** Assoc Prof Rosemary Lyster **Session:** S1 Late IntB **Classes:** block/intensive **Assessment:** 1x7000wd essay (80%) and class participation (20%)

This unit examines the ecologically sustainable management of water resources incorporating legal, scientific and economic perspectives. The legal analysis incorporates the following: international principles of water law; Commonwealth and state responsibilities for water management; the Water Management Act 2000 (NSW); the legal and constitutional implications of the reallocation of rights to use water; the implications of allocation and use for Indigenous people; the regulation of water pollution; and the corporatisation and privatisation of water utilities. Case studies from a number of jurisdictions are used to explore these themes. Economic perspectives include the impact of National Competition Policy on water law while the principles of sustainable water management are discussed within a scientific paradigm.

LAWS6257
Public Policy

Credit points: 6 **Teacher/Coordinator:** Prof Patricia Apps **Session:** S2 Late IntB **Classes:** block/intensive **Prohibitions:** LAWS6139, LAWS6042, LAWS6113 **Assessment:** 1xresearch essay (90%), 1x problem based assignment and class presentation of a case study (10%)

Note: compulsory for MALP candidates

The aim of the unit is to provide an understanding of the role of government policy within the analytical framework of welfare economics. Questions of central interest include: What are the conditions that justify government intervention? How can policies be designed to support basic principles of social justice? What kinds of reforms promote economic efficiency?

Applications will range from taxation and social security to environmental regulation and protection, and will cover the following specific topics: The structure of the Australian tax-benefit system; Uncertainty and social insurance; Unemployment, health and retirement income insurance; Externalities, environmental taxes and tradeable permits; Monopoly and environmental regulation; Utility pricing and access problems; Cost benefit analysis, intergenerational equity and growth.

The unit will provide an overview of the main empirical methodologies used in evaluating policy reforms in these areas. Candidates may select to specialise in one or more of the policy areas.

LAWS6833
European Environmental Law

Credit points: 6 **Teacher/Coordinator:** Adj Prof Gerry Bates **Session:** S1 Late IntC **Classes:** block/intensive **Assessment:** 1x8000wd research essay (100%)

This unit examines fundamental concepts that govern environmental law in the European Union and how environmental policy is developed and translated into the domestic laws of countries that form the EU. The influences at work behind the formulation of environmental policy, and therefore of environmental law, is explored. The unit also examines environmental democracy in the EU and implementation and enforcement of EU environmental laws. Areas of environmental law that are covered include environmental assessment, biodiversity, integrated pollution prevention and control, the European Climate Change Programme, and waste management. The unit encourages comparative analysis between the formation and implementation of environmental law in the EU and the Australian federal environmental law system.

Resolutions

Master of Environmental Science and Law (MEnvSci and Law)

1. **Admission**

1.1 The Dean of the Faculty of Science may admit to candidature:
1.1.1 graduates of the University of Sydney holding the degree of Bachelor of Science (BSc) or Bachelor of Laws (LLB); or
1.1.2 graduates of other universities or other appropriate institutions who have qualifications equivalent to those specified in subsection 1.1.1.

2. **Units of study**

2.1 The units of study for the Master of Environmental Science and Law are listed in the Table associated with these resolutions.

3. **Requirements for the Master of Environmental Science and Law**

3.1 Candidates for the Master of Environmental Science and Law are required to complete satisfactorily 48 credit points selected from units of study approved by the Faculties of Science and Law including:
3.1.1 a core unit of study (LAWS6044);
3.1.2 LAWS6252 is compulsory for students who do not have a law background
3.1.3 a minimum of 24 credit points selected from units of study offered by each Faculty.

Faculty Rules

4. **Details of units of study**

4.1 The units of study for the Master of Environmental Science and Law are listed in the following table:

Unit of study	
Unless otherwise indicated, all units are worth 6 credit points	
Core units	
LAWS6252	Legal Reasoning and Common Law System
LAWS6044	Environmental Law and Policy
Science Units (= recommended)*	
ENVI5501	Environmental Research Project (12cp)
ENVI5705*	Ecological Principles for Environmental Scientists
ENVI5707	Energy - Sources, Uses and Alternatives
ENVI5708*	Introduction to Environmental Chemistry
ENVI5808*	Applied Ecology for Environmental Scientists
ENVI5809	Computer Modelling and Resource Management
GEOG5001	Geographic Information Science A
GEOG5002	Geographic Information Science B
WILD5001	Australasian Wildlife: Introduction
WILD5002	Australasian Wildlife: Field Studies
Law units (# = offered every second year)	
LAWS6041	Environmental Dispute Resolution
LAWS6042	Environmental Economics
LAWS6043	Environmental Impact Assessment Law
LAWS6045	Environmental Planning Law
LAWS6055	Heritage Law
LAWS6081	Integrated Natural Resources Management
LAWS6061	International Environmental Law
LAWS6082#	Pollution Law
LAWS6154	Sustainable Development Law in China
LAWS6163	Energy Law
LAWS6165	Biodiversity Law
LAWS6186	Native Title - Co-Existence Perspectives
LAWS6191#	Water Law
LAWS6257	Public Policy

4.2 A candidate for the course shall proceed by completing units of study as prescribed by the Faculty.
4.3 A unit of study shall consist of such lectures, seminars, tutorial instruction, essays, exercises, practical work, or project work as may be prescribed.
4.4 In these resolutions, 'to complete a unit of study' or any derivative expression means:
4.4.1 to attend the lectures and the meetings, if any, for seminars or tutorial instruction;
4.4.2 to complete satisfactorily the essays, exercises, practical and project work if any; and
4.4.3 to pass any other examination of the unit of study that may apply.
4.5 All units of study for a particular subject area may not be available every semester.
4.6 A candidate shall complete coursework to the value of 48 credit points.
4.7 The Dean may allow substitution of any unit of study by another unit of study, including units of study from other postgraduate coursework programs in the Faculties of Science and Law, or elsewhere in the University.

5. **Enrolment in more/less than minimum load**

5.1 A candidate may proceed on either a full-time or a part-time basis.

6. **Cross-institutional study**

6.1 Cross-institutional study shall not be available to students enrolled in the Master of Environmental Science and Law except where the University of Sydney has a formal Cooperation Agreement with another University.

7. **Restrictions on enrolment**

7.1 Admission to the Master of Environmental Science and Law may be limited by a quota.
7.2 In determining the quota, the University will take into account:
7.2.1 availability of resources including space, laboratory and computing facilities; and
7.2.2 availability of adequate and appropriate supervision.
7.3 In considering an application for admission to candidature the Dean shall take account of the quota and will select, in preference, applicants who are most meritorious in terms of subsection 1 above.

8. **Discontinuation of enrolment**

8.1 A student who does not enrol in any semester without first obtaining written permission from the Dean to suspend candidature will be deemed to have discontinued enrolment in the course.

8.2 Students who have discontinued from the course will be required to apply for admission to the course and be subject to admission requirements pertaining at that time.

9. **Suspension of candidature**

9.1 A student may seek written permission from the Dean to suspend candidature in the course.

9.2 Suspension may be granted for a maximum of one year.

10. **Re-enrolment after an absence**

10.1 A student who plans to re-enrol after a period of suspension must advise the Faculty of Science Office in writing of their intention by no later than the end of October for First Semester of the following year or the end of May for Second Semester of the same year.

11. **Satisfactory progress**

11.1 Candidates for the Master of Environmental Science and Law shall be governed by the rule as follows:

11.1.1 A student who has failed a cumulative total of 12cp at any stage of enrolment in the Master of Science and Law will be required to show good cause why he or she should be allowed to re-enrol and, if good cause has not been established, the student's enrolment will be terminated and the student will not be permitted to re-enrol.

12. **Time limit**

12.1 A candidate for the Master of Environmental Science and Law shall complete the requirements for the award in a minimum of two semesters and a maximum of ten semesters, and except with permission of the Faculty, within six calendar years of admission to candidature.

13. **Assessment policy**

13.1 A candidate may be tested by written and oral examinations, assignments, exercises and practical work or any combination of these.

13.2 On completion of the requirements for the degree, the Dean shall determine the results of the candidature.

14. **Credit transfer policy**

14.1 A candidate who, before admission to candidature, has spent time in graduate study and, within the previous three years, has completed coursework considered by the Faculty to be equivalent to units of study prescribed for the degree, for which no award has been conferred, may receive credit of up to 12 credit points towards the requirements for the degree of Master of Environmental Science and Law.

15. **Authority of the Deans**

15.1 The Deans of Science and Law shall jointly exercise authority in any matter concerning the course not otherwise dealt with in these resolutions.

Environmental Science Applied Science degrees

Master of Applied Science (Environmental Science)

Degree Code: LC033

Graduate Diploma in Applied Science (Environmental Science)

Degree Code: LF020

Graduate Certificate in Applied Science (Environmental Science)

Degree Code: LG004

Further information can be found on the Environmental Science website: www.usyd.edu.au/envsci

Course overview

The Graduate Certificate in Applied Science (Environmental Science), Graduate Diploma in Applied Science (Environmental Science) and Master of Applied Science (Environmental Science) are articulated coursework programs that allow a large degree of flexibility in the depth at which studies are undertaken and the choice of subjects studied. Some of the major themes addressed include environmental sciences, environmental politics and law, project evaluation and assessment, decision making and conflict resolution.

Course outcomes

The articulated award program in Environmental Science is designed for both recent graduates wishing to obtain employment in the environmental field and for graduates already working in an environmental sphere who are interested in gaining either a formal qualification in environmental science or additional information about related areas of environmental science.

Environmental managers and scientists are increasingly finding that they need to have a broad interdisciplinary knowledge base and the ability to be flexible and innovative in their application of such knowledge. Thus the aim of this award program is to provide students with the ability to solve environmental problems that require the integration of knowledge from diverse disciplines. Emphasis is placed on studies which span several disciplines, adaptive problem solving, and the development of new skills and expertise.

Upon completion of the graduate certificate, graduates will possess a practical and theoretical background in some of the basic aspects of environmental science. This can be supplemented and extended upon completion of the graduate diploma, and extended further to include research and practical skills upon completion of the master's program. Students completing the full postgraduate program will have a solid grounding in all basic areas of environmental science, enabling them to understand the environmental problems that can arise and the disparate solutions that can be applied to solve such problems, and to comprehend all aspects of environmental assessment.

Graduates of the Master of Applied Science (Environmental Science) who have completed the 12cp Research Project ENVI5501 are eligible to apply for admission to a research degree (MSc, MSc (Environmental Science) or PhD).

Units of study

The table lists the units of study available within this degree.

Not all units of study may be available every semester. The faculty may allow substitution of any unit of study by an approved unit of study, including units of study from other postgraduate coursework programs in the faculty or elsewhere in the University.

Unit of study descriptions

Environmental Science units of study

Core units of study

ENVI5705
Ecolog Principles for Environ Scientists

Credit points: 6 **Teacher/Coordinator:** Dr Charlotte Taylor **Session:** Semester 1 **Classes:** One 3 hour lecture per week. **Assessment:** Assignment, presentation. **Campus:** Camperdown/Darlington **Mode of delivery:** Normal (lecture/lab/tutorial) Day

Note: This is a compulsory course for all levels of the postgraduate Applied Science (Environmental Science) program.

This unit of study introduces fundamental concepts of modern ecology for environmental scientists so as to provide non-biologically trained persons an understanding of the nomenclature of ecology and the physical parameters represented.

ENVI5708
Introduction to Environmental Chemistry

Credit points: 6 **Teacher/Coordinator:** A/Prof Gavin Birch **Session:** Semester 1 **Classes:** Two 1 hour lectures and one practical per week; one field trip per semester. **Assessment:** Assignment, presentation and report **Campus:** Camperdown/Darlington **Mode of delivery:** Normal (lecture/lab/tutorial) Day

Note: This is a compulsory course for the Grad Dip and Masters levels of the Applied Science (Environmental Science) program.

Introduction to Environmental Chemistry provides the basic chemical knowledge required to be able to understand chemical analysis of air, water and soil samples taken in the field. This is supplemented by a field-based project analysing soil and sediment samples for trace pollutants from locations in and around Sydney. This unit of study involves 4 contact hours per week for one semester as well as some time in the field as arranged with the class.

ENVI5808
App Ecology for Environmental Scientists

Credit points: 6 **Teacher/Coordinator:** Dr Clare McArthur **Session:** Semester 2 **Classes:** Three 1 hour lectures per week. **Assessment:** Essays and presentations **Campus:** Camperdown/Darlington **Mode of delivery:** Normal (lecture/lab/tutorial) Day

Note: This is a compulsory unit for all levels of the postgraduate Applied Science (Environmental Science) program

This unit of study complements ENVI5705, and covers in depth the concerns of modern ecology pertaining to both terrestrial and marine ecosystems. An understanding of the complex issues of invasive species, conservation of biodiversity and ecological management of the environment is provided.

ENVI5904
Understanding Environmental Uncertainty

Credit points: 6 **Teacher/Coordinator:** Associate Professor Ross Coleman **Session:** Semester 2 **Classes:** One three hour lecture per week for 8 weeks. **Assessment:** Tutorials, oral presentations and written reports. **Campus:** Camperdown/Darlington **Mode of delivery:** Normal (lecture/lab/tutorial) Day

No assessment of potential environmental impacts is possible without relevant information about the ecological consequences. This unit is for those without a science degree, to explain the need to quantify and what are relevant measures. Describing and understanding uncertainty will be explained in the context of precautionary principles. Issues about measuring biodiversity and the spatial and temporal problems of ecological systems will be introduced.

Optional units of study

ENVI5707
Energy - Sources, Uses and Alternatives

Credit points: 6 **Teacher/Coordinator:** Dr Chris Dey **Session:** Semester 2 **Classes:** Two 1 hour lectures per week and three field trips per semester. **Assessment:** Assignment, presentation and quiz **Campus:** Camperdown/Darlington **Mode of delivery:** Normal (lecture/lab/tutorial) Day

Environmental impacts of energy generation and use are addressed in this unit of study. Major topics include discussion of the various energy sources, global energy resources, the economics associated with energy production, the politics and culture that surrounds energy use, and the alternative sources of solar thermal and photovoltaic energy and atmospheric systems. This unit of study includes several field trips to energy utilities and industry groups associated with alternate energy sources and generation.

ENVI5801
Social Science of Environment

Credit points: 6 **Teacher/Coordinator:** Dr P McManus **Session:** Semester 1 **Classes:** 2hrs lectures and 2 hrs tutorials per week plus directed reading. The unit runs for weeks 1-7 **Assessment:** essay and seminar presentation **Campus:** Camperdown/Darlington **Mode of delivery:** Normal (lecture/lab/tutorial) Day

This unit provides both a conceptual and an empirical foundation for the analysis of relationships between society, the environment and natural resources. Contexts for application of social science concepts to the environment include climate change, water resources management, forest issues and urban environmental quality. Students will deal with both broad theoretical approaches to the societal analysis of relationships between people and the environment, for example political ecology, and with specific themes including the sociological basis of collective action, property relations, resource tenure, decentralisation, participatory approaches to environmental and natural resource management, and systems of knowledge. The unit pays particular attention to the implications of heterogeneous and competing interests for environmental and natural resource management and explores ways of dealing with diverse stakeholder interests. Empirical material is drawn from various countries, with special emphasis on Southeast Asia and Australia. The aim of the unit is to provide conceptual tools that will be used in other units of study within the program and for application in analysis of resource and environmental management issues faced in real world decision-making contexts. The unit will draw on the professional experience and agency roles of participants. The unit is taught through a combination of lectures and reading-based seminars.

ENVI5803
Law and the Environment

Credit points: 6 **Teacher/Coordinator:** Dr Gerry Bates **Session:** Semester 1 **Classes:** One 2 hour lectures per week. **Assessment:** Essays **Campus:** Camperdown/Darlington **Mode of delivery:** Normal (lecture/lab/tutorial) Day

This unit of study provides an overview of Australian and international law as it pertains to the environment. It looks at a number of environmental issues at the various levels of analysis, policy making, implementation of policy and dispute resolution. It also provides a broad background to political and economic issues as they related to the legal issues. This unit of study involves lecture material and an essay on policy issues.

ENVI5805
The Urban Environment and Planning

Credit points: 6 **Teacher/Coordinator:** Dr John Dee **Session:** Semester 1 **Classes:** Eight lectures and eight 2 hour seminars per semester **Assessment:** Report and short research paper **Campus:** Camperdown/Darlington **Mode of delivery:** Normal (lecture/lab/tutorial) Day

The aim of this unit of study is to introduce the concepts and procedures which are relevant to the application of scientific analysis to the formulation of urban and regional development policy and strategies.

ENVI5809
Environmental Simulation Modelling

Credit points: 6 **Teacher/Coordinator:** Dr David Chapman **Session:** Semester 1 **Classes:** Six workshops. **Assessment:** Report **Campus:** Camperdown/Darlington **Mode of delivery:** Normal (lecture/lab/tutorial) Day

The concept and use of computer modelling in natural resource management is introduced in this unit of study, which is aimed particularly at non-programmers.

ENVI5903
Sustainable Development

Credit points: 6 **Teacher/Coordinator:** Dr Phil McManus **Session:** Semester 2 **Classes:** Two 2 hour lectures per week for seven weeks. **Assessment:** Essay and presentation **Campus:** Camperdown/Darlington **Mode of delivery:** Normal (lecture/lab/tutorial) Day

This unit of study demonstrates the history and contested understandings of the concept of sustainable development. It applies these concepts to explore important environmental science issues such as population, water management sustainable cities, rural development, industrial ecology, and energy issues. The unit concludes by presenting a range of future scenarios and encouraging students to develop their own vision of sustainability at the global and other scales, and to communicate their means of achieving this sustainability vision.

ENVI5905
Management of Parks

Credit points: 6 **Teacher/Coordinator:** A/Prof Deirdre Dragovich **Session:** Semester 2 **Classes:** Lectures 2hrs for 6 weeks, Practical work 3 hrs for 3 wks, Fieldwork 21 hrs (2.5 days), Total / week 7 hrs average **Assessment:** A prac report, assignment, one 1hr exam **Campus:** Camperdown/Darlington **Mode of delivery:** Normal (lecture/lab/tutorial) Day

This unit of study evaluates the reasons for the existence of parks, including National Parks, recreational spaces and reserves, and examines the applied aspects of their management. Topics covered include conservation, ecotourism, plans of management and their implementation (with particular emphasis on the remediation of the impacts of visitor numbers and erosion), fire control practices and resource management. Students will visit various parks within the Sydney region (such as the Royal National Park, the Sydney Harbour Foreshore, Jenolan Caves Reserve and Centennial Park) that highlight the different issues introduced in lectures and which illustrate the practical measures undertaken to manage the parks in a sustainable fashion.

Textbooks
A Course Handbook will be provided.

GEOG5001
Geographic Information Science A

Credit points: 6 **Teacher/Coordinator:** Dr David Chapman **Session:** Semester 1, Semester 2 **Classes:** Six workshops. **Assessment:** Report **Campus:** Camperdown/Darlington **Mode of delivery:** Normal (lecture/lab/tutorial) Day

This unit of study gives an overview of basic spatial data models, and enables students to understand the import and export of data to and from a geographical information system (GIS). The manipulation of spatial data at a level appropriate to planning or locational applications, and the development of thematic maps from diverse data layers, will be addressed.

GEOG5002
Geographic Information Science B

Credit points: 6 **Teacher/Coordinator:** Dr Eleanor Bruce **Session:** Semester 2 **Classes:** One 2 hour lectures, one 1 hour tutorial, one 3 hour practical per week for 6 weeks. **Assumed knowledge:** GEOG5001 **Assessment:** 2500 word assignment, seminar presentation, tutorial reports, WebCT quiz. **Campus:** Camperdown/Darlington **Mode of delivery:** Normal (lecture/lab/tutorial) Day

This course will provide the conceptual background to more advanced GIS analysis applications and spatial reasoning methods in the context of contemporary environmental issues. The course is designed to provide an understanding of spatial analysis techniques available within a GIS environment, explore a diversity of both social and physical environmental applications and address emerging issues in GIS research. A range of topics will be introduced including field based capture of spatial information, spatial data structures, surface modelling, visibility analysis, hydrological modeling, network analysis, spatial data uncertainty and social GIS.

Conceptual material presented in lectures and tutorial workshops will be placed in an applied context through a series of laboratory and field sessions designed to strengthen practical understanding and awareness of GIS methods.

GEOG5004
Environmental Mapping and Monitoring

Credit points: 6 **Teacher/Coordinator:** Dr Peter Cowell **Session:** Semester 2 **Classes:** 2 hours of lectures and one three hour practical per week. **Assessment:** Assignments **Campus:** Camperdown/Darlington **Mode of delivery:** Normal (lecture/lab/tutorial) Day

The unit introduces methods associated with acquiring data in the field and examines issues associated with application of spatial data to environmental monitoring, terrain mapping and geocomputing. Students will learn both theoretically and practically how environmental data is collected using different remote sensing techniques, (pre)processing methods of integrating data in a GIS environment and the role of spatial data in understanding landscape processes and quantifying environmental change.

GEOS5501
Human Rights and the Environment

Credit points: 6 **Teacher/Coordinator:** Dr Robert Fisher **Session:** Semester 2 **Classes:** One 2 hour seminar per week and 4 hours per week personal study **Assessment:** 3000 word essay 70%, Seminar paper 30% **Campus:** Camperdown/Darlington **Mode of delivery:** Normal (lecture/lab/tutorial) Day

This core unit of study addresses the nexus between human rights and the environment. The unit has a geographical focus on Australia and the Asia-Pacific region. Human rights and environmental concerns intersect in diverse and complex ways. Rights to a healthy environment and rights to resources forge a common cause between human rights advocates and environmental activists. Projects such as dams and mines have on-site and wider environmental impacts that displace marginal groups and impact on their rights to livelihood. On the other hand, creation of protected areas and other forms of environmental protection that alienate indigenous and other groups from their customary land and livelihoods create an uneasy relationship between human rights and environmental movements. Public and private access to urban space is also bound up with rights around race, sexuality and class. There are also human rights issues associated with climate change, the fate of South Pacific islands and environmental refugees. The unit of study deals with the human rights -- environment nexus around such themes through a series of lectures, seminars and case study based assignment work.

ENGG5601
Greenhouse Gas Mitigation

Credit points: 6 **Teacher/Coordinator:** A/Professor Ian Jones I.Jones@civil.usyd.edu.au **Session:** Semester 2 **Classes:** 2 hour lecture and a tutorial each week. Offered every year **Assessment:** Assignments and final examination **Campus:** Camperdown/Darlington **Mode of delivery:** Normal (lecture/lab/tutorial) Day

Note: Department permission required for enrolment. Note: Unit Administration: WebCT

Graduate unit of study designed for environmental engineering students, either M.E.S. or Grad. Cert. of GHG Mitigation

Keywords:Greenhouse science, energy efficiency, carbon sinks, climate change amelioration

Objectives:To develop an understanding of, the significance of carbon dioxide in climate; the role of increasing fossil fuel energy conversion efficiency; the international framework for carbon sinks; the size, cost, potential and nature of terrestrial and oceanic sinks of carbon; the amelioration of the impacts of climate change.

Outcomes:Students will be able to make recommendations of the most cost effective approach to enterprises meeting carbon dioxide limits expected to be imposed as a result of the Kyoto Protocol.

Textbooks
P. Riemer, A. Smith, K. Thambimuthu (1998). Greenhouse Gas Mitigation, Elsevier, Amsterdam. pp777.

MARS5006
Coral Reefs, Science and Management

Credit points: 6 **Session:** Semester 1 **Classes:** University base delivery: Prefield trip Tutorial (1 hr), On-line exercises (2 hr) Field based delivery: Lectures (11 x 1 hr), Seminars (4 x 1 hr), Tutorials - individual consultations to develop concepts in research (2 x 1 hr), Independent Research an **Assessment:** Written assignments: essay and project report; oral presentations; seminar and lecture participation. **Campus:** Camperdown/Darlington **Mode of delivery:** Field Experience

Note: Department permission required for enrolment.

This unit provides an in - depth overview of the key biological and non-biological processes that make up coral reef ecosystems. There is a focus on the biogeographic, oceanographic and physiological processes underlying the integrity of global tropical reef systems. The Great Barrier Reef is used as a case study to explore emerging concepts on the influence of natural and anthropogenic processes on the integrity of global reef and lagoon systems. Learning activities will include a series of background lectures and research seminars and tutorials in the development of a major research project. A major aspect of this unit is an independent research project conducted under the supervision of the course instructors. The unit concludes with a series of oral presentations based on student research. Assessment tasks will consist of two essays and a research project report and presentation. The curriculum in this unit is based on current research and a course book will be provided. This is a field intensive course held at One Tree Island Research Station or Heron Island Research Station. The course is ex-Gladstone Queensland and students are expected to make their own way there. This unit will be run over 8 days and there will be an additional course fee for food and accommodation, expected to be $600.

NTMP5005
Tropical Coastal Management

Credit points: 6 **Teacher/Coordinator:** Belinda McMillen (course contact) **Session:** Semester 2 **Classes:** Fieldschool 80 hours intensive. **Corequisites:** MARS5002 and MARS5003 **Prohibitions:** NTMP3005 **Assessment:** Presentation, teamwork, assignment, 1 hr exam **Campus:** Camperdown/Darlington **Mode of delivery:** Block Mode

Note: Department permission required for enrolment. Note: department permission required for enrolment

This course examines the impacts of human activities on coastal and marine environments. It explores the complex relationships among the ecological and social values of these environments and outlines strategies and tools for their management. This is an intensive course that will be held at the University of Queensland Moreton Bay Research Station, North Stradbroke Island.

Textbooks
Handouts provided.

WILD5001
Australasian Wildlife: Introduction

Credit points: 6 **Teacher/Coordinator:** Professor Chris Dickman **Session:** S1 Intensive **Classes:** Intensively taught unit, the remainder of the unit will involve personal study and project activity. See the Wildlife Health and Population Management website for dates. **Assessment:** assessments for each unit may include practical work, field studies, student presentations and written reports **Campus:** Camperdown/Darlington **Mode of delivery:** Normal (lecture/lab/tutorial) Day

This unit of study provides an introduction to the wildlife of Australasia, an overview of the present status of that wildlife, and an understanding of both conservation problems and management solutions. Issues in wildlife management are exemplified using a broad range of vertebrate species occupying different environments. Emphasis is placed on providing students with a coordinated and interdisciplinary approach to wildlife health and management, and on developing expertise in recognising and solving a broad range of problems in field populations. The unit integrates lectures, practical work and supervised study, and offers students the opportunity to work through real-world wildlife conservation problems relevant to their individual backgrounds.

WILD5002
Australasian Wildlife: Field Studies

Credit points: 6 **Teacher/Coordinator:** Professor Chris Dickman **Session:** S1 Intensive **Classes:** Intensively taught unit. See the Wildlife Health and Population Management website for dates. **Assessment:** Assessments for each unit may include practical work, field studies, student presentations and written reports **Campus:** Camperdown/Darlington **Mode of delivery:** Normal (lecture/lab/tutorial) Day

This unit of study provides a first-hand introduction to the wildlife of Australasia, a practical overview of the present status of that wildlife, and an understanding of both conservation problems and management solutions. Issues in wildlife management are exemplified using sampling and diagnostic methods on a broad range of vertebrate species occupying different environments. The unit follows on from WILD5001 and provides practical experience via a five day field trip.

Optional units (Masters students only)

ENVI5501
Environmental Research Project

Credit points: 12 **Session:** Semester 1, Semester 2 **Classes:** Meetings arranged with supervisor. **Prerequisites:** 24 credit points of study with a credit average or better **Assessment:** Written report and continuous assessment **Campus:** Camperdown/Darlington **Mode of delivery:** Normal (lecture/lab/tutorial) Day

Note: This unit of study is available only to students enrolled in AppSc(EnvSc)

A valuable opportunity to apply some of the knowledge gained from earlier coursework, ENVI5501 consists of a research project as arranged between you (the student) and an appropriate supervisor. The project topic may contain a field or laboratory component, or may be entirely literature-based. The only requirement is that the topic be of environmental emphasis, meaning that potential topics range from ecotourism to pollution detection and monitoring, erosion to solar power, environmental law to conservation biology. The topic must also be able to be completed within the timeframe of 16 weeks (one semester) of investigation, including the literature survey, sample and data collection, analysis of data and results, and write up of the report. This unit is not conducted by way of a number of contact hours per week for a semester. Instead, the student will work on the project full-time (aside from other study commitments) in a continuous manner for the entire duration (1 semester). Any student interested in taking ENVI5501 should contact the postgraduate advisor for Environmental Science to discuss their project and for help in selecting and appropriate supervisor.

RESP5001
Fundamentals of Research

Credit points: 6 **Teacher/Coordinator:** A/Prof D Dragovich **Session:** Semester 1a, Semester 2a **Assessment:** Three 1000 word reports, oral presentation **Campus:** Camperdown/Darlington **Mode of delivery:** Normal (lecture/lab/tutorial) Day

This unit will provide research training for students wishing to undertake research at a Masters or PhD level. Students will revise or develop the necessary skills for commencing a research degree, including critical reading, developing the thesis proposal, developing a research plan with timelines and benchmarks, critical writing, library search techniques, use of referencing systems like EndNote, working with a supervisor, and matters relating to intellectual property and authorship.

Resolutions

Master of Applied Science (Environmental Science)
Graduate Diploma in Applied Science (Environmental Science)
Graduate Certificate in Applied Science (Environmental Science)

Course rules

1. **Admission**

1.1 The Dean of the Faculty of Science may admit to candidature for:

1.1.1 *the Graduate Certificate in Applied Science:*

1.1.1.1 graduates of the University of Sydney holding the degree of Bachelor of Science or any other equivalent award of the University of Sydney;

1.1.1.2 graduates of other universities or other appropriate institutions who have qualifications equivalent to those specified in subsection 1.1.1.1; or

1.1.1.3 persons who have experience which is considered to demonstrate the knowledge and aptitude required to undertake the units of study;

1.1.2 *the Graduate Diploma in Applied Science:*

1.1.2.1 graduates of the University of Sydney holding the degree of Bachelor of Science or any other equivalent award of the University of Sydney;

1.1.2.2 graduates of other universities or other appropriate institutions who have qualifications equivalent to those specified in subsection 1.1.2.1; or

1.1.2.3 persons who have completed requirements for the Graduate Certificate in Applied Science, or equivalent;

1.1.3 *the Master of Applied Science:*

1.1.3.1 graduates of the University of Sydney holding the degree of Bachelor of Science or any other equivalent award of the University of Sydney;

1.1.3.2 graduates of other universities or other appropriate institutions who have qualifications equivalent to those specified in subsection 1.1.3.1; or

1.1.3.3 persons who have completed requirements for the Graduate Diploma in Applied Science, or equivalent.

2. **Units of study**

2.1 The units of study for the Graduate Certificate in Applied Science (Environmental Science), Graduate Diploma in Applied Science (Environmental Science), and Master of Applied Science (Environmental Science), are listed in subsection 4.1.

2.2 Credit point value, assumed knowledge, corequisites, prerequisites and any special conditions are included under unit of study descriptions.

Faculty rules

3. **Requirements for Graduate Certificate in Applied Science (Environmental Science) (GradCertApplSc(EnvSc)); Graduate Diploma in Applied Science (Environmental Science) (GradDipApplSc(EnvSc)); Master of Applied Science (Environmental Science) (MApplSc(EnvSc))**

3.1 Candidates for the Graduate Certificate in Applied Science (Environmental Science) are required to satisfactorily complete 24 credit points of units of study including one of two core units of study (ENVI5708 or 5808) and 18 credit points from the optional units of study.

3.2 Candidates for the Graduate Diploma in Applied Science (Environmental Science) are required to satisfactorily complete three core units of study (ENVI5705 and ENVI5808 and either ENVI5708 or ENVI5904), and 18 credit points from optional units of study.

3.3 Candidates for the Master of Applied Science (Environmental Science) are required to satisfactorily complete three core units of study (ENVI5705 and ENVI5808 and either ENVI5708 or ENVI5904), and 30 credit points from optional units of study.

3.3.1 Masters candidates may only enrol in ENVI5501 after completing 24 credit points of study with a credit average or better, subject to availability of supervision.

4. **Details of units of study**

4.1 The units of study for the Graduate Certificate in Applied Science (Environmental Science), Graduate Diploma in Applied Science (Environmental Science), and Master of Applied Science (Environmental Science), are listed in the following table.

Units of Study	
Unless otherwise indicated, all units are worth 6 credit points	
ENVI5705	Ecological Principles for Environmental Sciences
ENVI5707	Energy â Sources, Uses and Alternatives
ENVI5708	Introduction to Environmental Chemistry
ENVI5801	Social Science of Environment
ENVI5803	Law and the Environment
ENVI5805	The Urban Environment and Planning
ENVI5808	App Ecology for Environmental Scientists
ENVI5809	Environmental Simulation Modelling
ENVI5903	Sustainable Development
ENVI5904	Understanding Environmental Uncertainty
ENVI5905	Management of Parks
GEOG5001	Geographic Information Science A
GEOG5002	Geographic Information Science B
GEOG5004	Environmental Mapping and Monitoring
GEOS5501	Human Rights and the Environment
ENGG5601	Greenhouse Gas Mitigation
NTMP5005	Tropical Coastal Management
MARS5006	Coral Reefs, Science & Management
For Masters students only:	
ENVI5501	Environmental Research Project (12cp)
RESP5001	Fundamentals of Research

4.2 A candidate for the course shall proceed by completing units of study as prescribed by the Faculty.

4.3 A unit of study shall consist of such lectures, seminars, tutorial instruction, essays, exercises, practical work, or project work as may be prescribed.

4.4 In these resolutions, 'to complete a unit of study' or any derivative expression means:

4.4.1 to attend the lectures and the meetings, if any, for seminars or tutorial instruction;

4.4.2 to complete satisfactorily the essays, exercises, practical and project work if any; and

4.4.3 to pass any other examination of the unit of study that may apply.

4.5 All units of study for a particular subject area may not be available every semester.

4.6 The Dean may allow substitution of any unit of study by another unit of study, including units of study from other postgraduate coursework programs in the Faculty or elsewhere in the University.

4.7 The Master of Applied Science (Environmental Science) shall be awarded in two grades, namely Pass and, in the case of an outstanding candidate, Pass with Merit.

5. **Enrolment in more/less than minimum load**

5.1 A candidate may proceed on either a full-time or a part-time basis.

6. **Cross-institutional study**

6.1 Cross institutional study shall not be available to students enrolled in the Graduate Certificate in Applied Science, Graduate Diploma in Applied Science and Master of Applied Science courses, except where the University of Sydney has a formal Cooperation Agreement with another University.

7. **Restrictions on enrolment**

7.1 Admission to candidature may be limited by a quota.

7.2 In determining the quota, the University will take into account:

7.2.1 availability of resources including space, laboratory and computing facilities; and

7.2.2 availability of adequate and appropriate supervision.

7.3 In considering an application for admission to candidature the Dean shall take account of the quota and will select, in preference, applicants who are most meritorious in terms of section 2 above.

8. **Discontinuation of enrolment**

8.1 A student who does not enrol in any semester without first obtaining written permission from the Dean to suspend candidature will be deemed to have discontinued enrolment in the course.

8.2 Students who have discontinued from the course will be required to apply for admission to the course and be subject to admission requirements pertaining at that time.

9. **Suspension of candidature**

9.1 A student may seek written permission from the Dean to suspend candidature in the course.

9.2 Suspension may be granted for a maximum of one year.

10. **Re-enrolment after an absence**

10.1 A student who plans to re-enrol after a period of suspension must advise the Faculty of Science Office in writing of their intention by no later than the end of October for First Semester of the following year or the end of May for Second Semester of the same year.

11. **Satisfactory progress**

11.1 Candidates for the Master of Applied Science, the Graduate Diploma in Applied Science, and the Graduate Certificate in Applied Science, shall be governed by the rules as follows:

11.1.1 A student who has failed a cumulative total of 12 credit points at any stage of enrolment in the Master of Applied Science will be required to show good cause why he or she should be allowed to re-enrol and, if good cause has not been established, the student's enrolment will be transferred to the Graduate Diploma in Applied Science;

11.1.2 A student who has failed a cumulative total of 18 credit points at any stage of enrolment in the Master of Applied Science and/or the Graduate Diploma in Applied Science will be required to show good cause why he or she should be allowed to re-enrol and, if good cause has not been established, the student's enrolment will be transferred to the Graduate Certificate in Applied Science;

11.1.3 A student who has failed a cumulative total of 12 credit points at any stage of enrolment in the Graduate Certificate in Applied Science will be required to show good cause why he or she should be allowed to re-enrol and, if good cause has not been established, the student will not be permitted to re-enrol.

11.2 A student who has failed a cumulative total of more than 18 credit points in the Master of Applied Science and/or the Graduate Diploma in Applied Science and/or the Graduate Certificate in Applied Science will be required to show good cause why he or she should be allowed to re-enrol and, if good cause has not been established, the student will not be permitted to re-enrol.

11.3.1 A student who has failed a core unit at the second attempt in the Master of Applied Science and/or the Graduate Diploma in Applied Science and/or the Graduate Certificate in Applied Science will be deemed to have failed to complete course requirements and will be required to show good cause why he or she should be allowed to re-enrol.

11.3.2 If good cause has not been established, the student will not be permitted to re-enrol.

12. **Time limit**

12.1 A candidate for the Graduate Certificate in Applied Science shall complete the requirements for the award in a minimum enrolment of one semester and a maximum enrolment of four semesters.

12.2 A candidate for the Graduate Diploma in Applied Science shall complete the requirements for the award in a minimum enrolment of two semesters and a maximum enrolment of six semesters.

12.3 A candidate for the Master of Applied Science shall complete the requirements for the award in a minimum of two semesters and a maximum of eight semesters.

13. **Assessment policy**

13.1 On completion of the requirements for the course, the Faculty shall determine the results of the candidature.

14. **Credit transfer policy**

14.1 Credit is not available in the Graduate Certificate in Applied Science, Graduate Diploma in Applied Science and Master of Applied Science for postgraduate study which has not been undertaken in these award courses within the previous three years.

14.2 A candidate who has qualified for the award of the Graduate Certificate in Applied Science may transfer, within three years, to the Graduate Diploma in Applied Science and receive credit for up to 24 credit points from the Graduate Certificate in Applied Science.

14.3 A candidate who has qualified for the award of the Graduate Diploma in Applied Science may transfer, within three years, to the Master of Applied Science and receive credit for up to 36 credit points from the Graduate Diploma in Applied Science.

14.4 A candidate who has completed units of study in the Applied Science program within the previous three years, but has not qualified for an award, may transfer to another award course within the same Applied Science program and receive credit for the units of study completed.

21. History and Philosophy of Science coursework degrees

Note: See Chapter 17 for other degrees related to the History and Philosophy of Science offered in the area of Bioethics

This chapter sets out the requirements for postgraduate degree offered in the Faculty of Science in the area of History and Philosophy of Science. A comprehensive guide to the requirements and units of study of the coursework degrees is listed.

The information in this chapter is in summary form and is subordinate to the provisions of the relevant degree Resolutions, collected variously in this chapter, or in the University of Sydney Calendar. The Calendar is available for sale at the Student Centre, for viewing at the faculty office or the Library, or online at www.usyd.edu.au/publications/calendar.

Graduate Certificate in Science (History and Philosophy of Science)

Degree Code: LG012

Course overview

The Graduate Certificate in Science (HPS) provides an introduction to the historical, philosophical, and sociological analysis of science. Candidates will be introduced to the main accounts of the nature of science and the methodologies underlying those interpretations.

Course outcomes

Upon completion of the graduate certificate candidates will understand the nature of the discipline of History and Philosophy of Science and will have acquired either basic research skills in history of science or basic skills in the sociological study of science or the basic skills of philosophical argument or some combination of the above, depending on their choice of options.

Units of study

- HPSC4101 Philosophy of Science
- HPSC4102 History of Science
- HPSC4103 Sociology of Science
- HPSC4104 Recent Topics in HPS
- HPSC4105 HPS Research Methods
- HPSC4108 Core Topics in HPS

Other information

The unit of study, HPSC4108 Core Topics in HPS, is not available to students who have completed a major in History and Philosophy of Science or equivalent program of study at another institution. Units of study listed below are available to students admitted to HPS Honours, Graduate Diploma in Science (History and Philosophy of Science) and Graduate Certificate in Science (History and Philosophy of Science), or by special permission.

Students who wish to write a thesis in addition to completing the requirements for the Grad Cert in Science (HPS) can undertake a Graduate Diploma in Science. This course of study is equivalent to the Honours degree in HPS.

Course resolutions

See this chapter following unit of study descriptions.

Units of study

History and Philosophy of science units available in 2009

HPSC4101
Philosophy of Science

Credit points: 6 **Teacher/Coordinator:** Dean Rickles **Session:** Semester 1 **Classes:** One 2 hour seminar per week, individual consultation. **Prerequisites:** Available only to students admitted to HPS Honours, Graduate Diploma in Science (History and Philosophy of Science) and Graduate Certificate in Science (History and Philosophy of Science), or by special permission. **Assessment:** Written assignments, seminar participation.

Note: Department permission required for enrolment.

The success of science in enabling us to manipulate the natural world has been so surprising, so often, that it has caused many individuals to revise a large part of their pre-scientific philosophical and religious consensus. Something very important is going on, and a number of fascinating philosophical topics emerge when we try to analyse what it is. Working backwards from the success of an epistemological enterprise offers a fruitful way to do philosophy, and, reciprocally, our philosophical insights help to clarify the contentious question of what it means to claim that science is successful.

This unit investigates the relationships between scientific theories and evidence, and the relationships between scientific theories. Participants will have an opportunity to relate the successes and failures of specific sciences to contemporary philosophical debates. Each week the seminar will discuss a piece of philosophical theory in the light of examples from particular sciences. Technical topics will be covered, but very little background knowledge will be assumed.

Textbooks
Blackburn S., The Oxford Dictionary of Philosophy, and course reader.

HPSC4102
History of Science

Credit points: 6 **Teacher/Coordinator:** Ofer Gal **Session:** Semester 1, Semester 2 **Classes:** One 2 hour seminar per week. **Prerequisites:** Available only to students admitted to HPS Honours, Graduate Diploma in Science (History and Philosophy of Science) and Graduate Certificate in Science (History and Philosophy of Science), or by special permission. **Assessment:** Essays, seminar participation.

Note: Department permission required for enrolment.

This unit explores major episodes in the history of science as well as introducing students to historiographic methods. Special attention is paid to developing practical skills in the history and philosophy of science.

Textbooks
Course reader

HPSC4103
Sociology of Science

Credit points: 6 **Teacher/Coordinator:** Dr Hans Pols **Session:** Semester 2 **Classes:** One 2 hour seminar per week, individual consultation. **Prerequisites:** Available only to students admitted to HPS Honours, Graduate Diploma in Science (History and Philosophy of Science) and Graduate Certificate in Science (History and Philosophy of Science), or by special permission. **Assessment:** Essays, fieldwork report, seminar participation mark.

Note: Department permission required for enrolment.

This unit explores recent approaches in the social studies of scientific knowledge. Students evaluate various sociological approaches by conducting their own research on topics relevant to their own major thesis.

The unit starts with an overview of the development of history and philosophy of science since 1945, to put the emergence of the sociology of science into perspective, before moving on to a selection of readings from the field. Topics will include: the strong program critique of traditional philosophy of science, the sociology of technology, the impact of feminism on the study of science, and the actor-network approach developed by Bruno Latour and Michel Callon.

Textbooks
Course reader

HPSC4104
Recent Topics in HPS

Credit points: 6 **Teacher/Coordinator:** HPS Staff **Session:** Semester 1, Semester 2 **Classes:** One 2 hour seminar per week, individual consultation. **Prerequisites:** Available only to students admitted to HPS Honours, Graduate Diploma in Science (History and Philosophy of Science) and Graduate Certificate in Science (History and Philosophy of Science), or by special permission. **Assessment:** Essays, seminar participation.

Note: Department permission required for enrolment.

An examination of one area of the contemporary literature in the history and philosophy of science. Special attention will be paid to development of research skills in the history and philosophy of science.

Textbooks
Course reader

HPSC4105
HPS Research Methods

Credit points: 6 **Teacher/Coordinator:** Hans Pols **Session:** Semester 1, Semester 2 **Classes:** One 2 hour seminar per week, individual consultation. **Prerequisites:** Available only to students admitted to HPS Honours, Graduate Diploma in Science (History and Philosophy of Science) and Graduate Certificate in Science (History and Philosophy of Science), or by special permission. **Assessment:** Literature review, archival research project, seminar participation mark, short essays.

Note: Department permission required for enrolment.

Adopting a seminar style, this unit provides students with an advanced knowledge of the skills necessarily to conduct their own original research in the sociology, history and philosophy of science. Participants will be given a weekly set of core readings, and specialists both from within the Unit and from outside will present their views on the topic in question. This presentation will form the basis for a discussion involving the students, the academic members of the Unit, and invited speakers.

Topics will include: the use of case studies in the philosophy of science, how to conduct oral history projects, institutional history, and sociological methodology.

Textbooks
Course reader

HPSC4108
Core topics: History & Philosophy of Sci

Credit points: 6 **Teacher/Coordinator:** HPS staff. **Session:** Semester 1, Semester 2 **Classes:** One 2 hour seminar per week. **Prerequisites:** Available only to students admitted to HPS Honours, Graduate Diploma in Science (History and Philosophy of Science) and Graduate Certificate in Science (History and Philosophy of Science), or by special permission **Prohibitions:** Not available to students who have completed a major in History and Philosophy of Science or an equivalent program of study at another institution. **Assessment:** Essays, seminar presentations, seminar participation mark.

Note: Department permission required for enrolment.

An intensive reading course, supported by discussion seminars, in the main figures and events of the 'Scientific Revolution' of the 16th to 18th centuries, in the leading historiographic interpretations of the scientific revolution and in the use of episodes in the scientific revolution as evidence for the philosophies of science of Karl Popper, Imre Lakatos, Thomas Kuhn and contemporary authors.

Textbooks
Course reader

Resolutions

Graduate Certificate in Science (History and Philosophy of Science)

Course rules

1. Admission

1.1 The Dean of the Faculty of Science may admit to candidature for the Graduate Certificate in Science (History and Philosophy of Science) an applicant who is:

1.1.1 the holder of the degree of Bachelor of Science or Bachelor of Medical Science or Bachelor of Arts or Bachelor of Liberal Studies, or any other award of Bachelor of the University of Sydney; or

1.1.2 a graduate of another university or other appropriate institution who has qualifications equivalent to those specified in subsection 1.1.1.

2. Units of study

2.1 The units of study for the Graduate Certificate in Science are listed in the table in sub-section 4.1 of these resolutions.

2.2 Credit point value, assumed knowledge, corequisites, prerequisites and any special conditions are included in the description of units of study.

3. Requirements for the Graduate Certificate in Science (History and Philosophy of Science)

3.1 A candidate shall complete course work to the value of 24 credit points selected from the following table associated with these resolutions, and including HPSC4108 (if they have not completed a major in History and Philosophy of Science, or equivalent program of study, at another institution).

Faculty rules

4. Details of units of study

4.1 The units of study for the Graduate Certificate in Science (History and Philosophy of Science) are listed in the following table:

All units of study are worth 6 credit points, unless otherwise indicated.

Unit of study	
HPSC4101	Philosophy of Science
HPSC4102	History of Science
HPSC4103	Sociology of Science
HPSC4104	Recent Topics in HPS
HPSC4105	HPS Research Methods
HPSC4108	Core Topics in HPS

4.2 A candidate for the course shall proceed by completing units of study as prescribed by the Faculty.

4.3 A unit of study shall consist of such lectures, seminars, tutorial instruction, essays, exercises, practical work, or project work as may be prescribed.

4.4 In these resolutions, 'to complete a unit of study' or any derivative expression means:

4.4.1 to attend the lectures and the meetings, if any, for seminars or tutorial instruction;

4.4.2 to complete satisfactorily the essays, exercises, practical and project work if any; and

4.4.3 to pass any other examination of the unit of study that may apply.

4.5 All units of study for a particular subject area may not be available every semester.

5. Enrolment in more/less than minimum load

5.1 A candidate may proceed on either a full-time or a part-time basis.

6. Cross-institutional study

6.1 Cross-institutional study shall not be available to students enrolled in the Graduate Certificate in Science (History and Philosophy of Science) except where the University of Sydney has a formal Cooperation Agreement with another University.

7. Restrictions on enrolment

7.1 Admission to the Graduate Certificate in Science (History and Philosophy of Science), may be limited by a quota.

7.2 In determining the quota, the University will take into account:
7.2.1 availability of resources including space, laboratory and computing facilities; and
7.2.2 availability of adequate and appropriate supervision.
7.3 In considering an application for admission to candidature the Dean shall take account of the quota and will select, in preference, applicants who are most meritorious in terms of subsection 1 above.

8. **Discontinuation of enrolment**

8.1 A student who does not enrol in any semester without first obtaining written permission from the Dean to suspend candidature will be deemed to have discontinued enrolment in the course.
8.2 Students who have discontinued from the course will be required to apply for admission to the course and be subject to admission requirements pertaining at that time.

9. **Suspension of candidature**

9.1 A student may seek written permission from the Dean to suspend candidature in the course.
9.2 Suspension may be granted for a maximum of one year.

10. **Re-enrolment after an absence**

10.1 A student who plans to re-enrol after a period of suspension must advise the Faculty of Science Office in writing of their intention by no later than the end of October for First Semester of the following year or the end of May for Second Semester of the same year.

11. **Satisfactory progress**

11.1 The Dean may call upon any candidate to show cause why that candidature should not be terminated by reason of unsatisfactory progress towards completion of the Graduate Certificate in Science (History and Philosophy of Science).
11.2 If good cause has not been established, the student's candidature will be terminated.

12. **Time limit**

12.1 A candidate shall proceed as a full time student for a period of one semester or as a part time student for up to three semesters.

13. **Assessment policy**

13.1 A candidate may be tested by written and oral examinations, assignments, exercises and practical work or any combination of these.
13.2 On completion of the requirements for the course, the Faculty shall determine the results of the candidature.

14. **Credit transfer policy**

14.1 Credit is not available in the Graduate Certificate in Science (History and Philosophy of Science), except for postgraduate units of study which have been taken through the University of Sydney Unit for History and Philosophy of Science within the previous three years, and for which no award has been conferred.

22. Microscopy and Microanalysis coursework degrees

Master of Applied Science (Microscopy and Microanalysis) (MApplSc(Microsc&Microanal)

Degree Code: LC041

Graduate Diploma in Applied Science (Microscopy and Microanalysis) (GradDipApplSc(Microsc&Microanal)

Degree Code: LF029

Graduate Certificate in Applied Science (Microscopy and Microanalysis) (GradCertApplSc(Microsc&Microanal)

Degree Code: LG018

This chapter sets out the requirements for postgraduate degrees offered in the Faculty of Science in the area of Microscopy and Microanalysis. A comprehensive guide to the requirements and units of study of the coursework degrees follows.

The information in this chapter is in summary form and is subordinate to the provisions of the relevant degree Resolutions, collected variously in this chapter, or in the University of Sydney Calendar. The Calendar is available for sale at the Student Centre, for viewing at the faculty office or the Library, or online at: www.usyd.edu.au/publications/calendar.

Course overview

The Graduate Certificate in Applied Science (Microscopy and Microanalysis), Graduate Diploma in Applied Science (Microscopy and Microanalysis) and Master of Applied Science (Microscopy and Microanalysis) are articulated award courses that provide a professional qualification to microscopists for industry, research, medical science and education. The course develops and enhances skills in specimen preparation, operation of microscopes and analytical equipment, interpretation of microscopical images and microanalysis.

Course outcomes

The aim of this articulated coursework program is to provide students with a coordinated and interdisciplinary approach to microscopy and microanalysis, thus developing expertise to recognise and solve a broad range of problems in life and material sciences. Upon the completion of the graduate certificate, graduates will possess practical and theoretical background in a wide variety of microscopy, microanalysis and specimen preparation techniques for the materials or life sciences. The graduate diploma will add more specialist knowledge in particular areas of interest or relevance. In addition, the master's will provide experience in designing, carrying out and completing an independent project and report.

Research path

After completing 24 credit points of coursework, students who have Distinction average results or above across all units of study attempted may be eligible for the Research path subject to the approval of the Director of the Key Centre for Microscopy and Microanalysis and the Dean. Students who pursue the Research path must study MCAN5201, MCAN5202, MCAN5203 and MCAN5210.

Unit of Study descriptions

Microscopy and microanalysis units of study

MCAN5005
Introductory Microscopy & Microanalysis

Credit points: 6 **Teacher/Coordinator:** Dr. Lilian Soon **Session:** Semester 1, Semester 2 **Classes:** Nine hour lectures, nine hour practicals, three hour tutorials (3 sessions). **Assessment:** Two reports/portfolios of images from light microscopy and demonstrations (80%). Practical assessment: two reports/portfolios of images from light microscopy and demonstrations (80%). Practical exercises (10%), attendance and participation (10%).

Note: Department permission required for enrolment in the following sessions: Semester 1.

The unit provides an introduction to the fundamental principles of optics and the related principles of spectroscopy that are commonly used in microscopy and microanalysis. Students are introduced to a variety of imaging and analysis techniques and their role in both biotechnology and the technology of materials, as relevant to laboratory-professionals and researchers. An emphasis on light-optical microscopy and related imaging modes is developed.

MCAN5006
Electron Microscopy

Credit points: 6 **Teacher/Coordinator:** Prof. Simon Ringer and (non-academic) Dr Tim Petersen **Session:** Semester 1, Semester 2 **Classes:** Eight groups(two people per group; can vary) of 4 one hour, 25 minutes lectures, 4 one hour lectures, 4 two hour practicals (TEMs), 4 one hour practical (SEM), forty minute tutorial, forty five minute practical demonstration. **Assessment:** Practical, analytical exercises in a written report including an annotated image portfolio (30-40 pages with ½ page sized images).

Note: Department permission required for enrolment in the following sessions: Semester 1.

Trains participants, with no prior knowledge of electron microscopy, to become operators of scanning and transmission electron microscopes. Participants are given theoretical and practical understanding of the operation and construction of the microscope and how to obtain the optimum performance from it in routine operation.

MCAN5101
Confocal & Fluorescence Microscopy

Credit points: 6 **Teacher/Coordinator:** Assoc. Prof. Filip Braet **Session:** Semester 1, Semester 2 **Classes:** 8 one hour lectures, thirty hour practicals (5 sessions). **Prerequisites:** MCAN5005. **Assessment:** 60% portfolio, 30% exercises, 10% attendance and participation.

Note: Department permission required for enrolment in the following sessions: Semester 1.

Introduces the general principles of confocal microscopy and training in the use of the confocal microscope. It covers the theory behind confocal microscopy, the instrumentation and its applications. Develops knowledge and skills in specimen preparation for biological and medical applications of optical and confocal microscopes - immunochemistry, cell loading, GFP.

MCAN5102
Biological Specimen Preparation

Credit points: 6 **Teacher/Coordinator:** Dr Lilian Soon and Dr Allan S. Jones **Session:** Semester 1, Semester 2 **Classes:** Electron microscopy section: 6 lectures, twenty three hours of practicals (13 sessions), one hour discussion, over one week. Light microscopy section: 2 one hour lectures, 4 three hour practicals, over one week. **Prerequisites:** MCAN5005 **Assessment:** Practical sessions assessed on basis of participation and competence. Electron

microscopy section requires a report containing a portfolio of images of at least 2500 words (60%) and submission of 2-4 prepared specimens. Light microscopy requires submission of four individual specimens for assessment with an accompanying report on each (about 1500 words). A major written assignment of at least 2500 words (includes library search tasks).

Note: Department permission required for enrolment in the following sessions: Semester 1.

Develops knowledge and skills in the fundamentals of specimen preparation for light microscopy. Techniques covered will include tissue processing for paraffin microtomy and an introduction to histochemical staining methods. In addition this unit will present the theory and practical skills of routine specimen preparation techniques used for electron microscopy in the biological sciences including fixing, embedding, sectioning, drying, coating and staining techniques. An introduction to cryotechniques and immuno methodologies is included.

MCAN5103
Materials Preparation and Microscopy

Credit points: 6 **Teacher/Coordinator:** Prof Simon Ringer, Dr Tim Petersen **Session:** Semester 1, Semester 2 **Classes:** 3 thirty minute lectures, 3 five and a half hour laboratory practicals, 1 three and a half hour demonstrations. **Assessment:** Flat polished SEM specimen brass (20%), TEM specimen of Al or steel using electropolishing (20%), TEM cross-sectional specimen of a Si based devices using tripod polishing (30%), Quiz (20%), Materials preparation log (10%).

Note: Department permission required for enrolment in the following sessions: Semester 1.

Gives practical training in the preparation of specimens for electron microscopy from a wide range of materials, including: metals, semiconductors, powders, ceramics and polymers. A comprehensive range of preparation techniques will be covered, including: electropolishing, tripod polishing, ion milling, dimple grinding, ultramicrotomy, cleavage and focused ion beam (FIB). Aspects of transmission electron microscopy specific to inorganic materials, such as crystallography, diffraction patterns and diffraction contrast will be introduced.

MCAN5104
Image Analysis

Credit points: 6 **Teacher/Coordinator:** Dr Allan S. Jones **Session:** Semester 1, Semester 2 **Classes:** 10 one hour lectures, 10 two hour practicals over a one week period. **Assessment:** Eight practical reports (50%), 1 three part mathematical assignment (20%), 1 in-depth assignment of 2500 word length on a relevant topic (30%).

Note: Department permission required for enrolment in the following sessions: Semester 1.

This unit of study covers the nature and processing of images and the extraction of quantitative data from them. Participants will develop a sound working knowledge of both traditional stereology techniques and modern digital image processing and analysis. Emphasis is placed on an understanding of both the strengths and the limitations that are inherent in image data, and the technology applied to it. Topics in this module include: a general review of image acquisition, filters and transforms, segmentation methods, calibration of hardware for analysis, extraction of simple features from images, advanced feature extraction from images, limitations of measurement and a general overview of stereology, including geometric probability, density estimation and sampling.

MCAN5110
Nanostructural Analysis of Materials

Credit points: 6 **Teacher/Coordinator:** Prof Simon Ringer, Dr Zongwen Liu **Session:** Semester 1, Semester 2 **Classes:** 8 one hour lectures, twenty hours of practicals, two hours of tutorials. **Assumed knowledge:** MCAN5005 or equivalent **Assessment:** Written report including portfolio of images, at least 3000 words (100%).

Note: Department permission required for enrolment in the following sessions: Semester 1.

This unit provides students with knowledge and training so that they may explore the relationships between the structure and properties of materials. The unit covers the principles and practice of materials characterisation with an emphasis on techniques for the quantitative determination of the nanoscale structure and chemistry of materials. Topics include diffraction, contrast theory in transmission electron microscopy, analytical electron microscopy, other X-ray, ion beam and scanned probe methodologies.

MCAN5112
Advances in Modern Microscopy

Credit points: 6 **Teacher/Coordinator:** Dr Allan S Jones, A/Prof Filip Braet, Dr Lilian Soon and others. **Session:** Semester 1, Semester 2 **Classes:** 12 one hour lectures, 2-4 one hour tutorials, 12 two hour practicals over a two week period. **Assessment:** Six practical reports, two to four tutorial reports, two major assignments of approximately 2500 words.

Note: Department permission required for enrolment in the following sessions: Semester 1.

This unit provides students with knowledge of and training in the application of the very latest advances in microscopy techniques and technologies. Students will examine in detail advances that are occurring in several areas of current microscopy practice and obtain knowledge of both the specific operational characteristics and the associated theory of newly developed instruments. Course content will maintain a focus on cutting-edge techniques that reflect the dynamic advances occurring in microscopy technologies.

MCAN5210
Research Methodology

Credit points: 6 **Teacher/Coordinator:** Dr Lilian Soon and Dr July Cairney **Session:** Semester 2 **Classes:** Thirteen hours of lectures, one hour student presentation, four hours of tutorials/practicals. **Assessment:** Risk assessment (10%), written research proposal (30%), written experimental plan (30%), worked exercises in data analysis (30%).

Note: Core for research path, optional for Masters

This unit covers the principles and practice of research methodology. Topics included: literature and database searches; citing and referencing; research proposals; safety, risk assessment and ethics; experimental design and documentation; statistics, errors and data analysis; and written and oral communication.

MCAN5201
Project and Report A

Credit points: 6 **Teacher/Coordinator:** A/Prof Filip Braet, Dr Allan Jones, Dr Lilian Soon **Session:** Semester 1, Semester 2 **Classes:** At least forty five hours devoted to a research project. **Assessment:** Continuing unit (see MCAN 5205 for assessment details).

Note: Department permission required for enrolment in the following sessions: Semester 1.

Gives students the opportunity to extend the practical work encountered in other modules, and gain skills in carrying out and writing up a research project. Students will choose topics in consultation with members of academic staff and complete project work under supervision. Students also need to enrol in MCAN5202.

MCAN5202
Project and Report B

Credit points: 6 **Teacher/Coordinator:** A/Prof Filip Braet, Dr Alan Jones, Dr Lilian Soon **Session:** Semester 1, Semester 2 **Classes:** At least forty five hours devoted to a research project. **Corequisites:** MCAN5201 **Assessment:** Written report (70%) and a oral presentation (30%).

Note: Department permission required for enrolment in the following sessions: Semester 1.

See MCAN5201.

MCAN5203
Project and Report Part C

Credit points: 6 **Teacher/Coordinator:** A/Prof Filip Braet, Dr Allan Jones, Dr Lilian Soon **Session:** Semester 1, Semester 2 **Classes:** Research project. **Corequisites:** MCAN5201 Project and Report A MCAN5202 Project and Report B MCAN5210 Research Methodology **Assessment:** Oral presentation (20%), problem solving task (20%), written report in the form of a journal publication (60%).

Note: Department permission required for enrolment in the following sessions: Semester 1.
Note: Research path only

This unit of study is an extension of Project and Report A and B and is only for those students approved for the Research path. Students will further extend their research, as well as formulating a literature review and a research plan and incorporating referee's comments into the final report. Students also need to enrol in or have completed MCAN5201, MCAN5202 and MCAN5210.

MCAN5210
Research Methodology

Credit points: 6 **Teacher/Coordinator:** Dr Lilian Soon and Dr July Cairney **Session:** Semester 2 **Classes:** Thirteen hours of lectures, one hour student presentation, four hours of tutorials/practicals. **Assessment:** Risk assessment (10%), written research proposal (30%), written experimental plan (30%), worked exercises in data analysis (30%).

Note: Core for research path, optional for Masters

This unit covers the principles and practice of research methodology. Topics included: literature and database searches; citing and referencing; research proposals; safety, risk assessment and ethics; experimental design and documentation; statistics, errors and data analysis; and written and oral communication.

Resolutions

Master of Applied Science (Microscopy and Microanalysis)
Graduate Diploma in Applied Science (Microscopy and Microanalysis)
Graduate Certificate in Applied Science (Microscopy and Microanalysis)

Course rules

1. **Admission**

1.1 The Dean of the Faculty of Science may admit to candidature for:

1.1.1 *the Graduate Certificate in Applied Science (Microscopy and Microanalysis):*

1.1.1.1 graduates of the University of Sydney holding the degree of Bachelor of Science or any other equivalent award of the University of Sydney;

1.1.1.2 graduates of other universities or other appropriate institutions who have qualifications equivalent to those specified in subsection 1.1.1.1; or

1.1.1.3 persons who have experience which is considered to demonstrate the knowledge and aptitude required to undertake the units of study;

1.1.2 *the Graduate Diploma in Applied Science (Microscopy and Microanalysis):*

1.1.2.1 graduates of the University of Sydney holding the degree of Bachelor of Science or any other equivalent award of the University of Sydney;

1.1.2.2 graduates of other universities or other appropriate institutions who have qualifications equivalent to those specified in subsection 1.1.2.1; or

1.1.2.3 persons who have completed requirements for the Graduate Certificate in Applied Science, or equivalent;

1.1.3 *the Master of Applied Science (Microscopy and Microanalysis):*

1.1.3.1 graduates of the University of Sydney holding the degree of Bachelor of Science or any other equivalent award of the University of Sydney;

1.1.3.2 graduates of other universities or other appropriate institutions who have qualifications equivalent to those specified in subsection 1.1.3.1; or

1.1.3.3 persons who have completed requirements for the Graduate Diploma in Applied Science, or equivalent.

2. **Units of study**

2.1 The units of study for the Graduate Certificate in Applied Science, Graduate Diploma in Applied Science and Master of Applied Science (Microscopy and Microanalysis) are listed in subsection 4.1.

2.2 Credit point value, assumed knowledge, corequisites, prerequisites and any special conditions are included in unit of study descriptions.

3. **Requirements for Graduate Certificate in Applied Science (Microscopy and Microanalysis); Graduate Diploma in Applied Science (Microscopy and Microanalysis) and Master of Applied Science (Microscopy and Microanalysis)**

3.1 Candidates for the Graduate Certificate in Applied Science (Microscopy and Microanalysis) are required to complete satisfactorily 12 credit points from core units of study and 12 credit points from optional units of study.

3.2 Candidates for the Graduate Diploma in Applied Science (Microscopy and Microanalysis) are required to complete satisfactorily 12 credit points from core units of study and a further 24 credit points from optional units of study.

3.3 Candidates for the Master of Applied Science (Microscopy and Microanalysis) are required to complete satisfactorily 12 credit points from core units of study, a further 24 credit points from optional units of study, and 12 credit points of additional core Project and Report units of study.

Faculty rules

4. **Details of units of study**

4.1 The units of study for the Graduate Certificate in Applied Science (Microscopy and Microanalysis), Graduate Diploma in Applied Science (Microscopy and Microanalysis) and Master of Applied Science (Microscopy and Microanalysis) are listed in the following table:

Not all units of study may be available every semester. The faculty may allow substitution of any unit of study by an approved unit of study, including units of study from other postgraduate coursework programs in the Faculty or elsewhere in the University.

Unit of study		Core/ Option
All units are worth 6 credit points. There are no prerequisites, corequisites or other special conditions for enrolment in these units of study except that 24 credit points of units of study must be completed successfully before a candidate may enrol in MCAN5201, MCAN5202 or MCAN5203.		
MCAN5005	Introductory Microscopy & Microanalysis	C
MCAN5006	Electron Microscopy	C
MCAN5101	Confocal & Fluorescence Microscopy	O
MCAN5102	Biological Specimen Preparation	O
MCAN5103	Materials Preparation and Microscopy	O
MCAN5104	Image Analysis	O
MCAN5110	Nanostructural Analysis of Materials	O
MCAN5112	Advances in Modern Microscopy	O
MCAN5210	Research Methodology	O
Masters additional core units		
MCAN5201	Project and Report A	C
MCAN5202	Project and Report B	C
Masters Research path, Additional Core units		
MCAN5203	Project and Report Part C	C
MCAN5210	Research Methodology	C

4.2 A candidate for the course shall proceed by completing units of study as prescribed by the Faculty.

4.3 A unit of study shall consist of such lectures, seminars, tutorial instruction, essays, exercises, practical work, or project work as may be prescribed.

4.4 In these resolutions, 'to complete a unit of study' or any derivative expression means:

4.4.1 to attend the lectures and the meetings, if any, for seminars or tutorial instruction;
4.4.2 to complete satisfactorily the essays, exercises, practical and project work if any; and
4.4.3 to pass any other examination of the unit of study that may apply.
4.5 All units of study for a particular subject area may not be available every semester.
4.6 The Dean may allow substitution of any unit of study by another unit of study, including units of study from other postgraduate coursework programs in the Faculty or elsewhere in the University.
4.7 The Master of Applied Science (Microscopy and Microanalysis) shall be awarded in two grades, namely Pass and, in the case of an outstanding candidate, Pass with Merit.

5. Enrolment in more/less than minimum load

5.1 A candidate may proceed on either a full-time or a part-time basis.

6. Cross-institutional study

6.1 Cross institutional study shall not be available to students enrolled in the Graduate Certificate in Applied Science, Graduate Diploma in Applied Science and Master of Applied Science courses, except where the University of Sydney has a formal Cooperation Agreement with another University.

7. Restrictions on enrolment

7.1 Admission to candidature may be limited by a quota.
7.2 In determining the quota, the University will take into account:
7.2.1 availability of resources including space, laboratory and computing facilities; and
7.2.2 availability of adequate and appropriate supervision.
7.3 In considering an application for admission to candidature the Dean shall take account of the quota and will select, in preference, applicants who are most meritorious in terms of sub-section 1 above.

8. Discontinuation of enrolment

8.1 A student who does not enrol in any semester without first obtaining written permission from the Dean to suspend candidature will be deemed to have discontinued enrolment in the course.
8.2 Students who have discontinued from the course will be required to apply for admission to the course and be subject to admission requirements pertaining at that time.

9. Suspension of candidature

9.1 A student may seek written permission from the Dean to suspend candidature in the course.
9.2 Suspension may be granted for a maximum of one year.

10. Re-enrolment after an absence

10.1 A student who plans to re-enrol after a period of suspension must advise the Faculty of Science Office in writing of their intention by no later than the end of October for First Semester of the following year or the end of May for Second Semester of the same year.

11. Satisfactory progress

11.1 Candidates for the Master of Applied Science (Microscopy and Microanalysis), the Graduate Diploma in Applied Science (Microscopy and Microanalysis), and the Graduate Certificate in Applied Science (Microscopy and Microanalysis), shall be governed by the rules as follows:
11.1.1 A student who has failed a cumulative total of 12 credit points at any stage of enrolment in the Master of Applied Science (Microscopy and Microanalysis) will be required to show good cause why he or she should be allowed to re-enrol and, if good cause has not been established, the student's enrolment will be transferred to the Graduate Diploma in Applied Science (Microscopy and Microanalysis);
11.1.2 A student who has failed a cumulative total of 18 credit points at any stage of enrolment in the Master of Applied Science (Microscopy and Microanalysis) and/or the Graduate Diploma in Applied Science (Microscopy and Microanalysis) will be required to show good cause why he or she should be allowed to re-enrol and, if good cause has not been established, the student's enrolment will be transferred to the Graduate Certificate in Applied Science (Microscopy and Microanalysis);
11.1.3 A student who has failed a cumulative total of 12 credit points at any stage of enrolment in the Graduate Certificate in Applied Science (Microscopy and Microanalysis) will be required to show good cause why he or she should be allowed to re-enrol and, if good cause has not been established, the student's enrolment will not be permitted to re-enrol.
11.2 A student who has failed a cumulative total of more than 18 credit points in the Master of Applied Science (Microscopy and Microanalysis) and/or the Graduate Diploma in Applied Science (Microscopy and Microanalysis) and/or the Graduate Certificate in Applied Science (Microscopy and Microanalysis) will be required to show good cause why he or she should be allowed to re-enrol and, if good cause has not been established, the student will not be permitted to re-enrol.
11.3.1 A student who has failed a core unit at the second attempt in the Master of Applied Science (Microscopy and Microanalysis) and/or the Graduate Diploma in Applied Science (Microscopy and Microanalysis) and/or the Graduate Certificate in Applied Science (Microscopy and Microanalysis) will be deemed to have failed to complete course requirements and will be required to show good cause why he or she should be allowed to re-enrol.
11.3.2 If good cause has not been established, the student will not be permitted to re-enrol.

12. Time limit

12.1 A candidate for the Graduate Certificate in Applied Science (Microscopy and Microanalysis) shall complete the requirements for the award in a minimum enrolment of one semester and a maximum enrolment of four semesters.
12.2 A candidate for the Graduate Diploma in Applied Science (Microscopy and Microanalysis) shall complete the requirements for the award in a minimum enrolment of two semesters and a maximum enrolment of six semesters.
12.3 A candidate for the Master of Applied Science (Microscopy and Microanalysis) shall complete the requirements for the award in a minimum of two semesters and a maximum of eight semesters.

13. Assessment policy

13.1 On completion of the requirements for the course, the Faculty shall determine the results of the candidature.

14. Credit transfer policy

14.1 Credit is not available in the Graduate Certificate in Applied Science (Microscopy and Microanalysis), Graduate Diploma in Applied Science (Microscopy and Microanalysis) and Master of Applied Science (Microscopy and Microanalysis) for postgraduate study which has not been undertaken in these award courses within the previous three years.
14.2 A candidate who has qualified for the award of the Graduate Certificate in Applied Science (Microscopy and Microanalysis) may transfer, within three years, to the Graduate Diploma in Applied Science (Microscopy and Microanalysis) and receive credit for up to 24 credit points from the Graduate Certificate in Applied Science (Microscopy and Microanalysis).
14.3 A candidate who has qualified for the award of the Graduate Diploma in Applied Science (Microscopy and Microanalysis) may transfer, within three years, to the Master of Applied Science (Microscopy and Microanalysis) and receive credit for up to 36 credit points from the Graduate Diploma in Applied Science (Microscopy and Microanalysis).
14.4 A candidate who has completed units of study in the Applied Science program within the previous three years, but has not qualified for an award, may transfer to another award course within the same Applied Science program and receive credit for the units of study completed.

23. Molecular Biotechnology coursework degrees

Master of Applied Science (Molecular Biotechnology)

Degree Code: LC035

Graduate Diploma in Applied Science (Molecular Biotechnology)

Degree Code: LF023

Graduate Certificate in Applied Science (Molecular Biotechnology)

Degree Code: LG008

This chapter sets out the requirements for postgraduate degrees offered in the Faculty of Science in the area of Molecular Biotechnology. A comprehensive guide to the requirements and units of study of the coursework degrees is listed.

The information in this chapter is in summary form and is subordinate to the provisions of the relevant degree Resolutions, collected variously in this chapter, or in the University of Sydney Calendar. The Calendar is available for sale at the Student Centre, for viewing at the faculty office or the Library, or on the Web at www.usyd.edu.au/publications/calendar.

Course overview and outcomes

The Graduate Certificate in Applied Science (Molecular Biotechnology), Graduate Diploma in Applied Science (Molecular Biotechnology) and Master of Applied Science (Molecular Biotechnology) are articulated programs intended for industry employees and those experienced in related fields to obtain relevant knowledge in molecular biotechnology. They include teaching in current and innovative areas and provide specialisations with attractive prospects for retraining and employment and for further education.

These programs cover new and leading edge high technologies that provide education in relevant aspects of biology, biochemistry, chemistry, food science and technology, agricultural science, bioinformatics and information bioscience. They aim to provide a basic knowledge and skills base emphasising scientific applications.

The courses also provide a professional graduate education for scientists and technologists already working in these areas. Students will be exposed to a solid grounding in molecular biotechnology including an appreciation of social and ethical implications. This professional development award course is particularly designed for those seeking training in this expanding high technology area.

Optional units

Students may select optional units relevant to Biotechnology and other graduate diploma or masters courses offered by the faculty, subject to timetable constraints and availability and satisfying any necessary prerequisites. These optional units are listed in the postgraduate section of this handbook.

Please note, the unit MOBT5303 is not an allowable elective for graduate diploma students.

Unit of Study descriptions

MOBT5101
Applied Molecular Biotechnology A

Credit points: 12 **Teacher/Coordinator:** Dr Neville Firth **Session:** Semester 1 **Classes:** 1 two hour lecture and 1 one hour turorial per week **Assessment:** Continuous assessment throughout semester, end of semester examination

This unit of study provides a solid foundation for education and training in applied molecular biotechnology. Classes emphasise molecular biology and genetics combined with essential aspects underscoring modern molecular biotechnology.

Textbooks
Required text: Acquaah, G. 2004, Understanding Biotechnology, Pearson Prentice Hall, New Jersey.
Recommended text: Glick, B. and Pasternak J. 2003, Molecular Biotechnology: Principles and Applications of Recombinant DNA", third edition, ASM Press, Washington.

MOBT5102
Applied Molecular Biotechnology B

Credit points: 12 **Teacher/Coordinator:** Dr Matthew Todd **Session:** Semester 2 **Classes:** 1 two hour lecture and 1 one hour turorial per week **Assessment:** Continuous assessment throughout semester, end of semester examination

Applied molecular biotechnology B broadens knowledge of and training in applications of the field. Key areas of molecular biology and genetics are combined with studies embracing major issues in modern molecular biotechnology, and are illustrated by examples and case studies.

Textbooks
Required text: Acquaah, G. 2004, Understanding Biotechnology, Pearson Prentice Hall, New Jersey.
Recommended text: Glick, B. and Pasternak J. 2003, Molecular Biotechnology: Principles and Applications of Recombinant DNA", third edition, ASM Press, Washington.

BIOL5002
Bioinformatics: Sequences and Genomes

Credit points: 6 **Teacher/Coordinator:** Dr Neville Firth **Session:** Semester 2 **Classes:** 1 lecture or tutorial per week, 1 three hour practical per fortnight. **Corequisites:** BIOL5001 **Prohibitions:** BIOL3027, BIOL3927 **Assessment:** Formal exam, projects.

Note: Department permission required for enrolment. Note: 57Molecular Biotechnology students do not require BIOL5001.

Bioinformatics - the application of computers to life sciences, and genomics - the study of biology at the genome-wide scale, are revolutionising basic and applied biological sciences in the 21st century. The unit focuses on the application of bioinformatics to the storage, retrieval and analysis of biological information, principally in the form of nucleotide and amino acid sequences. An extensive practical component emphasises the development of hands-on skills in the use of bioinformatics technologies. Students will gain an appreciation of the significance and potential of bioinformatics and genomics in contemporary life sciences; an awareness of the breadth of bioinformatics resources and applications, including non-sequence-based biological information; skills and experience in the use of a core set of programs and databases for nucleotide and amino acid sequence analysis and phylogenetic reconstruction; a basic understanding of the theoretical foundation and underlying assumptions of the programs, and their relative strengths/limitations; and, competence in the evaluation of output from the programs in appropriate biological context.

BETH5201
Ethics and Biotech: Genes and Stem Cells

Credit points: 6 **Session:** Semester 2 **Classes:** The equivalent of one 2-hour seminar per week presented in flexible mode incorporating seminars and an intensive format. In addition, students will spend up to four hours per week on online learning tasks, small group sessions, project work and consultati **Assumed knowledge:** A three-year undergraduate degree in science, medicine, nursing, allied health sciences, philosophy/ethics, sociology/anthropology, history, or other relevant field, or by special permission. **Assessment:** Essays, short written assignments, presentation/project.

Note: A limited number of students may be granted permission to take this unit during their honours year.

This unit introduces students to the broader social/political, ethical/philosophical and legal/regulatory issues that underlie genetics, stem cell research and the emerging biotechnologies. The unit will provide a brief overview of the relevant science before considering scientific, cultural and religious understandings of life and human identity. The second part of the unit will review the political, regulatory and commercial context of biotechnology and the control of information. Students will then review the history of genetics and eugenics and the ethical issues that arise in clinical and population genetics, stem cell research and cloning. The final part of the unit will explore the boundaries of research and knowledge and the issues raised by emerging biotechnologies, such as nanotechnology and proteomics. Learning activities will include an intensive seminar program, small group sessions and reading. Students will be able to concentrate on stem cell research, clinical or molecular genetics or other biotechnologies according to their clinical and scientific interests and experience.

MOBT5303
Applied Molecular Biotech C (Project)

Credit points: 6 **Teacher/Coordinator:** A/Prof Kevin Downard **Session:** Semester 1, Semester 2 **Prerequisites:** MOBT (5101 or 5102). **Prohibitions:** MOBT5103 **Assessment:** Report (60%) and individual/group poster and presentation (40%)

Note: This unit of study is only available to students enrolled in the Master of Applied Science (Molecular Biotechnology).

This unit of study provides students with the opportunity to undertake hands-on experience in the biotechnology industry. This will typically involve placement in an approved industry partner's facility on a part-time basis or a case study project conducted in association with an industry affiliate. Entry to an industry placement is limited by a quota and the availability of facilities and projects. Results obtained in MOBT units of study undertaken in the preceding semester (in theory and practical components) will decide whether students are assigned to placements or case study projects. All students enrolled in this unit are required to complete an industry placement suitability survey which will also be taken into consideration. Assessment is based on a student's performance in their placement or project, a report, poster and presentation.

Resolutions

Master of Applied Science (Molecular Biotechnology)
Graduate Diploma in Applied Science (Molecular Biotechnology)
Graduate Certificate in Applied Science (Molecular Biotechnology)

Course Rules

1. **Admission**

1.1 The Dean of the Faculty of Science may admit to candidature for:

1.1.1 *the Graduate Certificate in Applied Science (Molecular Biotechnology):*

1.1.1.1 graduates of the University of Sydney holding the degree of Bachelor of Science or any other equivalent award of the University of Sydney;

1.1.1.2 graduates of other universities or other appropriate institutions who have qualifications equivalent to those specified in subsection 1.1.1.1; or

1.1.1.3 persons who have experience which is considered to demonstrate the knowledge and aptitude required to undertake the units of study;

1.1.2 *the Graduate Diploma in Applied Science (Molecular Biotechnology):*

1.1.2.1 graduates of the University of Sydney holding the degree of Bachelor of Science or any other equivalent award of the University of Sydney;

1.1.2.2 graduates of other universities or other appropriate institutions who have qualifications equivalent to those specified in subsection 1.1.2.1; or

1.1.2.3 persons who have completed requirements for the Graduate Certificate in Applied Science, or equivalent;

1.1.3 *the Master of Applied Science (Molecular Biotechnology):*

1.1.3.1 graduates of the University of Sydney holding the degree of Bachelor of Science or any other equivalent award of the University of Sydney;

1.1.3.2 graduates of other universities or other appropriate institutions who have qualifications equivalent to those specified in subsection 1.1.3.1; or

1.1.3.3 persons who have completed requirements for the Graduate Diploma in Applied Science, or equivalent.

1.2 In relation to particular subject areas the Dean may require applicants to satisfy additional specific requirements relating to that subject area.

1.3 The additional requirements for Molecular Biotechnology are as follows.

1.3.1 Applicants for the Graduate Certificate in Applied Science (Molecular Biotechnology) should hold a bachelor's degree with credit average results in substantial study in areas of relevance to Molecular Biotechnology, such as biochemistry, biology, chemistry, genetics or molecular biology, or have previous experience in a relevant area that is considered to demonstrate the knowledge and aptitude required to undertake this award course.

1.3.2 Applicants for the Graduate Diploma in Applied Science (Molecular Biotechnology) should hold a bachelor's degree with credit average results in substantial study in areas of relevance to Molecular Biotechnology, such as biochemistry, biology, chemistry, genetics or molecular biology, or have completed the Graduate Certificate in Applied Science (Molecular Biotechnology) at the University of Sydney, without failing any units of study.

1.3.3 Applicants for a Master of Applied Science (Molecular Biotechnology) should hold a bachelor's degree with credit average results in substantial study in areas of relevance to Molecular Biotechnology, such as biochemistry, biology, chemistry, genetics or molecular biology; or have completed the Graduate Certificate in Applied Science (Molecular Biotechnology) at the University of Sydney, without failing any units of study; or have completed the Graduate Diploma in Applied Science (Molecular Biotechnology) at the

University of Sydney without failing more than 6 credit points of study.

2. Units of study

2.1 The units of study for the Graduate Certificate in Applied Science, Graduate Diploma in Applied Science and Master of Applied Science (Molecular Biotechnology) are listed in subsection 4.1.

2.2 Credit point value, assumed knowledge, corequisites, prerequisites and any special conditions are included in the unit of study descriptions.

3. Requirements for Graduate Certificate in Applied Science (Molecular Biotechnology) (GradCertApplSc(MBT)); Graduate Diploma in Applied Science (Molecular Biotechnology) (GradDipApplSc(MBT)); Master of Applied Science (Molecular Biotechnology) (MApplSc(MBT))

3.1 Candidates for the Graduate Certificate in Applied Science (Molecular Biotechnology) are required to complete satisfactorily two core units of study (MOBT5101 and MOBT5102).

3.2 Candidates for the Graduate Diploma in Applied Science (Molecular Biotechnology) are required to complete satisfactorily two core units of study (MOBT5101 and MOBT5102) and 12 credit points from optional units of study, excluding MOBT5303.

3.3 Candidates for the Master of Applied Science (MolecularBiotechnology) are required to complete satisfactorily four core units of study (MOBT5101, MOBT5102 or BETH5201, and MOBT5303) and 12 credit points from optional units of study.

Faculty Rules

4. Details of units of study

4.1 The units of study for the Graduate Certificate in Applied Science, Graduate Diploma in Applied Science and Master of Applied Science (Molecular Biotechnology) are listed in the following table.

Unit of study		Core/ Option
Unless otherwise indicated, all units are worth 6 credit points. To enrol in these units of study, candidates must satisfy the specific requirements relating to the subject area as detailed in subsection 3 of the Resolutions.		
Core units all degrees		
MOBT5101	Applied Molecular Biotechnology A (12 credit points)	C
MOBT5102	Applied Molecular Biotechnology B (12 credit points)	C
Core units Master's only		
BETH5201	Ethics and Biotechnology (Genes and Stem Cells)	C/O
OR		
BIOL5002	Bioinformatics: Sequences and Genomes (not available to students who have completed BIOL3027 or 3927)	C/O
MOBT5303	Applied Molecular Biotech C (Project)	C/O
Optional units Master's only: 12 credit points of units of study selected with the permission of the program coordinator.		

4.2 A candidate for the course shall proceed by completing units of study as prescribed by the Faculty.

4.3 A unit of study shall consist of such lectures, seminars, tutorial instruction, essays, exercises, practical work, or project work as may be prescribed.

4.4 In these resolutions, 'to complete a unit of study' or any derivative expression means:

4.4.1 to attend the lectures and the meetings, if any, for seminars or tutorial instruction;

4.4.2 to complete satisfactorily the essays, exercises, practical and project work if any; and

4.4.3 to pass any other examination of the unit of study that may apply.

4.5 All units of study for a particular subject area may not be available every semester.

4.6 The Dean may allow substitution of any unit of study by another unit of study, including units of study from other postgraduate coursework programs in the Faculty or elsewhere in the University.

4.7 The Master of Applied Science (Molecular Biotechnology) shall be awarded in two grades, namely Pass and, in the case of an outstanding candidate, Pass with Merit.

5. Enrolment in more/less than minimum load

5.1 A candidate may proceed on either a full-time or a part-time basis.

6. Cross-institutional study

6.1 Cross institutional study shall not be available to students enrolled in the Graduate Certificate in Applied Science, Graduate Diploma in Applied Science and Master of Applied Science courses, except where the University of Sydney has a formal Cooperation Agreement with another University.

7. Restrictions on enrolment

7.1 Admission to candidature may be limited by a quota.

7.2 In determining the quota, the University will take into account:

7.2.1 availability of resources including space, laboratory and computing facilities; and

7.2.2 availability of adequate and appropriate supervision.

7.3 In considering an application for admission to candidature the Dean shall take account of the quota and will select, in preference, applicants who are most meritorious in terms of sub-section 1 above.

8. Discontinuation of enrolment

8.1 A student who does not enrol in any semester without first obtaining written permission from the Dean to suspend candidature will be deemed to have discontinued enrolment in the course.

8.2 Students who have discontinued from the course will be required to apply for admission to the course and be subject to admission requirements pertaining at that time.

9. Suspension of candidature

9.1 A student may seek written permission from the Dean to suspend candidature in the course.

9.2 Suspension may be granted for a maximum of one year.

10. Re-enrolment after an absence

10.1 A student who plans to re-enrol after a period of suspension must advise the Faculty of Science Office in writing of their intention by no later than the end of October for First Semester of the following year or the end of May for Second Semester of the same year.

11. Satisfactory progress

11.1 Candidates for the Master of Applied Science (Molecular Biotechnology), the Graduate Diploma in Applied Science (Molecular Biotechnology), and the Graduate Certificate in Applied Science (Molecular Biotechnology), shall be governed by the rules as follows:

11.1.1 A student who has failed a cumulative total of 12 credit points at any stage of enrolment in the Master of Applied Science (Molecular Biotechnology) will be required to show good cause why he or she should be allowed to re-enrol and, if good cause has not been established, the student's enrolment will be transferred to the Graduate Diploma in Applied Science (Molecular Biotechnology);

11.1.2 A student who has failed a cumulative total of 18 credit points at any stage of enrolment in the Master of Applied Science (Molecular Biotechnology) and/or the Graduate Diploma in Applied Science (Molecular Biotechnology) will be required to show good cause why he or she should be allowed to re-enrol and, if good cause has not been established, the student's enrolment will be transferred to the Graduate Certificate in Applied Science (Molecular Biotechnology);

11.1.3 A student who has failed a cumulative total of 12 credit points at any stage of enrolment in the Graduate Certificate in Applied Science (Molecular Biotechnology) will be required to show good cause why he or she should be allowed to re-enrol and, if good cause has not been established, the student will not be permitted to re-enrol.

11.2 A student who has failed a cumulative total of more than 18 credit points in the Master of Applied Science (Molecular Biotechnology) and/or the Graduate Diploma in Applied Science (Molecular Biotechnology) and/or the Graduate Certificate in

Applied Science (Molecular Biotechnology) will be required to show good cause why he or she should be allowed to re-enrol and, if good cause has not been established, the student will not be permitted to re-enrol.

11.3.1 A student who has failed a core unit at the second attempt in the Master of Applied Science (Molecular Biotechnology) and/or the Graduate Diploma in Applied Science (Molecular Biotechnology) and/or the Graduate Certificate in Applied Science (Molecular Biotechnology) will be deemed to have failed to complete course requirements and will be required to show good cause why he or she should be allowed to re-enrol.

11.3.2 If good cause has not been established, the student will not be permitted to re-enrol.

12. Time limit

12.1 A candidate for the Graduate Certificate in Applied Science (Molecular Biotechnology) shall complete the requirements for the award in a minimum enrolment of one semester and a maximum enrolment of four semesters.

12.2 A candidate for the Graduate Diploma in Applied Science (Molecular Biotechnology) shall complete the requirements for the award in a minimum enrolment of two semesters and a maximum enrolment of six semesters.

12.3 A candidate for the Master of Applied Science (Molecular Biotechnology) shall complete the requirements for the award in a minimum of two semesters and a maximum of eight semesters.

13. Assessment policy

13.1 On completion of the requirements for the course, the Faculty shall determine the results of the candidature.

14. Credit transfer policy

14.1 Credit is not available in the Graduate Certificate in Applied Science (Molecular Biotechnology), Graduate Diploma in Applied Science (Molecular Biotechnology) and Master of Applied Science (Molecular Biotechnology) for postgraduate study which has not been undertaken in these award courses within the previous three years.

14.2 A candidate who has qualified for the award of the Graduate Certificate in Applied Science (Molecular Biotechnology) may transfer, within three years, to the Graduate Diploma in Applied Science (Molecular Biotechnology) and receive credit for up to 24 credit points from the Graduate Certificate in Applied Science (Molecular Biotechnology).

14.3 A candidate who has qualified for the award of the Graduate Diploma in Applied Science (Molecular Biotechnology) may transfer, within three years, to the Master of Applied Science (Molecular Biotechnology) and receive credit for up to 36 credit points from the Graduate Diploma in Applied Science (Molecular Biotechnology).

14.4 A candidate who has completed units of study in the Applied Science program within the previous three years, but has not qualified for an award, may transfer to another award course within the same Applied Science program and receive credit for the units of study completed.

24. Nutrition and Dietetics coursework degrees

This chapter sets out the requirements for the coursework postgraduate degree offered in the Faculty of Science in the area of Nutrition and Dietetics. The faculty offers one degree in this area – the Master of Nutrition and Dietetics.

The information in this chapter is in summary form and is subordinate to the provisions of the relevant degree Resolutions, collected variously at the end of this chapter, or in the University of Sydney Calendar. The Calendar is available for sale at the Student Centre, for viewing at the faculty office or the Library, or online at www.usyd.edu.au/calendar.

Master of Nutrition and Dietetics

Degree Code: LC005

Course overview

The MNutrDiet is a course designed to survey all aspects of human nutrition, with special emphasis on the needs of dietitians who will be working in Australia. It provides the basic training for hospital and community dietitians and nutritionists and is one of the recognised professional courses for dietitians in Australia. The MNutrDiet provides training in nutrition and dietetics for science graduates who have not completed the accredited degree of Bachelor of Science (Nutrition) or equivalent.

The course requires two years of full-time work and study. The first year consists of coursework, lectures, tutorials and practicals. In the second year, one semester is devoted to clinical training and the other semester is spent on a small research project. The dates for this course do not follow the undergraduate academic year. The second year commences in late January.

Course outcomes

Upon completion of the course, the graduate will have a sound knowledge base in nutrition and dietetics, possess the skills to improve nutritional status of individuals, families, and the community at large and to modulate the course of illness with dietetics. The graduate will be skilled in basic research and have a lifelong commitment to the pursuit of excellence in professional conduct.

Graduates of the Master of Nutrition and Dietetics are eligible to apply for admission to a research degree (Doctor of Philosophy).

Admission requirements

Applicants must have a degree from a recognised tertiary institution and have completed two semesters of study in Biochemistry and two semesters in Human Physiology. This preparation is required by the Dietitians Association of Australia. Applicants who meet the minimum entry requirements are then ranked according to their academic record and performance in Biochemistry and Human Physiology. Offers of places are dependent upon the ranking of applicants and competition for places.

Students who have completed the University of Sydney BSc (Nutrition) honours degree or equivalent are not eligible to enrol in the Master of Nutrition and Dietetics degree.

Course requirements

First year: This is an integrated academic year of teaching, practicals and study. As part of the course, students attend a nominated College of Technical and Further Education for practicals in commercial cookery, followed by dietetic cookery. All students take the units of study listed below.

Second year: In the first semester of second year (Jan to June), students undertake a clinical and community dietetics training placement, while in the second semester of second year (July to Nov) students carry out a research project.

During the second year all students are required to attend formal lectures at the University on several days. Lectures on management, advanced clinical nutrition and advanced community nutrition are compulsory.

The units of study are supervised by a Program Committee in Nutrition and Dietetics, chaired by the Head of School, annotated for corrections.

Unit of Study descriptions

Master of Nutrition and Dietetics

First year

NTDT5501
Nutritional Science

Credit points: 6 **Teacher/Coordinator:** A/Prof Samir Samman **Session:** Semester 1 **Classes:** 3 lectures per week. **Assessment:** Set reading, 2 hour exam

NTDT5501 aims to give a broad appreciation of different nutrients and the ways in which they are metabolised. The focus is on the multiple factors that drive metabolism and subsequently the relationship between nutrients and health and/or disease. Nutrients are discussed according to category, macronutrients and micronutrients, and there are different themes, including: the chemistry of macronutrients, vitamins and minerals, food sources and factors affecting availability for absorption, metabolism and excretion of the nutrient, the biochemical, physiological and pharmacological actions, methods of assessing biochemical status, the requirements at each stage of life and recommended intakes, signs of deficiency and toxicity, interactions with other nutrients.

NTDT5501 is a compulsory unit of study for students undertaking the Master of Nutrition and Dietetics or Master of Nutrition Science degrees and complements the learning in Food Science. NTDT5501 is also offered as an optional course to students in other degree programs.

Textbooks

Mann JI and Truswell AS. Essentials of Human Nutrition. 3rd edition, Oxford University Press 2007.
Shils ME, Olson JA, Sheike M and Ross AC. Modern Nutrition in Health and Disease. 10th edition, Lipincott 2004.

NTDT5502
Food Science

Credit points: 3 **Teacher/Coordinator:** Prof. J Brand-Miller **Session:** Semester 1 **Classes:** 2 lectures per week. **Assessment:** Set reading, exam.

NTDT5502 aims to give a broad appreciation of different types of foods, the ways in which they are processed and consumed, their social context as well as their nutritional attributes. The focus is on the multiple factors that drive a food's relationship to health and/or disease. Foods are covered according to category: animal foods, seafoods, cereals, sugars, fats and oils, dairy products, legumes, nuts, roots, tubers, green leafy vegetables, fruits, herbs and spices and

alcohol. NTDT5502 is a compulsory unit of study for students undertaking the Master of Nutrition and Dietetics degree and complements the learning in Nutritional Science. NTDT5502 is also offered as an optional course to students in other degree programs.

Textbooks

Mann JI and Truswell AS. Essentials of Human Nutrition. 3rd edition, Oxford University Press 2007.
Proudlove RK. The Science and Technology of Foods. Forbes London, 1997.

NTDT5503

Dietary Intake & Nutritional Assessment

Credit points: 6 **Teacher/Coordinator:** A/Prof Margaret Allman-Farinelli **Session:** Semester 1 **Classes:** 3 lectures, 2 workshops per week **Assessment:** Assignment, reports.

Basic concepts in nutritional status; four methods of dietary assessment in individuals, advantages and limitations; validation of dietary methods; nutritional guidelines, targets and recommended dietary intakes; computerized nutrient analysis; limitations of food composition analysis. Behavioural influences on food intake. Nutritional assessment of individuals through clinical examination and commonly used laboratory biochemical tests for nutritional status; methods used to diagnose nutritional deficiencies; specificity, reliability of biochemical tests. Anthropometry and body composition; soft tissue measurement; percent body fat; reference standards; growth standards and percentiles.

Textbooks

Principles of Nutritional Assessment, 2nd Ed. R.S. Gibson, Oxford University Press, New York, 2005.
Nutritional Assessment. A Laboratory Manual. RS Gibson, Oxford University Press, New York, 1993.

NTDT5504

Communications A

Credit points: 3 **Teacher/Coordinator:** Ms Jennifer McArthur Ms Veronica Taffs **Session:** Semester 1 **Classes:** 40 hours of lectures and tutorials **Assessment:** Communications: two reports and one in-class assessment; Small Group Education: one assignment

NTDT5504 introduces students to the theories of effective communication. Students will acquire skills used to communicate with individuals in a variety of contexts, including the patient/client and his/her family, colleagues, other health team members and the community-at-large. Factors enhancing and distracting from effective communication are identified. The role of the dietitian as a facilitator of change is explored. Barriers to change and techniques used to enhance compliance are identified. Opportunity is provided for students to observe a hospital dietitian conducting a counseling session and also to practice their own communication and interviewing skills. Students will be introduced to educational theory and small group education practice, especially the skills of planning, implementing and evaluation.

Textbooks

Bauer K and Sokolik C. "Basic Nutrition Counselling Skills". Wadsworth, 2002.

NTDT5305

Food Service Management

Credit points: 6 **Teacher/Coordinator:** Ms Beth Rohrlach **Session:** Semester 1 **Classes:** 3 hours per week practical classes, 2 hours per week lectures. **Assessment:** Continuous assessment that may include practical work and project.

The course introduces students to the principles of Food Service Management ranging from food safety and hygiene to the development of menus for theraputic diets. The course introduces students to commercial cookery equipment and food preperation principles for both domestic and commerical clinical and community nutrition application.

NTDT5307

Clinical Nutrition and Dietetics

Credit points: 12 **Teacher/Coordinator:** A/Prof Margaret Allman-Farinelli **Session:** Semester 2 **Classes:** Lectures average nine hours per week, tutorials/practicals average three hours per week. **Assessment:** Two assessment tasks and formal examination.

The broad objectives involve learning the role of nutrition in all aspects of disease from aetiology to medical nutrition therapy. The importance of client focused factors in dietary modification; education and interpretation of theory for client understanding are key discussion points.This unit of study includes paediatrics at the New Children's Hospital, the study of medicine as it relates to nutrition, and the modification of diet and nutrition support of patients with different illnesses.

NTDT5308

Community and Public Health Nutrition

Credit points: 10 **Teacher/Coordinator:** Ms Sue Amanatidis **Session:** Semester 2 **Classes:** Average of seven hours lectures per week. **Assessment:** Combination of assignments and formal exam.

This unit of study covers several topics which include an Introduction to health promotion which aims to introduce students to planning, implementing and evaluating nutrition health promotion programs for various population groups. Topics covered include principles of health promotion, effective nutrition promotion strategies, and program evaluation; Nutrition and chronic disease which examines the relationship and evidence for the role and etiology of chronic diseases such as cancer, heart disease, hypertension and diabetes. It also investigates the current nutrition policies and guidelines aimed at preventing these diseases; Food habits which covers theories of food habits and examines food habits of various population groups such as children, adolescents, older people and vulnerable groups; Basic concepts of epidemiology which investigates the advantages and limitations of various epidemiological methods.

Textbooks

Bonita, R, Beaglehole, R, Kjellstrom, T, Basic Epidemiology (2nd Edition), World Health Organisation, Geneva, 2006 ISBN 924154465 Lawrence M & Worsley (Editors). Public Health Nutrition - From Principles to Practice. Allen & Unwin, 2007. ISBN 978 174175 102 4 Hawe P, Degeling D and Hall J. Evaluating Health Promotion: A health worker's guide. McLennan and Petty, 1990. ISBN 086 4330677 Mann J & Trusswell AS. Essentials of Human Nutrition. Oxford Univeristy Press. Oxford. 3rd edition 2007.

NTDT5309

Communication

Credit points: 2 **Teacher/Coordinator:** Ms Veronica Taffs **Session:** Semester 2 **Classes:** Lectures average one hour per week, tutorials/practicals average one hour per week. **Assessment:** Two practical assessment tasks

The unit of study consolidates and extends skills that were introduced in Semester 1 (NTDT5504 Communications A). Students take part in a teaching clinic where they practise their interviewing, counselling and documentation skills with standardized patients. They also attend a hospital orientation program in preparation for their placement in Year 2.

Second year

NTDT5310

Nutrition Research Project

Credit points: 24 **Teacher/Coordinator:** A/Prof Samir Samman **Session:** Semester 2 **Classes:** Tutorials two hours per week, supervised research experience. **Assessment:** Two assignments, presentation, report.

During the research semester each student has a research supervisor. Research projects can include small surveys, simple bench work, supervised hospital assignments or library searches, and are carried out in the University or with an external supervisor. Students also attend nutrition seminars.

NTDT5311

Nutrition Practice

This unit of study is not available in 2009

Credit points: 12 **Teacher/Coordinator:** Ms Margaret Nicholson **Session:** Semester 1 **Classes:** Whole day lectures/workshops held on two to four occasions through the semester. **Assessment:** Attendance only

Note: This unit of study will commence prior to the start of semester.

The aim of this unit is to provide further knowledge and develop counselling strategies in specialty areas of dietetic practice. It builds on subjects introduced in the first year of the Master's course.

NTDT5312

Nutrition & Dietetics Training Placement

Credit points: 12 **Teacher/Coordinator:** Ms Margaret Nicholson **Session:** Semester 1 **Classes:** 20 week full time attendance of practical placement at clinical/community/food service sites. **Assessment:** Practical work and attendance

Note: This unit of study will commence prior to the start of semester.

All students must achieve competency in the 3 areas of clinical, community and food service dietics. Students undertake dietic clinical training at two or more hospitals. Community placements occur at community nutrition centres, public health units and food industry sites. Food service placements are usually part of a hospital food service department or other suitable site. The semester is of 20 weeks duration and placement starts early (usually late January) to accommodate this.

Resolutions

Graduate Certificate in Applied Science (Nutrition and Dietetics)

Graduate Diploma in Applied Science (Nutrition and Dietetics)

Master of Applied Science (Nutrition and Dietetics)

Course Rules

1. **Admission**

1.1 The Dean of the Faculty of Science may admit to candidature for:

1.1.1 *the Graduate Certificate in Applied Science:*

1.1.1.1 graduates of the University of Sydney holding the degree of Bachelor of Science or any other equivalent award of the University of Sydney;

1.1.1.2 graduates of other universities or other appropriate institutions who have qualifications equivalent to those specified in subsection 1.1.1.1; or

1.1.1.3 persons who have experience which is considered to demonstrate the knowledge and aptitude required to undertake the units of study;

1.1.2 *the Graduate Diploma in Applied Science:*

1.1.2.1 graduates of the University of Sydney holding the degree of Bachelor of Science or any other equivalent award of the University of Sydney;

1.1.2.2 graduates of other universities or other appropriate institutions who have qualifications equivalent to those specified in subsection 1.1.2.1; or

1.1.2.3 persons who have completed requirements for the Graduate Certificate in Applied Science, or equivalent;

1.1.3 *the Master of Applied Science:*

1.1.3.1 graduates of the University of Sydney holding the degree of Bachelor of Science or any other equivalent award of the University of Sydney;

1.1.3.2 graduates of other universities or other appropriate institutions who have qualifications equivalent to those specified in subsection 1.1.3.1; or

1.1.3.3 persons who have completed requirements for the Graduate Diploma in Applied Science, or equivalent.

1.2 In relation to particular subject areas the Dean may require applicants to satisfy additional specific requirements relating to that subject area.

1.3 The additional requirements are as follows.

1.3.1 *Nutrition and Dietetics*

1.3.2 Applicants for the Graduate Certificate in Applied Science (Nutrition and Dietetics), Graduate Diploma in Applied Science (Nutrition and Dietetics), Master of Applied Science (Nutrition and Dietetics) should:

1.3.3 be eligible for FULL membership of the Dietitians Association of Australia; and

1.3.4 have at least three years experience as a professional dietitian.

2. **Units of study**

2.1 The units of study for the Graduate Certificate in Applied Science, Graduate Diploma in Applied Science and Master of Applied Science (Nutrition and Dietetics) are listed in subsection 4.1.

2.2 Credit point value, assumed knowledge, corequisites, prerequisites and any special conditions are included in the units of study descriptions.

3. **Requirements for Graduate Certificate in Applied Science (Nutrition and Dietetics), Graduate Diploma in Applied Science (Nutrition and Dietetics), Master of Applied Science (Nutrition and Dietetics)**

3.1 Candidates for the Graduate Certificate in Applied Science (Nutrition and Dietetics) are required to complete satisfactorily two core units of study (NTDT6001 and NTDT6011) and 12 credit points from optional units of study.

3.2 Candidates for the Graduate Diploma in Applied Science (Nutrition and Dietetics) are required to complete satisfactorily two core units of study (NTDT6001 and NTDT6011) and 24 credit points from optional units of study.

3.3 Candidates for the Master of Applied Science (Nutrition and Dietetics) are required to complete satisfactorily three core units of study (NTDT6001 and NTDT6011) and 36 credit points from optional units of study.

Faculty rules

4. **Details of units of study**

4.1 The units of study for the Graduate Certificate in Applied Science, Graduate Diploma in Applied Science and Master of Applied Science (Nutrition and Dietetics) are listed in the following table.

Unit of study		Core/option
Unless otherwise indicated, all units are worth 6 credit points. To enrol in these units of study, candidates must satisfy the specific requirements detailed in subsection 4.8 of the Resolutions.		
Core units all degrees		
NTDT6001	Advanced Nutritional Support (Theory)	C
NTDT6011	Advanced Nutritional Support (Clinical)	C
Elective units all degrees		
NTDT6002	Nutrition Support in Critical Care	O
NTDT6012	Critical Care Nutritional Support	O
NTDT6003	Medical Gastroenterology (Theory)	O
NTDT6013	Medical Gastroenterology (Clinical)	O
NTDT6004	Surgical Gastroenterology (Theory)	O
NTDT6014	Surgical Gastroenterology (Clinical)	O

4.2 A candidate for the course shall proceed by completing units of study as prescribed by the Faculty.

4.3 A unit of study shall consist of such lectures, seminars, tutorial instruction, essays, exercises, practical work, or project work as may be prescribed.

4.4 In these resolutions, 'to complete a unit of study' or any derivative expression means:

4.4.1 to attend the lectures and the meetings, if any, for seminars or tutorial instruction;

4.4.2 to complete satisfactorily the essays, exercises, practical and project work if any; and

4.4.3 to pass any other examination of the unit of study that may apply.

4.5 All units of study for a particular subject area may not be available every semester.

4.6 The Dean may allow substitution of any unit of study by another unit of study, including units of study from other postgraduate coursework programs in the Faculty or elsewhere in the University.

5. **Enrolment in more/less than minimum load**

5.1 A candidate may proceed on either a full-time or a part-time basis.

6. Cross-institutional study

6.1 Cross institutional study shall not be available to students enrolled in the Graduate Certificate in Applied Science, Graduate Diploma in Applied Science and Master of Applied Science courses, except where the University of Sydney has a formal Cooperation Agreement with another University.

7. Restrictions on enrolment

7.1 Admission to candidature may be limited by a quota.

7.2 In determining the quota, the University will take into account:

7.2.1 availability of resources including space, laboratory and computing facilities; and

7.2.2 availability of adequate and appropriate supervision.

7.3 In considering an application for admission to candidature the Dean shall take account of the quota and will select, in preference, applicants who are most meritorious in terms of section 2 above.

8. Discontinuation of enrolment

8.1 A student who does not enrol in any semester without first obtaining written permission from the Dean to suspend candidature will be deemed to have discontinued enrolment in the course.

8.2 Students who have discontinued from the course will be required to apply for admission to the course and be subject to admission requirements pertaining at that time.

9. Suspension of candidature

9.1 A student may seek written permission from the Dean to suspend candidature in the course.

9.2 Suspension may be granted for a maximum of one year.

10. Re-enrolment after an absence

10.1 A student who plans to re-enrol after a period of suspension must advise the Faculty of Science Office in writing of their intention by no later than the end of October for First Semester of the following year or the end of May for Second Semester of the same year.

11. Satisfactory progress

11.1 Candidates for the Master of Applied Science, the Graduate Diploma in Applied Science, and the Graduate Certificate in Applied Science, shall be governed by the rules as follows:

11.1.1 A student who has failed a cumulative total of 12 credit points at any stage of enrolment in the Master of Applied Science will be required to show good cause why he or she should be allowed to re-enrol and, if good cause has not been established, the student's enrolment will be transferred to the Graduate Diploma in Applied Science;

11.1.2 A student who has failed a cumulative total of 18 credit points at any stage of enrolment in the Master of Applied Science and/or the Graduate Diploma in Applied Science will be required to show good cause why he or she should be allowed to re-enrol and, if good cause has not been established, the student's enrolment will be transferred to the Graduate Certificate in Applied Science;

11.1.3 A student who has failed a cumulative total of 12 credit points at any stage of enrolment in the Graduate Certificate in Applied Science will be required to show good cause why he or she should be allowed to re-enrol and, if good cause has not been established, the student will not be permitted to re-enrol.

11.2 A student who has failed a cumulative total of more than 18 credit points in the Master of Applied Science and/or the Graduate Diploma in Applied Science and/or the Graduate Certificate in Applied Science will be required to show good cause why he or she should be allowed to re-enrol and, if good cause has not been established, the student will not be permitted to re-enrol.

11.3.1 A student who has failed a core unit at the second attempt in the Master of Applied Science and/or the Graduate Diploma in Applied Science and/or the Graduate Certificate in Applied Science will be deemed to have failed to complete course requirements and will be required to show good cause why he or she should be allowed to re-enrol.

11.3.2 If good cause has not been established, the student will not be permitted to re-enrol.

12. Time limit

12.1 A candidate for the Graduate Certificate in Applied Science shall complete the requirements for the award in a minimum enrolment of one semester and a maximum enrolment of four semesters.

12.2 A candidate for the Graduate Diploma in Applied Science shall complete the requirements for the award in a minimum enrolment of two semesters and a maximum enrolment of six semesters.

12.3 A candidate for the Master of Applied Science shall complete the requirements for the award in a minimum of two semesters and a maximum of eight semesters.

13. Assessment policy

13.1 On completion of the requirements for the course, the Faculty shall determine the results of the candidature.

14. Credit transfer policy

14.1 Credit is not available in the Graduate Certificate in Applied Science, Graduate Diploma in Applied Science and Master of Applied Science for postgraduate study which has not been undertaken in these award courses within the previous three years.

14.2 A candidate who has qualified for the award of the Graduate Certificate in Applied Science may transfer, within three years, to the Graduate Diploma in Applied Science and receive credit for up to 24 credit points from the Graduate Certificate in Applied Science.

14.3 A candidate who has qualified for the award of the Graduate Diploma in Applied Science may transfer, within three years, to the Master of Applied Science and receive credit for up to 36 credit points from the Graduate Diploma in Applied Science.

14.4 A candidate who has completed units of study in the Applied Science program within the previous three years, but has not qualified for an award, may transfer to another award course within the same Applied Science program and receive credit for the units of study completed.

25. Physics coursework degrees

This chapter sets out the requirements for postgraduate degrees offered in the Faculty of Science in the area of Physics. Degrees offered in the area of Physics are listed in the following order:

- Medical Physics
- Nuclear Science
- Photonics and Optical Science

Medical Physics degrees

Master of Medical Physics (MMedPhys)

Degree Code: LC046

Graduate Diploma in Medical Physics (GradDipMedPhys)

Degree Code: LF034

This section sets out the requirements for coursework postgraduate degrees offered in the Faculty of Science in the area of Medical Physics. A comprehensive guide to the requirements and units of study of the coursework degrees is listed.

The information in this section is in summary form and is subordinate to the provisions of the relevant degree Resolutions, collected variously in at the end of this chapter, following the unit of study descriptions, or in the University of Sydney Calendar. The Calendar is available for sale at the Student Centre, for viewing at the faculty office or the Library, or online at www.usyd.edu.au/publications/calendar.

Course overview

The Master of Medical Physics (MMedPhys) and the Graduate Diploma in Medical Physics (GradDipMedPhys) are the entry level qualifications for trainee medical physicists. Physical scientists apply their knowledge and training in many different areas of medicine including the treatment of cancer, medical imaging, physiological monitoring and medical electronics.

Course outcomes

The MMedPhys and GradDipMedPhys provide the entry level qualification for trainee medical physicists working in a hospital medical physics department. Both courses are accredited by the Australasian College of Physical Scientists and Engineers in Medicine (ACPSEM). Graduates of these courses will qualify to apply for trainee medical physicist positions in hospitals in Australia and New Zealand. Medical physicists employed in hospitals often undertake research studies part-time for the higher Doctor of Philosophy (PhD) research degree.

Unit of Study descriptions

Medical Physics units for students commencing in 2009

PHYS5002
Anatomy and Physiology

Credit points: 6 **Session:** Semester 1 **Classes:** One 2 hour lecture and one 1 hour practical per week. **Assessment:** Assignments, written exam

In this unit normally undertaken as part of the Masters of Medical Physics degree or the Graduate Diploma in Medical Physics, the concepts of the structure of the human cell and tissues are introduced. The organisation and function of each of the major organ systems that constitute the human body are covered. Examples of pathology of diseases commonly encountered in the practice of medical physics will be included. Basic concepts in physiological modeling are introduced.

PHYS5003
Instrumentation

Credit points: 6 **Session:** Semester 1 **Classes:** One 2 hour lecture and one 1 hour practical per week. **Assessment:** Assignments, written exam

In this unit normally undertaken as part of the Masters of Medical Physics degree or the Graduate Diploma in Medical Physics, the principles underlying the fundamental operation of instrumentation used in medicine are covered. Examples will include pressure and volume measurements in respiratory medicine, and electric potential measurements in cardiology.

PHYS5005
Radiotherapy Physics

Credit points: 6 **Session:** Semester 2 **Classes:** One 2 hour lecture and one 1 hour practical per week. **Assessment:** Assignments, written exam

In this unit normally undertaken as part of the Masters of Medical Physics degree or the Graduate Diploma in Medical Physics, both theoretical and practical aspects of the major topics in radiotherapy physics are covered. These topics include radiation beam production and modification, calibration and characterisation, principles of treatment planning, dose calculation and reporting, and the physics of brachytherapy.

PHYS5006
Medical Imaging Physics

Credit points: 6 **Session:** Semester 2 **Classes:** One 2 hour lecture and one 1 hour practical per week. **Assessment:** Assignments, written exam

In this unit normally undertaken as part of the Masters of Medical Physics degree or the Graduate Diploma in Medical Physics, the physical principles underlying the science of imaging in radiology, ultrasound, magnetic resonance imaging and nuclear medicine are covered.

PHYS5011
Nuclear Physics

Credit points: 6 **Session:** Semester 1 **Classes:** One 2 hour lecture and one 1 hour practical per week **Assessment:** Assignments, written exam

This unit is normally undertaken as part of the Master of Medical Physics degree or the Graduate Diploma in Medical Physics or the Master of Applied Nuclear Science or the Graduate Diploma in Applied Nuclear Science. Nuclear properties, natural radioactivity, radioactive decay series, artificial radioactivity, nuclear models, nuclear decays (gamma, beta, alpha decays and heavy ion decay), nuclear reactions (including high energy nuclear particle induced spallation reactions), nuclear fission (spontaneous and induced fission) and nuclear fusion are covered.

PHYS5012
Radiation Physics and Dosimetry

Credit points: 6 **Session:** Semester 1 **Classes:** One 2 hour lecture and one 1 hour practical per week. **Prohibitions:** PHYS5001 **Assessment:** Assignments, written exam

This unit is normally undertaken as part of the Master of Medical Physics degree or the Graduate Diploma in Medical Physics or the Master of Applied Nuclear Science or the Graduate Diploma in Applied Nuclear Science. Sources of radiation, interaction of radiation with matter, physical, chemical, and biological effects of radiation in human tissue, physical principles of dosimetry, internal and external dosimetry, radiation units and measurement, Monte Carlo modeling of radiation transport are covered.

PHYS5018
Health Physics and Radiation Protection

Credit points: 6 **Session:** Semester 2 **Classes:** One 2 hour lecture and one 1 hour practical per week. **Prohibitions:** PHYS5008 **Assessment:** Assignments, written exam

This unit is normally undertaken as part of the Master of Medical Physics degree or the Graduate Diploma in Medical Physics or the Master of Applied Nuclear Science or the Graduate Diploma in Applied Nuclear Science. The biological effects due to the interaction of radiation with human tissues from the DNA level through to the major organ systems are covered. Factors affecting dose response of tissue are considered along with models describing characteristic behaviour. Physical and biological aspects of the safe use of ionizing radiation, physical principles underlying shielding design instrumentation, international and legislative requirements for radiation protection are covered.

PHYS5019
Research Methodology and Project

Credit points: 24 **Session:** Semester 1, Semester 2 **Prerequisites:** Successful completion of the eight coursework units of the postgraduate coursework Masters degree for which the student is enrolled, equivalent to completion of the requirements for award of the Graduate Diploma. **Prohibitions:** Both PHYS(5009 and 5010) **Assessment:** Report

Note: Department permission required for enrolment. Note: This unit is only available for students in the Master of Applied Nuclear Science or the Master of Medical Physics degrees

In this unit, normally undertaken as part of the Master of Applied Nuclear Science degree, a research project is undertaken. The topic of the project will be determined in consultation with the course coordinator. In addition, the processes involved in conducting various forms of research, basic data analysis and interpretation, research writing and presentation skills are covered.

PHYS5020
Computation and Image Processing

Credit points: 6 **Session:** Semester 2 **Classes:** One 2 hour lecture and one 1 hour practical per week **Prohibitions:** PHYS5007 **Assessment:** Assignments, written exam

In this unit normally undertaken as part of the Masters of Medical Physics degree or the Graduate Diploma in Medical Physics, the theory of image formation, concepts of computing, numerical methods and image processing are covered, including techniques such as enhancement, registration, fusion and 3D reconstruction.

Medical Physics units for students who commenced prior to 2008

PHYS5001
Radiation Physics

Credit points: 6 **Session:** Semester 1 **Classes:** One 2 hour lecture and one 1 hour practical per week. **Prohibitions:** PHYS5012 **Assessment:** Assignments, written exam

Note: Department permission required for enrolment. Note: This unit is for students who commenced in the Medical Physics program prior to 2008

In this unit normally undertaken as part of the Masters of Medical Physics degree or the Graduate Diploma in Medical Physics, the production of ionising radiation and its fundamental interactions with matter and related factors are covered.

PHYS5002
Anatomy and Physiology

Credit points: 6 **Session:** Semester 1 **Classes:** One 2 hour lecture and one 1 hour practical per week. **Assessment:** Assignments, written exam

In this unit normally undertaken as part of the Masters of Medical Physics degree or the Graduate Diploma in Medical Physics, the concepts of the structure of the human cell and tissues are introduced. The organisation and function of each of the major organ systems that constitute the human body are covered. Examples of pathology of diseases commonly encountered in the practice of medical physics will be included. Basic concepts in physiological modeling are introduced.

PHYS5003
Instrumentation

Credit points: 6 **Session:** Semester 1 **Classes:** One 2 hour lecture and one 1 hour practical per week. **Assessment:** Assignments, written exam

In this unit normally undertaken as part of the Masters of Medical Physics degree or the Graduate Diploma in Medical Physics, the principles underlying the fundamental operation of instrumentation used in medicine are covered. Examples will include pressure and volume measurements in respiratory medicine, and electric potential measurements in cardiology.

PHYS5004
Radiation Dosimetry

Credit points: 6 **Session:** Semester 1 **Classes:** One 2 hour lecture and one 1 hour practical per week. **Prohibitions:** PHYS5012 **Assessment:** Assignments, written exam

Note: Department permission required for enrolment. Note: This unit is for students who commenced the Medical Physics program prior to 2008

In this unit normally undertaken as part of the Masters of Medical Physics degree or the Graduate Diploma in Medical Physics, the principles of both absolute and relative measurement of ionising radiation in radiotherapy and medical imaging are covered. Issues related to the dosimetry of non-ionising radiation are also covered.

PHYS5005
Radiotherapy Physics

Credit points: 6 **Session:** Semester 2 **Classes:** One 2 hour lecture and one 1 hour practical per week. **Assessment:** Assignments, written exam

In this unit normally undertaken as part of the Masters of Medical Physics degree or the Graduate Diploma in Medical Physics, both theoretical and practical aspects of the major topics in radiotherapy physics are covered. These topics include radiation beam production and modification, calibration and characterisation, principles of treatment planning, dose calculation and reporting, and the physics of brachytherapy.

PHYS5006
Medical Imaging Physics

Credit points: 6 **Session:** Semester 2 **Classes:** One 2 hour lecture and one 1 hour practical per week. **Assessment:** Assignments, written exam

In this unit normally undertaken as part of the Masters of Medical Physics degree or the Graduate Diploma in Medical Physics, the physical principles underlying the science of imaging in radiology, ultrasound, magnetic resonance imaging and nuclear medicine are covered.

PHYS5007
Image Processing

Credit points: 3 **Session:** Semester 2 **Classes:** One 2 hour lecture and one 1 hour practical per week for half the semester. **Assessment:** Assignments, written exam

Note: Department permission required for enrolment. Note: This unit is for students who commenced the Medical Physics program prior to 2008.

In this unit normally undertaken as part of the Masters of Medical Physics degree or the Graduate Diploma in Medical Physics, the theory of image formation, concepts of computing, numerical methods

and image processing are covered, including techniques such as enhancement, registration, fusion and 3D reconstruction.

PHYS5008
Radiation Biology and Health Physics

Credit points: 6 **Session:** Semester 2 **Classes:** One 2 hour lecture and one 1 hour practical per week. **Assessment:** Assignments, written exam

Note: Department permission required for enrolment. Note: This unit is for students who commenced the Medical Physics program prior to 2008.

In this unit normally undertaken as part of the Masters of Medical Physics degree or the Graduate Diploma in Medical Physics, the biological effects due to the interaction of radiation with human tissues from the DNA level through to the major organ systems are covered. Factors affecting dose response of tissue are considered along with models describing characteristic behaviour.

PHYS5009
Research Methodology

Credit points: 3 **Session:** Semester 2 **Classes:** One 2 hour lecture and one 1 hour practical per week for half the semester. **Prohibitions:** PHYS5019 **Assessment:** Assignments, written exam

Note: Department permission required for enrolment. Note: This unit is for students who commenced the Medical Physics degree prior to 2008.

In this unit normally undertaken as part of the Masters of Medical Physics degree or the Graduate Diploma in Medical Physics, an understanding of the processes involved in conducting various forms of research, basic data analysis and interpretation, research writing and presentation skills are covered. The professional framework is presented by considering issues such as legal, ethical and basic management issues.

PHYS5010
Project

Credit points: 24 **Session:** Semester 1, Semester 2 **Prohibitions:** PHYS5019 **Assessment:** Report

Note: Department permission required for enrolment. Note: This unit is only available for students in the Master of Medical Physics degree who commenced prior to 2008.

This unit is a research project to be carried out in a hospital or similar environment. The topic of the project will be determined in consultation with the course coordinator.

Resolutions

Master of Medical Physics
Graduate Diploma in Medical Physics

Course rules

1. Admission

1.1 The Faculty may, on the recommendation of the Dean of the Faculty of Science, admit to candidature for:
1.1.1 the Graduate Diploma in Medical Physics:
1.1.2 an applicant who is the holder of a bachelor's degree in Science or Engineering from the University of Sydney provided the applicant has achieved a major in physics, or equivalent;
1.1.3 a graduate of another university or appropriate institution who has equivalent qualifications to those specified in subsection 1.1.2.
1.2 the Master of Medical Physics
1.2.1 a person who has the qualifications specified in subsection 1.1.2; or
1.2.2 a person who has completed requirements for the Graduate Diploma in Medical Physics.

2. Units of study

2.1 The units of study for the Graduate Diploma in Medical Physics and the Master of Medical Physics are listed in the *Table of units of study* associated with these resolutions.

3. Requirements for the Graduate Diploma in Medical Physics and Master of Medical Physics

3.1 Candidates for the Graduate Diploma in Medical Physics are required to complete 48 credit points consisting of the core units of study in the *Table of units of study* in subsection 4.1, excluding the project PHYS5019.
3.2 Candidates for the Master of Medical Physics are required to complete 72 credit points consisting of the 48 credit points of core units of study in the *Table of units of study* in subsection 4.1, including the 24 credit point project PHYS5019.
3.3 A candidate must complete successfully 48 credit points of units of study before enrolling in PHYS5019.

Faculty rules

4. Details of units of study

4.1 The units of study for the Graduate Diploma in Medical Physics, and the Master of Medical Physics are listed in the following tables. The first table relates to students who first enrolled in the program prior to 2008. The second table relates to students who enrol in the program from 2008 onwards:

Unit of study - Students enrolled prior to 2008	
All units are core. Unless otherwise indicated all units are worth 6 credit points	
PHYS5001	Radiation Physics
PHYS5002	Anatomy and Physiology
PHYS5003	Instrumentation
PHYS5004	Radiation Dosimetry
PHYS5005	Radiotherapy Physics
PHYS5006	Medical Imaging Physics
PHYS5007	Image Processing
PHYS5008	Radiation Biology and Health Physics
PHYS5009	Research Methodology
PHYS5010	Project (Masters only) (24cp)

Unit of study - students enrolled from 2008 onwards	
All units are core. Unless otherwise indicated all units are worth 6 credit points	
PHYS5002	Anatomy and Physiology
PHYS5003	Instrumentation
PHYS5011	Nuclear Physics
PHYS5012	Radiation Physics and Dosimetry
PHYS5005	Radiotherapy Physics
PHYS5006	Medical Imaging Physics
PHYS5018	Health Physics and Radiation Protection
PHYS5020	Computation and Image Processing
PHYS5019	Research Methodology & Project (Masters only) 24cp

4.2 A unit of study shall consist of such lectures, seminars, tutorial instruction, essays, exercises, practical work, or project work as may be prescribed. In these resolutions, 'to complete a unit of study' or any derivative expression means:
4.2.1 to attend lectures and meetings, if any, for seminars and tutorial instruction;
4.2.2 to complete satisfactorily the essays, exercises, practical and project work if any; and
4.2.3 to pass any other examination of the unit of study that may apply.
4.3 The Master of Medical Physics shall be awarded in two grades, namely Pass and, in the case of an outstanding candidate, Pass with Merit.

5. Enrolment in more/less than minimum load

5.1 A candidate may proceed on either a full-time or part-time basis.

6. Cross-institutional study

6.1 Cross-institutional study shall not be available to students enrolled in the Graduate Diploma in Medical Physics and the Master of Medical Physics courses, except where the University

of Sydney has a formal Cooperation Agreement with another University.

7. **Restrictions on enrolment**

7.1 Admission to either course may be limited by quota.

7.2 In determining the quota the University will take into account:

7.2.1 availability of resources including space, library, equipment, laboratory and computing facilities; and

7.2.2 availability of adequate and appropriate supervision.

7.3 In considering an application for admission to candidature the Head of Department and the Faculty shall take account of the quota and will select in preference applicants who are most meritorious in terms of section 1 above.

8. **Discontinuation of enrolment**

8.1 A student who does not enrol in any semester without first obtaining written permission from the Dean to suspend candidature will be deemed to have discontinued enrolment in the course. Students who have discontinued from the course will be required to apply for admission to the course and be subject to admission requirements pertaining at that time.

9. **Suspension of candidature**

9.1 A student may seek written permission from the Dean to suspend candidature in the course.

9.2 Suspension may be granted for a maximum of one year.

10. **Re-enrolment after an absence**

10.1 A student who plans to reenrol after a period of suspension must advise the Faculty of Science Office in writing of their intention by no later than the end of October for First Semester of the following year or the end of May for Second Semester of the same year.

11. **Satisfactory progress**

11.1 Candidates for the Master of Medical Physics and the Graduate Diploma in Medical Physics shall be governed by the rules as follows:

11.1.1 A student who has failed a cumulative total of 12cp at any stage of enrolment in the Master of Medical Physics will be required to show good cause why he or she should be allowed to re-enrol and, if good cause has not been established, the student's enrolment will be transferred to the Graduate Diploma in Medical Physics;

11.1.2 A student who has failed a cumulative total of 18cp at any stage of enrolment in the Master of Medical Physics and/or the Graduate Diploma in Medical Physics will be required to show good cause why he or she should be allowed to re-enrol and, if good cause has not been established, the student will not be permitted to re-enrol.

11.1.3 A student who has failed a unit at the second attempt in the Master of Medical Physics and/or the Graduate Diploma in Medical Physics will be deemed to have failed to complete course requirements and will be required to show good cause why he or she should be allowed to re-enrol. If good cause has not been established, the student will not be permitted to re-enrol.

12. **Time limit**

12.1 For the Graduate Diploma in Medical Physics:

12.1.1 A full-time candidate shall complete the requirements for the Graduate Diploma not earlier than the end of the second semester of candidature, and not later than the fourth semester of candidature.

12.1.2 A part-time candidate shall complete the requirements for the Graduate Diploma not earlier than the end of the fourth semester of candidature, and not later than the sixth semester of candidature.

12.2 For the Master of Medical Physics:

12.2.1 A full-time candidate shall complete the requirements for the Masters degree not earlier than the end of the third semester of candidature, and not later than the fourth semester of candidature.

12.2.2 A part-time candidate shall complete the requirements for the Masters degree not earlier than the end of the fourth semester of candidature, and not later than the sixth semester of candidature.

13. **Assessment policy**

13.1 On completion of the requirements for the course, the Faculty shall determine the results of the candidature, on the recommendation of the Head of the School of Physics.

14. **Credit transfer policy**

14.1 Credit is not available in the Graduate Diploma in Medical Physics and Master of Medical Physics for postgraduate study which has not been undertaken in these award courses within the previous three years.

14.2 A candidate who has qualified for the award of the Graduate Diploma in Medical Physics may transfer, within three years, to the Master of Medical Physics and receive credit for up to 48 credit points from the Graduate Diploma in Medical Physics.

Nuclear Science degrees

Master of Applied Nuclear Science

Degree Code: LC051

Graduate Diploma in Applied Nuclear Science

Degree Code: LF039

This section sets out the requirements for coursework postgraduate degrees offered in the Faculty of Science in the area of Applied Nuclear Science. A comprehensive guide to the requirements and units of study of the coursework degrees is listed.

The information in this section is in summary form and is subordinate to the provisions of the relevant degree Resolutions, collected variously in at the end of this chapter, following the unit of study descriptions, or in the University of Sydney Calendar. The Calendar is available for sale at the Student Centre, for viewing at the faculty office or the Library, or on the Web at:
www.usyd.edu.au/publications/calendar.

Course overview

The Master of Applied Nuclear Science (MApplNucSci) and the Graduate Diploma in Applied Nuclear Science (GradDipApplNucSci) are designed to meet the growing needs both within Australia and globally for individuals with a postgraduate education and training in nuclear science and technology. Both award courses build upon a Physics major and provide a level and type of specialisation that is not available at the undergraduate level.

Candidates will normally commence their study in Semester 1, except with the permission of the Dean.

Course outcomes

Graduates of the MApplNucSci and GradDipApplNucSci degrees will have gained a comprehensive understanding of nuclear science and its applications. Graduates of the Master's program will have gained, in addition, research experience. Both courses will enable students to gain entry into the specialist field of nuclear science or into occupations where knowledge of this field is desirable. It will also provide an opportunity for those already working in the field of nuclear science to gain further experience in this field of science and technology.

Graduates of the Master of Applied Nuclear Science are eligible to apply for admission to a research degree (PhD).

Unit of Study descriptions

Applied Nuclear Science units

PHYS5011
Nuclear Physics

Credit points: 6 **Session:** Semester 1 **Classes:** One 2 hour lecture and one 1 hour practical per week **Assessment:** Assignments, written exam

This unit is normally undertaken as part of the Master of Medical Physics degree or the Graduate Diploma in Medical Physics or the Master of Applied Nuclear Science or the Graduate Diploma in Applied Nuclear Science. Nuclear properties, natural radioactivity, radioactive decay series, artificial radioactivity, nuclear models, nuclear decays (gamma, beta, alpha decays and heavy ion decay), nuclear reactions (including high energy nuclear particle induced spallation reactions), nuclear fission (spontaneous and induced fission) and nuclear fusion are covered.

PHYS5012
Radiation Physics and Dosimetry

Credit points: 6 **Session:** Semester 1 **Classes:** One 2 hour lecture and one 1 hour practical per week. **Prohibitions:** PHYS5001 **Assessment:** Assignments, written exam

This unit is normally undertaken as part of the Master of Medical Physics degree or the Graduate Diploma in Medical Physics or the Master of Applied Nuclear Science or the Graduate Diploma in Applied Nuclear Science. Sources of radiation, interaction of radiation with matter, physical, chemical, and biological effects of radiation in human tissue, physical principles of dosimetry, internal and external dosimetry, radiation units and measurement, Monte Carlo modeling of radiation transport are covered.

PHYS5013
Nuclear Instrumentation

Credit points: 6 **Session:** Semester 1 **Classes:** One 2 hour lecture and one 1 hour practical per week. **Assessment:** Assignments, written exam

This unit is normally undertaken as part of the Master of Applied Nuclear Science or the Graduate Diploma in Applied Nuclear Science. It covers principles and operation of nuclear particle detectors, gas filled detectors (ionisation chambers, Geiger counter, proportional counter), scintillation detectors (organic and inorganic scintillators), solid state detectors (Surface barrier detectors, GeLi detectors, Pin diodes), nuclear track detectors, neutron detectors (BF3 detectors, He-3 detectors, He-4 detectors), nuclear data acquisition methods and data analysis (counting statistics and error prediction), as well as basic principles of accelerators.

PHYS5014
Applications of Nuclear Physics

Credit points: 6 **Session:** Semester 1 **Classes:** One 2 hour lecture and one 1 hour practical per week **Assessment:** Assignments, written exam

This unit is normally undertaken as part of the Master of Applied Nuclear Science or the Graduate Diploma in Applied Nuclear Science. Applications of radioisotopes in medicine, agriculture, geochronology and cosmo-chronology, archaeology, space research, industry and research are covered. Experiments will be undertaken in nuclear, radiation and neutron physics.

PHYS5015
Reactor Physics and Systems

Credit points: 6 **Session:** Semester 2 **Classes:** One 2 hour lecture and one 1 hour practical per week. **Assessment:** Assignments, written exam

This unit is normally undertaken as part of the Master of Applied Nuclear Science or the Graduate Diploma in Applied Nuclear Science. It covers the following: physical properties of neutrons; neutron sources; neutron cross-sections, interactions and scattering; neutron flux and field; nuclear fission and chain reactions in thermal and fast nuclear reactors; neutron diffusion; criticality conditions; nuclear reactor dynamics; production and transmutation of radionuclides.

PHYS5016
Nuclear Chemistry and Nuclear Fuel Cycle

Credit points: 6 **Session:** Semester 2 **Classes:** One 2 hour lecture and one 1 hour practical per week. **Assessment:** Assignments, written exam

This unit is normally undertaken as part of the Master of Applied Nuclear Science or the Graduate Diploma in Applied Nuclear Science. It covers fuel materials, reactor fuel production, properties of fuel element materials, processing of spent nuclear fuel, separation processes, nuclear waste disposal and transmutation.

PHYS5017
Energy Options and Environment

Credit points: 6 **Session:** Semester 2 **Classes:** One 2 hour lecture and one 1 hour practical per week. **Assessment:** Assignments, written exam

This unit is normally undertaken as part of the Master of Applied Nuclear Science or the Graduate Diploma in Applied Nuclear Science. It covers the following: fossil fuels (coal, oil, gas); renewable energies (solar, wind, wave, biomass, geothermal); nuclear energy (fission, fusion); relative advantages; environmental impact and economical viability.

PHYS5018
Health Physics and Radiation Protection

Credit points: 6 **Session:** Semester 2 **Classes:** One 2 hour lecture and one 1 hour practical per week. **Prohibitions:** PHYS5008 **Assessment:** Assignments, written exam

This unit is normally undertaken as part of the Master of Medical Physics degree or the Graduate Diploma in Medical Physics or the Master of Applied Nuclear Science or the Graduate Diploma in Applied Nuclear Science. The biological effects due to the interaction of radiation with human tissues from the DNA level through to the major organ systems are covered. Factors affecting dose response of tissue are considered along with models describing characteristic behaviour. Physical and biological aspects of the safe use of ionizing radiation, physical principles underlying shielding design instrumentation, international and legislative requirements for radiation protection are covered.

PHYS5019
Research Methodology and Project

Credit points: 24 **Session:** Semester 1, Semester 2 **Prerequisites:** Successful completion of the eight coursework units of the postgraduate coursework Masters degree for which the student is enrolled, equivalent to completion of the requirements for award of the Graduate Diploma. **Prohibitions:** Both PHYS(5009 and 5010) **Assessment:** Report

Note: Department permission required for enrolment. Note: This unit is only available for students in the Master of Applied Nuclear Science or the Master of Medical Physics degrees

In this unit, normally undertaken as part of the Master of Applied Nuclear Science degree, a research project is undertaken. The topic of the project will be determined in consultation with the course coordinator. In addition, the processes involved in conducting various forms of research, basic data analysis and interpretation, research writing and presentation skills are covered.

Resolutions

Master of Applied Nuclear Science Graduate Diploma in Applied Nuclear Science

Course rules

1. Admission

1.1 The Faculty may, on the recommendation of the Dean of the Faculty of Science, admit to candidature for:

1.1.1 *the Graduate Diploma in Applied Nuclear Science*

1.1.2 an applicant who is the holder of a bachelor's degree in Science or Engineering from the University of Sydney provided the applicant has achieved a major in physics, or equivalent;

1.1.3 a graduate of another university or appropriate institution who has equivalent qualifications to those specified in subsection 1.1.2.

1.2 *The Master of Applied Nuclear Science*

1.2.1 a person who has the qualifications specified in subsection 1.1.2; or

1.2.2 a person who has completed requirements for the Graduate Diploma in Applied Nuclear Science.

1.3 Conditions of candidature are prescribed by Resolutions of the Faculty.

2. Units of study

2.1 The units of study for the Graduate Diploma in Applied Nuclear Science and the Master of Applied Nuclear Science are listed in the Table of units of study associated with these resolutions.

3. Requirements for the Graduate Diploma in Applied Nuclear Science and Master of Applied Nuclear Science

3.1 Candidates for the Graduate Diploma in Applied Nuclear Science are required to complete 48 credit points consisting of the core units of study in the Table of units of study in subsection 4.1, excluding the project PHYS5019.

3.2 Candidates for the Master of Applied Nuclear Science are required to complete 72 credit points consisting of the 48 credit points of core units of study in the Table of units of study in subsection 4.1, including the 24 credit point project PHYS5019.

3.3 A candidate must complete successfully 48 credit points of units of study before enrolling in PHYS5019.

Faculty rules

4. Details of units of study

4.1 The units of study for the Graduate Diploma in Applied Nuclear Science, and the Master of Applied Nuclear Science are listed in the following table. The units of study may be varied by the Faculty from time to time:

All units are core. Unless otherwise indicated all units are worth 6 credit points.

Unit of study	Name
PHYS5011	Nuclear Physics
PHYS5012	Radiation Physics and Dosimetry
PHYS5013	Nuclear Instrumentation
PHYS5014	Applications of Nuclear Physics
PHYS5015	Reactor Physics and Systems
PHYS5016	Nuclear Chemistry & Nuclear Fuel Cycle
PHYS5017	Energy Options and Environment
PHYS5018	Health Physics and Radiation Protection
PHYS5019	Research Methodology & Project (Masters only) 24 cp

4.2 A candidate for the course shall proceed by completing units of study as prescribed by the Faculty.

4.3 A unit of study shall consist of such lectures, seminars, tutorial instruction, essays, exercises, practical work, or project work as may be prescribed.

4.4 In these resolutions, 'to complete a unit of study' or any derivative expression means:

4.4.1 to attend lectures and meetings, if any, for seminars and tutorial instruction;

4.4.2 to complete satisfactorily the essays, exercises, practical and project work if any; and

4.4.3 to pass any other examination of the unit of study that may apply.

4.5 All units of study for a particular subject area may not be available every semester.

4.6 The Master of Applied Nuclear Science shall be awarded in two grades, namely Pass and, in the case of an outstanding candidate, Pass with Merit.

5. Enrolment in more/less than minimum load

5.1 A candidate may proceed on either a full-time or part-time basis.

6. Cross-institutional study

6.1 Cross-institutional study shall not be available to students enrolled in the Graduate Diploma in Applied Nuclear Science and the Master of Applied Nuclear Science courses, except where the University of Sydney has a formal Cooperation Agreement with another University.

7. Restrictions on enrolment

7.1 Admission to the Graduate Diploma in Applied Nuclear Science and Master of Applied Nuclear Science may be limited by a quota.

7.2 In determining the quota the University will take into account:

7.2.1 availability of resources including space, library, equipment, laboratory and computing facilities; and

7.2.2 availability of adequate and appropriate supervision.

7.3 In considering an application for admission to candidature the Dean shall take account of the quota and will select, in preference, applicants who are most meritorious in terms of subsection 1 above.

8. Discontinuation of enrolment

8.1 A student who does not enrol in any semester without first obtaining written permission from the Dean to suspend candidature will be deemed to have discontinued enrolment in the course.

8.2 Students who have discontinued from the course will be required to apply for admission to the course and be subject to admission requirements pertaining at that time.

9. Suspension of candidature

9.1 A student may seek written permission from the Dean to suspend candidature in the course.

9.2 Suspension may be granted for a maximum of one year.

10. Re-enrolment after an absence

10.1 A student who plans to re-enrol after a period of suspension must advise the Faculty of Science Office in writing of their intention by no later than the end of October for First Semester of the following year or the end of May for Second Semester of the same year.

11. Satisfactory progress

11.1 Candidates for the Graduate Diploma in Applied Nuclear Science and the Master of Applied Nuclear Science shall be governed by the rules as follows:

11.1.1 A student who has failed a cumulative total of 12cp at any stage of enrolment in the Master of Applied Nuclear Science will be required to show good cause why he or she should be allowed to re-enrol and, if good cause has not been established, the student's enrolment will be transferred to the Graduate Diploma in Applied Nuclear Science;

11.1.2 A student who has failed a cumulative total of 18cp at any stage of enrolment in the Master of Applied Nuclear Science and/or the Graduate Diploma in Applied Nuclear Science will be required to show good cause why he or she should be allowed to re-enrol and, if good cause has not been established, the student will not be permitted to re-enrol.

11.1.3 A student who has failed a unit at the second attempt in the Master of Applied Nuclear Science and/or the Graduate Diploma in Applied Nuclear Science will be deemed to have failed to complete course requirements and will be required to show good cause why he or she should be allowed to re-enrol. If good cause has not been established, the student will not be permitted to re-enrol.

12. Time limit

12.1 A candidate for the Graduate Diploma in Applied Nuclear Science shall complete the requirements for the award in a minimum of two semesters and a maximum of 6 semesters, and (in the event of suspension) except with permission of the Dean within five calendar years of admission to candidature.

12.2 A candidate for the Master in Applied Nuclear Science shall complete the requirements for the award in a minimum of 3 semesters and a maximum of 6 semesters, and (in the event of suspension) except with permission of the Dean within five calendar years of admission to candidature.

13. Assessment policy

13.1 A candidate may be tested by written and oral examinations, assignments, exercises and practical work or any combination of these.

13.2 On completion of the requirements for the Graduate Diploma in Applied Nuclear Science or the Master in Applied Nuclear Science, the results of the examination of the coursework shall be reported by the School of Physics to the Faculty, which shall determine the result of the candidature.

14. Credit transfer policy

14.1 Credit is not available in the Graduate Diploma in Applied Nuclear Science and Master of Applied Nuclear Science for

postgraduate study which has not been undertaken in these award courses within the previous three years.

14.2 A candidate who has qualified for the award of the Graduate Diploma in Applied Nuclear Science may transfer, within three years, to the Master of Applied Nuclear Science and receive credit for up to 48 credit points from the Graduate Diploma in Applied Nuclear Science.

Photonics and Optical Science degrees

Master of Photonics and Optical Science

Degree Code: LC053

Graduate Diploma in Photonics and Optical Science

Degree Code: LF041

The Graduate Diploma in Photonics and Optical Science and the Master of Photonics and Optical Science are articulated coursework programs that allow a degree of flexibility in the depth at which studies are undertaken and the choice of subjects studied.

This section sets out the requirements for coursework postgraduate degrees offered in the Faculty of Science in the area of Photonics and Optical Science. A comprehensive guide to the requirements and units of study of the coursework degrees is listed.

The information in this section is in summary form and is subordinate to the provisions of the relevant degree Resolutions, collected variously in at the end of this chapter, following the unit of study descriptions, or in the University of Sydney Calendar. The Calendar is available for sale at the Student Centre, for viewing at the faculty office or the Library, or on the Web at:
www.usyd.edu.au/publications/calendar.

Course overview

The Master of Photonics and Optical Science is taken over three semesters of full-time study with two of those semesters comprised of coursework and one semester of study towards a research project carried out under the supervision of academic staff in the School of Physics. Each semester of coursework comprises four 6 unit courses in the following subject areas:

- Optical Instrumentation and Imaging
- Guided wave optics and communications applications
- Lasers and optical devices
- Optical materials and methods
- Fourier and nonlinear optics
- Quantum optics and nanophotonics
- Biophotonics and microscopy
- Optics in industry

Course outcomes

This course provides a professional level of education in optics and photonics with training applicable to employment in in communications, optical and scientific instruments and optical techniques in biology and medical applications. The course is suitable both for those training for senior positions in optical industries or as preparation for a PhD.

Unit of Study descriptions

Photonics and Optical Science units

PHYS5019
Research Methodology and Project

Credit points: 24 **Session:** Semester 1, Semester 2 **Prerequisites:** Successful completion of the eight coursework units of the postgraduate coursework Masters degree for which the student is enrolled, equivalent to completion of the requirements for award of the Graduate Diploma. **Prohibitions:** Both PHYS(5009 and 5010) **Assessment:** Report

Note: Department permission required for enrolment. Note: This unit is only available for students in the Master of Applied Nuclear Science or the Master of Medical Physics degrees

In this unit, normally undertaken as part of the Master of Applied Nuclear Science degree, a research project is undertaken. The topic of the project will be determined in consultation with the course coordinator. In addition, the processes involved in conducting various forms of research, basic data analysis and interpretation, research writing and presentation skills are covered.

PHYS5021
Optical Instrumentation and Imaging

Credit points: 6 **Teacher/Coordinator:** Dr Gordon Robertson **Session:** Semester 1 **Classes:** total of 32 lectures, 10 two hour practicals **Assumed knowledge:** Pass science degree majoring in Physics, or pass Engineering degree **Assessment:** One 2 hour exam 75%, one 2000 word essay 20%, tutorial papers 10%, prac reports 10%

Optical instrumentation covers the basics of geometrical optics before moving on to a detailed overview of the principles and practice of optical design principles of image formation, lenses and mirrors, aberrations and tolerancing. The course will cover different design examples - collimators, cameras, objective lenses. Students will gain experience in working with optical design software.

The Imaging component of the course provides training in the mathematical techniques used to analyse an image recorded by an electronic camera to recover information of interest. Students will be given an overview of image processing principles, and learn about processing in the spatial and frequency domains. The course covers noise removal, tomography and image restoration techniques. This section of the course will be complemented by laboratory sessions in which students manipulate images using one of the data processing packages (IDL, Matlab).

Textbooks
To be announced

PHYS5022
Optical Materials and Methods

Credit points: 6 **Teacher/Coordinator:** Dr Christian Karnutsch **Session:** Semester 1 **Classes:** Two lectures and 1 practical per week **Assumed knowledge:** Pass degree in Science majoring in Physics or equivalent, or a pass degree in Electrical Engineering or equivalent **Assessment:** One 2 hour examination 75%, practical reports 15%, assignments 10%

This unit of study introduces students to the properties and use of modern optical materials such as glasses, semiconductors, polymers and liquid crystals. We analyse the effect of electronic and crystallographic properties on the generation and propagation of light in these materials. We study fundamental methods for producing modern optical materials, which includes techniques to fabricate optically active glasses, to grow bulk semiconductor crystals and compound semiconductor heterostructures, and to deposit organic semiconducting polymers.

We will discuss advanced concepts such as generating abrupt interfaces, p-i-n junctions and doping profiles that are important concepts in the context of band gap engineering and low-dimensional semiconductor heterostructures, such as Quantum Wells or Quantum Dots. Students are then introduced to methods of micro-fabricating optical devices from these materials, including patterning by conventional optical lithography and novel Nanoimprint lithography, structuring by wet and dry etching and deposition of electrical contacts.

The properties and fabrication techniques for optical thin films will also be covered.

Students will receive training in the use of modern microfabrication tools (e.g. electron beam lithography, reactive ion etching, thin film deposition).

Textbooks

Optoelectronics, an introduction (3rd ed.) J Wilson & J Hawkes, Prentice Hall; Physics of Semiconductor Devices (2nd ed.) SM Sze, Wiley; Optoelectronic Semiconductor Devices D Wood, Prentice Hall; Optoelectronics E Rosencher & B Vintner, Cambridge University Press; Introduction to Solid State Physics C Kittel, Wiley; Quantum Semiconductor Structures C Weisbuch & B Vintner, Academic Press; The physics of low-dimensional semiconductors JH Davies, Cambridge University Press; Compound Semiconductor Technology DJ Colliver, Artech House; Fundamentals of Semiconductors: Physics and Materials Properties (3rd ed.) PY Yu & M Cardona, Springer; Introduction to Microelectronic Fabrication (2nd ed.) RC Jaeger, Prentice-Hall; Nanostructures & Nanomaterials: Synthesis, Properties & Applications - G Cao, Imperial College Press; Principles of Growth and Processing of Semiconductors S Mahajan & KS Sree Harsha, McGraw-Hill; The Science and Engineering of Microelectronic Fabrication (2nd ed.) SA Campbell, Oxford University Press; Handbook of Semiconductor Technology, Wiley-VCH; Handbook on Semiconductors, North-Holland; Introduction to Liquid Crystals: Chemistry and Physics PJ Collings & M Hird, CRC Press; Semiconducting Polymers: Chemistry, Physics and Engineering (2nd ed.) G Hadziioannou & G Malliaras, Wiley-VCH; The Properties of Optical Glass - H Bach & N Neuroth, Springer; Silicon Photonics: An Introduction GT Reed & AP Knights, Wiley; Silicon Photonics L Pavesi & DJ Lockwood, Springer

PHYS5024

Optical Sources and Detectors

Credit points: 6 **Teacher/Coordinator:** Dr David Moss **Session:** Semester 1 **Classes:** 2 lectures, 1 tutorial and 1 practical per week **Prerequisites:** Pass degree in Science majoring in Physics or equivalent, or a pass degree in Electrical Engineering or equivalent **Assessment:** One 2 hour examination 75%, two assignments 25%

This unit of study provides a detailed overview of sources and detectors of optical radiation as well as optical amplifiers. Lasers, light emitting diodes, optical amplifiers and other sources of radiation are covered. Students will study the principles of operation and application of a range of different lasers including diode lasers, fibre lasers and solid state diode-pumped lasers; modelocking and short pulse lasers and high power gas lasers. The properties of semiconductor lasers, amplifiers and detectors will be explained in terms of the materials properties of semiconductors.

Textbooks

Various (no single text will be used)

PHYS5025

Biophotonics and Microscopy

Credit points: 6 **Teacher/Coordinator:** Dr Boris Kuhlmey **Session:** Semester 2 **Classes:** One 1 hour lecture per week and an average of 0.5 hour tutorials and 1.5 practical hours per week over the semester **Assumed knowledge:** Pass degree in Science majoring in Physics or equivalent or a pass degree in Electrical Engineering or equivalent **Assessment:** One 2 hour examination 30%, three written assignments 30%, practical assessment 40%

Biophotonics is the use of optical techniques to probe living tissue either via imaging or spectral analysis. In this course we cover the basics of imaging in tissue and cover the principles of the main microscopy techniques: fluorescence imaging, confocal microscopy, two-photon microscopy, optical coherence tomography and endoscopic imaging. Using EMU facilities, students will be provided with practical training in these techniques. Approaches to biochemical detection, Raman spectroscopy, surface plasmon sensors will be covered. The course will also include lectures on laser tweezers and microfluidics, both of which are used for analyzing small biological samples.

Textbooks

To be announced

PHYS5026

Physical and Nonlinear Optics

Credit points: 6 **Teacher/Coordinator:** Professor Martijn de Sterke **Session:** Semester 2 **Classes:** 2 lectures per week, 2-5 tutorials per week, 3-5 hours laboratory work per week **Assumed knowledge:** basic electromagnetism, optical waveguide theory **Assessment:** One 3 hour examination 65%, written assignments 20%, lab 15%

This unit of study provides a rigorous introduction to physical optics and to nonlinear optics. Physical optics includes polarization, coherence, diffraction, Fourier properties of lenses and optical systems, spatial filtering and holography. Nonlinear optics starts with nonlinear polarization and covers Chi-2 effects (electro optic effect, second harmonic generation) and Chi-3 effects (self and cross phase modulation). Nonlinear wave propagation is examined by solving the nonlinear Schrodinger equation, which elucidates a range of physical phenomena including four wave mixing and soliton generation and their impact on communications systems.

Textbooks

"Light and Matter" by Yehuda Band (Wiley, 2006)

PHYS5027

Quantum Optics and Nanophotonics

Credit points: 6 **Teacher/Coordinator:** Dr Stephen Bartlett **Session:** Semester 2 **Classes:** 1 lecture, 1 tutorial, 1 seminar per week **Assumed knowledge:** Pass degree in Science majoring in Physics or equivalent, or a pass degree in Electrical Engineering or equivalent **Assessment:** One 2 hour examination 70%, written assignments 30%

Quantum optics will introduce the quantization of light and photon statistics, and cover a range of topics of current interest including intensity interferometry, quantum cryptography, optical quantum computing and atom optics including Bose Einstein condensates and atom lasers. Emphasis will be on qualitative understanding rather than rigorous mathematical descriptions.

Nanophotonics covers light propagation through materials with sub-wavelength structuring so light is guided not only by refraction but also diffraction. This leads to the study of photonic crystals including photonic crystal fibres, plasmonics, photonic 'nanowires' and metamaterials. The course also provides opportunities for students to use powerful finite difference time domain (FDTD) simulation packages to design devices like high Q nano-resonators using these materials, and discusses how such devices are actually made.

Textbooks

To be announced

PHYS5028

Optics in Industry

Credit points: 6 **Teacher/Coordinator:** Dr Chris Walsh **Session:** Semester 2 **Classes:** One 1 hour lecture per week, two hours of tutorials per week. **Prerequisites:** PHYS5021, 5022, 5024, 5025 **Assumed knowledge:** Equivalent to a pass degree in Science majoring in Physics or a pass degree in Electrical Engineering **Assessment:** One 2000 word essay 40%, prac assessments 60%

This unit of study will first provide students with a detailed optical analysis of a consumer or industry product whose operation embodies many of the principles discussed in this course. Examples include a phone camera or a DVD player.

Next, students will study the factors that become increasingly important when working as a professional in an industry/commercial environment. These include Intellectual property, Business plans and Project Management. This component of the unit will comprise lectures from University staff with industry experience and guest speakers from industry.

There will be a project-based activity in which students will be required to develop a business case for a specific product and draw up a project plan.

ELEC5511

Optical Communication Systems

Credit points: 6 **Session:** Semester 1 **Classes:** 2 hours of lectures and 2 hours laboratory/tutorial per week. **Prohibitions:** ELEC5503 Optical Communication Systems. **Assumed knowledge:** (ELEC3503 Introduction to Digital Communications or ELEC3505 Communications) and (ELEC3402 Communications Electronics or ELEC3405 Communications Electronics and Photonics). **Assessment:** Assignments and labs 25%, end of semester exam 75%.

Introduction to optical fibre communications. Optical fibre transmission characteristics; fibre modes, multi-mode fibres, single-mode fibres, dispersion, loss. Semiconductor and fibre laser signal sources; dynamic laser models, switching, chirp, noise, optical transmitters.

Optical modulation techniques. Optical amplifiers and repeaters, noise characteristics. Fibre devices, gratings, multiplexers. Optical detectors, shot noise and avalanche noise. Optical receiver and regenerator structures; sensitivity and error rate performance. Photonic switching and processing. Optical local area networks. Multi-channel multiplexing techniques. Design of optical fibre communication systems.

Resolutions

Master of Photonics and Optical Science Graduate Diploma in Photonics and Optical Science

Course rules

1. **Admission**

1.1 The Faculty may, on the recommendation of the Dean of the Faculty of Science, admit to candidature for:

1.1.1 **The Master of Photonics and Optical Science:**

1.1.1.1 an applicant who is the holder of a bachelor's degree in Science or Engineering from the University of Sydney provided the applicant has achieved a major in physics, or equivalent;

1.1.1.2 a graduate of another university or appropriate institution who has equivalent qualifications to those specified in subsection 1.1.1.1.

1.1.2 **The Graduate Diploma in Photonics and Optical Science:**

1.1.2.1 an applicant who has the qualifications specified in subsections 1.1.1.1 or 1.1.1.2.

2. **Units of study**

2.1 The units of study for the Graduate Diploma in Photonics and Optical Science and the the Master of Photonics and Optical Science are listed in the *Details of units of study* associated with these resolutions.

3. **Requirements for the Graduate Diploma in Photonics and Optical Science and Master of Photonics and Optical Science**

3.1 Candidates for the Graduate Diploma in Photonics and Optical Science are required to complete 48 credit points consisting of the core units of study in the *Details of units of study* in subsection 4.1.

3.2 Candidates for the Master of Photonics and Optical Science are required to complete 72 credit points consisting of the 48 credit points of core units of study in the *Details of units of study* in subsection 4.1 and the 24 credit point PHYS5019 Research Methodology and Project.

3.3 A candidate must complete successfully 48 credit points of units of study before enrolling in PHYS5019 Research Methodology and Project.

Details of units of study

Core units Diploma and Masters degrees	
PHYS5021	Optical Instrumentation and Imaging
PHYS5022	Optical Materials and Methods
PHYS5024	Optical Sources and Detectors
PHYS5025	Biophotonics and Microscopy
PHYS5106	Physical and Nonlinear Optics
PHYS5027	Quantum Optics and Nanophotonics
PHYS5028	Optics in Industry
ELEC5511	Optical Communications Systems
Core unit Masters only	
PHYS5019	Research Methodology and Project (taken in third semester of enrolment)

5. **Enrolment in more/less than minimum load**

5.1 A local candidate may proceed on either a full-time or part-time basis.

6. **Cross-institutional study**

6.1 Cross-institutional study shall not be available to students enrolled in the Graduate Diploma in Photonics and Optical Science and the Master of Photonics and Optical Science courses, except where the University of Sydney has a formal Cooperation Agreement with another University.

7. **Restrictions on enrolment**

7.1 Admission to either course may be limited by quota.

7.2 In determining the quota the University will take into account:

7.2.1 Availability of resources including space, library, equipment, laboratory and computing facilities; and

7.2.2 Availability of adequate and appropriate supervision.

7.2.3 In considering an application for admission to candidature the Head of Department and the Faculty shall take account of the quota and will select in preference applicants who are most meritorious in terms of section 1 above.

8. **Discontinuation of enrolment**

8.1 A student who does not enrol in any semester without first obtaining written permission from the Dean to suspend candidature will be deemed to have discontinued enrolment in the course. Students who have discontinued from the course will be required to apply for readmission to the course and be subject to admission requirements pertaining at that time.

9. **Suspension of candidature**

9.1 A student may seek written permission from the Dean to suspend candidature in the course.

9.2 Suspension may be granted for a maximum of one year.

10. **Re-enrolment after an absence**

10.1 A student who plans to re-enrol after a period of suspension must advise the Faculty of Science Office in writing of their intention by no later than the end of October for First Semester of the following year or the end of May for Second Semester of the same year.

11. **Satisfactory progress**

11.1 Candidates for the Master of Photonics and Optical Science and the Graduate Diploma in Photonics and Optical Science shall be governed by the rules as follows:

11.1.1 A student who has failed a cumulative total of 12cp at any stage of enrolment in the Master of Photonics and Optical Science will be required to show good cause why he or she should be allowed to re-enrol and, if good cause has not been established, the student's enrolment will be transferred to the Graduate Diploma in Photonics and Optical Science;

11.1.2 A student who has failed a cumulative total of 18cp at any stage of enrolment in the Master of Photonics and Optical Science and/or the Graduate Diploma in Photonics and Optical Science will be required to show good cause why he or she should be allowed to re-enrol and, if good cause has not been established, the student will not be permitted to re-enrol.

11.1.3 A student who has failed a unit at the second attempt in the Photonics and Optical Science and/or the Graduate Diploma in Photonics and Optical Science will be deemed to have failed to complete course requirements and will be required to show good cause why he or she should be allowed to re-enrol. If good cause has not been established, the student will not be permitted to re-enrol.

12. **Time limit**

12.1 For the Graduate Diploma in Photonics and Optical Science:

12.1.1 A full-time candidate shall complete the requirements for the Graduate Diploma not earlier than the end of the second semester of candidature, and not later than the fourth semester of candidature.

12.1.2 A part-time candidate shall complete the requirements for the Graduate Diploma not earlier than the end of the fourth semester of candidature, and not later than the sixth semester of candidature.

12.2 For the Master of Photonics and Optical Science:

12.2.1 A full-time candidate shall complete the requirements for the Masters degree not earlier than the end of the third semester of candidature, and not later than the fourth semester of candidature.

12.2.2 A part-time candidate shall complete the requirements for the Masters degree not earlier than the end of the fourth semester of candidature, and not later than the sixth semester of candidature.

13. **Assessment policy**

13.1 On completion of the requirements for the course, the Faculty shall determine the results of the candidature, on the recommendation of the Head of the School of Physics.

14. **Credit transfer policy**

14.1 Credit is not available in the Graduate Diploma in Photonics and Optical Science and Master of Photonics and Optical Science for postgraduate study which has not been undertaken in these award courses within the previous three years.

14.2 A candidate who has qualified for the award of the Graduate Diploma in Photonics and Optical Science may transfer, within three years, to the Master of Photonics and Optical Science and receive credit for up to 48 credit points from the Graduate Diploma in Photonics and Optical Science.

15. **Award of the Masters degree**

15.1 The Master of Photonics and Optical Science shall be awarded in two grades, namely Pass and, in the case of an outstanding candidate, Pass with Merit

26. Psychology coursework degrees

This chapter sets out the requirements for coursework postgraduate degrees offered by the School of Psychology.

The information in this chapter contains information in summary form and is subordinate to the provisions of the relevant degree Resolutions, collected variously in this chapter, or in the University of Sydney Calendar. The Calendar is available for sale at the Student Centre, for viewing at the faculty office or the Library, or online at www.usyd.edu.au/calendar.

The School offers a range of degrees:

- The Graduate Diploma in Psychology for graduates in other disciplines to obtain a Psychology major.
- The Graduate Certificate in Applied Science (Applied Positive Psychology) for students interested in the study of positive psychology.
- The Graduate Certificate, Graduate Diploma and Master of Applied Science (Health Psychology) – an articulated postgraduate program for students interested in the theory and practical applications of health psychology.
- The Graduate Certificate, Graduate Diploma and Master of Applied Science (Psychology of Coaching) – an articulated postgraduate program for students interested in the applied science of human performance enhancement and coaching.

Graduate Diploma in Psychology

Degree Code: LF017

Course outcomes

Upon completion of the course, the graduate will have a Psychology major, accredited by the Australian Psychological Society, equivalent to that available in the Bachelor of Arts, Bachelor of Science, Bachelor of Economics (Social Science), Bachelor of Liberal Studies or the Bachelor of Arts and Sciences. They will have studied all basic areas of experimental Psychology, statistical methods in Psychology, and an extensive range of optional topics. They will be eligible to apply to continue to a fourth year in Psychology (Honours) and from there to a higher degree in Psychology.

Eligibility for admission

Applicants holding relevant degrees

The Faculty of Science may admit to candidature applicants who hold the award course of Bachelor of Science, Bachelor of Arts, Bachelor of Economic & Social Sciences, Bachelor of Liberal Studies or Bachelor of Arts and Sciences from the University of Sydney, or equivalent degree as deemed by the faculty, who have not previously completed a major in Psychology. Applicants must have already successfully completed 12 credit points of Junior Psychology (currently PSYC1001 and 1002) or equivalent within the last 10 years. When assessing an applicant, both undergraduate record and UAI (or equivalent) may be taken into account.

Method of progression

Students are required to study a minimum of 48 credit points of intermediate and senior level Psychology. This shall consist of 24 credit points of Intermediate Psychology (currently PSYC 2011, 2012, 2013 and 2014) and a minimum of 24 credit points of Senior Psychology including PSYC3010 and one of PSYC(3011, 3012, 3013 or 3014). Students must complete the necessary qualifying units of study for entry into later units of study. Normally, progression will be over a minimum of four semesters. Students may study additional senior Psychology if they wish.

Study in Psychology beyond the graduate diploma

To be eligible for study in Psychology beyond the graduate diploma at the University of Sydney, students must, except with School approval, include PSYC3010 Advanced Statistics for Psychology for entry to Psychology 4 (Honours). Successful completion of HPSC3023 History and Philosophy of Psychology and Psychiatry is essential for students intending to take the Theoretical Thesis option in Psychology honours.

Exemptions and Advanced Standing

Students may apply for exemptions if they have already completed studies which the faculty deems equivalent to those in the program. Such units of study must have been completed within the previous 10 years. The number of exemptions allowed will not exceed Faculty of Science regulations or will not exceed 24 credit points, whichever is the lower.

See Chapter 10 for unit of study descriptions, under the School of Psychology entry.

Resolutions

Graduate Diploma in Psychology

[Section 1]

1. **Admission**

1.1 The Dean of the Faculty of Science may admit to candidature for the Graduate Diploma in Psychology:

1.1.1 applicants who hold the degree of Bachelor of Science, Bachelor of Arts, Bachelor of Economics (Social Science), or Bachelor of Liberal Studies from the University of Sydney, or 1.1.2 applicants who hold an equivalent degree as deemed by the Faculty, who have not previously completed a major in Psychology.

1.2 When assessing an applicant, both undergraduate record and UAI (or equivalent) may be taken into account.

1.3 Applicants must have already successfully completed 12 credit points of Junior Psychology (currently PSYC1001 and 1002) or equivalent within the last 10 years, except that an applicant who has completed 6 credit points of Junior Psychology at the University of Sydney in the previous 12 months with a grade of Distinction or better shall be considered for admission.

1.4 Conditions of candidature are prescribed by Resolutions of the Faculty.

2. **Units of study**

2.1 The units of study for the Graduate Diploma in Psychology are listed in Table 1 associated with the resolutions of the Bachelor of Science.

2.2 Credit point value, assumed knowledge, corequisites, prerequisites and any special conditions are included in the description of units of study associated with these resolutions.

3. **Requirements for the Graduate Diploma in Psychology**

3.1 A candidate shall complete coursework to the value of 48 credit points comprising:

3.1.1 24 credit points of Intermediate units of study in Psychology, and

3.1.2 24 credit points of Senior units of study in Psychology which must, except with Departmental approval, include PSYC(3012 or 3010) and one of PSYC(3011, 3012, 3013 and 3014).

3.2 The prerequisites and progression requirements for these units of study as set out in Table I for the BSc must be met.

[Section 2]

4. **Details of units of study**

4.1 The units of study for the Graduate Diploma Psychology are listed in Table 1 of the Resolutions of the Bachelor of Science.

4.2 A candidate for the course shall proceed by completing units of study as prescribed by the Faculty.

4.3 A unit of study shall consist of such lectures, seminars, tutorial instruction, essays, exercises, practical work, or project work as may be prescribed.

4.4 In these resolutions, 'to complete a unit of study' or any derivative expression means:

4.4.1 to attend the lectures and the meetings, if any, for seminars or tutorial instruction;

4.4.2 to complete satisfactorily the essays, exercises, practical and project work if any; and

4.4.3 to pass any other examination of the unit of study that may apply.

4.5 All units of study for a particular subject area may not be available every semester.

5. **Enrolment in more/less than minimum load**

5.1 A candidate may proceed on a part-time basis only.

6. **Cross-institutional study**

6.1 Cross-institutional study shall not be available to students enrolled in the Graduate Diploma in Psychology except where the University of Sydney has a formal Cooperation Agreement with another University.

7. **Restrictions on enrolment**

7.1 Admission to the Graduate Diploma in Psychology, may be limited by a quota.

7.2 In determining the quota, the University will take into account:

7.2.1 availability of resources including space, laboratory and computing facilities; and

7.2.2 availability of adequate and appropriate supervision.

7.3 In considering an application for admission to candidature the Dean shall take account of the quota and will select, in preference, applicants who are most meritorious in terms of subsection 1 above.

8. **Discontinuation of enrolment**

8.1 A student who does not enrol in any semester without first obtaining written permission from the Dean to suspend candidature will be deemed to have discontinued enrolment in the course.

8.2 Students who have discontinued from the course will be required to apply for admission to the course and be subject to admission requirements pertaining at that time.

9. **Suspension of candidature**

9.1 A student may seek written permission from the Dean to suspend candidature in the course.

9.2 Suspension may be granted for a maximum of one year.

10. **Re-enrolment after an absence**

10.1 A student who plans to re-enrol after a period of suspension must advise the Faculty of Science Office in writing of their intention by no later than the end of October for First Semester of the following year or the end of May for Second Semester of the same year.

11. **Satisfactory progress**

11.1 Candidates for the Graduate Diploma in Psychology shall be governed by the rule as follows:

11.1.2 A student who has failed a cumulative total of 12cp at any stage of enrolment in the Graduate Diploma in Psychology will be required to show good cause why he or she should be allowed to re-enrol and, if good cause has not been established, the student's enrolment will be terminated and the student will not be permitted to re-enrol.

12. **Time limit**

12.1 A candidate for the Graduate Diploma in Psychology shall complete the requirements for the award in a minimum of four semesters and a maximum of eight semesters, and (in the event of suspension) except with permission of the Dean within five calendar years of admission to candidature.

13. **Assessment policy**

13.1 A candidate may be tested by written and oral examinations, assignments, exercises and practical work or any combination of these.

13.2 On completion of the requirements for the Graduate Diploma in Psychology, the results of the examination of the coursework and participation in the seminar series shall be reported by the School of Psychology to the Faculty, which shall determine the result of the candidature.

14. **Credit transfer policy**

14.1 Students may apply for credit (up to 24 credit points) for unit(s) of study where they have already completed studies which the Faculty deems equivalent to unit(s) in the Graduate Diploma in Psychology and for which no award has been conferred.

14.2 Such units of study must have been completed within the previous 10 years.

Applied Positive Psychology

Graduate Certificate in Applied Science (Applied Positive Psychology)

Degree Code: LG024

Course overview

Positive psychology is the scientific study of the factors that enable individuals, organisations and communities to flourish and thrive. There is considerable interest worldwide in positive psychology and its application in work, professional and personal settings. This degree program teaches history and development of positive psychology, an understanding of the key theoretical constructs of positive psychology, the core research methods used in positive psychology, and the application of positive psychology principles in a wide range of settings.

Course outcomes

The aim of the program is to equip graduates with the skills, knowledge and ability to be effective change agents in the area of applied positive psychology. Topics covered in the program include goals, meaning and self-concordance; subjective and psychological well-being; the languishing vs. flourishing dichotomy; positive psychology in organisations, broaden and build theory; the psychology of peak performance; resilience flow, mental toughness, and the philosophy and psychology of happiness. There is emphasis on both theoretical understating and applied skills, and students will be expected to engage in experiential learning, to participate in group discussion and to relate the taught material to their own personal life experience.

Unit of Study descriptions

Applied Positive Psychology units of study

PSYC4731

Psychology of Peak Performance

Credit points: 6 **Session:** Semester 2 **Classes:** One 3 hour seminar per week **Assessment:** Written papers (essays or case studies) and exam **Campus:** Camperdown/Darlington **Mode of delivery:** Normal (lecture/lab/tutorial) Day

The Psychology of Peak Performance draws on theories and models of sport, performance and positive psychology and applies these to use in executive, workplace and personal coaching practice. Topics covered include flow, mental toughness, mental readiness, concentration enhancement strategies and techniques, rehearsal and debrief strategies, thriving under pressure, self-coaching, overcoming setbacks, performance protocols, focusing, and surviving success. In addition the unit covers issues related to high performing teams and groups. Issues of work/life balance are also addressed, particularly in relation to the management of optimal energy levels (avoiding burnout). There is emphasis on both theoretical understanding and personal practice. The experiential learning component requires students to evaluate each week's topic in relation to their own personal life experience and to participate in group discussion and coaching practice.

Textbooks

No set text book: A reading pack can be obtained from the University Copy Centre

PSYC4721
Theories & Techniques of Coaching Psych

Credit points: 6 **Session:** Semester 1, Semester 2 **Classes:** One 3 hour lecture per week. **Assessment:** Written papers (essay, journal or case study) and exam. **Campus:** Camperdown/Darlington **Mode of delivery:** Normal (lecture/lab/tutorial) Day

This unit details the core theories and techniques of coaching psychology and evidence-based coaching, and the use of coaching as an applied positive psychology. Theories and techniques will be evaluated by reference to empirical research and conceptual analysis. An integrated goal-focused approach to coaching draws on a broad base of established Behavioural Science. Within this framework, primary attention will be paid to cognitive-behavioural and solution-focused theories and techniques of behaviour change and self-regulation, and their application to coaching clients. Each weekly seminar has a lecture component and an experiential learning component. The experiential learning component requires students to evaluate each week's topic in relation to their own personal life experience and to participate in group discussion and coaching practice.

PSYC4727
Positive Organisational Coaching

Credit points: 6 **Session:** S1 Intensive, Summer Late **Classes:** Five Day Seminars: Block Teaching. **Assessment:** A written coaching proposal (3,000 words) (50%), take home exam and written assignment (1,000 words) (35%), in-class exam (short answer and multiple choice) (15%). **Campus:** Camperdown/Darlington **Mode of delivery:** Block Mode

How can psychology help create 'healthy' workplaces? Executive and management coaching have emerged as important factors in the enhancement of performance, engagement and well-being in the workplace, This unit examines key issues in contemporary executive and workplace coaching and equips students with the knowledge and skills to provide world-class executive and management coaching, The emphasis is on critical evaluation of theory and application to practice, Although primarily focused on positive psychology, solution-focused and cognitive- behavioural approaches to coaching in organisations, the application of psychodynamic (eg Kilburg) and systems (eg O'Neil) approaches to the enhancement of performance and well-being are also considered. The unit covers issues in senior executive coaching, coaching middle management, establishing manager-as-coach programs, and the use of positive psychology in the workplace.

PSYC4730
Applied Positive Psychology

Credit points: 6 **Session:** Semester 1 **Classes:** One 3 hour lecture per week. **Assessment:** Written papers (Essays or case studies) and exam. **Campus:** Camperdown/Darlington **Mode of delivery:** Normal (lecture/lab/tutorial) Day

This unit of study teaches the application of positive psychology to coaching in work and personal life contexts. We consider the core principles of positive psychology and how these can be applied in coaching interventions. Topics covered in this unit include; coaching as an applied positive psychology; goals, meaning and well-being; subjective and psychological well-being: happiness; gratitude; the languishing vs. flourishing dichotomy; broaden and build theory; self-concordance; well-being in the workplace; career coaching through the life span; and the use of positive psychology in health coaching. There is emphasis on both theoretical understanding and personal practice. The experiential learning component requires students to evaluate each week's topic in relation to their own personal life experience and to participate in group discussion and coaching practice.

PHIL7840
Philosophy and the Science of Happiness

Credit points: 6 **Teacher/Coordinator:** Dr C West with Assoc Prof D Braddon Mitchell **Session:** Semester 1 **Classes:** 2 hours per week **Assessment:** Short essay 1500 words; long essay 3500 words **Campus:** Camperdown/Darlington **Mode of delivery:** Normal (lecture/lab/tutorial) Day

This unit deals with the philosophy and psychology of happiness and wellbeing. It covers classical and contemporary philosophical work on the nature of happiness. It discusses the kind of goal happiness or wellbeing is - is it something that we want only insofar as we desire it, or is there some rational requirement to make a richer conception of wellbeing the goal of life? The unit will also engage with aspects of positive psychology.

Resolutions

Graduate Certificate in Applied Science (Applied Positive Psychology)

1. **Admission**

1.1 The Dean of the Faculty of Science may admit to candidature for:

1.1.1 **The Graduate Certificate in Applied Science (Applied Positive Psychology):**

1.1.1.1 graduates of the University of Sydney holding the degree of Bachelor of Science or any other equivalent award of the University of Sydney;

1.1.1.2 graduates of other universities or other appropriate institutions who have qualifications equivalent to those specified in subsection 1.1.1.1; or

1.1.1.3 persons who have experience which is considered to demonstrate the knowledge and aptitude required to undertake the units of study.

1.2 Applicants must also meet the following requirements:

1.2.1 have either a 3-year Psychology degree or a 3-year degree in a cognate discipline; and

1.2.2 at least 2 years relevant employment experience is required.

1.2.3 Relevant work experience may include counselling, experience in organisational learning and development, management experience, employment in applied psychology settings, professional coaching or other areas directly related to coaching.

2. **Units of Study**

2.1 The units of study for the Graduate Certificate in Applied Science (Applied Positive Psychology) are listed in subsection 4.1.

2.2 Credit point value, assumed knowledge, corequisites, prerequisites and any special conditions are included in the unit of study descriptions.

3.0 **Requirements for Graduate Certificate in Applied Science (Applied Positive Psychology)**

3.1 Candidates for the Graduate Certificate in Applied Science (Applied Positive Psychology) are required to satisfactorily complete two core units of study PSYC4727 and PSYC4730, and 12 credit points from elective units.

Details of units of study

4.1 The units of study for the Graduate Certificate in Applied Science (Applied Positive Psychology), are listed in the following table:

Unit of study 2009	
Core units	
PSYC4727	Positive Organisational Coaching
PSYC4730	Applied Positive Psychology
Elective units	
PSYC4721	Theories & Techniques of Coaching Psychology
PSYC4731	Psychology of Peak Performance
PHIL7840	Philosophy and Science of Happiness

Students may enrol in alternative elective units with permission.

4.2 A candidate for the course shall proceed by completing units of study as prescribed by the Faculty.

4.3 A unit of study shall consist of such lectures, seminars, tutorial instruction, essays, exercises, practical work, or project work as may be prescribed.
4.4 In these resolutions, 'to complete a unit of study' or any derivative expression means:
4.4.1 to attend the lectures and the meetings, if any, for seminars or tutorial instruction;
4.4.2 to complete satisfactorily the essays, exercises, practical and project work if any; and
4.4.3 to pass any other examination of the unit of study that may apply.
4.5 All units of study for a particular subject area may not be available every semester.
4.6 The Dean may allow substitution of any unit of study by another unit of study, including units of study from other postgraduate coursework programs in the Faculty or elsewhere in the University.

5. **Enrolment in more/less than minimum load**

5.1 A candidate may only proceed on a part-time basis.

6. **Cross-institutional study**

6.1 Cross institutional study shall not be available to students enrolled in the Graduate Certificate course, except where the University of Sydney has a formal Cooperation Agreement with another University.

7. **Restrictions on enrolment**

7.1 Admission to candidature may be limited by a quota.
7.2 In determining the quota, the University will take into account:
7.2.1 availability of resources including space, laboratory and computing facilities; and
7.2.2 availability of adequate and appropriate supervision.
7.3 In considering an application for admission to candidature the Dean shall take account of the quota and will select, in preference, applicants who are most meritorious in terms of subsection 1 above.

8. **Discontinuation of enrolment**

8.1 A student who does not enrol in any semester without first obtaining written permission from the Dean to suspend candidature will be deemed to have discontinued enrolment in the course.
8.2 Students who have discontinued from the course will be required to apply for admission to the course and be subject to admission requirements pertaining at that time.

9. **Suspension of candidature**

9.1 A student may seek written permission from the Dean to suspend candidature in the course.
9.2 Suspension may be granted for a maximum of one year.

10. **Re-enrolment after an absence**

10.1 A student who plans to re-enrol after a period of suspension must advise the Faculty of Science Office in writing of their intention by no later than the end of October for First Semester of the following year or the end of May for Second Semester of the same year.

11. **Satisfactory progress**

11.1 Candidates for the Graduate Certificate in Applied Science (Applied Positive Psychology), shall be governed by the rules as follows:
11.1.1 A student who has failed a cumulative total of 12 credit points at any stage of enrolment in the Graduate Certificate in Applied Science (Applied Positive Psychology) will be required to show good cause why he or she should be allowed to re-enrol and, if good cause has not been established, the student will not be permitted to re-enrol.
11.2 A student who has failed a core unit at the second attempt in the Graduate Certificate in Applied Science (Applied Positive Psychology) will be deemed to have failed to complete course requirements and will be required to show good cause why he or she should be allowed to re-enrol.
11.2.1 If good cause has not been established, the student will not be permitted to re-enrol.

12. **Time limit**

12.1 A candidate for the Graduate Certificate in Applied Science (Applied Positive Psychology) shall complete the requirements for the award in a minimum enrolment of two semesters and a maximum enrolment of four semesters.

13. **Assessment policy**

13.1 On completion of the requirements for the course, the Faculty shall determine the results of the candidature.

14. **Credit transfer policy**

14.1 Credit is not available in the Graduate Certificate in Applied Science (Applied Positive Psychology) for postgraduate study which has not been undertaken in this award course within the previous three years.
14.2 A candidate who has qualified for the award of the Graduate Certificate in Applied Science (Applied Positive Psychology) may transfer, within three years, to the Master of Applied Science (Psychology of Coaching) and receive credit for up to 12 credit points from the Graduate Certificate in Applied Science (Applied Positive Psychology).
14.3 A candidate who has completed units of study in the Applied Science program within the previous three years, but has not qualified for an award, may transfer to another award course within the same Applied Science program and receive credit for the units of study completed.

Health Psychology degrees

Master of Applied Science (Health Psychology)

Degree Code: LC050

Graduate Diploma in Applied Science (Health Psychology)

Degree Code: LF038

Graduate Certificate in Applied Science (Health Psychology)

Degree Code: LG022

Course overview

The Master of Applied Science (Health Psychology) is an articulated postgraduate program which teaches the theory and practical applications of Health Psychology. Health psychology is the field of psychology devoted to the study of the promotion and maintenance of health; the causes and detection of illness; the prevention and treatment of illness; and the improvement of health care systems and health care policy. The Master of Applied Science (Health Psychology) is designed to provide students with an understanding of the theoretical, methodological and practical aspects of health psychology.

Students enrolled in the Graduate Certificate in Applied Science (Health Psychology) are required to complete satisfactorily the following core units of study: PSYC5010, PSYC5011, PUBH5018 and one elective unit of study from the following: PSYC5012, PSYC5013, BACH5340 and BACH5180.

Students enrolled in the Graduate Diploma in Applied Science (Health Psychology) are required to complete satisfactorily the following core units of study: PSYC5010, PSYC5011, PUBH5018 and BACH5341; and two elective units of study from PSYC5013, PSYC5012, BACH5180, and BACH5340.

At master's level students complete two additional electives.

A research stream is also available to Master of Applied Science (Health Psychology) students in their second semester of enrolment, upon completion of at least 24 credit points with a distinction average in their first full-time semester (or equivalent).

Course outcomes

This program is designed to meet the needs of a wide variety of health professionals interested in the growing area of health psychology: for example, people working within the Department of Health and other organisations, charities and research groups, allied health professionals, psychology students, geneticists and genetic counsellors. These programs will allow these individuals to pursue

health psychology careers within the health service, academia and government.

Unit of Study descriptions

Units of study available in 2009 for Health Psychology

Unit of study		Core /Option
Unless otherwise indicated, all units are worth 6 credit points		
Core units of study - all degrees		
PSYC5010	Applying Psychology to Health	C
PSYC5011	Applying Models of Health Behaviour	C
PUBH5018	Introductory Biostatictics	C
Additional core units - Diploma, Masters and Masters Research stream		
PSYC5015	Research project in Health Psychology (12cp)	C
BACH5341	Research & Inquiry in Health Professions	C
Elective units of study		
PSYC5013	Coping and adjustment to illness	O
PSYC5012	Advanced Communication Skills	O
BACH5180	Stress, Illness & Management Issues	O
BACH5340	Healthy Behaviours: Promoting Self-Change	O
PSYC5014	Developments in Health Psychology	O
HPSC1001	Bioethics	O
PUBH5010	Epidemiology Methods and Uses	O
NURS6010	Clinical Qualitative Research	O
NURS5024	Cancer Nursing Practice	O
NURS5025	Understanding cancer causes and therapies	O
NURS5026	Health Promotion in Cancer Recovery	O
BACH5300	Action Research	O

Health Psychology units of study

Core units of study - all degrees

PSYC5010
Applying Psychology to Health

Credit points: 6 **Session:** Semester 1 **Classes:** 1 one hour lecture, two hours of tutorials per week **Assessment:** Tutorial attendence and presentation, major assignment - 2500 word essay **Campus:** Camperdown/Darlington **Mode of delivery:** Normal (lecture/lab/tutorial) Day

The work of health psychologists relies on a broad range of professional skills and attributes. The aim of this unit of study is to conceptually define health within a biopsychosocial framework and to present some of the psychological reactions to hospitalisation, illness and pain. This unit of study provides students with an introduction to key areas of health psychology, and demonstrates how they relate to other disciplines. It also considers the context within which treatment takes place. This unit of study will explore mental and physical diseases. This unit of study examines the application of psychology in clinical settings. The unit of study considers the application of psychological theory to illness and preparation for hospitalisation; the management of adverse psychological sequelae arising from hospitalisation; and rehabilitation.

PSYC5011
Applying Models of Health Behaviour

Credit points: 6 **Session:** Semester 2 **Classes:** 1 one hour lecture and two hours of tutorials per week **Assessment:** Presentation of intervention, write up of intervention **Campus:** Camperdown/Darlington **Mode of delivery:** Normal (lecture/lab/tutorial) Day

The student will be given the opportunity to develop an intervention based on social cognitions models. The process can be followed from start to finish allowing the individual to utilise knowledge and skills gained in other units of study. It is an intended outcome for students enrolled in the MApplSc (HealthPsych) that students can demonstrate an understanding of the key models and theories in Health Psychology which are seen by many to be the foundations of the subject area. The aim of this unit of study is to allow students to identify an area of Health Psychology where an intervention would be appropriate, review existing literature on the topic, formulate the intervention, and evaluate the intervention on a pilot level.

PUBH5018
Introductory Biostatistics

Credit points: 6 **Teacher/Coordinator:** Associate Professor Petra Macaskill, Dr Timothy Dobbins **Session:** Semester 1 **Classes:** 2x2hr lecture, 10x1hr lectures, 11x2hr tutorials, 2x1hr and 8x0.5hr statistical computing self directed learning tasks over 12 weeks **Assessment:** 1x4page assignment (30%) and 1x2.5hr open-book exam (70%) **Campus:** Camperdown/Darlington **Mode of delivery:** Normal (lecture/lab/tutorial) Day

This unit aims to provide students with an introduction to statistical concepts, their use and relevance in public health. This unit covers descriptive analyses to summarise and display data; concepts underlying statistical inference; basic statistical methods for the analysis of continuous and binary data; and statistical aspects of study design. Specific topics include: sampling; probability distributions; sampling distribution of the mean; confidence interval and significance tests for one-sample, two paired samples and two independent samples for continuous data and also binary data; correlation and simple linear regression; distribution-free methods for two paired samples, two independent samples and correlation; power and sample size estimation for simple studies; statistical aspects of study design and analysis. Students will be required to perform analyses using a calculator and will also be required to conduct analyses using statistical software (SPSS). It is expected that students spend an additional 2 hours per week preparing for their tutorials. This unit may be undertaken in face to face or online/distance mode. Computing tasks are self-directed.

Textbooks
Course notes are provided.

Additional core units - Masters Research Stream

PSYC5015
Research Project

Credit points: 12 **Session:** Semester 1, Semester 2 **Classes:** The student will use as many of the identified sessions as s/he wishes for collection of data, preparation of the project etc under the supervision of their research supervisor. **Prerequisites:** all of PSYC5010, PSYC5011, PUBH5018 and BACH5268; plus 12 credit points of electives. Students must have a distinction average in the prerequisite units. **Assessment:** Project **Campus:** Camperdown/Darlington **Mode of delivery:** Normal (lecture/lab/tutorial) Day

The student will be given the opportunity to carry out a substantial piece of research in the field of health psychology. The research process can be followed from start to finish allowing the individual to utilise knowledge and skills gained in other unit of study. It is an intended outcome for students enrolled in the MApplSc (HealthPsych research stream) that they present evidence of their capacity to conduct a substantial piece of independent research that builds clearly upon their prior learning and which draws upon appropriate methodologies. The aim of this unit of study is to allow students to identify a research issue, review existing literature on the topic, formulate novel research questions, and test these questions through the application of contemporary psychological methodologies and appropriate data-analytic procedures. Lectures are voluntary, and are

designed to cover common problems. The majority of support will be one-on-one tutorial sessions with the student's supervisor.

BACH5341
Research & Inquiry in Health Professions

Credit points: 6 **Teacher/Coordinator:** Dr Rob Heard **Session:** Semester 1, Semester 2 **Classes:** On-campus: 3 hrs/week evening classes throughout semester. Off-campus: distance mode **Assessment:** 3 assignments **Campus:** Cumberland **Mode of delivery:** Normal (lecture/lab/tutorial) Evening

Note: Not available for Doctor of Health Science students. This unit of study is suitable for postgraduate coursework students who do not intend to progress to a research degree

This unit provides an overview of the research process and focuses on the formulation of a proposal for a small research project. It provides students with an opportunity to review and update their knowledge of research methods, and acts as an introduction to the research electives which concentrate on a particular methodology or aspect of the research process. Basic research design issues are considered. Various methods of data collection are examined together with their suitability for investigating different types of research questions. Students explore the use of quantitative and qualitative data, longitudinal and cross-sectional designs, and data resulting from experimental interview, observation, single case and survey research methods in addition to content analysis and secondary data analysis. Emphasis is placed on the issues of validity and reliability of data collection techniques. Basic statistical procedures are briefly reviewed and applications such as epidemiology and evaluation research are introduced.

Textbooks
Minichiello V, Sullivan G, Greenwood K & Axford R, Handbook of Research Methods for Nursing and Health Sciences (2nd ed), Pearson Education Australia, Frenchs Forest (2004)
Babbie E, The Practice of Social Research (11th ed), Thomson/Wadsworth, Belmont (2007)

Elective units of study

PSYC5013
Coping and Adjustment to Illness

Credit points: 6 **Session:** Semester 1 **Classes:** 1 one hour lecture and two hours of tutorials per week **Assessment:** Formal examination **Campus:** Camperdown/Darlington **Mode of delivery:** Normal (lecture/lab/tutorial) Day

The unit of study aims to apply a psychosocial perspective to the study of disability and chronic disease. In this unit, students will consider the impact of acute and chronic illness states (including physical and mental illness) on the patient and their family. Aspects of quality of life affected will be considered, including sexuality, body image, fatigue, existential crisis, social and intimate relationships, physical reactions and spirituality. The impact of formal and informally systems of social support on illness and outcomes will be explored. The unit will incorporate evaluation of research methods used in such studies together with the application of health psychology theory and a critical examination of research findings. Relationships between health cognitions, health behaviour and psychological adjustment will be an important theme of the unit of study, as will be a consideration of interventions to improve patient well being. Broad social, cultural, and political aspects of disability and acute and chronic disease will also be examined. The rise in number of people suffering from or caring for someone who has a chronic condition has proved to be a major challenge facing health psychologists. The impact on and needs of carers and family members will also be considered in this unit of study.

PSYC5012
Advanced Communication Skills

Credit points: 6 **Session:** S2 Intensive **Classes:** lectures, seminars and role play. This unit will be taught in block intensive mode over five days **Assessment:** Role play examination, essay **Campus:** Camperdown/Darlington **Mode of delivery:** Block Mode

In this unit of study students will consider risk communication, health professional skills, empathy, breaking bad news and interaction analysis. This unit of study seeks to develop a critical awareness of the psychological aspects of the health care contexts. The unit of study will investigate: health professional-patient communication and implications for patient adherence to treatment programmes and patient satisfaction; the impact of psycho-social and physical aspects of hospitalisation on patients and health care professionals; effects of representations and perceptions of illness and symptoms on decision making and health related behaviour. Patient interaction with the health care system is an important issue across a range of facets of health care provision. The aim of this unit of study is to provide students with a comprehensive understanding of the key issues related to the nature of and outcome form patient interaction with health care provision.

BACH5180
Stress and Illness: Management Issues

Credit points: 6 **Teacher/Coordinator:** Dr Chris Lennings **Session:** Semester 1 **Classes:** On-campus contract learning **Assessment:** Assignments **Campus:** Cumberland **Mode of delivery:** Normal (lecture/lab/tutorial) Day

The nature of the relationship of the psychophysiological stress response and the development of illness will be explored and critically evaluated in this elective. A range of disorders will be considered, for example headaches, coronary heart disease and diabetes. Current research literature across a variety of relevant disciplines will be evaluated as a background to original research. An introduction to the theoretical and practical aspects of a range of stress management techniques is provided. Emphasis will be placed on the research utility of those techniques commonly included in stress-management 'packages', such as relaxation, biofeedback, cognitive restructuring and time management. This is an on-campus directed independent study unit.

Textbooks
Rice PC, Stress and Health (3rd ed), Brooks/Cole Publishing Company, Melbourne (1999)

BACH5340
Healthy Behaviours-Promoting Self Change

Credit points: 6 **Teacher/Coordinator:** Dr Gomathi Sitharthan **Session:** Semester 2 **Classes:** 2hrs lectures, 1hr tutorials/week **Assessment:** Two assignments: 1500 & 3000 words (25%, 50% respectively), short answer exam (25%) **Campus:** Cumberland **Mode of delivery:** Normal (lecture/lab/tutorial) Day

The aim of this unit is to advance student's knowledge on lifestyle factors that enhance health and prevent illness. Mortality from today's leading causes of death would be markedly reduced if people adopt health protective behaviours, such as not smoking, responsible consumption of alcohol, regular exercises, healthy diets etc. Some of the major issues covered by this unit will include: lifestyles, risk factors, and health; interdisciplinary perspectives on preventing illness; developmental, gender and sociocultural factors in health; effective methods for promoting health in the community (e.g., social marketing, opportunistic advocacy, community mobilsations, etc); reducing alcohol/substance misuse; improving healthy eating habits; promoting physical activities; macrolevel analyses of program impacts.

Researchers, health promotion practitioners, health planners, and policy analysts will be invited to present lectures.

PSYC5014
Developments in Health Psychology

Credit points: 6 **Session:** Semester 1 **Classes:** tutorials- three hours per week **Assessment:** one major assignment - 5000 word essay **Campus:** Camperdown/Darlington **Mode of delivery:** Normal (lecture/lab/tutorial) Day

The purpose of this unit of study is to allow the student to choose a topic of particular relevance to their areas of expertise. It will allow the student to examine new developments within Health Psychology which may impact on their clinical or work practice.

PUBH5010
Epidemiology Methods and Uses

Credit points: 6 **Teacher/Coordinator:** Associate Professor Alex Barratt, Dr Tim Driscoll **Session:** Semester 1 **Classes:** 1x1hr lecture and 1x2hr tutorial per week for 13 weeks - lectures and tutorials may be completed online **Prohibitions:** BSTA5011 **Assessment:** 1x4page assignment (30%) and 1x2.5hr

open-book exam (70%) **Campus:** Camperdown/Darlington **Mode of delivery:** Normal (lecture/lab/tutorial) Day

This unit provides students with core skills in epidemiology, particularly the ability to critically appraise public health and clinical epidemiological research literature. This unit covers: study types; measures of frequency and association; measurement bias; confounding/effect modification; systematic reviews, screening and test evaluation; infectious disease outbreaks; measuring public health impact and use and interpretation of population health data. It is expected that students spend an additional 2-3 hours preparing for their tutorials.

Textbooks

Webb, PW. Bain, CJ. and Pirozzo, SL. Essential Epidemiology: An Introduction for Students and Health Professionals: Cambridge University Press 2005.

NURS6010

Clinical Qualitative Research

Credit points: 6 **Session:** Semester 2 **Classes:** distance education/intensive **Assessment:** Two essays, seminar participation **Campus:** Camperdown/Darlington **Mode of delivery:** Distance Education/Intensive on Campus

This unit explores the specific issues related to the use of qualitative research in clinical settings and with clinical populations. In particular, it explores the appropriate uses of a qualitative research methodology in which the experiences of people with a health issue or illness are being researched. The unit focuses specifically on research approaches where human social interaction and/or observation is fundamental to the collection of data. The unit explores issues of design, methods of data collection, ethical and clinical considerations as well as matters related to rigor, analysis and reporting of results.

NURS5024

Cancer Nursing Practice

Credit points: 6 **Session:** Semester 2 **Classes:** distance education/intensive **Prerequisites:** NURS5025 **Assessment:** Two essays, online participation. **Campus:** Cumberland **Mode of delivery:** Distance Education/Intensive on Campus

This unit will explore the evidence-based knowledge for best nursing practice in cancer treatment and care. It will investigate the nurse's role in the diagnosis of cancer, treatment and follow up and explore notions of leadership in cancer nursing. Biomedical approaches to cure and cancer control will be explored. The therapeutic nursing role of communicating with patients and their families, translating medical information, educating patients and families, and providing support will be investigated. The unit will also identify common side effects of the medical treatment for cancer and identify best practice for developing related supportive care strategies. The unit will further investigate how nursing services are being reconfigured in Australia to more appropriately meet the needs of people undergoing diagnostic tests or treatment for cancer, rather than for those of the service or service provider.

NURS5025

Understanding Cancer Causes & Therapies

Credit points: 6 **Session:** Semester 1 **Classes:** distance education/intensive **Assessment:** 1 x 3000 word assignment, exam, online participation including quizzes. **Campus:** Camperdown/Darlington **Mode of delivery:** Distance Education/Intensive on Campus

Note: This unit of study is a pre requisite for the field of cancer nursing and will provide the scientific basis for cancer nursing practice.

The unit will explore cancer epidemiology, with a focus on identifying the determinants and distribution of cancer in defined populations. The reporting and measurement of cancer in Australia will be included. Cancer as a genetic disease is explored and advances in understanding the biology of cancer is critiqued. Biological and physiological principles that support cancer treatments will be reviewed in detail.

NURS5026

Health Promotion in Cancer Recovery

Credit points: 6 **Session:** Semester 2 **Classes:** distance education/intensive **Prerequisites:** NURS5025 **Assessment:** two essays, online participation **Campus:** Camperdown/Darlington **Mode of delivery:** Distance Education/Intensive on Campus

This unit will critically analyse the consequences of a cancer diagnosis and the subsequent treatment, on the individual and their family. The acute and long term disease and treatment related sequelae, impact on quality of life, employment, physical and psychological functioning will be reviewed. Approaches to maximising the individual's recovery and resilience will be explored, with specific focus on the role of early interventions, and maintaining individual autonomy. Areas such as identity, body image, fertility, employment, and management of fatigue will be a major focus of this unit. Such issues will be considered from the perspective of interdisciplinary working and the unique contribution of the nurse to contemporary cancer care.

BACH5300

Action Research

Credit points: 6 **Teacher/Coordinator:** Dr Freidoon Khavarpour **Session:** Semester 1 **Classes:** No on-campus attendance required **Assessment:** Three assignments **Campus:** Cumberland **Mode of delivery:** Distance Education

Note: Department permission required for enrolment.

Action research is a participatory, process concerned with developing practical knowledge in the pursuit of worthwhile human purposes. In participation with others, health professionals and researchers bring action and reflection, theory and practice together in the pursuit of practical solutions to pressing issues of health and wellbeing of individuals and their communities. Action research is a set of practices for systematic development of knowledge grounded in a participatory worldview. It is rather different from traditional academic research, with different purposes, based in different relationships, and with different ways of conceiving knowledge and its relation to practice. Action research can be applied in community work, complex systems research, collaborative inquiry, improving health interventions and in other ways. This unit is suitable for research students developing action research, participatory research or similar projects, and for health professionals who are serious about improving their practice.

Resolutions

Master of Applied Science (Health Psychology)
Graduate Diploma in Applied Science (Health Psychology)
Graduate Certificate in Applied Science (Health Psychology)

Course rules

1. **Admission**

1.1 The Dean of the Faculty of Science may admit to candidature for:

1.1.1 **the Graduate Certificate in Applied Science (Health Psychology):**

1.1.1.1 graduates of the University of Sydney holding the degree of Bachelor of Science or any other equivalent award of the University of Sydney;

1.1.1.2 graduates of other universities or other appropriate institutions who have qualifications equivalent to those specified in subsection 1.1.1.1; or

1.1.1.3 persons who have experience which is considered to demonstrate the knowledge and aptitude required to undertake the units of study;

1.1.2 **the Graduate Diploma in Applied Science (Health Psychology):**

1.1.2.1 graduates of the University of Sydney holding the degree of Bachelor of Science or any other equivalent award of the University of Sydney;

1.1.2.2 graduates of other universities or other appropriate institutions who have qualifications equivalent to those specified in subsection 1.1.2.1; or

1.1.2.3 persons who have completed requirements for the Graduate Certificate in Applied Science, or equivalent;

1.1.3 **the Master of Applied Science (Health Psychology):**

1.1.3.1 graduates of the University of Sydney holding the degree of Bachelor of Science or any other equivalent award of the University of Sydney;

1.1.3.2 graduates of other universities or other appropriate institutions who have qualifications equivalent to those specified in subsection 1.1.3.1; or

1.1.3.3 persons who have completed requirements for the Graduate Diploma in Applied Science, or equivalent.

1.2 In relation to particular subject areas the Dean may require applicants to satisfy additional specific requirements relating to that subject area.

1.3 The additional requirements for Health Psychology are as follows.

1.3.1 Students must have either a four-year Psychology degree or a three-year degree in a cognate discipline with at least two years relevant employment experience.

1.3.2 Students can articulate from Certificate to Master by obtaining Distinction level results at the Certificate level.

1.3.3 To obtain entry into the Research Master stream, students will need to obtain distinction or better at the Certificate level.

2. Units of study

2.1 The units of study for the Graduate Certificate in Applied Science (Health Psychology), Graduate Diploma in Applied Science (Health Psychology) and Master of Applied Science (Health Psychology) are listed in subsection 4.1.

2.2 Credit point value, assumed knowledge, corequisites, prerequisites and any special conditions are included in the unit of study descriptions.

3. Requirements for the Graduate Certificate in Applied Science (Health Psychology) (GradCertAppSc (HlthPsych)); Graduate Diploma in Applied Science (Health Psychology) (GradDipApplSc HlthPsych)); Master of Applied Science (Health Psychology) (MApplSc (HlthPsych))

3.1 Candidates for the Graduate Certificate in Applied Science (Health Psychology) are required to complete satisfactorily the following core units of study: PSYC5010, PSYC5011, PUBH5018 and one elective unit of study from the following: PSYC5012, PSYC5013, BACH5340 and BACH5180.

3.2 Candidates for the Graduate Diploma in Applied Science (Health Psychology) are required to complete satisfactorily the following core units of study: PSYC5010, PSYC5011, PUBH5018 and BACH5341; and two elective units of study from PSYC5013, PSYC5012, BACH5180, and BACH5340.

3.3 Candidates for the Master of Applied Science ((Health Psychology) are required to complete satisfactorily the following core units of study: PSYC5010, PSYC5011, BACH5341 and PUBH5018; two elective units of study from PSYC5013, PSYC5012, BACH5340 and BACH5180; one elective unit of study from PSYC5013, PSYC5012, BACH5180 and BACH5340; two elective units of study.

3.4 Candidates for the Master of Applied Science (Health Psychology) may be admitted to the Research stream in their second semester of enrolment, upon completion of at least 24 credit points with a distinction average.

3.4.1

3.5 The units of study associated with the award course are listed in the table in subsection 4.1. Other electives will be available to students where appropriate and with agreement with the Program Coordinator and Head of School and with agreement from the Faculty involved.

3.6 A candidate for the course shall proceed by completing units of study as prescribed by the Faculty.

Faculty rules

4. Details of units of study

4.1 The units of study for the Graduate Certificate in Applied Science (Health Psychology), Graduate Diploma in Applied Science (Health Psychology) and Master of Applied Science (Health Psychology) are listed in the following table:

Unless otherwise indicated, all units are worth 6 credit points.

Unit of study		Core /Option
Core units of study - all degrees		
PSYC5010	Applying Psychology to Health	C
PSYC5011	Applying Models of Health Behaviour	C
PUBH5018	Introductory Biostatictics	C
Additional core units - Diploma, Masters and Masters Research stream		
PSYC5015	Research project in Health Psychology	C
BACH5341	Research & Inquiry in Health Professions	C
Elective units of study		
PSYC5013	Coping and adjustment to illness	O
PSYC5012	Advanced Communication Skills	O
BACH5180	Stress, Illness & Management Issues	O
BACH5340	Healthy Behaviours: Promoting Self-Change	O
PSYC5014	Developments in Health Psychology	O
HPSC1001	Bioethics	O
PUBH5010	Epidemiology Methods and Uses	O
NURS6010	Clinical Qualitative Research	O
NURS5024	Cancer Nursing Practice	O
NURS5025	Understanding cancer causes and therapies	O
NURS5026	Health Promotion in Cancer Recovery	O
BACH5061	Statistical Analysis with SPSS	O
BACH5300	Action Research	O

4.2 A candidate for the course shall proceed by completing units of study as prescribed by the Faculty.

4.3 A unit of study shall consist of such lectures, seminars, tutorial instruction, essays, exercises, practical work, or project work as may be prescribed.

4.4 In these resolutions, 'to complete a unit of study' or any derivative expression means:

4.4.1 to attend the lectures and the meetings, if any, for seminars or tutorial instruction;

4.4.2 to complete satisfactorily the essays, exercises, practical and project work if any; and

4.4.3 to pass any other examination of the unit of study that may apply.

4.5 All units of study for a particular subject area may not be available every semester.

4.6 The Dean may allow substitution of any unit of study by another unit of study, including units of study from other postgraduate coursework programs in the Faculty or elsewhere in the University.

4.7 The Master of Applied Science (Health Psychology) shall be awarded in two grades, namely Pass and, in the case of an outstanding candidate, Pass with Merit.

5. Enrolment in more/less than minimum load

5.1 A candidate may proceed on either a full-time or a part-time basis.

6. Cross-institutional study

6.1 Cross institutional study shall not be available to students enrolled in the Graduate Certificate in Applied Science, Graduate Diploma in Applied Science and Master of Applied Science courses, except where the University of Sydney has a formal Cooperation Agreement with another University.

7. Restrictions on enrolment

7.1 Admission to candidature may be limited by a quota.

7.2 In determining the quota, the University will take into account:

7.2.1 availability of resources including space, laboratory and computing facilities; and
7.2.2 availability of adequate and appropriate supervision.
7.3 In considering an application for admission to candidature the Dean shall take account of the quota and will select, in preference, applicants who are most meritorious in terms of subsection 1 above.

8. **Discontinuation of enrolment**

8.1 A student who does not enrol in any semester without first obtaining written permission from the Dean to suspend candidature will be deemed to have discontinued enrolment in the course.
8.2 Students who have discontinued from the course will be required to apply for admission to the course and be subject to admission requirements pertaining at that time.

9. **Suspension of candidature**

9.1 A student may seek written permission from the Dean to suspend candidature in the course.
9.2 Suspension may be granted for a maximum of one year.

10. **Re-enrolment after an absence**

10.1 A student who plans to re-enrol after a period of suspension must advise the Faculty of Science Office in writing of their intention by no later than the end of October for First Semester of the following year or the end of May for Second Semester of the same year.

11. **Satisfactory progress**

11.1 Candidates for the Master of Applied Science (Health Psychology), the Graduate Diploma in Applied Science (Health Psychology), and the Graduate Certificate in Applied Science (Health Psychology), shall be governed by the rules as follows:
11.1.1 A student who has failed a cumulative total of 12 credit points at any stage of enrolment in the Master of Applied Science (Health Psychology), will be required to show good cause why he or she should be allowed to re-enrol and, if good cause has not been established, the student's enrolment will be transferred to the Graduate Diploma in Applied Science (Health Psychology);
11.1.2 A student who has failed a cumulative total of 18 credit points at any stage of enrolment in the Master of Applied Science (Health Psychology), and/or the Graduate Diploma in Applied Science (Health Psychology), will be required to show good cause why he or she should be allowed to re-enrol and, if good cause has not been established, the student's enrolment will be transferred to the Graduate Certificate in Applied Science (Health Psychology);
11.1.3 A student who has failed a cumulative total of 12 credit points at any stage of enrolment in the Graduate Certificate in Applied Science (Health Psychology), will be required to show good cause why he or she should be allowed to re-enrol and, if good cause has not been established, the student will not be permitted to re-enrol.
11.2 A student who has failed a cumulative total of more than 18 credit points in the Master of Applied Science (Health Psychology), and/or the Graduate Diploma in Applied Science (Health Psychology), and/or the Graduate Certificate in Applied Science (Health Psychology), will be required to show good cause why he or she should be allowed to re-enrol and, if good cause has not been established, the student will not be permitted to re-enrol.
11.3.1 A student who has failed a core unit at the second attempt in the Master of Applied Science (Health Psychology), and/or the Graduate Diploma in Applied Science (Health Psychology), and/or the Graduate Certificate in Applied Science (Health Psychology), will be deemed to have failed to complete course requirements and will be required to show good cause why he or she should be allowed to re-enrol.
11.3.2 If good cause has not been established, the student will not be permitted to re-enrol.

12. **Time limit**

12.1 A candidate for the Graduate Certificate in Applied Science (Health Psychology), shall complete the requirements for the award in a minimum enrolment of two semesters and a maximum enrolment of four semesters.
12.2 A candidate for the Graduate Diploma in Applied Science (Health Psychology), shall complete the requirements for the award in a minimum enrolment of two semesters and a maximum enrolment of six semesters.
12.3 A candidate for the Master of Applied Science (Health Psychology), shall complete the requirements for the award in a minimum of two semesters and a maximum of eight semesters.

13. **Assessment policy**

13.1 On completion of the requirements for the course, the Faculty shall determine the results of the candidature.

14. **Credit transfer policy**

14.1 Credit is not available in the Graduate Certificate in Applied Science (Health Psychology), Graduate Diploma in Applied Science (Health Psychology) and Master of Applied Science (Health Psychology) for postgraduate study which has not been undertaken in these award courses within the previous three years.
14.2 A candidate who has qualified for the award of the Graduate Certificate in Applied Science (Health Psychology) may transfer, within three years, to the Graduate Diploma in Applied Science (Health Psychology) and receive credit for up to 24 credit points from the Graduate Certificate in Applied Science (Health Psychology).
14.3 A candidate who has qualified for the award of the Graduate Diploma in Applied Science (Health Psychology)may transfer, within three years, to the Master of Applied Science (Health Psychology) and receive credit for up to 36 credit points from the Graduate Diploma in Applied Science (Health Psychology).
14.4 A candidate who has completed units of study in the Applied Science program within the previous three years, but has not qualified for an award, may transfer to another award course within the same Applied Science program and receive credit for the units of study completed.

Psychology of Coaching

Master of Applied Science (Psychology of Coaching)

Degree Code: LC044

Graduate Diploma in Applied Science (Psychology of Coaching)

Degree Code: LF028

Graduate Certificate in Applied Science (Psychology of Coaching)

Degree Code: LG005

Course overview

The Master of Applied Science (Psychology of Coaching) is an articulated postgraduate program which teaches the applied science of human performance enhancement and coaching. Coaching psychology sits at the intersection of counselling, clinical and organisational psychology and focuses on working with non-clinical populations. This program provides students with a sound grounding in the theoretical and methodological aspects of coaching and coaching psychology and teaches fundamental applied coaching skills.

Students enrolled in the Graduate Certificate in Applied Science (Psychology of Coaching) may only enrol part-time.

Study for the Graduate Diploma in Applied Science (Psychology of Coaching) and the Master of Applied Science (Psychology of Coaching) may be undertaken in either part-time or full-time mode.

The progression sequence for part-time students is as follows: First semester of enrolment PSYC4721 and PSYC4722; second semester of enrolment and following semesters, PSYC4724 and remaining elective units to suit the individual student's needs and interests and to meet degree requirements.

For students studying full-time, the progression sequence is as follows: First semester of enrolment PSYC4721; PSYC4722 and other elective units, second semester of enrolment PSYC4724 and remaining elective units to suit the individual student's needs and interests and to meet degree requirements. PSYC4721 and PSYC4722 must be completed before enrolling in PSYC4724. If PSYC4741 and PSYC4722 are taken in separate semesters, students should enrol in PSYC4721 before PSYC4722.

Students in the Masters of Applied Science (Psychology of Coaching) may take a specialised Executive and Workplace Coaching stream. This stream is comprised of the following units of study: PSYC4721 Theories and Techniques of Coaching Psychology, PSYC4722 Fundamentals of Coaching Practice, PSYC4724 Coaching Practice, PSYC4727 Positive Organisational Coaching, PSYC 4729 Groups, Teams and Systems, PSYC4730 Applied Positive Psychology and two elective units from PSYC4725 Assessment and Selection, PSYC4731 Psychology of Peak Performance, or PSYC4723 Socio-cognitive Issues. With permission students may also take PHIL7840 Philosophy and Science of Happiness as one of their elective units. The Executive and Workplace Coaching stream is only available at Master's level.

A Health Coaching stream is available to Master of Applied Science (Psychology of Coaching) students. The Health Coaching stream is comprised of the following units of study: PSYC5010 Applying Psychology to Health, PSYC5011 Applying models of health behaviour, PSYC5012 Advanced Communication Skills, PSYC4721 Theories and Techniques of Coaching Psychology, PSYC4722 Fundamentals of Coaching, PSYC4724 Coaching Practice, and one elective from PSYC4729 Groups, Teams and Systems, PSYC4730 Applied Positive Psychology, or PSYC5014 Developments In Health Psychology. With permission students may also take PHIL7840 Philosophy and Science of Happiness as one of their elective units. The Health Coaching stream is only available at Master's level.

Students who wish to complete a research project may enrol in the Research Master's stream. To obtain entry into the Research Master's stream, students will need to have a 4 year Psychology degree on entry. Students without a 4 year Psychology degree will need to hold a 3 year degree in Psychology or in a cognate discipline and obtain distinction or better at the Certificate level and complete PUBH5018 Introductory Biostatistics or an equivalent statistical course (with approval).

Eligibility for admission

An applicant for admission will satisfy the admission requirements for the Graduate Certificate in Applied Science or the Graduate Diploma in Applied Science or the Master of Applied Science and:

1. Students must have either a 3 year Psychology degree or a 3 year degree in a cognate discipline. At least 2 years relevant employment experience is required.
2. Students who wish to complete a research project may enrol in the Research Master's stream. To obtain entry into the Research Master's stream, students will need to have a 4 year Psychology degree on entry. Students without a 4 year Psychology degree will need to hold a three year degree in Psychology or in a cognate discipline and obtain distinction or better at the Certificate level and complete PUBH5018 Introductory Biostatistics or an equivalent statistical course (with approval).

Course outcomes

This program is designed to provide graduates with the key theoretical understandings and the core skills necessary to work as a coach in a wide range of settings. Graduates of this course will be equipped to work in the scientist-practioner or scholar-practitioner model, and can expect to find employment as human performance consultants and personal, workplace of executive coaches in industry, in the human resources field or in private practice.

Graduates of the MAppSci (Coach Psych) who have completed the 12 credit point unit PSYC5015 Research Project are eligible to apply for admission to a research degree (Master of Science or Doctor of Philosophy).

Unit of Study descriptions

Units of study available in 2009 for Psychology of Coaching

Units of study		Core/option
Unless otherwise indicated, all units are worth 6 credit points		
Core units all degrees		
PSYC4721	Theories & Techniques of Coaching Psych	C
PSYC4722	Fundamentals of Coaching Practice	C
PSYC4724	Coaching Practice	C
Elective units Graduate Diploma and Masters		
PSYC4723	Socio-cognitive Issues in Coaching Psych	O
PSYC4725	Assessment and Selection	O
PSYC4727	Positive Organisational Coaching	O
PSYC4729	Groups, Teams and Systems	O
PSYC4730	Applied Positive Psychology	O
PSYC4731	Psychology of Peak Performance	O
Students who wish to do a research project will substitute the two electives with a 12 credit point research project		
PSYC5015	Research Project (12cp)	O

Specialist Streams

There are two specialist streams: Executive and Workplace Coaching, and Health Coaching.

Executive and Workplace Coaching Stream

The Executive and Workplace Coaching stream comprises the following units of study: PSYC4721 Theories & Techniques of Coaching Psych, PSYC4722 Fundamentals of Coaching Practice, PSYC4724 Coaching Practics, PSYC4727 Positive Organisational Coaching, PSYC4729 Groups, Teams and Systems, PSYC4730 Applied Positive Psychology; and two elective units from PSYC4725 Assessment and Selection, PSYC4731 Psychology of Peak Performance, or PSYC4723 Socio-cognitive Issues. Students may also take PHIL7840 Philosophy and Science of Happiness as one of their elective units. The Executive and Workplace Coaching stream is only available at Masters level.

Master of Applied Science (Coaching Psychology) Executive and Workplace Coaching Stream

Unit of Study	Title	Sem	CP
Coaching Psychology			
PSYC4721	Theories & Techniques of Coaching Psych	1 & 2	6
PSYC4722	Fundamentals of Coaching Practice	1 & 2	6
PSYC4724	Coaching Practice	1 & 2	6
PSYC4727	Coaching in Organisations	Summer school	6
PSYC4729	Groups, Teams and Systems	2	6
PSYC4730	Applied Positive Psychology	1	6
Two elective units of study from the following, or an appropriate elective as per program regulations			
PSYC4725	Assessment and Selection	2	6
PSYC4731	Psychology of Peak Performance	tba	6
PHIL7840	Philosophy and Science of Happiness	2	6
PSYC4723	Socio-cognitive Issues	1	6
Students who wish to do a research project will substitute the two electives with a 12 credit point research project			

Unit of Study	Title	Sem	CP
PSYC5015	Research Project	2	12

Health Coaching Stream

The Health Coaching stream is comprised of the following units of study: PSYC5010 Applying Psychology to Health, PSYC5011 Applying Models of Health Behaviour, PSYC5012 Advanced Communication Skills, PSYC 4721 Theories and Techniques Coaching Psychology, PSYC 4722 Fundamentals of Coaching, PSYC 4724 Coaching Practice; and one elective from PSYC4729 Groups, Teams and Systems, PSYC4730 Applied Positive Psychology, PSYC5014 Developments in Health Psychology. The Health Coaching stream is only available at Masters level.

Master of Applied Science (Coaching Psychology) Health Coaching Stream

Unit of Study	Title	Sem	CP
Health Psychology			
PSYC5010	Applying Psychology to Health	1	6
PSYC5011	Applying Models of Health Behaviour	2	6
PSYC5012	Advanced Communication Skills	2 (Block week)	6
Coaching Psychology			
PSYC4721	Theories & Techniques of Coaching Psych	1 & 2	6
PSYC4722	Fundamentals of Coaching	1 & 2	6
PSYC4724	Coaching Practice	1 & 2	6
Two elective units of study from the following, or an appropriate elective as per program regulations			
PSYC4729	Groups, Teams and Systems	2	6
PSYC4730	Applied Positive Psychology	1	6
PSYC5014	Developments in Health Psychology	1	6
PSYC4723	Socio-cognitive Issues	1	6
Students who wish to do a research project will substitute the two electives with a 12 credit point research project			
PSYC5015	Research Project	2	12

Non-specialist Coaching Stream

Students who wish to complete a non-specialist or generalist coaching program will complete the core units PSYC4721 Theories & Techniques of Coaching Psych, PSYC4722 Fundamentals of Coaching Practice, PSYC4724 Coaching Practice; elective units of study from PSYC4727 Positive Organisational Coaching, PSYC4729 Groups, Teams and Systems, PSYC4730 Applied Positive Psychology; and two elective units.

Coaching units of study

Core units of study

PSYC4721
Theories & Techniques of Coaching Psych

Credit points: 6 **Session:** Semester 1, Semester 2 **Classes:** One 3 hour lecture per week. **Assessment:** Written papers (essay, journal or case study) and exam.

This unit details the core theories and techniques of coaching psychology and evidence-based coaching, and the use of coaching as an applied positive psychology. Theories and techniques will be evaluated by reference to empirical research and conceptual analysis. An integrated goal-focused approach to coaching draws on a broad base of established Behavioural Science. Within this framework, primary attention will be paid to cognitive-behavioural and solution-focused theories and techniques of behaviour change and self-regulation, and their application to coaching clients. Each weekly seminar has a lecture component and an experiential learning component. The experiential learning component requires students to evaluate each week's topic in relation to their own personal life experience and to participate in group discussion and coaching practice.

PSYC4722
Fundamentals of Coaching Practice

Credit points: 6 **Session:** Semester 1, Semester 2 **Classes:** Block teaching. **Assessment:** Written papers (essay, journal or case study) and exam.

This unit teaches the fundamentals of coaching, and lays the foundations for sound contemporary practice. This unit outlines the emergence of contemporary coaching from its roots in the Human Potential Movement, sports coaching, management consulting, clinical and counseling psychology, through to the establishment of the positive psychology movement. Drawing on established approaches students will be trained in the core micro skills of coaching. Core issues relating to mental illness and mental health and ethical professional coaching practice are addressed. Each seminar has a lecture component and an experiential learning component. The experiential learning component requires students to evaluate each topic in relation to their own personal life/work experience and to participate in group discussion. Practical experience of self-coaching and co-coaching are central aspects of this unit. This unit will be taught in block intensive mode over five days.

PSYC4724
Coaching Practice

Credit points: 6 **Session:** Semester 1, Semester 2 **Classes:** One 3 hour lecture per week. **Prerequisites:** PSYC (4721 and 4722) **Assessment:** Written papers (case study and learning journal) and exam.

Students will consolidate the theory and skills acquired in PSYC4721 and PSYC4722 through a semester-long coaching practicum. Using real-life issues in a supportive and confidential environment, students will coach each other in a structured solution-focused personal coaching program based on the material taught in previous units of study. This unit gives students experience in being both a coach and a client. A key component of this course will be feedback from the lecturer on students' coaching styles, skills and other relevant issues. As such this unit provides students with the opportunity to embed and develop their coaching skills. Case studies and case presentations will form part of the unit.

Elective units

PSYC4723
Socio-cognitive Issues in Coaching Psych

Credit points: 6 **Session:** Semester 1 **Classes:** Block teaching with some evening tutorials. **Assessment:** Written papers (major and minor essay) and exam.

The aim of this unit is to give students an understanding of key socio-cognitive issues related to coaching and behaviour change The focus of the unit is on critical appraisal of theory and the relation of theory to practice and research. Topics covered in this unit include models of self-regulated behaviour, personality type, the relationships between emotion, cognition and behaviour, and the roles of learnt resourcefulness, learned optimism, psychological mindedness, self-reflection and insight in behaviour change. The unit also critically evaluates contemporary understandings and assessments of emotional intelligence. Current topics and research methods in coaching psychology are also examined. Each weekly seminar has a lecture component and an experiential learning component. The experiential learning component requires students to evaluate each topic in relation to their own personal life/work experience and to participate in group discussion. This unit is run in a block teaching format.

PSYC4725
Assessment and Selection

Credit points: 6 **Session:** Semester 2 **Classes:** One 2 hour lecture per week. **Assessment:** Take home exam, Selection Case Study and Design of assessment program.

This unit will introduce students to some of the major assessment instruments used in coaching psychology. This unit does not accredit

students to administer any of the instruments examined in this unit of study. Rather the unit focuses both on critical evaluation of assessment instruments and on fostering an understanding of where each may be best utilised. Assessment instruments include: NEO 4; 16PF5; Myers Briggs Type Inventory; the DISK; Human Synergistics; BarOn EQI; WAIS; MMPI; Self-directed Search; Strong Interest Inventory; Multi-factor Leadership Questionnaire.

PSYC4727
Positive Organisational Coaching

Credit points: 6 **Session:** S1 Intensive, Summer Late **Classes:** Five Day Seminars: Block Teaching. **Assessment:** A written coaching proposal (3,000 words) (50%), take home exam and written assignment (1,000 words) (35%), in-class exam (short answer and multiple choice) (15%).

How can psychology help create 'healthy' workplaces? Executive and management coaching have emerged as important factors in the enhancement of performance, engagement and well-being in the workplace, This unit examines key issues in contemporary executive and workplace coaching and equips students with the knowledge and skills to provide world-class executive and management coaching, The emphasis is on critical evaluation of theory and application to practice, Although primarily focused on positive psychology, solution-focused and cognitive- behavioural approaches to coaching in organisations, the application of psychodynamic (eg Kilburg) and systems (eg O'Neil) approaches to the enhancement of performance and well-being are also considered. The unit covers issues in senior executive coaching, coaching middle management, establishing manager-as-coach programs, and the use of positive psychology in the workplace.

PSYC4729
Groups, Teams and Systems

Credit points: 6 **Session:** Semester 2 **Classes:** One 3 hour lecture per week. **Prerequisites:** PSYC (4721 and 4722 and either 4724 or 4728) **Assessment:** Written papers (major essay, minor essay) and exam.

Coaching always takes place within the context of human systems, be they family, social networks, or workplace organisations. This unit of study considers both the theory and practice of working in human systems. At the theoretical level, students undertaking this unit will consider the major theoretical advances which aid our understanding of groups and complex human systems. These will include systems theory and complexity theory as well as major research findings in group and team dynamics. Students will also consider the practical implications of these theoretical approaches to coaching within organisations. Issues surrounding self organisation, leadership and control, and the management of change in complex adaptive systems will also be discussed. Students will design and facilitate a small group coaching program. This unit is run in a block teaching format.

PSYC4730
Applied Positive Psychology

Credit points: 6 **Session:** Semester 1 **Classes:** One 3 hour lecture per week. **Assessment:** Written papers (Essays or case studies) and exam.

This unit of study teaches the application of positive psychology to coaching in work and personal life contexts. We consider the core principles of positive psychology and how these can be applied in coaching interventions. Topics covered in this unit include; coaching as an applied positive psychology; goals, meaning and well-being; subjective and psychological well-being: happiness; gratitude; the languishing vs. flourishing dichotomy; broaden and build theory; self-concordance; well-being in the workplace; career coaching through the life span; and the use of positive psychology in health coaching. There is emphasis on both theoretical understanding and personal practice. The experiential learning component requires students to evaluate each week's topic in relation to their own personal life experience and to participate in group discussion and coaching practice.

PSYC4731
Psychology of Peak Performance

Credit points: 6 **Session:** Semester 2 **Classes:** One 3 hour seminar per week **Assessment:** Written papers (essays or case studies) and exam

The Psychology of Peak Performance draws on theories and models of sport, performance and positive psychology and applies these to use in executive, workplace and personal coaching practice. Topics covered include flow, mental toughness, mental readiness, concentration enhancement strategies and techniques, rehearsal and debrief strategies, thriving under pressure, self-coaching, overcoming setbacks, performance protocols, focusing, and surviving success. In addition the unit covers issues related to high performing teams and groups. Issues of work/life balance are also addressed, particularly in relation to the management of optimal energy levels (avoiding burnout). There is emphasis on both theoretical understanding and personal practice. The experiential learning component requires students to evaluate each week's topic in relation to their own personal life experience and to participate in group discussion and coaching practice.

Textbooks
No set text book: A reading pack can be obtained from the University Copy Centre

PSYC5010
Applying Psychology to Health

Credit points: 6 **Session:** Semester 1 **Classes:** 1 one hour lecture, two hours of tutorials per week **Assessment:** Tutorial attendence and presentation, major assignment - 2500 word essay

The work of health psychologists relies on a broad range of professional skills and attributes. The aim of this unit of study is to conceptually define health within a biopsychosocial framework and to present some of the psychological reactions to hospitalisation, illness and pain. This unit of study provides students with an introduction to key areas of health psychology, and demonstrates how they relate to other disciplines. It also considers the context within which treatment takes place. This unit of study will explore mental and physical diseases. This unit of study examines the application of psychology in clinical settings. The unit of study considers the application of psychological theory to illness and preparation for hospitalisation; the management of adverse psychological sequelae arising from hospitalisation; and rehabilitation.

PSYC5011
Applying Models of Health Behaviour

Credit points: 6 **Session:** Semester 2 **Classes:** 1 one hour lecture and two hours of tutorials per week **Assessment:** Presentation of intervention, write up of intervention

The student will be given the opportunity to develop an intervention based on social cognitions models. The process can be followed from start to finish allowing the individual to utilise knowledge and skills gained in other units of study. It is an intended outcome for students enrolled in the MApplSc (HealthPsych) that students can demonstrate an understanding of the key models and theories in Health Psychology which are seen by many to be the foundations of the subject area. The aim of this unit of study is to allow students to identify an area of Health Psychology where an intervention would be appropriate, review existing literature on the topic, formulate the intervention, and evaluate the intervention on a pilot level.

PSYC5012
Advanced Communication Skills

Credit points: 6 **Session:** S2 Intensive **Classes:** lectures, seminars and role play. This unit will be taught in block intensive mode over five days **Assessment:** Role play examination, essay

In this unit of study students will consider risk communication, health professional skills, empathy, breaking bad news and interaction analysis. This unit of study seeks to develop a critical awareness of the psychological aspects of the health care contexts. The unit of study will investigate: health professional-patient communication and implications for patient adherence to treatment programmes and

patient satisfaction; the impact of psycho-social and physical aspects of hospitalisation on patients and health care professionals; effects of representations and perceptions of illness and symptoms on decision making and health related behaviour. Patient interaction with the health care system is an important issue across a range of facets of health care provision. The aim of this unit of study is to provide students with a comprehensive understanding of the key issues related to the nature of and outcome form patient interaction with health care provision.

PSYC5014
Developments in Health Psychology

Credit points: 6 **Session:** Semester 1 **Classes:** tutorials- three hours per week **Assessment:** one major assignment - 5000 word essay

The purpose of this unit of study is to allow the student to choose a topic of particular relevance to their areas of expertise. It will allow the student to examine new developments within Health Psychology which may impact on their clinical or work practice.

PSYC5015
Research Project

Credit points: 12 **Session:** Semester 1, Semester 2 **Classes:** The student will use as many of the identified sessions as s/he wishes for collection of data, preparation of the project etc under the supervision of their research supervisor. **Prerequisites:** all of PSYC5010, PSYC5011, PUBH5018 and BACH5268; plus 12 credit points of electives. Students must have a distinction average in the prerequisite units. **Assessment:** Project

The student will be given the opportunity to carry out a substantial piece of research in the field of health psychology. The research process can be followed from start to finish allowing the individual to utilise knowledge and skills gained in other unit of study. It is an intended outcome for students enrolled in the MApplSc (HealthPsych research stream) that they present evidence of their capacity to conduct a substantial piece of independent research that builds clearly upon their prior learning and which draws upon appropriate methodologies. The aim of this unit of study is to allow students to identify a research issue, review existing literature on the topic, formulate novel research questions, and test these questions through the application of contemporary psychological methodologies and appropriate data-analytic procedures. Lectures are voluntary, and are designed to cover common problems. The majority of support will be one-on-one tutorial sessions with the student's supervisor.

PHIL7840
Philosophy and the Science of Happiness

Credit points: 6 **Teacher/Coordinator:** Dr C West with Assoc Prof D Braddon Mitchell **Session:** Semester 1 **Classes:** 2 hours per week **Assessment:** Short essay 1500 words; long essay 3500 words

This unit deals with the philosophy and psychology of happiness and wellbeing. It covers classical and contemporary philosophical work on the nature of happiness. It discusses the kind of goal happiness or wellbeing is - is it something that we want only insofar as we desire it, or is there some rational requirement to make a richer conception of wellbeing the goal of life? The unit will also engage with aspects of positive psychology.

Resolutions

Master of Applied Science (Psychology of Coaching)
Graduate Diploma in Applied Science (Psychology of Coaching)
Graduate Certificate in Applied Science (Psychology of Coaching)

Course rules

1. **Admission**

1.1 The Dean of the Faculty of Science may admit to candidature for:

1.1.1 *the Graduate Certificate in Applied Science (Psychology of Coaching):*

1.1.1.1 graduates of the University of Sydney holding the degree of Bachelor of Science or any other equivalent award of the University of Sydney;

1.1.1.2 graduates of other universities or other appropriate institutions who have qualifications equivalent to those specified in subsection 1.1.1.1; or

1.1.1.3 persons who have experience which is considered to demonstrate the knowledge and aptitude required to undertake the units of study;

1.1.2 *the Graduate Diploma in Applied Science (Psychology of Coaching):*

1.1.2.1 graduates of the University of Sydney holding the degree of Bachelor of Science or any other equivalent award of the University of Sydney;

1.1.2.2 graduates of other universities or other appropriate institutions who have qualifications equivalent to those specified in subsection 1.1.2.1; or

1.1.2.3 persons who have completed requirements for the Graduate Certificate in Applied Science, or equivalent;

1.1.3 *the Master of Applied Science (Psychology of Coaching):*

1.1.3.1 graduates of the University of Sydney holding the degree of Bachelor of Science or any other equivalent award of the University of Sydney;

1.1.3.2 graduates of other universities or other appropriate institutions who have qualifications equivalent to those specified in subsection 1.1.3.1; or

1.1.3.3 persons who have completed requirements for the Graduate Diploma in Applied Science, or equivalent.

1.2 In relation to particular subject areas the Dean may require applicants to satisfy additional specific requirements relating to that subject area.

1.3 The additional requirements for Psychology of Coaching are as follows.

1.3.2 An applicant for admission to the Graduate Certificate in Applied Science (Psychology of Coaching), Graduate Diploma in Applied Science (Psychology of Coaching) or Master of Applied Science (Psychology of Coaching) should:

1.3.3 have either a 3 year Psychology degree or a 3 year degree in a cognate discipline;

1.3.4 at least 2 years relevant employment experience is required. Relevant work experience may include counselling, experience in organisational learning and development, management experience, employment in applied psychology settings, professional coaching or other areas directly related to coaching.

1.3.5 Candidates for the Master of Applied Science (Psychology of Coaching) may complete a stream in either Executive and Workplace Coaching or Health Coaching and are required to complete satisfactorily units of study giving credit for a total of 48 credit points selected from the units of study approved for the Master of Applied Science (Psychology of Coaching), satisfying the conditions approved from time to time by the Faculty.

1.3.6 The Executive and Workplace Coaching stream will be comprised of the following units of study: PSYC4721 Theories & Techniques of Coaching Psych, PSYC4722 Fundamentals of Coaching Practice, PSYC4724 Coaching Practice:

Co-Coaching & Groups, PSYC4727 Positive Organisational Coaching, PSYC4729 Groups, Teams and Systems, PSYC4730 Applied Positive Psychology; and two elective units from PSYC4725 Assessment and Selection, PSYC4731 Psychology of Peak Performance and PSYC4723 Socio-cognitive Issues in Coaching Psych. Students may also take PHIL7840 Philosophy and Science of Happiness as one of their elective units. The Executive and Workplace Coaching stream will only be available at Masters level.

1.3.7 The Health Coaching stream will be comprised of the following units of study: PSYC5010 Applying Psychology to Health, PSYC5011 Applying Models of Health Behaviour, PSYC5012 Advanced Communication Skills, PSYC4721 Theories & Techniques of Coaching Psych, PSYC4722 Fundamentals of Coaching Practice, PSYC4724 Coaching Practice: Co-Coaching & Groups; and two electives from PSYC4729 Groups, Teams and Systems, PSYC4730 Applied Positive Psychology and PSYC5014 Developments in Health Psychology. The Health Coaching stream will only be available at Masters level.

1.3.8 Candidates who wish to complete a non-specialist or generalist coaching program will complete the core units PSYC4721 Theories & Techniques of Coaching Psych, PSYC4722 Fundamentals of Coaching Practice, PSYC4724 Coaching Practice, and elective units of study approved for the Master of Applied Science (Psychology of Coaching).

2. Units of study

2.1 The units of study for the Graduate Certificate in Applied Science (Psychology of Coaching), Graduate Diploma in Applied Science (Psychology of Coaching) and Master of Applied Science (Psychology of Coaching) are listed in subsection 4.1.

2.2 Credit point value, assumed knowledge, corequisites, prerequisites and any special conditions are included in the unit of study descriptions.

3. Requirements for Graduate Certificate in Applied Science (Psychology of Coaching) (GradCertApplSc(PsychCoach)); Graduate Diploma in Applied Science (Psychology of Coaching) (GradDipAppSc (PsychCoach)); Master of Applied Science(Psychology of Coaching) (MApplSc(PsychCoach))

3.1 Candidates for the Graduate Certificate in Applied Science (Psychology of Coaching) are required to satisfactorily complete three core units of study PSYC4721, PSYC4722 and PSYC4724 and 6 credit points from elective units.

3.2 Candidates for the Graduate Diploma in Applied Science (Psychology of Coaching) are required to satisfactorily complete three core units of study PSYC4721, PSYC4722 and PSYC4724 and 18 credit points from elective units.

3.3 Candidates for the Master of Applied Science (Psychology of Coaching) are required to complete satisfactorily three core units of study PSYC4721, PSYC4722 and PSYC4724 and a further 30 credit points from elective units of study.

Faculty rules

4. Details of units of study

4.1 The units of study for the Graduate Certificate in Applied Science (Psychology of Coaching), Graduate Diploma in Applied Science (Psychology of Coaching), and Master of Applied Science (Psychology of Coaching), are listed in the following table:

Unit of study		Core/option
Unless otherwise indicated, all units are worth 6 credit points. To enrol in these units of study, candidates must satisfy the specific requirements detailed in subsection 3 of the Resolutions.		
Core units all degrees		
PSYC4721	Theories & Techniques of Coaching Psych	C
PSYC4722	Fundamentals of Coaching Practice	C
PSYC4724	Coaching Practice: Co-coaching & Groups	C
Elective units Graduate Diploma and Masters		
PSYC4723	Socio-cognitive Issues in Coaching Psych	O
PSYC4725	Assessment and Selection	O
PSYC4727	Positive Organisational Coaching	O
PSYC4729	Groups, Teams and Systems	O
PSYC4730	Applied Positive Coaching	O
PSYC4731	Psychology of Peak Performance	O
Students who wish to do a research project will substitute the two electives with a research project		
PSYC5015	Research Project (12cp)	O
Students may also enrol in the following elective units with special permission		
PSYC5010	Applying Psychology to Health	O
PSYC5011	Applying Models of Health Behaviour	O
PSYC5014	Developments in Health Psychology	O
PHIL7840	Philosophy and Science of Happiness	O

4.2 A candidate for the course shall proceed by completing units of study as prescribed by the Faculty.

4.3 A unit of study shall consist of such lectures, seminars, tutorial instruction, essays, exercises, practical work, or project work as may be prescribed.

4.4 In these resolutions, 'to complete a unit of study' or any derivative expression means:

4.4.1 to attend the lectures and the meetings, if any, for seminars or tutorial instruction;

4.4.2 to complete satisfactorily the essays, exercises, practical and project work if any; and

4.4.3 to pass any other examination of the unit of study that may apply.

4.5 All units of study for a particular subject area may not be available every semester.

4.6 The Dean may allow substitution of any unit of study by another unit of study, including units of study from other postgraduate coursework programs in the Faculty or elsewhere in the University.

4.7 The Master of Applied Science (Psychology of Coaching) shall be awarded in two grades, namely Pass and, in the case of an outstanding candidate, Pass with Merit.

5. Enrolment in more/less than minimum load

5.1 A candidate for the GradCertApplSci(PsychCoach) may proceed only on a part-time basis.

5.2 A candidate for the GradDipApplSci(PsychCoach) may proceed either on a full-time or a part-time basis.

6. Cross-institutional study

6.1 Cross institutional study shall not be available to students enrolled in the Graduate Certificate in Applied Science, Graduate Diploma in Applied Science and Master of Applied Science courses, except where the University of Sydney has a formal Cooperation Agreement with another University.

7. Restrictions on enrolment

7.1 Admission to candidature may be limited by a quota.

7.2 In determining the quota, the University will take into account:

7.2.1 availability of resources including space, laboratory and computing facilities; and

7.2.2 availability of adequate and appropriate supervision.

7.3 In considering an application for admission to candidature the Dean shall take account of the quota and will select, in preference, applicants who are most meritorious in terms of subsection 1 above.

8. Discontinuation of enrolment

8.1 A student who does not enrol in any semester without first obtaining written permission from the Dean to suspend candidature will be deemed to have discontinued enrolment in the course.

8.2 Students who have discontinued from the course will be required to apply for admission to the course and be subject to admission requirements pertaining at that time.

9. Suspension of candidature

9.1 A student may seek written permission from the Dean to suspend candidature in the course.

9.2 Suspension may be granted for a maximum of one year.

10. Re-enrolment after an absence

10.1 A student who plans to re-enrol after a period of suspension must advise the Faculty of Science Office in writing of their intention by no later than the end of October for First Semester of the following year or the end of May for Second Semester of the same year.

11. Satisfactory progress

11.1 Candidates for the Master of Applied Science (Psychology of Coaching), the Graduate Diploma in Applied Science (Psychology of Coaching), and the Graduate Certificate in Applied Science (Psychology of Coaching), shall be governed by the rules as follows:

11.1.1 A student who has failed a cumulative total of 12 credit points at any stage of enrolment in the Master of Applied Science (Psychology of Coaching) will be required to show good cause why he or she should be allowed to re-enrol and, if good cause has not been established, the student's enrolment will be transferred to the Graduate Diploma in Applied Science (Psychology of Coaching);

11.1.2 A student who has failed a cumulative total of 18 credit points at any stage of enrolment in the Master of Applied Science (Psychology of Coaching) and/or the Graduate Diploma in Applied Science (Psychology of Coaching) will be required to show good cause why he or she should be allowed to re-enrol and, if good cause has not been established, the student's enrolment will be transferred to the Graduate Certificate in Applied Science (Psychology of Coaching);

11.1.3 A student who has failed a cumulative total of 12 credit points at any stage of enrolment in the Graduate Certificate in Applied Science (Psychology of Coaching) will be required to show good cause why he or she should be allowed to re-enrol and, if good cause has not been established, the student will not be permitted to re-enrol.

11.2 A student who has failed a cumulative total of more than 18 credit points in the Master of Applied Science (Psychology of Coaching) and/or the Graduate Diploma in Applied Science (Psychology of Coaching) and/or the Graduate Certificate in Applied Science (Psychology of Coaching) will be required to show good cause why he or she should be allowed to re-enrol and, if good cause has not been established, the student will not be permitted to re-enrol.

11.3.1 A student who has failed a core unit at the second attempt in the Master of Applied Science (Psychology of Coaching) and/or the Graduate Diploma in Applied Science (Psychology of Coaching) and/or the Graduate Certificate in Applied Science (Psychology of Coaching) will be deemed to have failed to complete course requirements and will be required to show good cause why he or she should be allowed to re-enrol.

11.3.2 If good cause has not been established, the student will not be permitted to re-enrol.

12. Time limit

12.1 A candidate for the Graduate Certificate in Applied Science (Psychology of Coaching) shall complete the requirements for the award in a minimum enrolment of one semester and a maximum enrolment of four semesters.

12.2 A candidate for the Graduate Diploma in Applied Science (Psychology of Coaching) shall complete the requirements for the award in a minimum enrolment of two semesters and a maximum enrolment of six semesters.

12.3 A candidate for the Master of Applied Science (Psychology of Coaching) shall complete the requirements for the award in a minimum of two semesters and a maximum of eight semesters.

13. Assessment policy

13.1 On completion of the requirements for the course, the Faculty shall determine the results of the candidature.

14. Credit transfer policy

14.1 Credit is not available in the Graduate Certificate in Applied Science (Psychology of Coaching), Graduate Diploma in Applied Science (Psychology of Coaching) and Master of Applied Science (Psychology of Coaching) for postgraduate study which has not been undertaken in these award courses within the previous three years.

14.2 A candidate who has qualified for the award of the Graduate Certificate in Applied Science (Psychology of Coaching) may transfer, within three years, to the Graduate Diploma in Applied Science (Psychology of Coaching) and receive credit for up to 24 credit points from the Graduate Certificate in Applied Science (Psychology of Coaching).

14.3 A candidate who has qualified for the award of the Graduate Diploma in Applied Science (Psychology of Coaching) may transfer, within three years, to the Master of Applied Science (Psychology of Coaching) and receive credit for up to 36 credit points from the Graduate Diploma in Applied Science (Psychology of Coaching).

14.4 A candidate who has completed units of study in the Applied Science program within the previous three years, but has not qualified for an award, may transfer to another award course within the same Applied Science program and receive credit for the units of study completed.

27. Spatial Information Science coursework degrees

Master of Applied Science (Spatial Information Science)

Degree Code: LC052

Graduate Diploma in Applied Science (Spatial Information Science)

Degree Code: LF040

Graduate Certificate in Applied Science (Spatial Information Science)

Degree Code: LG018

This chapter sets out the requirements for the Graduate Certificate in Applied Science (Spatial Information Science), the Graduate Diploma in Applied Science (Spatial Information Science) and the Master of Applied Science (Spatial Information Science). A comprehensive guide to the requirements and units of study of the coursework degrees is listed.

The information in this chapter is in summary form and is subordinate to the provisions of the relevant degree Resolutions, collected variously at the end of this chapter, or in the University of Sydney Calendar. The Calendar is available for sale at the Student Centre, for viewing at the faculty office or the Library, or online at: www.usyd.edu.au/publications/calendar.

Course overview

The Applied Science (Spatial Information Science) articulated degree program provides an understanding of spatial analysis and modelling theory and use of GIS and Remote Sensing methods in a range of application fields. The opportunity to select optional units in combination with the core GIS units will allow students to focus on a preferred specialisation within the broader spatial science spectrum. In providing a solid grounding in the principles of spatio-temporal analysis and spatial reasoning, the core units will engender a depth of knowledge that is immediately transferable to industry. The optional units will extend this knowledge in specific applications areas and reinforce spatial science skills through practical and field-based training. Students may seek admission to the Graduate Certificate in Applied Science (Spatial Information Science), the Graduate Diploma in Applied Science (Spatial Information Science) or the Master of Applied Science (Spatial Information Science).

Course outcomes

The program will enable students to adopt effective spatial analysis methods for addressing broader environmental and socio-economic issues, examine geographical trends, embrace advances in spatial information technologies and contribute to innovations in the spatial science industry.

Graduates of the Master of Applied Science (Spatial Information Science) who have completed the 12cp Research Project unit are eligible to apply for admission to a research degree (MSc, MSc (Environmental Science), PhD).

Research Path

Unit of Study descriptions

Spatial Information Science units of study

GEOG5001
Geographic Information Science A

Credit points: 6 **Teacher/Coordinator:** Dr David Chapman **Session:** Semester 1, Semester 2 **Classes:** Six workshops. **Assessment:** Report

This unit of study gives an overview of basic spatial data models, and enables students to understand the import and export of data to and from a geographical information system (GIS). The manipulation of spatial data at a level appropriate to planning or locational applications, and the development of thematic maps from diverse data layers, will be addressed.

GEOG5002
Geographic Information Science B

Credit points: 6 **Teacher/Coordinator:** Dr Eleanor Bruce **Session:** Semester 2 **Classes:** One 2 hour lectures, one 1 hour tutorial, one 3 hour practical per week for 6 weeks. **Assumed knowledge:** GEOG5001 **Assessment:** 2500 word assignment, seminar presentation, tutorial reports, WebCT quiz.

This course will provide the conceptual background to more advanced GIS analysis applications and spatial reasoning methods in the context of contemporary environmental issues. The course is designed to provide an understanding of spatial analysis techniques available within a GIS environment, explore a diversity of both social and physical environmental applications and address emerging issues in GIS research. A range of topics will be introduced including field based capture of spatial information, spatial data structures, surface modelling, visibility analysis, hydrological modeling, network analysis, spatial data uncertainty and social GIS.

Conceptual material presented in lectures and tutorial workshops will be placed in an applied context through a series of laboratory and field sessions designed to strengthen practical understanding and awareness of GIS methods.

GEOG5003
Environmental Remote Sensing

Credit points: 6 **Teacher/Coordinator:** Dr Richard Murphy **Session:** Semester 1 **Classes:** 2 one hour lectures and a 4 hour practical per week **Assumed knowledge:** Knowledge or experience equivalent to GEOG5001 (Introduction to GIS) **Assessment:** Assignments, practicals and examination

This unit of study provides a comprehensive introduction to the computational manipulation and application of imaging techniques commonly used in environmental management, from the microscopic to macroscopic level. It includes an introduction to the uses of aerial photography and initial training in image analysis using computer-based exercises. The application and interpretation of remote sensing techniques is then covered in computer-based practical exercises that use a mixture of Landsat thematic mapper, Hyper-spectral, airborne radiometric and magnetic databases. The application of processed images in environmental management will be covered through integrated lectures and laboratory exercise, with assignments being done as part of private study time.

GEOG5004
Environmental Mapping and Monitoring

Credit points: 6 **Teacher/Coordinator:** Dr Peter Cowell **Session:** Semester 2 **Classes:** 2 hours of lectures and one three hour practical per week. **Assessment:** Assignments

The unit introduces methods associated with acquiring data in the field and examines issues associated with application of spatial data to environmental monitoring, terrain mapping and geocomputing. Students will learn both theoretically and practically how environmental data is collected using different remote sensing techniques, (pre)processing methods of integrating data in a GIS environment and the role of spatial data in understanding landscape processes and quantifying environmental change.

GEOG5005
Spatial Science Research Project

Credit points: 12 **Session:** Semester 1, Semester 2 **Classes:** Regular meetings with supervisor **Assessment:** Written thesis

Note: Department permission required for enrolment in the following sessions: Semester 1.

This unit provides students with an opportunity for research and in-depth inquiry in a spatial science topic of interest allowing students to further extend their knowledge or theoretical and conceptual material presented in other units. The research topic will be arranged between the student and supervisor and must have a spatial science focus. Potential topics range from modeling coastal impacts of predicted sea level rise, applying remote sensing in vegetation change detection to the spatial modeling of public transport accessibility. The project topic may involve a spatial modeling or field component, or may be entirely literature-based.

COMP5338
Advanced Data Models

Credit points: 6 **Session:** Semester 1, Semester 2 **Classes:** (Lec 2hrs & Prac 1hr) per week **Assumed knowledge:** COMP5138 or equivalent **Assessment:** Assignments, written exam.

This unit of study gives a comprehensive overview of post-relational data models and of latest developments in database technology. Particular emphasis is put on spatial, temporal, and semi-structured data. The unit extensively covers the advanced features of SQL:2003, as well as XML and related standards such as XMLSchema, xPath, and xQuery. The last part is dedicated to current developments of advanced data management techniques. Besides in lectures, the advanced topics will be also studied with prescribed readings of database research publications.

ENVI5809
Environmental Simulation Modelling

Credit points: 6 **Teacher/Coordinator:** Dr David Chapman **Session:** Semester 1 **Classes:** Six workshops. **Assessment:** Report

The concept and use of computer modelling in natural resource management is introduced in this unit of study, which is aimed particularly at non-programmers.

RESP5001
Fundamentals of Research

Credit points: 6 **Teacher/Coordinator:** A/Prof D Dragovich **Session:** Semester 1a, Semester 2a **Assessment:** Three 1000 word reports, oral presentation

This unit will provide research training for students wishing to undertake research at a Masters or PhD level. Students will revise or develop the necessary skills for commencing a research degree, including critical reading, developing the thesis proposal, developing a research plan with timelines and benchmarks, critical writing, library search techniques, use of referencing systems like EndNote, working with a supervisor, and matters relating to intellectual property and authorship.

Resolutions

Master of Applied Science (Spatial Information Science)
Graduate Diploma in Applied Science (Spatial Information Science
Graduate Certificate in Applied Science (Spatial Information Science)

Course rules

1. **Admission**

1.1 The Dean of the Faculty of Science may admit to candidature for:

1.1.1 *the Graduate Certificate in Applied Science (Spatial Information Science)*

1.1.1.1 graduates of the University of Sydney holding the degree of Bachelor of Science or any other equivalent award of the University of Sydney;

1.1.1.2 graduates of other universities or other appropriate institutions who have qualifications equivalent to those specified in subsection 1.1.1.1; or

1.1.1.3 persons who have experience which is considered to demonstrate the knowledge and aptitude required to undertake the units of study.

1.1.2 *the Graduate Diploma in Applied Science (Spatial Information Science):*

1.1.2.1 graduates of the University of Sydney holding the degree of Bachelor of Science or any other equivalent award of the University of Sydney;

1.1.2.2 graduates of other universities or other appropriate institutions who have qualifications equivalent to those specified in subsection 1.1.2.1; or

1.1.2.3 persons who have completed requirements for the Graduate Certificate in Applied Science, or equivalent.

1.1.3 *the Master of Applied Science (Spatial Information Science)*

1.1.3.1 graduates of the University of Sydney holding the degree of Bachelor of Science or any other equivalent award of the University of Sydney;

1.1.3.2 graduates of other universities or other appropriate institutions who have qualifications equivalent to those specified in subsection 1.1.3.1; or

1.1.3.3 persons who have completed requirements for the Graduate Diploma in Applied Science, or equivalent.

2. **Units of study**

2.1 The units of study for the Graduate Certificate in Applied Science (Spatial Information Science), Graduate Diploma in Applied Science (Spatial Information Science), Master of Applied Science (Spatial Information Science), are listed in subsection 4.1.

2.2 Credit point value, assumed knowledge, corequisites, prerequisites and any special conditions are included in the table.

3. **Requirements for the Graduate Certificate in Applied Science (Spatial Information Science), Graduate Diploma in Applied Science (Spatial Information Science), Master of Applied Science (Spatial Information Science)**

3.1 Candidates for the Graduate Certificate in Applied Science (Spatial Information Science) are required to satisfactorily complete 24 credit points of units of study comprising GEOG5001, GEOG5002, GEOG5003 and GEOG5004.

3.2 Candidates for the Graduate Diploma in Applied Science (Spatial Information Science) are required to complete satisfactorily 36 credit points of units of study comprising GEOG5001, GEOG5002, GEOG5003, GEOG5004 and 12 credit points from other units in the following table.

3.3 Candidates for the Master of Applied Science (Spatial Information Science) are required to complete satisfactorily 48 credit points of units of study comprising

3.3.1 GEOG5001, GEOG5002, GEOG5003 and GEOG5004; and either

3.3.2 18 credit points from the list of units of study in the following table, not including GEOG5005 or RESP5001; and 6 credit points from an optional unit offered by the Faculty of Science and approved by the coordinator of the Spatial Information Science program; or

3.3.3 only if qualified to enrol in GEOG5005 and RESP5001, 48 credit points of study from the list of units in the following table.

Faculty rules

4. Details of units of study

4.1 The units of study for the Graduate Certificate in Applied Science (Spatial Information Science), Graduate Diploma in Applied Science (Spatial Information Science) and the Master of Applied Science (Spatial Information Science) are listed in the following table:

Unit of study			Co req, pre reqs	Special conditions
Unless otherwise indicated, all units are worth 6 credit points.				
GEOG5001	Geographic Information Science A	sem 1 & 2		Students must enrol in this unit in the first semester of enrolment
GEOG5002	Geographic Information Science B	sem 2	GEOG5001	
GEOG5003	Environmental Remote Sensing	sem 2	GEOG5001	
GEOG5004	Environmental Mapping and Monitoring	sem 1	GEOG5001	
ENVI5809	Environmental Simulation Modelling	sem 2	GEOG5001	
COMP5338	Advanced Data Models	sem 1 & 2	GEOG5001	
AFNR5502	Remote Sensing, GIS and Land Management	sem 1	GEOG5001	
GEOG5005	Spatial Science Research Project (12 credit points)	sem 1 & 2	Completion of 24 credit points at Credit average or better	Available to Masters students only
RESP5001	Fundamentals of Research	sem 1 & 2	Completion of 24 credit points at Credit average or better	Available to Masters students only

4.2 A candidate for the course shall proceed by completing units of study as prescribed by the Faculty.

4.3 A unit of study shall consist of such lectures, seminars, tutorial instruction, essays, exercises, practical work, or project work as may be prescribed.

4.4 In these resolutions, 'to complete a unit of study' or any derivative expression means:

4.4.1 to attend the lectures and the meetings, if any, for seminars or tutorial instruction;

4.4.2 to complete satisfactorily the essays, exercises, practical and project work if any; and

4.4.3 to pass any other examination of the unit of study that may apply.

4.5 All units of study for a particular subject area may not be available every semester.

4.6 The Dean may allow substitution of any unit of study by another unit of study, including units of study from other postgraduate coursework programs in the Faculty or elsewhere in the University.

4.7 The Master of Applied Science (Spatial Information Science) shall be awarded in two grades, namely Pass and, in the case of an outstanding candidate, Pass with Merit.

5. Enrolment in more/less than minimum load

5.1 A candidate may proceed on either a full-time or a part-time basis.

6. Cross-institutional study

6.1 Cross institutional study shall not be available to students enrolled in the Master of Applied Science (Spatial Information Science), the Graduate Diploma in Applied Science (Spatial Information Science) or the Graduate Certificate in Applied Science (Spatial Information Science) except where the University of Sydney has a formal Cooperation Agreement with another University.

7. Restrictions on enrolment

7.1 Admission to candidature may be limited by a quota.

7.2 In determining the quota, the University will take into account:

7.2.1 availability of resources including space, laboratory and computing facilities; and

7.2.2 availability of adequate and appropriate supervision.

7.3 In considering an application for admission to candidature the Dean shall take account of the quota and will select, in preference, applicants who are most meritorious in terms of section 2 above.

8. Discontinuation of enrolment

8.1 A student who does not enrol in any semester without first obtaining written permission from the Dean to suspend candidature will be deemed to have discontinued enrolment in the course.

8.2 Students who have discontinued from the course will be required to apply for admission to the course and be subject to admission requirements pertaining at that time.

9. Suspension of candidature

9.1 A student may seek written permission from the Dean to suspend candidature in the course.

9.2 Suspension may be granted for a maximum of one year.

10. Re-enrolment after an absence

10.1 A student who plans to re-enrol after a period of suspension must advise the Faculty of Science Office in writing of their intention by no later than the end of October for First Semester of the following year or the end of May for Second Semester of the same year.

11. Satisfactory progress

11.1 Candidates for the Graduate Certificate in Applied Science (Spatial Information Science), Graduate Diploma in Applied Science (Spatial Information Science) and the Master of Applied Science (Spatial Information Science) shall be governed by the rules as follows:

11.1.1 A student who has failed a cumulative total of 12cp at any stage of enrolment in the Master of Applied Science (Spatial Information Science) will be required to show good cause why he or she should be allowed to re-enrol and, if good cause has not been established, the student's enrolment will be transferred to the Graduate Diploma in Applied Science (Spatial Information Science);

11.1.2 A student who has failed a cumulative total of 18cp at any stage of enrolment in the Master of Applied Science (Spatial Information Science) and/or the Graduate Diploma in Applied Science (Spatial Information Science) will be required to show good cause why he or she should be allowed to re-enrol and, if good cause has not been established, the student's enrolment will be transferred to the Graduate Certificate in Science (Spatial Information Science).

11.1.3 A student who has failed a cumulative total of 12cp at any stage of enrolment in the Graduate Certificate in Applied Science (Spatial Information Science) will be required to show good cause why he or she should be allowed to re-enrol and, if good cause has not been established, the student will not be permitted to reenrol.

11.2 A student who has failed a cumulative total of more than 18cp in the Master of Applied Science (Spatial Information Science) and/or the Graduate Diploma in Applied Science (Spatial Information Science) and/or the Graduate Certificate in Applied Science (Spatial Information Science) will be required to show good cause why he or she should be allowed to re-enrol and, if good cause has not been established, the student will not be permitted to reenrol.

11.3.1 A student who has failed a unit at the second attempt in the Master of Applied Science (Spatial Information Science) and/or the Graduate Diploma in Applied Science (Spatial Information Science) and/or the Graduate Certificate in Applied Science (Spatial Information Science) will be deemed to have failed to complete course requirements and will be

required to show good cause why he or she should be allowed to re-enrol.

11.3.2 If good cause has not been established, the student will not be permitted to re-enrol.

12. Time limit

12.1 A candidate for the Graduate Certificate in Applied Science (Spatial Information Science) shall complete the requirements for the award in a minimum enrolment of one semester and a maximum enrolment of four semesters.

12.2 A candidate for the Graduate Diploma in Applied Science (Spatial Information Science) shall complete the requirements for the award in a minimum enrolment of two semesters and a maximum enrolment of six semesters.

12.3 A candidate for the Master of Applied Science (Spatial Information Science) shall complete the requirements for the award in a minimum enrolment of two semesters and a maximum enrolment of eight semesters.

13. Assessment policy

13.1 On completion of the requirements for the course, the Faculty shall determine the results of the candidature.

14. Credit transfer policy

14.1 Credit is not available in the Graduate Certificate in Applied Science (Spatial Information Science), Graduate Diploma in Applied Science (Spatial Information Science) and Master of Applied Science (Spatial Information Science) for postgraduate study which has not been undertaken in these award courses within the previous three years.

14.2 A candidate who has qualified for the award of the Graduate Certificate in Applied Science (Spatial Information Science) may transfer, within three years, to the Graduate Diploma in Applied Science (Spatial Information Science) and receive credit for up to 24 credit points from the Graduate Certificate in Applied Science (Spatial Information Science).

14.3 A candidate who has qualified for the award of the Graduate Diploma in Applied Science (Spatial Information Science) may transfer, within three years, to the Master of Applied Science (Spatial Information Science) and receive credit for up to 36 credit points from the Graduate Diploma in Applied Science (Spatial Information Science).

14.4 A candidate who has completed units of study in the Applied Science program within the previous three years, but has not qualified for an award, may transfer to another award course within the same Applied Science program and receive credit for the units of study completed.

28. Postgraduate coursework: Wildlife Health and Population Management Degrees

Master of Applied Science (Wildlife Health and Population Management)

Degree Code: LC034

Graduate Diploma in Applied Science (Wildlife Health and Population Management)

Degree Code: LF022

Graduate Certificate in Applied Science (Wildlife Health and Population Management)

Degree Code: LG007

This chapter sets out the requirements for coursework postgraduate degrees offered in the areas of Wildlife Health and Population Management.

The information in this chapter is in summary form and is subordinate to the provisions of the relevant degree Resolutions, collected variously at the end of this chapter, or in the University of Sydney Calendar. The Calendar is available for sale at the Student Centre, for viewing at the faculty office or the Library, or online at: www.usyd.edu.au/publications/calendar.

Course overview

The Graduate Certificate in Applied Science (Wildlife Health and Population Management), Graduate Diploma in Applied Science (Wildlife Health and Population Management) and Master of Applied Science (Wildlife Health and Population Management) are articulated award courses that provide a professional qualification to biologists and veterinarians working in private practice, industry, research and education. The award program brings together the disciplines of animal health and wildlife population management, developing and enhancing skills in conservation techniques for native fauna, diagnosis and management of wildlife health, and management of native and pest species populations.

Candidates will normally commence their study in Semester 1, except with the permission of the Dean.

Course outcomes

The aim of this articulated coursework program is to provide students with a coordinated and interdisciplinary approach to wildlife health and wildlife management, thus developing expertise to recognise and solve a broad range of problems in field populations. Upon completion of the graduate certificate, graduate diploma or Master's, graduates will have a broad understanding of the topic of wildlife management and practical skills developed from field studies. In addition, the Master's will provide experience in designing, carrying out and completing a research project and thesis.

Graduates of the Master of Applied Science (Wildlife Health & Population Management) are eligible to apply for admission to a research degree (PhD).

Unit of Study descriptions

Wildlife Health and Population Management units of study

Core units of study

WILD5001
Australasian Wildlife: Introduction

Credit points: 6 **Teacher/Coordinator:** Professor Chris Dickman **Session:** S1 Intensive **Classes:** Intensively taught unit, the remainder of the unit will involve personal study and project activity. See the Wildlife Health and Population Management website for dates. **Assessment:** assessments for each unit may include practical work, field studies, student presentations and written reports

This unit of study provides an introduction to the wildlife of Australasia, an overview of the present status of that wildlife, and an understanding of both conservation problems and management solutions. Issues in wildlife management are exemplified using a broad range of vertebrate species occupying different environments. Emphasis is placed on providing students with a coordinated and interdisciplinary approach to wildlife health and management, and on developing expertise in recognising and solving a broad range of problems in field populations. The unit integrates lectures, practical work and supervised study, and offers students the opportunity to work through real-world wildlife conservation problems relevant to their individual backgrounds.

WILD5002
Australasian Wildlife: Field Studies

Credit points: 6 **Teacher/Coordinator:** Professor Chris Dickman **Session:** S1 Intensive **Classes:** Intensively taught unit. See the Wildlife Health and Population Management website for dates. **Assessment:** Assessments for each unit may include practical work, field studies, student presentations and written reports

This unit of study provides a first-hand introduction to the wildlife of Australasia, a practical overview of the present status of that wildlife, and an understanding of both conservation problems and management solutions. Issues in wildlife management are exemplified using sampling and diagnostic methods on a broad range of vertebrate species occupying different environments. The unit follows on from WILD5001 and provides practical experience via a five day field trip.

Additional Core unit (Masters program only)

WILD5009
Research Project

Credit points: 12 **Session:** Semester 1, Semester 2 **Classes:** meetings throughout semester to be arranged with supervisor. **Assessment:** independent research project

Note: Core for the Masters program

A valuable opportunity to apply some of the knowledge gained from earlier coursework, WILD5009 comprises a research project on a topic with significant emphasis on wildlife health and/or population management, as arranged between the student and an appropriate supervisor. This research experience is highly valued by prospective employers as it shows a willingness and ability to undertake guided but independent research. The project is not conducted by way of contact hours per week for a semester. Instead the student is expected to work on the project full-time and in a continuous manner for the semester. This unit of study is available only to students enrolled in the Master of Applied Science (Wildlife Health and Population Management).

Optional units

WILD5003
Wildlife Health

Credit points: 6 **Teacher/Coordinator:** Assoc Prof DN Phalen **Session:** S1 Late Int **Classes:** A full-time week on the Camden campus, with one day spent on a field trip to Taronga Zoo. **Assessment:** The assessment of this unit occurs both in the full-time week and in individual written assignments done in the student's own time. The full-time week contributes 40% of the total mark through a number of individual and syndicate tasks, with presentations to the group. The remaining 60% comes from two written assignments of 3,000 words (20%) and 5,000 words (40%) respectively.

This unit of study provides an introduction to the health issues confronting wildlife in Australasia, an overview of the health status of that wildlife, and an understanding of both the investigation of health problems and the effective management of these. Issues in wildlife disease management are exemplified using a broad range of vertebrate species occupying different environments. Emphasis is placed on providing students with a coordinated and interdisciplinary approach to wildlife health, and on developing expertise in recognising and solving a broad range of health problems in field populations. The unit is taught intensively in a full-time week on the Camden campus, with one day spent on a field trip to Taronga Zoo. The unit integrates lectures, practical work and supervised study, and offer students the opportunity to work through real-world wildlife conservation problems relevant to their individual backgrounds.

Textbooks
Unit of Study Handbook is the primary reference.

WILD5004
Vertebrate Pest Management

Credit points: 6 **Teacher/Coordinator:** Tony Buckmaster **Session:** S2 Intensive **Classes:** The Unit is taught in a full-time week at the university farm "Arthursleigh" near Marulan NSW. There are lectures, tutorials, and a variety of practical classes. **Assessment:** The assessment of this unit occurs both in the full-time week and in individual written assignments done in the student's own time. The full-time week contributes 40% of the total mark through a number of individual and syndicate tasks, with presentations to the group. The remaining 60% comes from two written assignments of 3000 words (20%) and 5000 words (40%) respectively.

Vertebrate pests occur in many parts of the world, and can pose significant problems for management of habitat, agricultural productivity, human and wildlife health. This unit focuses on vertebrates that have been introduced to new environments, and considers in detail the impacts and management of pest vertebrates in Australia. Steps in pest management are reviewed, from problem analysis to acceptable levels of control, using case studies of cane toads, rabbits, house mice and red foxes. Traditional mortality methods of management are reviewed, and emphasis placed on developing methods based on fertility control. The Unit is taught in a full-time week at the university farm "Arthursleigh" near Marulan NSW. There are lectures, tutorials, and a variety of practical classes. The Unit is taught in a full-time week at the university farm "Arthursleigh" near Marulan NSW. There are lectures, tutorials, and a variety of practical classes.

Textbooks
Unit of Study Handbook is the primary reference.

WILD5005
In Situ Wildlife Management

Credit points: 6 **Teacher/Coordinator:** Professor Chris Dickman **Session:** S1 Late Int **Classes:** Intensively taught unit. See the Wildlife Health and Population Management website for dates. **Assessment:** Assessments for each unit may include practical work, field studies, student presentations and written reports

Wildlife populations do not remain static, but change in size and composition over both time and space. The challenge for managers is to recognise when change in target populations exceeds acceptable limits and intervention is necessary. This unit of study develops skills in assessing population status and recognising differences between 'small populations' and 'declining populations'. It introduces methods used in population pattern analysis, demographic analysis, threat and resource assessment, and determination of health, emphasising the value of a coordinated and interdisciplinary approach to problem recognition and resolution.

WILD5006
Ex Situ Wildlife Management

Credit points: 6 **Teacher/Coordinator:** Assoc Prof DN Phalen **Session:** S2 Late Int **Classes:** The Unit is taught in a full-time week at Western Plains Zoo in Dubbo, NSW. **Assessment:** The assessment of this unit occurs both in the full-time week and in individual written assignments done in the student's own time. The full-time week contributes 40% of the total mark through a number of individual and syndicate tasks, with presenations to the group. The remaining 60% comes from two written assignments of 3,000 words (20%) and 5,000 words (40%) respectively.

Wildlife populations are under a variety of threats, most of which result from human activities. Modern conservation biology seeks practical solutions to these problems, using a wide variety of options. These options may include captive breeding and re-introduction programs, provided that a range of biological, ethical and politico-economic issues are addressed. This unit of study will provide students with the ability to evaluate the likely cost-effectiveness of such programs. It will also develop knowledge of the technologies available to capture and translocate wildlife, and of the planning required to ensure the best possible chance of success. The Unit is taught in a full-time week at Western Plains Zoo in Dubbo, NSW. The unit integrates lectures, tutorials, practical work and supervised study, and offers students the opportunity to examine real-world problems in the conservation and management of threatened wildlife populations using case studies relevant to their individual backgrounds.

Textbooks
Unit of Study Handbook is the primary reference.

WILD5010
Southern Ocean Vertebrates Conservation

This unit of study is not available in 2009

Credit points: 6 **Teacher/Coordinator:** Program Academic Supervisor: Assoc Prof David Phalen Instructor(s): Assoc Prof David Phalen, Dr Rachael Gray, Dr Tracey Rogers **Session:** Semester 2 **Classes:** Residential and self study. See the Wildlife Health and Population Management website for dates. **Assumed knowledge:** All students will need to have the equivalent of a bachelor's degree. They will be assumed to know how to use electronic resources to search data bases that relate to environmental topics. **Assessment:** presentation, written assignment

Note: This unit of study is one that is offered as part of the Master's of Wildlife Health and Population Management program

A diverse range of fish, birds and mammals inhabit the oceans surrounding the Antarctic. These oceans fall under the jurisdiction of many nations and international regulatory agencies. Our knowledge of and ability to monitor the populations of fish, mammals and birds that live in these oceans is complicated by the fact that many species migrate across huge areas of the oceans crossing many jurisdictions. Many nations have an interest in the animals of the Southern Ocean. These interests range from strictly commercial to the desire to see that they are left untouched or at least utilized in a sustainable manner. In this course we will examine how anthropogenic factors are impacting the birds, mammals, and fish of the Southern Oceans and to learn how these changes can be monitored and documented. We will also discuss how commercial interests are regulated by law and how change in these laws may come about and the difficulties of enforcement.

ENVI5808
App Ecology for Environmental Scientists

Credit points: 6 **Teacher/Coordinator:** Dr Clare McArthur **Session:** Semester 2 **Classes:** Three 1 hour lectures per week. **Assessment:** Essays and presentations

Note: This is a compulsory unit for all levels of the postgraduate Applied Science (Environmental Science) program

This unit of study complements ENVI5705, and covers in depth the concerns of modern ecology pertaining to both terrestrial and marine ecosystems. An understanding of the complex issues of invasive species, conservation of biodiversity and ecological management of the environment is provided.

Resolutions

Master of Applied Science (Wildlife Health and Population Management)
Graduate Diploma in Applied Science (Wildlife Health and Population Management)
Graduate Certificate in Applied Science (Wildlife Health and Population Management)

Course rules

1. Admission

1.1 The Dean of the Faculty of Science may admit to candidature for:

1.1.1 *the Graduate Certificate in Applied Science (Wildlife Health and Population Management):*

1.1.1.1 graduates of the University of Sydney holding the degree of Bachelor of Science or any other equivalent award of the University of Sydney;

1.1.1.2 graduates of other universities or other appropriate institutions who have qualifications equivalent to those specified in subsection 1.1.1.1; or

1.1.1.3 persons who have experience which is considered to demonstrate the knowledge and aptitude required to undertake the units of study;

1.1.2 *the Graduate Diploma in Applied Science (Wildlife Health and Population Management):*

1.1.2.1 graduates of the University of Sydney holding the degree of Bachelor of Science or any other equivalent award of the University of Sydney;

1.1.2.2 graduates of other universities or other appropriate institutions who have qualifications equivalent to those specified in subsection 1.1.2.1; or

1.1.2.3 persons who have completed requirements for the Graduate Certificate in Applied Science, or equivalent;

1.1.3 *the Master of Applied Science (Wildlife Health and Population Management):*

1.1.3.1 graduates of the University of Sydney holding the degree of Bachelor of Science or any other equivalent award of the University of Sydney;

1.1.3.2 graduates of other universities or other appropriate institutions who have qualifications equivalent to those specified in subsection 1.1.3.1; or

1.1.3.3 persons who have completed requirements for the Graduate Diploma in Applied Science, or equivalent.

2. Units of study

2.1 The units of study for the Graduate Certificate in Applied Science, Graduate Diploma in Applied Science and Master of Applied Science (Wildlife Health and Population Management) are listed in subsection 4.

2.2 Credit point value, assumed knowledge, corequisites, prerequisites and any special conditions are included in the unit of study description.

3. Requirements for Graduate Certificate in Applied Science (Wildlife Health and Population Management), Graduate Diploma in Applied Science (Wildlife Health and Population Management) and Master of Applied Science (Wildlife Health and Population Management)

3.1 Candidates for the Graduate Certificate in Applied Science (Wildlife Health and Population Management) are required to complete satisfactorily two core units of study (WILD5001 and WILD5002) and 12 credit points from optional units of study.

3.2 Candidates for the Graduate Diploma in Applied Science (Wildlife Health and Population Management) are required to complete satisfactorily two core units of study (WILD5001 and WILD5002) and 24 credit points from optional units of study.

3.3 Candidates for the Master of Applied Science (Wildlife Health and Population Management) are required to complete satisfactorily three core units of study (WILD5001, WILD5002 and WILD5009) and 24 credit points from optional units of study.

Faculty rules

4. Details of units of study

4.1 The units of study for the Graduate Certificate in Applied Science, Graduate Diploma in Applied Science and Master of Applied Science (Wildlife Health and Population Management) are listed in the following table.

Unless otherwise indicated, all units are worth 6 credit points. There are no prerequisites, corequisites or other special conditions for enrolment in these units of study except that 24 credit points of units of study must be completed successfully before a candidate may enrol in WILD5009.

Unit of study		Sem
Core units all degrees		
WILD5001	Australasian Wildlife: Introduction	1
WILD5002	Australasian Wildlife: Field Studies	1
Additional core unit Master		
WILD5009	Research Project (12cp)	2
Optional units		
WILD5003	Wildlife Health	1
WILD5005	In Situ Wildlife Management	1
WILD5006	Ex Situ Wildlife Management	2
WILD5010	Conservation of Vertebrates in the Southern Ocean	2

4.2 A candidate for the course shall proceed by completing units of study as prescribed by the Faculty.

4.3 A unit of study shall consist of such lectures, seminars, tutorial instruction, essays, exercises, practical work, or project work as may be prescribed.

4.4 In these resolutions, 'to complete a unit of study' or any derivative expression means:

4.4.1 to attend the lectures and the meetings, if any, for seminars or tutorial instruction;

4.4.2 to complete satisfactorily the essays, exercises, practical and project work if any; and

4.4.3 to pass any other examination of the unit of study that may apply.

4.5 All units of study for a particular subject area may not be available every semester.

4.6 The Dean may allow substitution of any unit of study by another unit of study, including units of study from other postgraduate coursework programs in the Faculty or elsewhere in the University.

4.7 The Master of Applied Science (Wildlife Health and Population Management) shall be awarded in two grades, namely Pass and, in the case of an outstanding candidate, Pass with Merit.

5. Enrolment in more/less than minimum load

5.1 A candidate may proceed on either a full-time or a part-time basis.

6. Cross-institutional study

6.1 Cross institutional study shall not be available to students enrolled in the Graduate Certificate in Applied Science, Graduate Diploma in Applied Science and Master of Applied Science courses, except where the University of Sydney has a formal Cooperation Agreement with another University.

7. Restrictions on enrolment

7.1 Admission to candidature may be limited by a quota.

7.2 In determining the quota, the University will take into account:

7.2.1 availability of resources including space, laboratory and computing facilities; and

7.2.2 availability of adequate and appropriate supervision.

7.3 In considering an application for admission to candidature the Dean shall take account of the quota and will select, in preference, applicants who are most meritorious in terms of subsection 1 above.

8. Discontinuation of enrolment

8.1 A student who does not enrol in any semester without first obtaining written permission from the Dean to suspend candidature will be deemed to have discontinued enrolment in the course.

8.2 Students who have discontinued from the course will be required to apply for admission to the course and be subject to admission requirements pertaining at that time.

9. Suspension of candidature

9.1 A student may seek written permission from the Dean to suspend candidature in the course.

9.2 Suspension may be granted for a maximum of one year.

10. Re-enrolment after an absence

10.1 A student who plans to re-enrol after a period of suspension must advise the Faculty of Science Office in writing of their intention by no later than the end of October for First Semester of the following year or the end of May for Second Semester of the same year.

11. Satisfactory progress

11.1 Candidates for the Master of Applied Science (Wildlife Health and Population Management), the Graduate Diploma in Applied Science (Wildlife Health and Population Management), and the Graduate Certificate in Applied Science (Wildlife Health and Population Management), shall be governed by the rules as follows:

11.1.1 A student who has failed a cumulative total of 12 credit points at any stage of enrolment in the Master of Applied Science (Wildlife Health and Population Management) will be required to show good cause why he or she should be allowed to re-enrol and, if good cause has not been established, the student's enrolment will be transferred to the Graduate Diploma in Applied Science (Wildlife Health and Population Management);

11.1.2 A student who has failed a cumulative total of 18 credit points at any stage of enrolment in the Master of Applied Science (Wildlife Health and Population Management) and/or the Graduate Diploma in Applied Science (Wildlife Health and Population Management)will be required to show good cause why he or she should be allowed to re-enrol and, if good cause has not been established, the student's enrolment will be transferred to the Graduate Certificate in Applied Science (Wildlife Health and Population Management);

11.1.3 A student who has failed a cumulative total of 12 credit points at any stage of enrolment in the Graduate Certificate in Applied Science (Wildlife Health and Population Management) will be required to show good cause why he or she should be allowed to re-enrol and, if good cause has not been established, the studentwill not be permitted to re-enrol.

11.2 A student who has failed a cumulative total of more than 18 credit points in the Master of Applied Science (Wildlife Health and Population Management) and/or the Graduate Diploma in Applied Science (Wildlife Health and Population Management) and/or the Graduate Certificate in Applied Science (Wildlife Health and Population Management) will be required to show good cause why he or she should be allowed to re-enrol and, if good cause has not been established, the student will not be permitted to re-enrol.

11.3.1 A student who has failed a core unit at the second attempt in the Master of Applied Science (Wildlife Health and Population Management) and/or the Graduate Diploma in Applied Science (Wildlife Health and Population Management) and/or the Graduate Certificate in Applied Science (Wildlife Health and Population Management) will be deemed to have failed to complete course requirements and will be required to show good cause why he or she should be allowed to re-enrol.

11.3.2 If good cause has not been established, the student will not be permitted to re-enrol.

12. Time limit

12.1 A candidate for the Graduate Certificate in Applied Science (Wildlife Health and Population Management)shall complete the requirements for the award in a minimum enrolment of one semester and a maximum enrolment of four semesters.

12.2 A candidate for the Graduate Diploma in Applied Science (Wildlife Health and Population Management) shall complete the requirements for the award in a minimum enrolment of two semesters and a maximum enrolment of six semesters.

12.3 A candidate for the Master of Applied Science (Wildlife Health and Population Management) shall complete the requirements for the award in a minimum of two semesters and a maximum of eight semesters.

13. Assessment policy

13.1 On completion of the requirements for the course, the Faculty shall determine the results of the candidature.

14. Credit transfer policy

14.1 Credit is not available in the Graduate Certificate in Applied Science (Wildlife Health and Population Management), Graduate Diploma in Applied Science (Wildlife Health and Population Management) and Master of Applied Science (Wildlife Health and Population Management) for postgraduate study which has not been undertaken in these award courses within the previous three years.

14.2 A candidate who has qualified for the award of the Graduate Certificate in Applied Science (Wildlife Health and Population Management) may transfer, within three years, to the Graduate Diploma in Applied Science (Wildlife Health and Population Management) and receive credit for up to 24 credit points from the Graduate Certificate in Applied Science (Wildlife Health and Population Management).

14.3 A candidate who has qualified for the award of the Graduate Diploma in Applied Science (Wildlife Health and Population Management) may transfer, within three years, to the Master of Applied Science (Wildlife Health and Population Management) and receive credit for up to 36 credit points from the Graduate Diploma in Applied Science (Wildlife Health and Population Management).

14.4 A candidate who has completed units of study in the Applied Science program within the previous three years, but has not qualified for an award, may transfer to another award course within the same Applied Science program and receive credit for the units of study completed.

29. Staff

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Jeffrey Neilson, PhD *Syd*
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Gabor Foldvary, PhD *Syd*
Peter Hoare, MSc PhD *Syd*
Ronald Horvath, MA PhD *Syd*
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Iain Mason, BScEng MA PhD *Syd*
Gordon Packham, PhD *Syd*
Peter Roy, BSc PhD *ImpColl*
Bruce Thom, PhD *Syd*
Robin F Warner, BA *Birm* PhD *NE*
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Graham Lloyd
Phil Manning
David Mitchell
Tom E Savage, BE *Syd*

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John S Twyman, BSc(Hons) *Syd*

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Discipline of Infectious Diseases and Immunology

Immunology

Discipline Head and Professor
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Associate Professor
Helen Briscoe, BSc PhD *Edin*

Senior Lecturers
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Robert H Loblay, MB BS PhD *Syd*, FRACP

Sesqui Lecturer in Bioinformatics
Jonathan Arthur, BSc PhD *Syd*

Senior Technical Officer
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Professor Antony Basten AO, MB BS DPhil *Oxf*, FAA FTSE FRCP FRACP FRCPA
G Alex Bishop, MScAgr PhD *Syd*
Roger J Garsia, MB BS PhD *Syd*, FRACP FRCPA
Mark D Gorrell, BSc PhD *ANU*
Barbara D Fazekas de St Groth, BSc(Med) PhD *Melb* MB BS *Syd*
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Bernadette Saunders, BSc PhD *Melb*

Infectious Diseases

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Thomas Goottlieb, MB BS *Syd*, FRACP FRCPA

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Senior Technical Officers
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Professor in Pure Mathematics
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Professor in Applied Mathematics and *Head of School*
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Professor in Mathematical Statistics (Personal Chair)
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Professor in Mathematical Statistics
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Joyce Calvitto (HNU)
Maria Karasantes (HNU)
Isa Hopwood (HNU)
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Ben Monaghan, DipHealthSc *TAFE*
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Glassware Cleaners
Ana M Julca
Joyce Menouhos
Trudie T Smith
Jun Wang

Apprentice Fitter and Machinist
James F Gibson

Attendant
Max A Francis

Honorary appointments

Emeritus Professors
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Noel S Hush AO, DSc *Manc* MSc *Syd*, FRS FAA FRACI
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Ruiting Lan, BScAgr *Jiangxi* PhD *Syd*
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Bogdan E Chapman, BSc PhD *ANU*
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Ivan Darvey, BSc PhD *NSW*
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Judy Chan, BSc MPsych *NSW*
Denise Chu, BSc(Hons) *Oregon* MClinPsych *Macq*
Anna Cohen, BA(Hons) MPsych *Woll*
Natalie Daniela Crino, BEco (Hons) MClinPsych *NSW*
Carlie Dean, BSc MPsych *Syd*
Angela Dixon, BSc *Melb* MA *Harv* MPsych PhD *Syd*
Emma Djukic, BA(Hons) MPsych *Syd*
Suzette Doctor, BSc *Lond* MSc *Leic*
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Danielle Einstein, BSc *NSW* MPsych *NSW*
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Adam John Guastella, BA(Hons) *Qld* PhD *Griffith*
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Chantal Braganza, BSc MPsych *NSW*
Ainslie Hatch, BA MPsych *Syd*
Christopher Hunt, BSc MPsych *NSW*
Julia Lam, BSSc MPhil *UHK* MSc *Leic* PhD *Melb*
Kate Leeds, BAppPsych MPsyc *Canberra*
Norris Ma, BA GDS(Psych) *Syd*
Sylvana Sturevska, BSc *NSW* MA(Psych) *Syd*
Maree-Jo Richards, BSc *Woll* GDS(Psych) *Syd*
Kristen Shannon, BA MA *Syd*
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Philip Chapple, PhD *Syd*
David Haddad, BSc DPhil *Oxf*
Alexa Troedson, BSc PhD *Syd*
John You, PhD *Syd*

30. Scholarships

These tables contain simplified details of some of the prizes and scholarships offered by the University. Further information regarding scholarships is available from the University scholarships website and from the Research Office website.

Additional criteria are attached to each award below and for full details you are advised to consult the administering unit. In particular, requirements of sufficient merit or of a higher year enrolment in particular subjects or degrees are common.The University may not offer an award every year.

The values of the awards are indicative only and may vary without notice.

The scholarships and prizes fall into two broad categories:

Prizes awarded on application – See the Scholarships Office and Research Office websites for more information. Applications usually close in September each year for the following year.

Prizes awarded automatically – Successful students are notified of these either by the faculty or the Student Centre. Nearly all the prizes in these tables are awarded without application.

Prize compositions

Details of these may be obtained from the Scholarships Office. Applications generally close in the third week of second semester.

Bursaries

Bursaries are awarded on the combined grounds of financial need and academic merit. Applications to the Financial Assistance Office usually close at the end of April.

Undergraduate prizes and scholarships

Award	Value (pa)	Tenure (yrs)	Number	Brief description
Scholarships awarded by the Faculty to students entering first year.				
Science Alumni Entry Scholarship	$1000	5	up to 4	Awarded to highly ranked University of Sydney Undergraduate Scholarship applicants who do not obtain one of those scholarships. Minimum UAI 98. These scholarships may not be held concurrently with a University of Sydney Scholarship for Outstanding Achievement.
Science Entry Scholarship	$4000	1	up to 4	Awarded to highly ranked University of Sydney Undergraduate Scholarship applicants who do not obtain one of those scholarships. Minimum UAI 98. These scholarships may not be held concurrently with a University of Sydney Scholarship for Outstanding Achievement.
Science Alumni Achievement Scholarship	$1000	2	up to 7	Awarded to highly ranked University of Sydney Undergraduate Scholarship applicants who do not obtain one of those scholarships. Minimum UAI 95. These scholarships may not be held concurrently with a University of Sydney Scholarship for Outstanding Achievement.
Faculty of Science Olympiad Scholarship	1 x $3000 then 3 x $1000	4	varies	Awarded to highly ranked University of Sydney Undergraduate Scholarship applicants who do not obtain one of those scholarships. Applicants must be medallists in an International Olympiad in Biology, Chemistry, Informatics, Mathematics or Physics. Minimum UAI 95. These scholarships may not be held concurrently with a University of Sydney Scholarship for Outstanding Achievement.
Biology Entry Scholarship	$2000	1	2	Awarded automatically on the basis of academic merit in the HSC to intending BSc Biology majors. Cannot be held with other scholarships of equal or greater value.
Chemistry Entry Scholarship	$2000	1	2	Awarded automatically on the basis of academic merit in the HSC to intending BSc Chemistry majors. Cannot be held with other scholarships of equal or greater value.
Geography Entry Scholarship	$2000	1	1	Awarded automatically on the basis of academic merit in the HSC to intending BSc Geography majors. Cannot be held with other scholarships of equal or greater value.
Liberal Studies Entry Scholarship	$2000	1	1	Offered jointly by the Faculties of Arts and Science. Awarded automatically on the basis of UAI to students entering the BLibStud. Cannot be held with other scholarships of equal or greater value.
Marine Science Entry Scholarship	$2000	1	1	Awarded automatically on the basis of UAI to students entering the BSc (Marine Science). Cannot be held with other scholarships of equal or greater value.
Mathematics Entry Scholarship	$2000	1	2	Awarded automatically on the basis of academic merit in the HSC to intending BSc Mathematics majors. Cannot be held with other scholarships of equal or greater value.
Molecular Biology & Genetics Entry Scholarship	$2000	1	1	Awarded automatically on the basis of UAI to students entering the BSc (Molecular Biology and Genetics). Cannot be held with other scholarships of equal or greater value.
Medical Science Entry Scholarship	$2000	1	2	Offered jointly by the Faculties of Science and Medicine. Awarded automatically on the basis of UAI to students entering the BMedSc. Cannot be held with other scholarships of equal or greater value.
Psychology Entry Scholarship	$2000	1	2	Awarded automatically on the basis of UAI to students entering the BPsych. Cannot be held with other scholarships of equal or greater value.
Farrand Science Scholarships	$2500	1	11	Eleven scholarships for full time first year BSc students who have not undertaken previous tertiary study. Awarded automatically on the basis of academic merit in the HSC (or equivalent). May not be held with the Science Scholarship.
Liversidge Scholarship	$1000	3	2	Awarded automatically to the Chemistry student who, in the immediately preceding year, achieved the highest number of marks in HSC Chemistry.
Plumian Scholarship	$400	2	1	Awarded automatically for general proficiency at the HSC to a student enrolled in Biology, Geology or Geography in the candidate's first year.
Science Scholarships	$500	1	10	Awarded automatically to full-time first year BSc students for academic merit in the HSC or equivalent and who have not previously enrolled in a degree course. May not be held with the Farrand Science Scholarship.

Award	Value (pa)	Tenure (yrs)	Number	Brief description
Horner Exhibition Prize	$500	1	1	Awarded automatically after enrolment for proficiency in Mathematics at the HSC, to candidates in the faculties of Science, Arts or Engineering. Must enrol in 12 credit points of Mathematics.
A.J. Shearsby Prize	$100	1	1	Awarded automatically to the Junior Geology student gaining the highest place in Earth and Environmental Science at the NSW HSC.
Scholarships and prizes awarded by the Scholarships Office to students entering first year in any faculty				
University of Sydney Scholarships Merit Award	$6000	5	50	Awarded on basis of application to the Scholarships Unit. Applications close 30 September in the year prior to enrolment. Selection based on academic merit and other achievements. Minimum UAI 95. For further information see www.usyd.edu.au/scholarships
University of Sydney Scholarships Entry Award	$6000	1	100	Awarded on basis of application to the Scholarships Unit. Applications close 30 September in the year prior to enrolment. Selection based on academic merit and other achievements. Minimum UAI 95. For further information see www.usyd.edu.au/scholarships
University of Sydney Scholarships for Outstanding Achievement	$10,000	5	approx 35	Awarded to any student enrolling at the University of Sydney who scores a UAI of 100 or 99.95 in the NSW HSC or equivalent in the preceding year. For further information see www.usyd.edu.au/scholarships
University of Sydney Access Scholarships	$6000	5	140	Access Scholarships assist new and continuing students who have been disadvantantaged in some way. They are available to students who have a competitive UAI and who also meet at least one of these criteria: financial disadvantage, disability or rural/remote area. Applications close 30 September. Apply through UAC - consult the UAC booklet or UAC website: www.uac.edu.au
Commonwealth Learning Scholarships	$2042 or $4084 (indexed)	4	approx 350	The Commonwealth Learning Scholarships program is a Commonwealth-funded scheme open to undergraduate students at the University of Sydney. Applications close 30 September. Apply through UAC - consult the UAC booklet or UAC website: www.uac.edu.au
E. Trenchard Miller Memorial Scholarships	$1000	5	approx 8	Awarded automatically after enrolment for general proficiency in the HSC.
G.C. Halliday Scholarship	$200	3	1	Awarded for general proficiency in the HSC to a Sydney Grammar School student enrolling into the faculties of Arts, Law, Science, or Engineering.
Killeen Prize	$190	1	1	Awarded on the recommendation of the Principal of the Fort Street High School to a student proceeding from that school to the University.
John West Medal	$400	1	1	Awarded automatically after enrolment for general proficiency in the HSC.
Faculty prizes and scholarships for continuing students				
Bachelor of Liberal Studies (International) Travelling Scholarship	$2000	1	up to 3	Awarded annually to Bachelor of Liberal Studies (International) students proceeding overseas to participate in the University's Exchange Program. May not be held with a CHASS Student Travel Scholarship, a Chancellor's Committee Scholarship, an International Office Exchange Scholarship or an International Office Exchange Bursary.
Helen Beh Award for Citizenship	$350	1	1	Awarded annually to the Science student who has contributed most to the faculty's non-academic activities and interests. May not be held with the Dean's Award for Citizenship.
Dean's Award for Citizenship	$100	1	varies	Awarded annually to the Science student who has contributed most to the faculty's non-academic activities and interests. May not be held with the Helen Beh award.
Dean's List of Excellence in Academic Performance		1		Students of the Faculty of Science earn a place on the Dean's List of Excellence in Academic Performance if they achieve a WAM at the High Distinction level over at least 48 credit points in the given academic year.
Dean's Honour List Prize	$500	1	3	Highest WAM of all candidates in junior, intermediate and senior years of study who have attempted at least 48 credit points in the year.
Dean's Scholarship in Science	$1000	1	9	Awarded on basis of academic merit to candidates enrolled full time for courses offered by the faculty who have completed between 2 and 6 semesters and are not holders of a University of Sydney Undergraduate Scholarship.
Science Achievement Prize	$500	1	1	Highest WAM for all units of study to a student completing the requirements for a faculty degree in six semesters.
USA Foundation Scholarship for Women in Science	$800	1	1	The scholarship shall be awarded on merit to a woman who is a citizen or permanent resident of Australia enrolling into an honours program in the Faculty of Science at the University of Sydney.
Scholarships Office prizes and scholarships for continuing students				
University of Sydney Access Scholarships	$4000	5	approx 60	Access Scholarships assist new and continuing students who have been disadvantantaged in some way. They are available to students who have a competitive UAI and who also meet at least one of these criteria: financial disadvantage, disability or rural/remote area. Applications close 30 September. Apply through UAC - consult the UAC booklet or UAC website: www.uac.edu.au
Commonwealth Learning Scholarships	$2042 or $4084 (indexed)	4	approx 350	The Commonwealth Learning Scholarships program is a Commonwealth-funded scheme, open to undergraduate students at the University of Sydney. Applications close 30 September. Apply through UAC - consult the UAC booklet or UAC website: www.uac.edu.au
Continuing Undergraduate Scholarship	$5000	1	100	Awarded without application to continuing undergraduate students in any faculty on the basis of merit.
Honours Scholarship	$5000	1	50	Awarded on the basis of merit or equity and merit to students enrolled in an honours program at the University of Sydney. Equity applications to the Scholarships Unit usually close at the end of March in the year of candidature.
International Office scholarships for continuing students				
International Merit Scholarship		1	up to 8	Half fee scholarships awarded on academic merit to International students who have completed at least 36 credit points at the University of Sydney.
Scholarships and prizes awarded by Schools and Departments				
Anatomy and Histology				
J L Shellshear Memorial Prize	$120		1	Merit in practical Anatomy to a student in the Bachelor of Medical Science.
Grafton Elliot Smith Memorial Prize	$280		1	For merit in Anatomy to a Bachelor of Medical Science student.
J T Wilson Memorial Prize	$140		1	Proficiency in Neuroscience for a student in the Bachelor of Medical Science.
Biological Sciences				

Award	Value (pa)	Tenure (yrs)	Number	Brief description
Mary Besly Memorial Prize	$100		1	Merit in Intermediate or Senior invertebrate zoology.
Ilma Brewer Prize	$1250		1	Excellence in botany or plant sciences honours.
G.S. Caird Scholarship in Botany	$1500	1	1	Merit in Senior plant biology to a student proceeding to plant biology honours.
G.S. Caird Scholarship in Zoology	$1500	1	1	Merit in Senior animal biology to a student proceeding to animal biology honours.
Eleanor Chase Memorial Prize	$300		1	Merit in Intermediate animal biology.
George Herbert Clarke Prize	$100		1	Merit in Intermediate plant morphology to a student born in Australia.
Collie Prize	$250		1	Awarded to the student enrolled in the Faculty of Science who obtains the highest aggregate mark for 12 credit points of Junior Biology.
William John Dakin Memorial Prize in Zoology	$450		1	For excellence in the subject of Zoology to a student gaining first class honours in Biology.
John H. Elliott Memorial Prize	$200			For merit in an honours thesis on animal biology.
Haswell Prize	$150		1	Proficiency in 24 credit points of Senior zoology.
McGraw-Hill Prize for Academic Excellence in Biology	$250		4	Awarded annually in the form of a book voucher to the most proficient student in each of four streams in First Year Biology. These four streams are: Concepts in Biology, Ecosystems to Genes, Living Systems, and Human Biology.
E.N. (Ted) O'Reilly Memorial Prize	$500		1	Merit in senior plant physiology.
Eva Saunders Memorial Prize	$100		1	To a female student for merit in intermediate or senior plant biology.
Slade Prize in Junior Biology	$100		1	For proficiency in junior biology practicals.
Professor Spencer Smith-White Prize	$300		1	For merit in genetics honours.
Gabriella Wittman Prize	$350		1	Proficiency in senior genetics.
Biology Honours Scholarship	$1000		1	The scholarship shall be open to full time students enrolling in fourth year honours in Biology in the Bachelor of Science degree on a basis of prior academic merit. May not be held in conjunction with the G.S. Caird Scholarship.
Chemistry				
Arthur Hollis Memorial Prize	$150		1	For excellence in mainstream intermediate Chemistry.
Australia-USA Foundation Prize	$250		1	Greatest improvement between junior and intermediate Chemistry.
C.H. Wilson Prize	$150		1	Highest grade in Organic Chemistry honours.
Charles E. Fawsitt Prize	$100		1	Proficiency in junior Chemistry.
Chemistry Summer Undergraduate Scholarship	varies	6 weeks	varies	This scholarship aims to encourage further study in chemistry and to provide experience in chemical research laboratory. Awarded on the basis of academic merit and an assessment of details provided on an application form to Australian citizens and permanent residents proceeding into senior Chemistry.
Edna Maude Goulston Prize in Organic Chemistry	$375		1	Awarded annually to the Chemistry honours student gaining the highest mark in the Organic coursework module, provided that the student's work is of sufficient merit.
Frank E. Dixon Scholarship	$750	1	1	Merit in senior Chemistry for a student proceeding to honours.
G.S. Caird Scholarships (in Chemistry)	$1500	1	3	Merit in senior Chemistry for a student proceeding to honours.
Hush Prize in Theoretical Chemistry	$350		1	Merit in senior Theoretical Chemistry for a student proceeding to honours in Theoretical Chemistry.
Inglis Hudson Scholarships	1 x $400 & 2 x $200	1	3	Merit in senior Chemistry for a student proceeding to Organic Chemistry honours.
Iredale Prize	$120		1	For merit in mainstream intermediate Chemistry.
Janet Elspeth Crawford Prize In Chemistry	$1500		1	To a female graduate for merit in Chemistry honours.
Levey Scholarship No. 2	$550	1	1	For merit in junior Chemistry for a student proceeding to intermediate Chemistry.
Levey Scholarship No. 3	$300	1	1	For merit in junior Chemistry for a student proceeding to intermediate Chemistry.
RJW Le Fevre-DAASN Rao Prize in Physical Chemistry	$350		1	For merit in senior Physical Chemistry to the student entering Physical Chemistry honours.
Slade Prize in Intermediate Chemistry Practical	$100		1	Awarded for proficiency in the practical component of both a Semester 1 and a Semester 2 intermediate Chemistry unit of study.
Walter Burfitt Scholarship No 1	$750	1	1	Merit in senior Chemistry to a student proceeding to honours in Chemistry.
Geosciences				
AusIMM: Charles Marshall Thesis Prize	Varies		1	Proficiency in honours in a mining related field.
AusIMM: Mining and Metallurgical Bursaries	$500 + $100 book voucher		1	Awarded annually by the New South Wales and ACT Branch of the Australian Institute of Mining and Metallurgy for the best intermediate, senior and honours students in a geoscience, mining or extractive metallurgical engineering department in NSW and the ACT. Application forms become available in March each year. Completed forms must be submitted to the Head of School of Geosciences by the end of April each year.
Olga Marian Browne Prize	$100		1	For merit in intermediate Geology fieldwork.
G.S. Caird Scholarship (in Geography)	$1500	1	1	For merit in senior Geography.
Leo A. Cotton Prize in Exploration Geophysics	$100		1	For proficiency in senior year studies in the field of Exploration Geophysics.
Deas-Thomson Scholarship in Mineralogy	$1500	1	1	For proficiency in senior Geology to a student who proceeds to honours in Geology and/or Geophysics.
Earth Resources Foundation First Year Scholarships	Varies	1	4	Merit in first semester junior Geology.
Earth Resources Foundation Second Year Scholarships	Varies	1	4	For merit in junior Geology to students proceeding to intermediate Geology.

Award	Value (pa)	Tenure (yrs)	Number	Brief description
Earth Resources Foundation Third Year Scholarships	Varies	1	3	For merit in intermediate Geology to students proceeding to senior Geology and/or Geophysics.
Earth Resources Foundation Honours Year Scholarships	Varies	1	2	For merit in senior Geology and/or Geophysics to students proceeding to honours in these areas.
Edgeworth David Prize for Palaeontology	$60		1	For proficiency in senior Palaeontology.
Elliston Medal	Medal		1	For proficiency in Geology honours.
Edgar Ford Memorial Scholarship	$500	1	1	For proficiency in senior Geography to the student who proceeds to Geography honours.
Fugro Geophysics Prize	$1000		1	For proficiency in Senior Geophysics for a student proceeding to Geophysics honours.
Geological Society of Australia Prize			1	For proficiency in senior Geophysics for a student proceeding to geology honours. The prize consists of one year's student membership of the Geological Society of Australia and subscription to the Australian Journal of Earth Sciences.
Roy Lindseth Bursary	$180	1	1	Awarded to a candidate for a bachelor's degree enrolled in a unit of study or units of study in Geology and/or Geophysics who requires financial assistance to meet student expenses and who has demonstrated academic merit.
Jack Mahoney Memorial Prize	$100		1	Proficiency in the practical component of junior Geology.
C.E. Marshall Scholarship	$525	1	1	Proficiency in junior Geology to a student proceeding to Intermediate Geology.
Professor Griffith Taylor Prize	$100		1	Awarded to the woman student who gains the highest marks in the GEOG 1001 and 1002 examinations in the Faculty of Science.
Professor James Macdonald Holmes Prize	$100		1	Awarded to the degree student who gains the highest marks in the GEOG 1001 and 1002 examinations, provided the student's work is of sufficient merit.
W.H. Maze Prize in Intermediate Geography	$250		1	Awarded to the most proficient student in two units of study from GEOG 2001, 2002, 2101, 2102, 2201 and 2202 if the student's work is of sufficient merit.
Rev. A.S. McCook Memorial Scholarship	$1000	1	1	Awarded for merit in senior Geography to a student proceeding to Geography or Geomorphology honours, to assist in the expenses for field work connected with the thesis.
Sheila Mitchell Swain Memorial Prize	$250		1	Awarded to the senior Geology student who submits the best field report.
Quodling Testimonial Prize	$350		1	Awarded to a student in senior Geology and/or Geophysics who has shown proficiency in petrology.
Ken Richards Memorial Scholarship	$1250	1	1	For an honours student with interest and aptitude in applied geosciences.
Slade Prize in Junior Geography Practical	$100		1	Proficiency in junior Geology practicals.
Slade Prize in intermediate Geology Practical	$100		1	Proficiency in intermediate Geology practicals.
University Prize for Geology	$30		1	Awarded to the first year student who gains the highest marks in the class examination in Geology.
History and Philosophy of Science				
Dr G.A.M. Heydon Prize	$120		1	Merit in intermediate History and Philosophy of Science.
Ian Langham Memorial Prize	$150		1	Merit in senior History and Philosophy of Science.
Marine Science				
Prize in Marine Sciences	$100			Merit in senior Marine Science
Mathematics and Statistics				
George Allen Scholarship	$400 each	1	3	Three scholarships: one to a student proceeding to honours in Applied Mathematics, one to a student proceeding to honours in Mathematical Statistics and one to a student proceeding to honours in Pure Mathematics, each one of whom has shown proficiency in at least 24 credit points of senior units of study in the School of Mathematics & Statistics.
The MJ and M Ashby Prize for Mathematics in Science	$250		1	For the best essay, submitted by a student in the Faculty of Science, that forms part of the requirements of Pure Mathematics honours, Applied Mathematics honours or Mathematical Statistics honours.
Applied Probability Trust Prize	$150		1	Awarded annually to the student enrolled in STAT3911 Stochastic Processes and Time Series (Advanced) who demonstrates the greatest proficiency.
Australian Federation of University Women (NSW) Prize in Mathematics	$100		1	Awarded to the most distinguished woman candidate for the degree of Bachelor of Arts or Bachelor of Science who graduates with first class honours in Applied Mathematics, Pure Mathematics or Mathematical Statistics.
Barker Prize	$375		1	Awarded at the fourth (honours) year examination for proficiency in Pure Mathematics, Applied Mathematics or Mathematical Statistics.
Barker Scholarship, No. I	$750	1	1	Awarded for proficiency in Intermediate Mathematics. The scholar is required to have attended 30 credit points of Senior units of study in the School of Mathematics and Statistics by the end of the year of the tenure of the scholarship.
Tim Brown Prize No. 1	$130		1	For proficiency in 12 credit points of intermediate Statistics.
Tim Brown Prize No. 2	$210		1	For proficiency in 24 credit points of senior Statistics.
K.E. Bullen Memorial Prize	$650		1	To the most proficient student in Applied Mathematics honours.
K E Bullen Scholarships Nos. I & II	$1250	1	2	Proficiency in senior Mathematics and Statistics to the student who enrol full-time in Applied Mathematics honours.
K.E. Bullen Scholarship No III	$1000	1	1	Proficiency in Senior Mathematics and Statistics to the woman student who enrols full-time in Applied Mathematics honours, provided that the candidate has not received any other K E Bullen Scholarship.
David G A Jackson Prize	$1000		1	Awarded for creativity and originality in any undergraduate Pure Mathematics unit of study.
Joye Prize in Mathematics	$5000 & medal		1	To the most outstanding student completing fourth year honours in Applied Mathematics, Pure Mathematics or Mathematical Statistics
Norbert Quirk Prizes	$225		4	For the best essay on a given mathematical subject by a student enrolled in a junior, intermediate, senior and honours units of study in Mathematics (Pure Mathematics, Applied Mathematics or Mathematical Statistics),

Award	Value (pa)	Tenure (yrs)	Number	Brief description
NSW Institute of Sport Mathematics & Statistics Scholarship	$3000	1	varies	Established in 2007 by an offer of funding from the NSW Institute of Sport. Awarded on the basis of an application, to students in the honours year undertaking a research topic related to mathematical or statistical modelling relevant to sports science.
Veronica Thomas Prize	$100		1	For proficiency in General Statistical Methods
Thomson Learning Publishers Prize No.1	$125		1	Established in 1981 by the offer of Wadsworth Publishing Company (Australasia) to establish a prize for junior Mathematics, this prize is awarded annually to a student for proficiency in Advanced level units of study in junior Mathematics by the annual donation of a book voucher.
Thomson Learning Publishers Prize No.2	$125		1	Established in 1981 by the offer of Wadsworth Publishing Company (Australasia) to establish a prize for junior Mathematics, this prize is awarded annually to a student for proficiency in normal level units of study in junior Mathematics by the annual donation of a book voucher.
Medical Sciences				
Korner Prize	$500	1	1	Awarded for proficiency in the intermediate year of the Bachelor of Medical Science degree.
Molecular and Microbial Biosciences				
Allman Prize	$300	1	1	Awarded annually to the student in the clinical stream of the honours year in the BSc (Nutrition) who obtains the top aggregate mark in NUTR 4001 and NUTR 4002.
Australian Society for Microbiology prize	$500	1	1	Awarded to an enrolled Microbiology honours student for outstanding achievement in undergraduate Microbiology.
G.S. Caird Scholarship (in Biochemistry)	$750	1	2	Awarded for greatest proficiency in the units of study MBLG 2071 or MBLG 2971, provided that the student's work is of sufficient merit.
Roslyn Flora Goulston Prize	$650		1	Awarded for greatest proficiency in 24 credit points of senior Biochemistry (taken from BCHM3071/3971; BCHM3081/3981; BCHM3072/3972; BCHM3082/3982; BCHM3092/3992) to an undergraduate in science who intends proceeding to a BSc degree with honours in Biochemistry.
Mannatech Australia Prize in Modern Metabolic Biochemistry	$1000		1	Established in 2005 by annual donation from Mannatech Australia, this prize is awarded annually by the School of Molecular and Microbial Biosciences to the student who attains the highest performance in their honours year in the School, in the field of modern metabolic biochemistry, provided the work is of sufficient merit.
Sigma-Aldrich Molecular Biotechnology Third Year Award	$500	1	1	The award recognises the best overall grade performance in MOBT senior (third year) units of study by a student enrolled in the BSc (Molecular Biotechnology) undergraduate degree. Students must receive a minimum Distinction average in this unit of study.
Slade Prize in Intermediate Biochemistry	$100		1	Awarded for proficiency in the units of study MBLG2071 or MBLG2971 and either BCHM2072 or BCHM2972.
Nestle Australia - Uncle Toby's Prize in Nutrition	$500	1	1	Awarded annually to a student who is enrolled in both intermediate units of study (NUTR2911 and NUTR2912) who demonstrates the greatest proficiency, provided that the work is of sufficient merit.
Australian Society for Microbiology Prize	$500	1	1	Awarded annually to the student enrolled in honours in Microbiology with the most outstanding undergraduate record in Microbiology.
2M Vending Prize for Proficiency in Introductory Molecular Biology and Genetics	$150	1	1	Generously donated by Mr Michael Miller, a former member of staff; the 2M vending prize is awarded to the student who achieves the highest score in the lab course in MBLG1001.
Neville Whiffen Scholarship	varies		1	Established in 2004 by a bequest left as a legacy to the Nutrition Research Foundation by Neville Whiffen US Medal of Freedom, FSTC FRSC FRACI FIE Aust FI ChemE FAIM who was a Life Governor of the Foundation. This scholarship is awarded annually or bi-annually by the Nutrition Research Foundation on the recommendation of the Head of the Human Nutrition Unit to a student in the Human Nutrition Unit to attend a conference in Australia or overseas.
Pharmacology				
Dorothy Thorp Prize in Science Communication	$250		1	Merit in Pharmacology honours.
Roland H. Thorp Prize	$500		1	Merit in senior Pharmacology.
Physics				
Australian Institute of Physics (N.S.W. Branch) Prize in Physics	$200		1	To the student graduating with the degree of Bachelor of Science with honours in Physics who shows greatest proficiency.
Geoffrey Builder - AWA Prize	$250	1	1	Awarded annually to a student for proficiency in practical work in intermediate Physics.
Walter Burfitt Scholarship No. II	$750		1	Awarded annually for proficiency in senior Physics in the Faculty of Science. The scholar shall be required to pursue the study of Physics honours.
Deas-Thomson Scholarship in Physics	$6500	1	1	To the student in either the Faculty of Arts or the Faculty of Science who demonstrates the greatest proficiency in senior Physics, provided the student's work is of sufficient merit. The student is required to enrol in Physics honours at the University.
Henry Chamberlain Russell Prize	$1400	1	1	Awarded for an essay, a thesis or research report on an astronomical subject written by a student enrolled for a degree within the University.
Levey Scholarship No. 1	$825	1	1	Awarded for proficiency in junior Physics to a student in the Faculty of Arts, Science or Engineering who enrols in at least 12 credit points of intermediate Physics.
School of Physics Outstanding Achievement Scholarship	1 x $2000 then 3 x $1000	4	1	Awarded automatically on the basis of academic merit in the HSC to intending BSc Physics majors. Cannot be held with other scholarships awarded by the Faculty of Science or University of Sydney.
Science Foundation for Physics Scholarships No. 1	$700	1	5	Up to five scholarships for proficiency in junior Physics, provided that the student's work is of sufficient merit and that the student enrols in at least 12 credit points of intermediate Physics.
Science Foundation for Physics Scholarships No. 2	$800	1	5	Up to five scholarships for proficiency in intermediate Physics, provided that the student's work is of sufficient merit and that the student enrols in 12 credit points of senior Physics.
Science Foundation for Physics Scholarships No. 3	$3000	1	5	Up to five scholarships for proficiency in senior Physics, provided that the student's work is of sufficient merit and that the student enrols in Physics honours.
Shiroki Prize	$500		1	Awarded to the student who submits the best project in Physics honours provided the candidate's work is of sufficient merit.
School of Physics Honours Scholarship	$3000	1	1	Awarded to a student who has completed a major in Physics or equivalent and has achieved a result of at least Distinction in senior Physics.

Award	Value (pa)	Tenure (yrs)	Number	Brief description
School of Physics - Julius Sumner Miller Scholarships for Academic Excellence No. 1	$700	1	2	To the most proficient students in junior Physics provided that their work is of sufficient merit and they enrol in at least 12 credit points of intermediate Physics.
School of Physics - Julius Sumner Miller Scholarships for Academic Excellence No. 2	$800	1	2	To the most proficient students in intermediate Physics provided that their work is of sufficient merit and they enrol in 12 credit points of senior Physics.
School of Physics - Julius Sumner Miller Scholarships for Academic Excellence No. 3	$3000	1	2	To the most proficient students in senior Physics provided that their work is of sufficient merit and they enrol in Physics honours.
Slade Prize in Intermediate Physics	$350		1	Proficiency in intermediate Experimental Physics.
Smith Prize	$200		1	Awarded to the best undergraduate in junior Experimental Physics.
W.I.B. Smith Prize	$500		1	Awarded to the student who best combines the characteristics of experimental skill, proficiency and exceptional motivation in the senior laboratory classes.
Malcolm Turki Memorial Scholarship	$1700	1	1	To encourage and assist an outstanding student within the School of Physics in the completion of Physics honours who might not otherwise be able to do so due to insufficient financial support.
CISRA Postgraduate Physics Prize	$2000	1	1	Awarded to the postgraduate research student that produces the best refereed publication in a leading international journal.
School of Physics Postgraduate Alumni Prize	$1000	1	1	Awarded to the student who has completed the most outstanding PhD thesis in the School of Physics.
Physiology				
Claude Bernard Prize	$150		1	Proficiency in PHSI 3003/3903.
Colin Dunlop Prize	$200		1	Merit in Physiology honours.
Frank Cotton Memorial Prize	$350		1	For merit in the Human Cellular Physiology units of study (PHSI3005 or 3905) and (PHSI3006 or 3906)
Intermediate Physiology Merit Award	$300		1	For merit in the units of study PHSI2005 or PHSI2905 and PHSI2006 or PHSI2906
Y E Knight Neuroscience Essay Prize	$100		1	For the best essay or report in NEUR3001 or NEUR3901 and NEUR3002 or NEUR3902
David J. Monk Adams Award	$600		1	Travel assistance for a student enrolled in Physiology honours.
Psychology				
Australian Psychological Society Prize in Psychology	$200		1	For distinction in Psychology honours. As well as the cash prize, the winner will have the opportunity to present a paper to the annual APS conference, with substantial costs covered.
Blanka Buring Prize	$400		1	Awarded to the student enrolled in Arts who demonstrates the greatest proficiency in a minimum of 24 credit points of Psychology 3000 level units of study.
Dick Champion Prize	$200		1	Awarded to the Psychology 4 honours student who presents the best Empirical Thesis in the areas of learning or motivation, providing the thesis is of sufficient merit.
Dick Thomson Prize	$200		1	Awarded to the best student in Psychology honours, provided the performance is of sufficient merit.
Frank Albert Prize in Psychology	$200		1	For merit in intermediate Psychology.
Lithgow Scholarship No. V	$1000	1	1	Awarded for proficiency in Psychology 1001 and 1002. The scholar is required to attend PSYC 2011 and 2012, PSYC 2013 and 2014 during the tenure of the scholarship.
Lithgow Scholarship No. VI	$1000	1	1	Awarded for proficiency in PSYC 2011 and 2012, PSYC2013 and 2014. The scholar is required to attend a minimum of 24 credit points of Psychology 3000 level units of study during the tenure of the scholarship.
Lithgow Scholarship No. VII	$1000	1	1	Awarded for proficiency in a minimum of 32 credit points of Psychology 3000 level units of study. The scholar is required to attend Fourth Year Psychology (Honours or GDS).
O'Neil Prize in Psychology 4 Honours	$200		1	The prize may be awarded to the student who shows greatest proficiency in the theoretical thesis in Psychology honours.
Winifred O'Neill Sydney University Undergraduate Scholarship	$2500	Up to 3	1	For full-time students in Psychology who achieve the best results in the first or second years of study in Psychology, and who enrol in either 16 credit points of intermediate or 32 credit points of senior units of study in Psychology in the following year. Preference is to be given to students who are blind or who are visually impaired. The scholarship may be awarded to a student who has a different disability.
Westmead Institute for Cancer Research				
WICR Scholarship	$5000	1		Awarded by application following advertisement to the Westmead Institute for Cancer Research to an honours student in the Bachelor of Science or Bachelor of Medical Science undertaking cancer research. Applications close with the Director, Westmead Institute for Cancer Research, Westmead Hospital on 30 September each year.

Postgraduate Prizes and Scholarships

Research Office – Postgraduate and intending postgraduate research students are advised to consult the Research Office website for comprehensive information on a wide range of scholarships available.

Postgraduate Travelling Scholarships – Each year the University offers five or six travelling scholarships with a closing date in March. Generally, applicants need to have a first class honours degree approaching medal standard to be considered. Applications for the major travelling scholarships offered by external bodies generally close in August or September. All postgraduate scholarships are advertised in the Bulletin Board, which is available in departments or from the Research Office in the Quadrangle.

Award	Value (p.a.)	Tenure (yrs)	Number	Brief description
Scholarships and prizes awarded by the University				
Australian Postgraduate Awards (APAs)	$20,007	3.5 max	varies	For local students enrolling into a higher research degree at the University. Applications close 31 October each year. Applications from the Research Office or web site: http://www.usyd.edu.au/su/reschols/welcome.html.
University of Sydney Postgraduate Awards (UPAs)	Same as APA	3.5 max	varies	For local students enrolling into a higher research degree at the University. Applications close 31 October each year. Applications from the Research Office or web site: http://www.usyd.edu.au/su/reschols/welcome.html.
Henry Chamberlain Russell Prize	$1400	1	1	Essay, thesis or research report on Astronomy.
Scholarships awarded by the International Office				
International Postgraduate Research Scholarships		up to 3	approx 25	For International students enrolling into a higher research degree at the University. Applications open between 1 May and 31 August each year. Scholarship covers tuition fees, a living allowance of approx. $16,700 p.a. and health cover. Application forms from the International Office.
Scholarships and prizes awarded by Faculty, Schools and Departments				
Biological Sciences				
Jabez King Heydon Memorial Prize	$700		1	For the most meritorious PhD in the preceding 12 months in the School of Biological Sciences.
Postgraduate Excellence Prize in Biological Sciences	$500–$3000			For research students in the School of Biological Sciences. Awarded after application and seminar to the student who best communicates the aims of their research, its contribution to its field and its likelihood of timely completion.
Chemistry				
Agnes Campbell Prizes	Varies			For excellence in Organic Chemistry in either an honours year or in a research Master's or PhD.
Bruce Veness Chandler Research Support Scholarship in Food Chemistry	Varies	1	Varies	For research support for postgraduate candidates working in the area of food Chemistry.
John A Lamberton Research Scholarships	Varies	Up to 3 for each category	varies	Awarded to a meritorious candidate for the degree of Doctor of Philosophy or Master of Science in the area of natural products, or chemical understanding of the brain.
C.G. and R.J.W. Le Fevre Postgraduate Student Lectures	$130		up to 3	Awarded to postgraduate students of Chemistry on the recommendation of the Council of the Sydney University Chemistry Society.
Dr Joan R Clark Research Scholarship	Varies	up to 0.5	1	Awarded to a PhD student in Inorganic Chemistry to assist with costs of travel and subsistence while pursuing their research at a leading overseas university for a period of between 6 and 26 weeks.
George Harris Scholarships	$400	1	3	Awarded to a meritorious candidate for the degree of Doctor of Philosophy in Chemistry.
RJW Le Fevre Research Travelling Scholarship	$2500		1	Assists an outstanding female postgraduate research student to present a paper or poster at a major international conference.
Surface Coatings Association Australia Scholarship	$1500	1	1	Awarded to a meritorious candidate for the degree of Doctor of Philosophy or Master of Science in the area of surface coatings (including pigments, polymers, corrosion, weathering, adhesion and methods of manufacture).
Faculty of Science				
Postgraduate Research Prize for Outstanding Academic Achievement	$500	1	up to 8	Established in 2007 by the Faculty of Science to recognise outstanding postgraduate student achievements, particularly during the early phases of candidature.
Postgraduate Research Prize for Outstanding Academic Achievement and Outreach	$500	1	1	Established in 2007 by the Faculty of Science to recognise outstanding postgraduate student achievements which combine high-quality research with significant science outreach activities.
John Coutts Scholarship	$2750	3	1	Awarded in September to the top honours student in the Faculty of Science proceeding to postgraduate study at the University the following year.
Science Centenary Fund Scholarship	$2500	1	1	Awarded to the honours student from the Faculty of Science who is ranked highest over four years and proceeds to a postgraduate research degree in the faculty.
Geosciences				
Deas-Thomson Scholarship in Geology	$6500	1	1	For proficiency in Geology honours to the student who proceeds to postgraduate study with the School of Geosciences.
George Harris Scholarships	$1200	1	1	Awarded to a candidate for the degree of Doctor of Philosophy in Geology and Geophysics.
L.A. Richardson Memorial Prize	$3000		1	For the most outstanding thesis in the field of exploration geophysics in either Geophysics honours or Geology honours by a student who enrols as a full-time research student in the following year.
Mathematics and Statistics				
T G Room Medal	Medal		1	For a PhD thesis in Pure Mathematics which is considered of outstanding merit.
Molecular and Microbial Biosciences				
The Jo Rogers Memorial Prize	$400	1	1	Awarded annually to the top student in the final year of the Master of Nutrition and Dietetics course at the University of Sydney.
Bruce Veness Chandler Research Support Scholarship in Food Chemistry No.2	varies		varies	Established in 2004 by a bequest from the residual estate of Bruce Veness Chandler, this scholarship provides funding for research support for postgraduate or post-doctorate candidates working in the field of Food Chemistry applied to any aspect of food. Applicants must submit a proposal setting out the details of the research support sought and its importance to the applicant's research.
Physics				

Award	Value (p.a.)	Tenure (yrs)	Number	Brief description
PhD Bridging Award	same as APA	0.5	varies	Established in 2002 by the School of Physics, the purpose of the award is to provide a six-month living allowance to full-time PhD students commencing mid-year in the School of Physics at the University of Sydney. Applicants must meet the eligibility conditions for the Australian Postgraduate Award (APA/UPA), and must apply for an APA/UPA in their first semester of candidature.
Denison Postgraduate Award	same as APA	3	varies	To the most academically-able new PhD student who has met eligibility criteria for the APA/UPA awards. Scholarship holders must be enrolled for a full time Doctoral postgraduate research degree at the University of Sydney.
International Denison Postgraduate Award	same as APA	3	varies	Established in 2005 by the School of Physics, the purpose of the award is to provide a living allowance to international students who are undertaking full-time research towards a Master's or PhD in Physics. The award may be offered to incoming international research students with a first class honours degree, or equivalent. Applicants must make a formal application to the School using the advertised contact details.
Denison Postgraduate Conversion Award	same as APA	3	varies	Established in 2004 by the School of Physics, the purpose of the award is to provide a living allowance to recently upgraded full-time PhD students undertaking research in the School of Physics. Applicants must not be eligible for the Australian Postgraduate Award (APA), University Postgraduate Award or the Denison Postgraduate Award (DPA), must have been previously enrolled in the MSc by research in the School of Physics, in the year prior to application, and must have made a formal application to the Faculty of Science for an upgrade to PhD candidature.
Denison Merit Award	varies	3	varies	This award is a supplementary scholarship for full-time PhD students with First Class honours and a University medal.
International Denison Merit Award	varies	3	varies	This award is a supplementary scholarship for full-time PhD international students with First Class honours and a University medal.
Relocation Scholarship	Up to $3000 each	-	varies	To assist outstanding incoming PhD students from outside the Sydney metropolitan area who may otherwise be deterred from studying at the University of Sydney by the high cost of relocation. Evidence of relocation costs must be supplied.
Psychology				
Lucy Firth Sydney University Postgraduate Scholarship	$10000	3	1	Scholarship holders must be enrolled for a full time Doctoral postgraduate research degree at the University of Sydney. They must be Australian citizens or permanent residents with a Class 1 or high Class II honours degree.
A.H. Martin Scholarship	$550	1	1	Awarded to the candidate for the degree of Doctor of Clinical Psychology who performs best in Part I of the course, preferably in the fields of vocational guidance and vocational selection or a related field.
Martin and Elizabeth Jane Simmat Prize No 1	$350		1	The prize shall be awarded to the candidate most distinguished in meeting requirements for the award of the Graduate Diploma in Science (Psychology).
Martin and Elizabeth Jane Simmat Prize No.2	$350		1	Awarded to the student with the best performance in Part II of the Doctor of Clinical Psychology course.
Margaret Stewart Fund Scholarship	Same as APA	up to 4	1	The scholarship is open to suitably qualified graduates in Psychology of the University of Sydney or any other university who wish to undertake research into ethics and behaviour, towards a higher degree.
School of Psychology Prize for Year 3 DCP/DCN	300		1	This prize is awarded annually to the candidate who performs best across the group of students enrolled in either the Doctor of Clinical Psychology or Doctor of Clinical Neuropsychology in year 3, provided the performance is of sufficient merit.
H. Tasman Lovell Memorial Medallion	Medal		1	The medallion is awarded to the candidate who submits the best thesis for the degree of Doctor of Philosophy in the School of Psychology, provided the thesis is of sufficient merit.
Winifred O'Neill Sydney University Undergraduate Scholarship	2500	1-3	1	Established in 1997 from the estate of Dr Gregory John Lamb O'Neill who was a medical practitioner in Chatswood, NSW, this scholarship is open to full-time postgraduate students in Psychology at the University of Sydney and will be based on meritorious performance in Undergraduate Psychology. Preference is given to students who are visually impaired or, if there is no visually impaired applicant, to students with other disability.

The Sydney Summer and Winter Schools

2009	Dates
Summer School	December 2008 to February 2009
Winter School	29 June to 25 July 2009

The Summer School

The Summer School is a full fee-paying, intensive program offering high quality undergraduate and postgraduate subjects from nine faculties. These subjects are the same as those offered in Semesters One and Two, but are taught as an intensive program over summer.

Some classes commence in December; others commence in the first week of January; others in the third week and continue into February (including the exam week). Some subjects run for six weeks; others are shorter. Students can take a maximum of two subjects.

The Winter School

The Winter School is a smaller, more intensive program that runs for four weeks, including the exam week, during July.

Advantages

Attending classes at Sydney University during Summer and Winter School offers many advantages. You can:

- accelerate your academic career and finish your degree sooner
- devote your full attention to a single area of study
- take subjects that are outside your normal degree
- reduce your workload throughout the rest of the year
- repeat subjects in which you may have been unsuccessful
- combine study with a field trip in Australia or a tour overseas.

High school graduates can sample a university subject, and get an early start on their degree.

How to apply

Applications are only accepted online at www.summer.usyd.edu.au. Most subjects have limited places and fill very quickly. All places are filled strictly on a first-in, first-served basis so it is recommended that you apply early.

Applications open on:

- 29 September 2008 (Summer School)
- 25 May 2009 (Winter School)

Applications close:
28 November 2008 (Session 1, Summer December)
12 December 2008 (Session 2, Summer Main)
9 January 2009 (Session 3, Summer Late)
12 June 2009 (Winter School)

Late application fees may apply after these dates.

Census dates

Students can withdraw from their subject without academic penalty and receive a full refund until the census date (based on when the class commences). However, a late withdrawal fee may apply.

There is one census date for the Winter School, and three for the Summer School, as classes start between December and February.

ID	Session name	Classes begin	Census date
42*	Summer December	8 December 2008	2 January 2009
43	Summer Main	5 January 2009	9 January 2009
44**	Summer Late	19 January 2009	5 February 2009
11	Winter School	29 June 2009	3 July 2009

** 42 Summer December: Allows for a unit to run for 3-9 weeks, provided that the 20 per cent criterion is met.*
*** 44 Summer Late: Last exam must be held by 1 March.*

Withdrawal and refund policy

- For Summer School classes starting in **December 2008**, students who withdraw from a subject between 29 November 2008 and the relevant census date will receive a refund of tuition fees but will be liable for a $500 late withdrawal fee.
- For Summer School classes starting in **January 2009**, students who withdraw from a subject between 13 December 2008 and the relevant census date will receive a refund of tuition fees but will be liable for a $500 late withdrawal fee.
- For Winter School classes starting on **29 June 2009**, students who withdraw from a subject between 27 June 2009 and the relevant census date will receive a refund of their tuition fees but will be liable for a $500 late fee withdrawal.

Students may withdraw from their Summer or Winter School subject(s) up until 4pm on the last day of the teaching period for that particular subject. However, there may be an academic penalty (please refer to our website).The teaching period for purposes of this policy is defined in hours of published classes from the first day through to the last day of classes, excluding any final examination or assessment.

Students who withdraw from a subject after 4pm on the relevant census date will receive no refund of their tuition fee.

Transferring between subjects

Students on a waiting list can transfer between subjects at any time prior to the commencement of class. For all other students, transfers should be completed a week before classes commence. **No** transfers will be allowed after commencement of the class.

Summer and Winter School scholarships

Merit scholarships

Three undergraduate merit scholarships and one postgraduate merit scholarship are available. These are automatically awarded to the top four students in their respective faculty (Arts, Science, or Economics and Business) for their Summer School subject.

Educational/Financial Disadvantage scholarships

Full Summer School scholarships are available to local undergraduate students who have a good academic record. To be eligible for consideration you will need to provide evidence of long-term and serious educational disadvantage based on two or more criteria, one of which must be financial hardship. Please check our website for further details. Scholarship applications close on 31 October 2008 (Summer School), and 10 June 2009 (Winter School).

For more information

Website: www.summer.usyd.edu.au
Email: info@summer.usyd.edu.au
Phone: +61 2 9351 5542 Fax: +61 2 9351 5888

General University information

For further information or advice, please call our toll-free helpline on **1300 362 006**.

This section includes information on the following:

Academic progression
Accommodation Service
Admissions Office
Applying for a course
Attendance
Bus service
Campuses
Careers Centre
Centre for Continuing Education (CCE)
Centre for English Teaching (CET)
Child Care Information Office
The Co-op Bookshop
Counselling Service
Disability Services
Employment opportunities for students
Enrolment
Environmental Policy
Equity Support Services
Examinations
Fees
Financial Assistance Office
Freedom of Information
Graduations Office
Grievances and appeals
HECS and Fees Office
Information and Communications Technology
International Office
International Student Support Unit (ISSU)
Koori Centre and Yooroang Garang
Learning Centre
Library
Mathematics Learning Centre
Museums and galleries
MyUni Student Portal
Orientation and O-Week
Part-time, full-time attendance
Policy online
Printing Service (UPS)
Privacy
Research Office
Scholarships for undergraduates
Security Service
Service Management, Information and Communications Technology (ICT)
Staff and Student Equal Opportunity Unit (SSEOU)
Student Administration and Support
Student Centre
Student identity cards
Sydney Summer School
Sydney Student Development
Sydney Welcome Orientation and Transition Program (SWOT)
The University of Sydney Foundation Program (USFP)
Timetabling Unit
University Health Service

Academic progression

The University requires students to maintain a minimum rate of progression throughout their candidature. Any student who does not satisfy progression requirements for their degree will be placed on a monitored academic progression program. This program requires students to consult an academic adviser in their faculty, to attend a support services information session, and fill in a survey. Students will be advised of the requirements of the program by their faculty.

Students who do not sustain the minimum academic progression requirements may be asked to show cause as to why they should not be excluded from their degree. For further information, please see www.usyd.edu.au/secretariat/students.

Student Affairs, Registrar's Division
Quadrangle, A14
The University of Sydney
NSW 2006 Australia

Phone: +61 2 9351 3183
Fax: +61 2 9351 3572
Email: appeals@secretariat.usyd.edu.au

Accommodation Service

This service maintains an extensive database of off-campus accommodation, including shared, full-board and rental properties. Current students can access the online database through the accommodation website or MyUni student portal (myuni.usyd.edu.au).

Level 5, Jane Foss Russell Building, G02
The University of Sydney
NSW 2006 Australia

Phone: +61 2 9351 3312
Fax: +61 2 9351 8262
Email: accomm@stuserv.usyd.edu.au
Website: www.usyd.edu.au/stuserv/accommodation

Admissions Office

The Admissions Office, located in the Student Centre, is responsible for overseeing the distribution of offers to undergraduate applicants through the Universities Admission Centre (UAC). They can advise prospective local undergraduate students on admission requirements. Postgraduate students should contact the appropriate faculty.

- If you are an Australian citizen, or permanent resident with qualifications from a non-Australian institution, you can get more information by phoning +61 2 9351 4118.
- For enquiries regarding special admissions (including mature-age entry), phone +61 2 9351 3615.
- Applicants without Australian citizenship or permanent residency should contact the International Office.

Admissions Office, Student Centre
Level 3, Jane Foss Russell Building, G02
The University of Sydney
NSW 2006 Australia

Phone: +61 2 9351 4117 or +61 2 9351 4118
Fax: +61 2 9351 4869
Email: admissions@records.usyd.edu.au
Website: www.usyd.edu.au/studentcentre/admissions

Applying for a course

Domestic applicants for undergraduate courses and programs of study

For the purpose of admission and enrolment, 'domestic applicant' refers to citizens and permanent residents of Australia and citizens of New Zealand. If you are in this group and wish to apply for admission to an undergraduate course, you would generally apply through the Universities Admissions Centre (UAC).

The deadline for applications is the last working day in September in the year before enrolment. For more information see www.uac.edu.au.

Some faculties have additional application procedures, such as the Conservatorium of Music, Sydney College of the Arts and Pharmacy.

Domestic applicants for postgraduate courses and programs of study

For the purpose of admission and enrolment, 'domestic applicant' refers to citizens and permanent residents of Australia and citizens of New Zealand. Application is direct to the faculty which offers the course that you are interested in. Application forms for postgraduate coursework, postgraduate research and the master's qualifying or preliminary program and for non-award postgraduate study can be found at www.usyd.edu.au/studentcentre.

Note: some faculties use their own specially tailored application forms for admission into their courses. Check with the relevant faculty.

International applicants for all course types (undergraduate and postgraduate)

'International applicants' refers to all applicants other than Australian citizens, Australian permanent residents and citizens of New Zealand. In the majority of cases international applicants apply for admission through the University's International Office (IO). All the information international applicants need, including application forms, is available from the IO website (www.usyd.edu.au/internationaloffice).

Attendance

In cases of illness or misadventure, students should complete an *Application for Special Consideration* form, accompanied by relevant documentation, such as medical certificates, and submit it to the relevant faculty office.

The forms are available at faculty offices, the Student Centre, and online at www.usyd.edu.au/studentcentre/forms.shtml.

Exemption from re-attendance

Although you may have attended certain lectures or practical classes before, exemption from re-attendance is granted only in exceptional circumstances. In any case, you are required to enrol in all units of study in which you propose to take examinations, whether or not you have been granted leave of absence (or exemption) from re-attendance at lectures and/or practical work. To obtain exemption from re-attendance, apply at your faculty office.

Bus service

A free bus service operates to, from and around Camperdown and Darlington campuses each weekday that Fisher Library is open (except for public holidays). The service commences at 4.15pm and concludes at Fisher Library closing time.

Two buses operate along the route, starting at Fisher Library and finishing at Redfern station. The buses leave at approximately 10 minute intervals during semester and in semester breaks.

The bus timetable/route guide can be collected from Security Administration or Campus Infrastructure Services reception.

Floor 2, Services Building G12
Corner of Codrington and Abercrombie Streets
Darlington Campus
The University of Sydney
NSW 2006 Australia

Phone: +61 2 9351 4753
Fax: +61 2 9351 5699
Website: www.security.usyd.edu.au

Campuses

The University has ten different teaching campuses, located throughout the Sydney area. For information on each campus, including maps, contact details and parking information, see www.usyd.edu.au/about/campus/pub/campus.shtml.

Campus	Faculties
Camperdown and Darlington campuses	Faculty of Arts Faculty of Architecture, Design and Planning Faculty of Agriculture, Food and Natural Resources Faculty of Economics and Business Faculty of Education and Social Work Faculty of Engineering and Information Technologies Faculty of Medicine Faculty of Pharmacy Faculty of Science Faculty of Veterinary Science The Sydney Summer School
Cumberland Campus	Faculty of Health Sciences
St James Campus	Faculty of Law
Mallett Street Campus	Faculty of Nursing and Midwifery The Centre for English Teaching The NHMRC Clinical Trials Centre
Sydney Conservatorium of Music	The Sydney Conservatorium of Music
Sydney College of the Arts	Sydney College of the Arts (SCA)
Camden Campus	Faculty of Veterinary Science Faculty of Agriculture, Food and Natural Resources
Surry Hills Campus	Faculty of Dentistry
Burren Street Campus	Institute of Transport and Logistics Studies

Careers Centre

The University's Careers Centre can provide you with assistance if you are not sure of your career path, and help you to find both casual and career-related employment.

The Careers Centre provides a range of free and accessible services for students, including:

- help in finding casual and part-time work
- finding career-related work experience and graduate employment
- an internet vacancy database
- individual careers advice and counselling, by appointment
- comprehensive library and online resources
- workshops in resume writing, interview skills, and job searching
- careers fairs, employer presentations and talks.

Careers Centre
Jane Foss Russell Building, G02
The University of Sydney
NSW 2006 Australia

Phone: +61 2 9351 3481
Fax: +61 2 9351 5134
Email: careers.information@usyd.edu.au
Website: www.careers.usyd.edu.au

Centre for Continuing Education (CCE)

The CCE provides the community with the opportunity to engage with the University of Sydney, offering people access to the academic expertise of one of Australia's finest educational institutions.

As a community leader, the CCE provides lifelong learning opportunities for people at all stages of life who want to undertake a course in self-enrichment, engage in active retirement learning,

upgrade their professional skills and qualifications, or bridge a gap between previous study and univeristy. CCE offers short courses in all areas of the Humanities and Social Sciences, Languages, Science and Technology, Business and Management, and Continuing Professional Development.

160 Missenden Road
Newtown NSW 2042

Postal address:
Locked Bag 2020
Glebe NSW 2037

Phone: +61 2 9036 4789
Fax: +61 2 9036 4799
Email: cce.info@usyd.edu.au
Website: www.cce.usyd.edu.au

Centre for English Teaching (CET)

The CET offers English language and academic study skills programs to international students who need to develop their English language skills in order to meet academic entry requirements.

Wentworth Building, G01
The University of Sydney
NSW 2006 Australia

Phone: +61 2 9036 7900
Fax: +61 2 9036 7910
Email: info@cet.usyd.edu.au
Website: www.usyd.edu.au/cet

Child Care Information Office

The Child Care Information Office has information for parents who are students and staff of the University, about child care centres, vacation and occasional care. For more details, see the child care website, via the MyUni student portal (myuni.usyd.edu.au) or the Services for Students website (www.usyd.edu.au/stuserv).

Child Care Information Office
Level 5, Jane Foss Russell Building, G02
The University of Sydney
NSW 2006 Australia

Phone: +61 2 9351 5667
Fax: +61 2 9351 7055
Email: childc@stuserv.usyd.edu.au
Website: www.usyd.edu.au/childcare

The Co-op Bookshop

The Co-op Bookshop is a one-stop store for:

- textbooks
- general books
- reference books
- University of Sydney clothing and memorabilia
- DVDs
- flash drives
- software at academic prices

Take advantage of a lifetime of membership benefits. For a one-time joining fee of $20, you are entitled to great member pricing, promotional offers and much more.

The Co-op Bookshop
Sports and Aquatic Centre Building, G09
The University of Sydney
NSW 2006 Australia

Phone: +61 2 9351 3705
Fax: +61 2 9660 5256
Email: sydu@coop-bookshop.com.au
Website: www.coop-bookshop.com.au

Counselling Service

The Counselling Service aims to help students fulfil their academic, individual and social goals, by providing short-term, problem-focused counselling to promote psychological wellbeing and help students develop effective and realistic coping strategies. International students can access counselling assistance through the International Student Support Unit (ISSU).

Each semester the Counselling Service runs a program of workshops which are designed to help students master essential study and life management skills. These are open to all local and international students. Phone to make an appointment. Daily walk-in appointments are also available between 11am and 3pm.

For details of workshops, activities and online resources, see the Counselling Service website via the MyUni portal (myuni.usyd.edu.au) or the Services for Students website (www.usyd.edu.au/stuserv).

Camperdown and Darlington campuses

Level 5, Jane Foss Russell Building, G02
The University of Sydney
NSW 2006 Australia

Phone: +61 2 9351 2228
Fax: +61 2 9351 7055
Email: counsell@stuserv.usyd.edu.au
Website: www.usyd.edu.au/counsel

Cumberland Campus

Ground Floor, A Block, C42
The University of Sydney
East Street, Lidcombe
NSW 2141 Australia

Phone: +61 2 9351 9638
Fax: +61 2 9351 9635
Email: CS.Cumberland@stuserv.usyd.edu.au

Disability Services

Disability Services is the principal point of contact for advice on assistance available for students with disabilities. Students need to register to receive support and assistance. Disability Services works closely with academic and administrative staff to ensure that students receive reasonable accommodation in their areas of study.

Assistance includes note taking, interpreters, and negotiation with academic staff regarding assessment and course-requirement modifications where appropriate. For details on registering, including required documentation and online resources, see the Disability Services' website via the MyUni student portal (myuni.usyd.edu.au) or the Services for Students website (www.usyd.edu.au/stuserv).

Camperdown and Darlington campuses

Level 5, Jane Foss Russell Building, G02
The University of Sydney
NSW 2006 Australia

Phone: +61 2 9351 7040
Fax: +61 2 9351 3320
TTY: +61 2 9351 3412
Email: disserv@stuserv.usyd.edu.au
Website: www.usyd.edu.au/disability

Cumberland Campus

Ground Floor, A Block, C42
The University of Sydney
East Street, Lidcombe
NSW 2141 Australia

Phone: +61 2 9351 9638
Fax: +61 2 9351 9635
Email: DS.Cumberland@stuserv.usyd.edu.au

Employment opportunities for students

See 'Sydney Student Development'.

Enrolment

Domestic and international students entering their first year via UAC

Details of enrolment procedures will be sent to students with their UAC offer of enrolment. Enrolment takes place during the last week of January or in February for the later offer rounds.

Domestic and international students entering their first year via a direct offer from the University

Details of the enrolment procedures will be sent to students with their University offer of enrolment. Enrolment takes place during the first two weeks of February.

All continuing domestic and international students

A pre-enrolment package is sent to all enrolled students in late September and contains instructions on the procedure for web-based pre-enrolment.

Environmental Policy

The University of Sydney's Environmental Policy promotes sustainable resource and product use and encourages the practice of environmental stewardship by staff and students. The policy is supported by the University-wide Sustainable Campus Program. Enquiries can be directed to:

Manager, Campus Sustainability
Phone: +61 2 9036 5441
Email: sustainable@usyd.edu.au

Visit the website www.usyd.edu.au/sustainable to find out what the University is doing, and learn how you can get involved, make suggestions or receive the Sustainable Campus Newsletter.

Equity Support Services

Equity Support Services, located within Student Administration and Support, brings together a number of student support services that produce practical assistance and information to help students meet their academic and personal goals while at University.

Services include the Accommodation Service, Casual Employment Service, Child Care Information Office, Disability Services and the Financial Assistance Office.

More information is available through the MyUni student portal (myuni.usyd.edu.au) or the Services for Students website (www.usyd.edu.au/stuserv).

Examinations

Most examinations are facilitated primarily through the Examinations Office. However, some faculties arrange and conduct their own examinations.

Information and timetables on examinations can be located by searching the University's website. For more details, contact the Examinations Office.

Student Centre
Level 3, Jane Foss Russell Building, G02
The University of Sydney
NSW 2006 Australia

Phone: +61 2 9351 4005 or +61 2 9351 4006
Fax: +61 2 9351 7330
Email: exams.office@exams.usyd.edu.au

Fees

The Fees Office provides information on where and how to pay fees, and how to find out if payments have been received. The office can also provide information on obtaining a refund for fee payments. More details are available on the website (listed below).

Fees Office
Margaret Telfer Building, K07
The University of Sydney
NSW 2006 Australia

Phone: +61 2 9351 5222
Fax: +61 2 9114 0556
Email: feespay@usyd.edu.au
Website: www.finance.usyd.edu.au/revenue_income/fees.shtml
Office hours: 9am to 4.30pm, Monday to Friday

Financial Assistance Office

The University of Sydney has a number of loan and bursary funds to assist students experiencing financial difficulties. Loan assistance is available for undergraduate and postgraduate students enrolled in degree and diploma courses at the University.

The assistance is not intended to provide the principle means of support but to help enrolled students in financial need with expenses such as housing bonds and rent, phone and electricity bills, medical expenses, and buying textbooks and course equipment.

Loans are interest-free and are usually repayable within one year. Bursaries may be awarded depending on financial need and academic merit and are usually only available to local full-time undergraduate students. Advertised bursaries, including first-year bursaries, are advertised through the MyUni student portal in January each year.

For details of types of assistance and online resources provided by the service see the Financial Assistance website via the MyUni student portal (myuni.usyd.edu.au) or the Services for Students website (www.usyd.edu.au/stuserv).

Level 5, Jane Foss Russell Building, G02
The University of Sydney
NSW 2006 Australia

Phone: +61 2 9351 2416
Fax: +61 2 9351 7055
Email: fao@stuserv.usyd.edu.au
Website: www.usyd.edu.au/fin_assist

Freedom of Information

The University of Sydney falls within the jurisdiction of the *NSW Freedom of Information Act 1989*. The Act:

- requires information concerning documents held by the University to be made available to the public
- enables a member of the public to obtain access to documents held by the University; and
- enables a member of the public to ensure that records held by the University concerning his or her personal affairs are not incomplete, incorrect, out of date or misleading.

A 'member of the public' includes staff and students of the University.

It is a requirement of the Act that applications be processed and a determination made within a specified time period, generally 21 days. Determinations are made by the University's Registrar.

While an application may be made to access University documents, some may not be released in accordance with particular exemptions provided by the Act. There are review and appeal mechanisms which apply when access has been refused.

The University is required to report to the public on its freedom of information activities on a regular basis and to produce two documents: a *Statement of Affairs* (annually) and a *Summary of Affairs* (every six months).

The *Statement of Affairs* contains information about the University, its structure, function and the kinds of documents held. The *Summary of Affairs* identifies the University's policy documents and provides information on how to make an application for access to University documents. More information and copies of the reports can be found at www.usyd.edu.au/arms/info_freedom.

Graduations Office

The Graduations Office is responsible for organising graduation ceremonies and informing students of their graduation arrangements.

Student Centre
Level 3, Jane Foss Russell Building, G02
The University of Sydney
NSW 2006 Australia

Phone: +61 2 9351 3199 or +61 2 9351 4009
Protocol enquiries: +61 2 9351 4612
Fax: +61 2 9351 5072

Grievances and appeals

You may consider that a decision affecting your candidature for a degree or other activities at the University has not taken into account all relevant matters. In some cases the by-laws or resolutions of the Senate provide for a right of appeal against particular decisions. For example, there is provision for appeal against academic decisions, disciplinary decisions and exclusion after failure.

A document outlining the current procedures for appeals against academic decisions is available at the Student Centre, the Student Representative Council, and on the Policy Online website (www.usyd.edu.au/policy (click on 'Study at the University', then 'Appeals' – see the Academic Board and Senate resolutions).

For assistance or advice regarding an appeal contact:

Undergraduates

Students' Representative Council
Level 1, Wentworth Building, G01
The University of Sydney
NSW 2006 Australia
Phone: +61 2 9660 5222

Postgraduates

Sydney University Postgraduate Representative Association (SUPRA)
Corner of Raglan and Abercrombie Streets
The University of Sydney
NSW 2006 Australia
Phone: +61 2 9351 3115

HECS and Fees Office

Student Centre
Level 3, Jane Foss Russell Building, G02
The University of Sydney
NSW 2006 Australia

Phone: +61 2 9351 5659
Fax: +61 2 9036 6111
Email: hecs.fees@records.usyd.edu.au

Information and Communications Technology (ICT)

See 'Service Management, Information and Communications Technology'.

International Office

The International Office helps international students with application, admission and enrolment procedures. The International Office has units responsible for international marketing, government and student relations, international scholarships (including AusAID scholarships and administrative support for international financial aid programs), and compliance with government regulations relating to international students.

The Study Abroad and Student Exchange units assist both domestic and international students who wish to enrol for study abroad or exchange programs.

International Office

Services Building, G12
The University of Sydney
NSW 2006 Australia

Phone: +61 2 9351 4079
Fax: +61 2 9351 4013
Email: info@io.usyd.edu.au
Website: www.usyd.edu.au/internationaloffice

Study Abroad

Phone: +61 2 9351 3699
Fax: +61 2 9351 2795
Email: studyabroad@io.usyd.edu.au
Website: www.usyd.edu.au/studyabroad

Student Exchange

Phone: +61 2 9351 3699
Fax: +61 2 9351 2795
Email: exchange@io.usyd.edu.au
Website: www.usyd.edu.au/studentexchange

International Student Support Unit (ISSU)

The ISSU helps international students through the provision of orientation, counselling and welfare services to both students and their families. ISSU aims to help international students cope successfully with the challenges of living and studying in an unfamiliar culture, to achieve success in their studies and to make the experience of being an international student rewarding and enjoyable.

For details of orientation activities, counselling and welfare services provided to both students and their families and online resources, see the MyUni student portal (myuni.usyd.edu.au) or the Services for Students website (www.usyd.edu.au/stuserv). International students also have access to all University student support services.

Camperdown and Darlington campuses

Level 5, Jane Foss Russell Building, G02
The University of Sydney
NSW 2006 Australia

Phone: +61 2 9351 4749
Fax: +61 2 9351 6818
Email: info@issu.usyd.edu.au
Website: www.usyd.edu.au/issu

Cumberland Campus

Ground Floor, A Block, Cumberland Campus, C42
The University of Sydney
East Street, Lidcombe
NSW 2141 Australia

Phone: +61 2 9351 9638
Fax: +61 2 9351 9635
Email: ISSU.Cumberland@stuserv.usyd.edu.au
Website: www.usyd.edu.au/issu

Koori Centre and Yooroang Garang

The Koori Centre and Yooroang Garang support Aboriginal and Torres Strait Islander people in all aspects of tertiary education at the University of Sydney. The Cadigal Special Entry Program assists Indigenous Australians to enter undergraduate study across all areas of the University.

As well as delivering block-mode courses for Indigenous Australian students, the Koori Centre teaches Indigenous Australian Studies in various faculties across mainstream courses. The Koori Centre also provides tutorial assistance, and student facilities including a computer lab, indigenous research library and study rooms for Indigenous Australian students at the University.

In particular, the Koori Centre aims to increase the successful participation of Indigenous Australians in undergraduate and postgraduate degrees, develop the teaching of Aboriginal studies, conduct research in the field of Aboriginal education, and establish working ties with schools and communities.

The Koori Centre works in close collaboration with Yooroang Garang, School of Indigenous Health Studies in the Faculty of Health Sciences at the Cumberland Campus. Yooroang Garang provides assistance, advice and academic support for Indigenous students in the faculty, as well as preparatory undergraduate and postgraduate courses.

Koori Centre
Ground Floor, Old Teachers College, A22
The University of Sydney
NSW 2006 Australia

Phone: +61 2 9351 2046 (general enquiries)
Toll-free within Australia: 1800 622 742
Community Liaison Officer: +61 2 9351 7003
Fax: +61 2 9351 6923
Email: koori@koori.usyd.edu.au
Website: www.koori.usyd.edu.au

Yooroang Garang
T Block, Level 4, Cumberland Campus, C42
The University of Sydney
NSW 2006 Australia

Phone: +61 2 9351 9393
Toll free: 1800 000 418
Fax: +61 2 9351 9400
Email: yginfo@fhs.usyd.edu.au
Website: www.yg.fhs.usyd.edu.au

Learning Centre

The Learning Centre helps students develop the generic learning and communication skills that are necessary for university study and beyond. The centre is committed to helping students achieve their academic potential during their undergraduate and postgraduate studies.

Learning Centre staff can be found at the Camperdown, Darlington and Cumberland campuses. The centre's program includes a wide range of workshops on study skills, academic reading and writing, oral communication skills and postgraduate writing and research skills. Other services include an individual learning program, a faculty-based program and access to online and print-based learning resources.

For details of programs, activities and online resources available from the Learning Centre, see its website via the MyUni student portal (myuni.usyd.edu.au) or the Services for Students website (www.usyd.edu.au/stuserv).

Camperdown and Darlington campuses
Level 7, Education Building, A35
The University of Sydney
NSW 2006 Australia

Phone: +61 2 9351 3853
Fax: +61 2 9351 4865
Email: lc@stuserv.usyd.edu.au
Website: www.usyd.edu.au/lc

Cumberland Campus
Ground Floor, A Block, C42
The University of Sydney
East Street, Lidcombe
NSW 2141 Australia

Phone: +61 2 9351 9638
Fax: +61 2 9351 9635
Email: LC.Cumberland@stuserv.usyd.edu.au
Website: www.usyd.edu.au/stuserv/learning_centre/cumberl.shtml

Library

The University of Sydney Library provides services via a network of 14 libraries on 10 campuses, and online at www.library.usyd.edu.au.

The location, opening hours and specific subject focus of each library is listed on the website. Over 5.5 million items are available via the library catalogue, including more than 67,000 online journals and 325,000 online books.

Enrolled students are entitled to borrow from any of the University libraries. Reading list books and articles are available via the reserve service either online or in print. Past examination papers are also available online.

Library facilities include individual and group study spaces, computers, printers, multimedia equipment, photocopiers and adaptive technologies. Refer to the 'Libraries' link on the University website to find out about services and facilities in specific libraries.

Library staff are available in every library to support students with their study and research. Faculty liaison librarians assist students to find great information on any topic and provide training in using a wide range of resources. For contact details of faculty liaison librarians, see www.library.usyd.edu.au/contacts/subjectcontacts.html. It is also possible to learn research and information skills online; see www.library.usyd.edu.au/skills.

Comments and suggestions about library services are welcome.

The University of Sydney Library, F03
Camperdown Campus
NSW 2006 Australia

Phone: +61 2 9351 2993
Website: www.library.usyd.edu.au

Mathematics Learning Centre

The Mathematics Learning Centre helps undergraduate students to develop the mathematical knowledge, skills and confidence that are needed for studying first-level mathematics or statistics units at university. The centre runs bridging courses in mathematics at the beginning of the academic year (fees apply). The centre also provides ongoing support to eligible students during the year through individual assistance and small group tutorials.

For details of activities and online resources provided by the centre see the website via the MyUni student portal (myuni.usyd.edu.au) or the Services for Students website (www.usyd.edu.au/stuserv).

Level 4, Carslaw Building, F07
The University of Sydney
NSW 2006 Australia

Phone: +61 2 9351 4061
Fax: +61 2 9351 5797
Email: mlc@stuserv.usyd.edu.au
Website: www.usyd.edu.au/mlc

Museums and galleries

The University of Sydney has one of the largest and finest university collections of antiquities, art, ethnography and natural history in Australia. While these collections are used for teaching, they also provide an opportunity for the University to contribute to the cultural life of the country.

University Art Gallery

Founded in the 1860s, the University of Sydney Art Collection now holds more than 3000 paintings, sculptures and works on paper by Australian, Asian and European artists, as well as more than 700 works from the University Union Art Collection. The University Art Gallery showcases changing exhibitions of works from the collection as well as high-quality exhibitions of both contemporary and historical works.

War Memorial Arch
Quadrangle, A14
Camperdown Campus

Phone: +61 2 9351 6883
Fax: +61 2 9351 7785
Website: www.usyd.edu.au/museums

Macleay Museum

The Macleay Museum originated with the eighteenth century collection of insects owned by Alexander Macleay. The oldest of its kind in Australia, the museum today holds significant collections of ethnographic artefacts, scientific instruments, biological specimens and historic photographs. Changing exhibitions engage with the diversity of the collection.

Macleay Building, A12
Gosper Lane (off Science Road)
Camperdown Campus

Phone: +61 2 9036 5253
Fax: +61 2 9351 5646
Email: macleaymuseum@usyd.edu.au
Website: www.usyd.edu.au/museums

Nicholson Museum

The Nicholson Museum contains the largest and most prestigious collection of antiquities in Australia. It is also the country's oldest university museum, and features works of ancient art and objects of daily life from Greece, Italy, Egypt, Cyprus the Near and Middle East, as well as Northern Europe. A regular changing schedule of exhibitions highlights various parts of the collection.

Quadrangle, A14
Camperdown Campus

Phone: +61 2 9351 2812
Fax: +61 2 9351 7305
Email: nicholsonmuseum@usyd.edu.au
Website: www.usyd.edu.au/museums

The Tin Sheds Gallery

The Tin Sheds Gallery is part of the Art Workshop complex within the University of Sydney's Faculty of Architecture, Design and Planning. The gallery hosts exhibitions across a wide variety of contemporary visual arts practices from individuals and groups, as well as community projects and curated exhibitions.

Tin Sheds Gallery and Art Workshops
Faculty of Architecture
Wilkinson Building
148 City Road

Phone: +61 2 9351 3115
Fax: +61 2 9351 4184
Email: tinsheds@arch.usyd.edu.au
Website: www.arch.usyd.edu.au/art_workshop

MyUni Student Portal

The MyUni student portal (myuni.usyd.edu.au) is the starting point and 'one-stop' environment for students to access all their web-based University information and services.

MyUni automatically tailors what a student sees based on their login and offers students the option of further personalising content. Most importantly, MyUni allows students to complete tasks online that would previously have required attendance in person. The following are examples of MyUni services and information:

- support services relating to health, counselling, employment, child care, accommodation, and general wellbeing
- student administration systems for obtaining examination results, enrolment and variations, timetabling, email services and links to courses and units of study information
- links to the University's e-learning systems
- library services
- important messages and student alerts
- information and communications technology and support services
- information for local, Indigenous and international students
- campus maps, with descriptions of cultural, sporting and campus facilities.

Orientation and O-Week

Orientation

Transition to University involves both opportunities and challenges. A successful transition is important in developing a sense of belonging and better academic adjustment and success. The University seeks to facilitate students' successful transition through a wide range of programs and activities.

Orientation activities for both undergraduate and postgraduate students are scheduled at the beginning of each semester. Transition support continues throughout the academic year within faculties while student support services are available to assist students for the duration of their study.

For more information, see www.usyd.edu.au/orientation.

Undergraduate students

Sydney Welcome Orientation and Transition (SWOT) Program
In the week prior to Semester One, the SWOT program offers all commencing undergraduate students an opportunity to learn more about the University of Sydney.

During this week you can get to know the University, develop key skills for success, discover other key resources for getting the most out of university life and develop a sense of belonging. All students are welcome to attend activities which are based at the Camperdown and Darlington campuses. Faculties based on other campuses also provide orientation activities and programs.

SWOT 2009 will run from **25 to 27 February 2009**.
For more information, see www.swot.usyd.edu.au.

Postgraduate students

The University of Sydney Postgraduate Induction Program is a specialised program for postgraduate students organised by the Dean of Graduate Studies. See www.dogs.usyd.edu.au.

O-Week

O-Week is the orientation event at the beginning of Semester One. Organised by the University of Sydney Union (USU) and other student organisations, it runs in parallel with the SWOT program. O-Week provides an opportunity to learn about and participate in the many clubs and societies available at the University and the services and activities of the student organisations.

It's packed with fun activities and events, plus information to help you get acquainted with the University and grab hold of all of the opportunities this campus has to offer.

Rock, jazz, orchestral and choral concerts, plays, demonstrations, symposia on current affairs, reviews, competitions, sports, bus tours, games, special-interest meetings, guest speakers, debates, films, food and freebies are all organised for commencing students' participation and enjoyment. You need to know what's on and what's available in order to make the most out of your time here.

O-Week 2009 will run from **25 to 27 February 2009**.
Programs are available at www.usuonline.com.

Part-time, full-time attendance

Undergraduate students

Undergraduate students are usually considered full-time if they have a student load of at least 0.375 each semester. Anything under this amount is considered a part-time study load.

Note that some faculties have minimum study load requirements for satisfactory progress.

Postgraduate students (coursework)

Part-time or full-time status for postgraduate coursework students is determined by credit-point load. Enrolment in units of study which total at least 18 credit points in a semester is classed as full-time. Anything under this amount is a part-time study load.

Please note that classes for some coursework programs are held in the evenings (usually 6pm to 9pm).

Postgraduate students (research)

Full-time candidates for research degrees do not keep to the normal semester schedule. Instead they work continuously throughout the year with a period of four weeks recreation leave.

There is no strict definition of what constitutes full-time candidature but if you have employment or other commitments that would prevent you from devoting at least the equivalent of a 35-hour working week to your candidature (including attendance at the University for lectures, seminars, practical work and consultation with your supervisor) you should enrol as a part-time candidate. If in doubt, consult your faculty or supervisor.

International students

Student visa regulations require international students to undertake full-time study. International students on visas other than student visas may be permitted to study part-time.

Policy Online

In addition to the resolutions covering specific courses there are a number of University policies that apply to students. These include:

- Code of Conduct for students
- Academic Honesty in Coursework
- Student Plagiarism: Coursework Assessment and Examination of Coursework
- Identifying and Supporting Students at Risk

All of these policies can be accessed at the University's Policy website online (www.usyd.edu.au/policy).

Printing Service

The University Printing Service (UPS) provides printing and binding services including: high-volume printing and copying, short run/low-volume printing, and four-colour process printing. It also offers finished artwork and design, including website design, document scanning, file conversion and CD burning.

UPS products range from stationery, books, brochures, handbooks, graduation certificates and examination papers through to invitations, flyers and banners.

UPS also offers a variety of finishing options plus collating, addressing and filling of envelopes, mail merge options and print-broking services.

University Printing Service
Room 314, Top Floor
Services Building, G12
Codrington Street

Phone: +61 2 9351 2004
Fax: +61 2 9351 7757
Email: ups@ups.usyd.edu.au
Website: www.usyd.edu.au/ups

Privacy

The University is subject to the *NSW Privacy and Personal Information Protection Act 1998* and the *NSW Health Records and Information Privacy Act 2002*. Central to both Acts are the sets of information protection principles (IPPs) and health privacy principles which regulate the collection, management, use and disclosure of personal and health information.

In compliance with the *Privacy and Personal Information Protection Act* the University developed a *Privacy Management Plan* which includes the *University Privacy Policy*. The *Privacy Management Plan* sets out the IPPs and how they apply to functions and activities carried out by the University. Both the plan and the *University Privacy Policy* were endorsed by the Vice-Chancellor on 28 June 2000.

Further information and a copy of the plan may be found at www.usyd.edu.au/arms/privacy.

Any questions regarding the *Freedom of Information Act*, the *Privacy and Personal Information Protection Act*, the *Health Records and Information Privacy Act* or the *Privacy Management Plan* should be directed to one of the following:

Tim Robinson: +61 2 9351 4263
Anne Picot: +61 2 9351 7262
Email: foi@mail.usyd.edu.au

Research Office

The Research Office administers the major government-funded research awards. Details of these awards and many others may be obtained from www.usyd.edu.au/ro/training.

The closing date for Australian Postgraduate Awards (APA) and University of Sydney Postgraduate Awards (UPA) is October every year.

National Health and Medical Research Council (NHMRC) Postgraduate Research Scholarships usually close in mid-July. It is wise to confirm in advance the exact closing date.

Research Office
Level 6, Jane Foss Russell Building, G02
Phone: +61 2 8627 8112
Email: research.training@usyd.edu.au
Website: www.usyd.edu.au/ro/training

Scholarships for undergraduates

The Scholarships and Prizes Office administers scholarships and prizes for undergraduate and postgraduate coursework degrees at the University of Sydney. To learn more, see the website.

Scholarships and Prizes Office
Jane Foss Russell Building, G02
The University of Sydney
NSW 2006 Australia

Phone: +61 2 9351 2717
Fax: +61 2 9036 7879
Email: scholarships.reception@usyd.edu.au
Website: www.usyd.edu.au/scholarships

Security Services

Security staff patrol the University's Camperdown and Darlington campuses 24 hours a day, seven days a week and are easily identified by their blue uniforms and distinguishing badges.

Security Escort Service

The University's Security Escort Service may be booked by telephoning +61 2 9351 3487. This service provides transportation around the Camperdown and Darlington campuses as well as to the nearest transport point at its edge (it generally operates after the Security Bus has ceased). The service is for security situations and is not designed for convenience use. Requests for this service will be prioritised against other security demands.

Emergency contact

Phone: +61 2 9351 3333

Enquiries

Phone: +61 2 9351 3487 or (toll-free within Australia) 1800 063 487
Fax: +61 2 9351 4555
Email: security.admin@mail.usyd.edu.au
Website: www.security.usyd.edu.au

Traffic

Phone: +61 2 9351 3336

Lost property

Phone: +61 2 9351 5325

Service Management, Information and Communications Technology (ICT)

Client Services are responsible for the delivery of many of the computing services provided to students. Students can contact Client Services by phoning the ICT Helpdesk on (02) 9351 6000, through the IT Assist website (www.switch.usyd.edu.au) or by visiting the staff at one of the University Access Labs.

Access labs on the Camperdown and Darlington campuses:

- Fisher Library (Level 2)
- Carslaw Building (Room 201)
- Education Building (Room 232)
- Christopher Brennan Building (Room 232)
- Engineering Link Building (Room 222)
- Pharmacy and Bank Building (Room 510)

Other labs are available at the Law Campus, Westmead Hospital and Cumberland Campus.

The labs provide students free access to computers, including office productivity and desktop publishing software. Some services are available on a fee-for-service basis, such as Internet access, printing facilities, and the opportunity for students to host their own non-commercial website.

Each student is supplied with an account, called a 'Unikey' account, which allows access to a number of services including:

- free email (www-mail.usyd.edu.au)
- WebCT/elearning online resources via https://learn-on-line.ce.usyd.edu.au/webct/entryPageIns.dowebct
- access to the Internet from home or residential colleges (www.switch.usyd.edu.au/services.html)
- facilities via the MyUni student portal: myuni.usyd.edu.au including exam results, enrolment variations and timetabling
- free courses in basic computing (such as MS Office, basic html and Excel), run by Access Lab staff in the week following orientation week. To register contact the Access Lab Supervisor on +61 2 9351 6870.

Service Management, Helpdesk
University Computer Centre, H08
Camperdown Campus

Phone: +61 2 9351 6000
Fax: +61 2 9351 6004
Email: support@usyd.edu.au
Website: www.switch.usyd.edu.au

Staff and Student Equal Opportunity Unit (SSEOU)

The Staff and Student Equal Opportunity Unit works with the University community to promote equal opportunity in education and employment, to create opportunities for staff and students who have traditionally been disadvantaged by mainstream practices and policies, and to create an environment that is free from discrimination and harassment.

The Staff and Student Equal Opportunity Unit is responsible for:

- providing policy advice to staff on harassment and discrimination
- providing equal opportunity policy development, promotion and training for staff and students
- coordinating and monitoring equity programs and initiatives
- providing information and advice to staff and students on equal opportunity matters
- resolving individual staff and student concerns about harassment and discrimination
- overseeing the University's Harassment and Discrimination Resolution procedure
- monitoring and reporting to external bodies on the University's progress in the equal opportunity area.

Every student and employee at the University of Sydney has the right to expect from their fellow students and colleagues behaviour that reflects these key values, irrespective of background, beliefs or culture.

In addition, every student and employee has a right to expect from the University-equitable practices that preserve and promote equal opportunity to access, participate, and excel in their chosen field.

Second Floor, Margaret Telfer Building, K07
The University of Sydney
NSW 2006 Australia

Phone: +61 2 9351 2212
Fax: +61 2 9351 3195
Email: admin@eeo.usyd.edu.au
Website: www.usyd.edu.au/eeo

Student Administration and Support

The University provides personal, welfare, administrative and academic support services to facilitate your success. Many factors can have an impact on your wellbeing while studying, and Student Services can help you to manage these more effectively.

For details of services and online resources provided, see the MyUni student portal (myuni.usyd.edu.au) or the Services for Students website (www.usyd.edu.au/stuserv).

Student Centre

Level 3, Jane Foss Russell Building, G02
The University of Sydney
NSW 2006 Australia

General enquiries: +61 2 9351 3023
Academic records: +61 2 9351 4109
Handbooks: +61 2 9351 5057
Fax: +61 2 9351 5081 or +61 2 9351 5350 (academic records)
Website: www.usyd.edu.au/studentcentre

Student identity cards

The student identity card functions as a library borrowing card, a transport concession card (when suitably endorsed) and a general identity card. The card must be carried at all times on the grounds of the University and must be shown on demand, and must be taken to all examinations. Details for obtaining a student card can be found at: www.usyd.edu.au/cstudent/student_cards.shtml

Sydney Student Development

Sydney Student Development offers paid course-related employment to students with the aim of increasing their employment prospects upon graduation. During the semester students can work part-time to accommodate their study commitments and potentially full-time during the semester break.

For more information, see www.usyd.edu.au/student_employment.

Sydney Summer School

Nine faculties at the University offer subjects from undergraduate and postgraduate degree programs during summer. As the University uses its entire quota of Commonwealth-supported places in Semesters One and Two, these units are full fee-paying for both local and international students and enrolment is entirely voluntary.

Summer School enables students to accelerate their degree progress, make up for a failed subject or fit in a subject which otherwise would not suit their timetables. New students may also gain an early start by completing subjects before they commence their degrees.

Three Summer Sessions are offered, commencing in mid December, the first week of January and the third week of January and run for up to six weeks (followed by an examination week). Details of the available subjects are on the Summer School website and is usually circulated to students with their results notices.

A smaller Winter School is also run by the Summer School office. It will commence on 29 June 2009 and run for three weeks (followed by an examination week). The Winter School offers both postgraduate and undergraduate subjects.

To find out information about subjects offered and to enrol, see the Summer School website: www.summer.usyd.edu.au.

Sydney Welcome Orientation and Transition Program (SWOT)

The Sydney Welcome Orientation and Transition program (SWOT) offers a head start to commencing undergraduate students at the University, helping you to become familiar with the University and its student support services. The Library and central student support services work together with faculties to provide the SWOT program.

SWOT 2009 runs from **25 to 27 February 2009**.
For more information, see www.swot.usyd.edu.au.

The University of Sydney Foundation Program (USFP)

The University of Sydney provides a foundation program to international students as a preparation for undergraduate degrees at several Australian universities.

The program is conducted by Taylors College on behalf of Study Group Australia and the University of Sydney. It allows both first and second semester entry to undergraduate courses at the University of Sydney and other universities within Australia.

Contact details
Phone: +61 2 8263 1888
Fax: +61 2 9267 0531
Email: info@taylorscollege.edu.au
Website: www.usyd.edu.au/foundationprogram

College address
The University of Sydney Foundation Program
Taylors College
965 Bourke St
Waterloo NSW 2017
Phone: +61 2 8303 9700
Fax: +61 2 8303 9777

Timetabling Unit

The Timetabling Unit in the Student Centre is responsible for producing students' class and tutorial timetables. Semester One timetables are available ten days prior to the beginning of semester.

Website: www.usyd.edu.au/studentcentre/timetabling.shtml

University Health Service

The University Health Service provides a full experienced general practitioner service and emergency medical care to all members of the University community. You can consult a doctor either by appointment or on a walk-in basis (for more urgent matters only). The Health Service bills Medicare or your overseas student health care provider (Worldcare or Medibank Private) directly for the full cost of most consultations.

Email: i.marshall@unihealth.usyd.edu.au
Website: www.unihealth.usyd.edu.au
Phone: +61 2 9351 3484
Fax: +61 2 9351 4110

University Health Service (Wentworth)

Level 3, Wentworth Building, G01
The University of Sydney
NSW 2006 Australia

Opening hours: 8.30am to 5.30pm, Monday to Friday
Phone: +61 2 9351 3484

University Health Service (Holme)

Holme Building, A09
Entry Level, Science Road
The University of Sydney
NSW 2006 Australia

Opening hours: 8.30am to 5.30pm, Monday to Friday
Phone: +61 2 9351 4095

Student organisations

Students' Representative Council (SRC)

The Students' Representative Council (SRC) represents, campaigns and advocates for undergraduate students throughout the University.

SRC caseworkers advise students on a range of issues, including academic appeals, Centrelink and Austudy, tenancy, harassment and discrimination. The solicitor (from Redfern Legal Centre) provides legal assistance and court representation. These services are free and confidential. The SRC also offers financial support in the form of emergency loans up to $50.

In addition, the SRC runs a second-hand bookshop that specialises in the purchase and sale of coursework textbooks. Among the publications produced by the SRC are the weekly student newspaper *Honi Soit*, the *Counter-Course Handbook* and the *O-Week Handbook*.

Recently celebrating its 80th anniversary, the SRC is one of the oldest student organisations in Australia, and is run by and for students. This is a great way for you to be involved in student life. Office bearers elected to student council campaign on issues that directly affect students, such as course cuts and assessments, fee increases, discrimination and welfare rights. They also advocate on social justice matters both within the University and throughout the wider community.

SRC main office
Level 1, Wentworth Building, City Road
Phone: +61 2 9660 5222
Fax: +61 2 9660 4260
Email: help@src.usyd.edu.au
Email (*Honi Soit* editors): editors@src.usyd.edu.au
Website: www.src.usyd.edu.au

Contain the main office for details of other campuses.

The SRC Secondhand Bookshop
Level 3, Wentworth Building, City Road
Phone: +61 2 9660 4756
Fax: +61 2 9660 4260
Email: books@src.usyd.edu.au
Website: www.src.usyd.edu.au

Sydney University Postgraduate Representative Association (SUPRA)

SUPRA is an independent association which provides advice, advocacy and support services to postgraduate students. SUPRA is both the voice and safety net of these students, and represents their interests by:

- ensuring the representation of postgraduate views within the University and wider community
- providing free, confidential assistance and advocacy for postgraduates through the employment of Student Advice and Advocacy Officers (SAAOs)
- providing free legal advice for postgraduate students, in association with the Redfern Legal Centre
- representing postgraduates on University policy-making bodies such as the Academic Board, its committees and working parties
- meeting with members of the Senate on the Senate/Student Organisations Liaison Committee
- regularly consulting with the Vice-Chancellor, Registrar and other senior University officers
- drawing postgraduates together at all levels of University life.

SUPRA Council, committees and networks

The SUPRA Council is elected annually by and from the postgraduate student community. Council meetings are held monthly and postgraduate students are encouraged to attend. SUPRA committees and networks help to coordinate activities and run campaigns, and are a great way to get involved. All postgraduates can stand for the Council or attend any SUPRA events provided they are a SUPRA subscriber.

Advice and advocacy

SUPRA employs professional Student Advice and Advocacy Officers (SAAOs) to help postgraduate students with any academic or personal problems that may be affecting their study, such as:

- fee paying and administrative issues
- academic appeals and exclusions
- supervision problems
- tenancy issues
- Centrelink and financial assistance concerns
- harassment and discrimination.

This is a free and confidential service for all postgraduates at the University of Sydney. To access the SAAO service, you must be a SUPRA subscriber. It's free to subscribe and you can do it online, in the office, or when you see an SAAO. To find out more about the SAAO service, email: help@supra.usyd.edu.au.

Publications

SUPRA places the highest priority upon communication, being responsive to postgraduates and encouraging maximum participation in SUPRA through the following publications:

- *eXpress*, a magazine-style publication
- *eGrad*, a regular email bulletin
- *Survive!* Postgraduate Survival Manual
- *The Counter Course Handbook*
- *Thesis Guide*
- a range of factsheets and brochures.

Electronic versions are available at www.supra.usyd.edu.au.

All of SUPRA's services, activities and publications are free to SUPRA subscribers. By subscribing, you also show your support for all the work that SUPRA does on your behalf. It's free to subscribe and you can sign up online or drop into the SUPRA offices and fill out the form.

SUPRA Office
Raglan St Building, G10
Corner Raglan and Abercrombie Streets
Phone: +61 2 9351 3715 or toll-free 1800 249 950
Fax: +61 2 9351 6400
Email: admin@supra.usyd.edu.au
Website: www.supra.usyd.edu.au

University of Sydney Union (USU)

USU is the organisation that coordinates activities, programs, events, services and facilities in and around Manning House, Wentworth Building and Holme Building, to provide an exciting and varied student experience. USU looks after on-campus catering and functions, spaces to relax and eat in, clubs and societies, entertainment, and other social and cultural programs.

For more information on USU, see www.usuonline.com.

Access Card Benefits Program

The Access program is a savings and benefits scheme offered by USU. Once you've bought an Access Card, you can take advantage of great discounts, such as 15 per cent off purchases from USU catering and retail outlets, and 20 percent off coffee and water across campus.

As part of your membership, you can also make fantastic savings off-campus from Access Partners offering discounts and deals on gifts, clothing, family entertainment and food.

For more information, see www.accessbenefits.com.au.

Clubs and societies

The USU funds, accommodates, trains and supports around 250 clubs and societies – groups that students can join and operate to pursue their own interests. Clubs and societies organise their own activities and events and are funded by USU. Being part of a club or society is the best way to get involved in campus life, meet people who share your interests, network and gain valuable organisational skills, training and experience.

There are clubs and societies focused on politics, culture, the arts, the environment, religion, volunteering, skills, hobbies, departments and faculties. If there isn’t a club or society catering to your interests, we'll help you create and operate your own!

USU provides all of their clubs and societies with grants, insurance, venues, training and support for a range of events and projects including barbecues, dinners, annual balls, dance parties, cocktail parties, video nights, camps, conferences, excursions, trivia nights, fundraisers, merchandise and t-shirt production, postage and printing.

Registered clubs and societies can make free use of USU meeting rooms (as available) and free photocopying. Registered clubs can also use letterbox hire and USU equipment hire.

C&S Office
University of Sydney Union
Level 1, Manning House, Manning Road
Phone: +61 2 9563 6161
Email: clubsandsocs@usu.usyd.edu.au

The USU Student Leadership Program

The USU believes that a university should educate you, prepare you for life, and be fun!

The University of Sydney is able to boast the broadest, most inclusive extra-curricular program of all universities in Australia, and the USU prides itself on the world-class student experience program it delivers for the University.

The USU takes very seriously the need to create a vibrant community outside the classroom. Our programs are designed not only to entertain, but to teach and prepare participants for their lives after graduation. At the apex of what we do is mentoring, personal development, and leadership training.

The vitality of the USU is founded on the involvement of students as leaders within its community. These positions range from a student Board of Directors, Club and Society Executives, Festival Directors, Debate Directors, volunteers, and community portfolio convenors.

Sydney Uni Sport & Fitness

Sydney Uni Sport & Fitness invites you to choose from our range of value membership options, giving access to many sport and recreation clubs, fitness programs, top-level sporting facilities, regular competition and events, and great member benefits.

Join a vast array of sporting and recreational clubs for men and women with well-developed juniors programs, take part in excellent courses and world-class sporting events, and improve your performance under the guidance of some of Australia's most accomplished coaches and sportspeople.

Purpose-built venues, such as the University Sports and Aquatic Centre, Arena Sports Centre with the Ledge Climbing Centre, and the HK Ward Gymnasium, offer tennis and squash courts, rock-climbing, fitness equipment, a martial arts room and an Olympic-size heated swimming pool.

Check out the historic and panoramic sporting ovals, rowing sheds and a multi-purpose facility at Tempe, and don't forget the on-campus Grandstand Sports Bar.

Sydney Uni Sport & Fitness
University Sports & Aquatic Centre
Phone: +61 2 9351 4960
Fax: +61 2 9351 4962
Email: admin@sport.usyd.edu.au
Website: www.susf.com.au

Facilities

Sydney Uni Sport & Fitness has three main fitness centres.

University Sports & Aquatic Centre

Corner Codrington and Darlington Streets
Darlington Campus
Phone: +61 2 9351 4978
Email: nmrc@sport.usyd.edu.au

Facilities at the centre include:

- 50-metre heated swimming pool
- six synthetic tennis courts
- four squash courts
- multi-function sports hall
- modern fitness equipment
- group fitness studio
- RPM Studio
- health assessments and fitness testing
- personal training
- a café.

Arena Sports Centre

Western Avenue
Camperdown Campus
Phone: +61 2 9351 8111
Email: arenaman@sport.usyd.edu.au

Facilities at the Arena Sports Centre include:

- extensive weights room
- Yoga classes
- personal training
- modern cardio equipment
- multi-purpose sports hall (Badminton)
- two squash courts
- sports clinic
- The Ledge Climbing Centre
- Ralph’s Café.

HK Ward Gymnasium

Between Ovals 1 and 2
Camperdown Campus
Phone: +61 2 9351 4988
Email: hk@sport.usyd.edu.au

Facilities at the gymnasium include:

- martial arts facility
- international-standard sports hall
- boxing ring and gym
- group fitness studio
- boxercise and kickboxing classes
- ergometer training
- sports equipment hire.

International students

The following information is for international students studying onshore on an Australian student visa.

Completion within the expected duration

Education Providers are required to ensure that international students complete their studies within the duration specified on the electronic Confirmation of Enrolment (eCoE). Extensions to a student's course duration are allowed only in limited circumstances. For example, for compassionate or compelling reasons, where an intervention strategy has been implemented or where there has been an approved leave of absence or suspension.

It is important for students to ensure they are on track to complete their studies within the expected duration, or that they have permission from their faculty to extend their duration.

Satisfactory academic progress

Maintaining satisfactory course progress is a mandatory student visa condition. Education providers are required to monitor course progress, intervene where students are at risk of failing to achieve satisfactory course progress, notify students who fail to achieve satisfactory course progress, and report students who fail to achieve satisfactory course progress to the Department of Immigration and Citizenship (DIAC).

It is important that every student is aware of the progress rules for their course and participates in the intervention strategies implemented by their faculty. Exclusion from a course due to unsatisfactory progress can have serious implications for student visa holders including visa cancellation and restrictions on returning to Australia.

The University provides many avenues of support for students who are struggling academically. International students who are experiencing any difficulties with their academic progress should consult their faculty, the international student advisers in the International Office or the counsellors in the International Student Support Unit (ISSU).

Distance/web-based study

International students may undertake no more than 25 per cent of their total course by distance and/or online learning. Students must not enrol in exclusively distance or online study in any compulsory study period.

Work permits

International students with a work permit are permitted to work for up to 20 hours during semester and full-time during the University's official vacation periods. Contact the international student advisers in the International Office for more information.

Change of address

International students must notify the University of their residential address within seven days of arrival and notify any change of address within seven days. This should be done online via the University's MyUni student portal (http://myuni.usyd.edu.au).

Sponsored students

Sponsored students will need permission from their sponsors before transferring courses, suspending their studies or varying their study load. Students sponsored by the Australian Government (AusAID, Endeavour), or Asia Development Bank (ADB) should contact the International Office in the early stages of considering a change to their program.

Suspension/discontinuation

The University is required to report to DIAC any international students who discontinue or suspend their studies. Students who suspend their studies for medical or compassionate reasons should contact the International Student Advisers in the International Office urgently.

Overseas student health cover

The Australian government requires that all international students and their families pay for health insurance in Australia through the Overseas Student Health Cover (OSHC) scheme. The University-preferred provider is OSHC Worldcare. The International Office will, on receipt of the student's first payment of tuition fees and the OSHC premium, pay the compulsory amount to OSHC Worldcare on his/her behalf.

OSHC provides free access to the University health service and public hospitals. Higher-level coverage (eg, access to private hospitals coverage for spouse and family) is the student's responsibility.

The University of Sydney Foundation Program (USFP)

The University of Sydney offers its foundation program to international students as a preparation for undergraduate degrees at several Australian universities.

The Foundation Program is conducted by Taylors College on behalf of Study Group Australia and the University of Sydney. The Foundation Program allows both first and second-semester entry to undergraduate courses at the University of Sydney and other Australian universities.

University of Sydney Foundation Program
Taylors College
965 Bourke Street
Waterloo NSW 2017

Phone: +61 2 8303 9700
Fax: +61 2 8303 9777
Email: info@taylorscollege.edu.au
Website: www.usyd.edu.au/foundationprogram

International Office

The International Office provides advice and assistance with application, admission and enrolment procedures for international students. The International Office also includes units responsible for international marketing, government and student relations, international scholarships, including AusAID scholarships and administrative support for international financial aid programs, and compliance with government regulations related to international students.

The International Office also coordinates student exchange and study abroad programs, and other inter-institutional links.The Study Abroad and Exchange unit assists both domestic and international students who wish to enrol for study abroad or exchange programs.

International Admissions and Customer Services
Jane Foss Russell Building, G02
The University of Sydney
NSW 2006 Australia

Phone: +61 2 9351 4079
Future student enquiries: 1800 899 376 (domestic free call)
Fax: +61 2 9351 4013
Email: info@io.usyd.edu.au
Website: www.usyd.edu.au/internationaloffice

Study Abroad
Phone: +61 2 9351 3699
Fax: +61 2 9351 2795
Email: studyabroad@io.usyd.edu.au
Website: www.usyd.edu.au/studyabroad

Student Exchange
Phone: +61 2 9351 3699
Fax: +61 2 9351 2795
Email: studyabroad@io.usyd.edu.au
Website: www.usyd.edu.au/studentexchange

International Student Support Unit

The International Student Support Unit (ISSU) provides support to international students through the provision of information, orientation programs, welfare advice and counselling.

The ISSU provides advice to international students on:

- preparations before leaving their home country
- what to expect upon arrival in Sydney
- emotional changes that can take place when moving to a different country
- academic concerns, including understanding the University system and liaising with staff members
- preparing family visit letters
- preparing to return to their home country.

The ISSU has two offices:

Camperdown Campus
Jane Foss Russell Building, G02
University of Sydney
NSW 2006 Australia

Phone: +61 2 9351 4749
Fax: +61 2 9351 6818
Email: info@issu.usyd.edu.au
Website: www.usyd.edu.au/stuserv/issu

Cumberland Campus
Ground Floor, A Block, C42
75 East St, Lidcombe
NSW 2141 Australia

Phone: +61 2 9351 9638
Email: ISSU.Cumberland@stuserv.usyd.edu.au
Website: www.usyd.edu.au/stuserv/issu

Essential information for students

Calendar

The annual *University of Sydney Calendar* and its online updates are the University of Sydney's central source of official information.

The *Calendar* provides general and historical information about the University of Sydney, the statutes and regulations under which it operates and the Resolutions of the Senate relating to constitutions of and courses in each faculty. The statutes and regulations, as well as some Resolutions of the Senate, also appear in Policy Online (www.usyd.edu.au/policy).

Along with the University of Sydney handbooks, the *Calendar* forms the official legal source of information relating to study at the University of Sydney.

The latest *Calendar* is available in hard copy from the Student Centre. It is also available online, at www.usyd.edu.au/calendar. The PDF and Word document files can be downloaded and printed if required.

Coursework Rule

It is very important that students are aware of the *University of Sydney (Coursework) Rule 2000*, which governs all coursework award courses in the University.

The Coursework Rule relates to:

- award course requirements
- credit points and assessment
- enrolment
- credit
- cross-institutional study and its upper limits
- progression
- discontinuation of enrolment and suspension of candidature
- unsatisfactory progress and exclusion
- exceptional circumstances
- award of degrees
- diplomas and certificates
- transitional provisions.

It should be read in conjunction with two other documents:

- *University of Sydney (Amendment Act) Rule 1999*; and
- Resolutions of the Senate and the faculty resolutions relating to each award course. These are found in the relevant faculty handbook.

The Coursework Rule can be found in the following places:

- *University of Sydney Calendar* (print or online version): www.usyd.edu.au/calendar)
- Policy Online: www.usyd.edu.au/policy
- Handbooks online: www.usyd.edu.au/handbooks/university_information/01_uni_coursework_rule

PhD Rule

The *University of Sydney (Doctor of Philosophy (PhD)) Rule 2004* deals with matters relating to the degree of Doctor of Philosophy, including admission, probation, supervision and submission of theses.

It should be read in conjunction with two other documents:

- *University of Sydney (Amendment Act) Rule 1999*; and
- Senate and faculty resolutions relating to each award course (found in the relevant faculty handbook).

The PhD Rule can be found in the following locations:

- *University of Sydney Calendar* (print or online version): www.usyd.edu.au/calendar
- Policy Online: www.usyd.edu.au/policy
- Handbooks online: www.usyd.edu.au/handbooks/postgrad_hb/ap04_phd_rule.shtml

Plagiarism

The University of Sydney is opposed to and will not tolerate plagiarism. It is the responsibility of all students to:

- ensure that they do not commit or collude with another person to commit plagiarism
- report possible instances of plagiarism
- comply with the University's policy and procedure on plagiarism.

The policy and procedure on plagiarism can be found at the Policy Online website www.usyd.edu.au/policy.

The Policy Online website also lists related policies and procedures, including:

- *Academic Honesty in Coursework (plagiarism)* policy; and
- *Code of Conduct for Responsible Research Practice and Guidelines for Dealing with Allegations of Research Misconduct*.

The University will treat all identified cases of student plagiarism seriously, in accordance with this policy and procedure, and with Chapter 8 of the *University of Sydney By-Law 1999 (as amended)*, which deals with student discipline.

Students at Risk Policy

The Students at Risk Policy enables early detection of students who are making poor or unsatisfactory progress and are therefore at risk of exclusion from their degree.

The policy outlines procedures and processes to support students in their ongoing studies, including:

- timely intervention and the provision of advice and assistance
- regularly and effectively advising students of progress requirements
- identifying students at risk
- alerting students that they are at risk
- providing assistance to address the risk
- tracking the progress of students after they are identified as being at risk.

For more information on this policy, please see the Secretariat website at www.usyd.edu.au/secretariat/students/riskstudents.

Grievance procedure

The University's policy and procedures document on student grievances, appeals and applications for review is available on the Policy Online website: www.usyd.edu.au/policy.

The *Grievance Procedure* document is a statement of the University's processes for handling student grievances, appeals and applications for review regarding academic and non-academic matters.

Study at the University presents opportunities for interacting with other members of the University community. The University recognises and values the diversity of student experiences and expectations, and is committed to treating students, both academically and administratively, in a fair and transparent manner.

Abbreviations

Listed below are commonly used acronyms that appear in University documents and publications. (See also the Glossary.)

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

A	
AARNet	Australian Academic Research Network
AAUT	Australian Awards for University Teaching
AAM	Annual Average Mark
ABC	Activity-based costing
ABSTUDY	Aboriginal Study Assistance Scheme
ACER	Australian Council for Educational Research
AGSM	Australian Graduate School of Management
ANZAAS	Australian and New Zealand Association for the Advancement of Science
APA	Australian Postgraduate Awards
APAC	Australian Partnership for Advanced Computing
APAI	Australian Postgraduate Awards (Industry)
APA-IT	Australian Postgraduate Awards in Information Technology
APDI	Australian Postdoctoral Fellowships Industry
APEC	Asia-Pacific Economic Cooperation
APF	Australian Postdoctoral Fellowship
AQF	Australian Qualifications Framework
ARC	Australian Research Council
ARTS	Automated Results Transfer System
ASDOT	Assessment Fee Subsidy for Disadvantaged Overseas Students
ATN	Australian Technology Network
ATP	Australian Technology Park
AUQA	Australian Universities Quality Agency
AusAID	Australian Agency for International Development
AUTC	Australian Universities Teaching Committee
AVCC	Australian Vice-Chancellors' Committee

B	
BAA	Backing Australia's Ability
BAC	Budget Advisory Committee
BITLab	Business Intelligence Lab
BLO	Business Liaison Office
BOTPLS	Bridging for Overseas Trained Professionals Loans Scheme

C	
CAF	Cost adjustment factor
CPS	Campus Property Services
CAUT	Committee for Advancement of University Teaching
CDP	Capital Development Program
CEP	Country Education Profile
CEQ	Course Experience Questionnaire
CES	Casual Employment Service
CFO	Chief Financial Officer
CHASS	College of Humanities and Social Sciences
CHESSN	Commonwealth Higher Education System Student Number
CHS	College of Health Sciences
CIO	Chief Information Officer
COE	Confirmation of Enrolment
CPSU	Community and Public Sector Union
CRC	Cooperative Research Centre

C	
CREO	Centre for Regional Education, Orange
CRICOS	Commonwealth Register of Institutions and Courses for Overseas Students
CRRI	Centre for Rural and Regional Innovation
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CST	College of Sciences and Technology
CULT	Combined Universities Language Test
CUTSD	Committee for University Teaching and Staff Development

D	
DAC	Data Audit Committee
DEST	Commonwealth Department of Education, Science and Training
DET	NSW Department of Education and Training
DIMA	Department of Immigration and Multicultural Affairs
D-IRD	Discovery-Indigenous Researchers Development Program
DVC	Deputy Vice-Chancellor

E	
EB	Enterprise bargaining
EFTSU	Equivalent full-time student unit
EFTSL	Equivalent full-time student load
EIP	Evaluations and Investigations Program
ELICOS	English Language Intensive Course of Study
EMU	Electron Microscope Unit
ESOS Act	Education Services for Overseas Student Act

F	
FFT	Fractional full-time (equivalent staff)
FlexSIS	Flexible Student Information System
FHS	Faculty of Health Sciences
FOS	Field of study
FTE	Full-time equivalent (staff)
FRM	Faculty of Rural Management

G	
GATS	General Agreement on Trade in Services
GCCA	Graduate Careers Council of Australia
GDS	Graduate destination survey
GPOF	General Purpose Operating Funds
GSA	Graduate Skills Assessment
GSG	Graduate School of Government
GWSLN	Greater Western Sydney Learning Network

H	
HDR	Higher Degree Research
HECS	Higher Education Contribution Scheme
HEEP	Higher Education Equity Program
HEFA	Higher Education Funding Act 1988
HEIMS	Higher Education Information Management System
HEIP	Higher Education Innovation Program (DEST)
HELP	Higher Education Loan Program

H	
HEO	Higher education officer
HEP	Higher education provider
HERDC	Higher Education Research Data Collection
HESA	Higher Education Support Act

I	
IAF	Institutional Assessment Framework
IAS	Institute of Advanced Studies
ICT	Information and Communication Technology
IELTS	International English Language Testing Scheme
IGS	Institutional Grants Scheme (DEST)
IO	International Office
IP	Intellectual property
IPRS	International Postgraduate Research Scholarships
IREX	International Researcher Exchange Scheme
ISFP	Indigenous Support Funding Program
ISIG	Innovation Summit Implementation Group
ISSU	International Student Services Unit
ITC	Information Technology Committee
ITL	Institute for Teaching and Learning
ITS	Information Technology Services

J	
JASON	Joint Academic Scholarships Online Network

L	
LBOTE	Language background other than English

M	
MISG	Management Information Steering Group
MNRF	Major National Research Facilities Scheme
MOU	Memorandum of Understanding
MRB	Medical Rural Bonded Scholarship Scheme

N	
NBCOTP	National Bridging Courses for Overseas Trained Program
NCG	National Competitive Grant
NESB	Non-English-speaking background
NHMRC	National Health and Medical Research Council
NOIE	National Office for the Information Economy
NOOSR	National Office for Overseas Skill Recognition
NRSL	Non-recent school leaver
NSW VCC	New South Wales Vice-Chancellors' Conference
NTEU	National Tertiary Education Industry Union

O	
OECD	Organisation for Economic Cooperation and Development
OLA	Open Learning Australia
OLDPS	Open Learning Deferred Payment Scheme
OPRS	Overseas Postgraduate Research Scholarships

P	
PELS	Postgraduate Education Loans Scheme
PSO	Planning Support Office
PVC	Pro-Vice-Chancellor

Q	
QA	Quality assurance
QACG	Quality Advisory and Coordination Group

R	
R&D	Research and development
R&R	Restructuring and Rationalisation Program
RC	Responsibility Centre
REG	Research and Earmarked Grants
REP	Research Education Program
RFM	Relative Funding Model
RIBG	Research Infrastructure Block Grant (DEST)
RIEF	Research Infrastructure Equipment and Facilities Scheme
RISF	Restructuring Initiatives Support Fund
RMO	Risk Management Office
ROA	Record of Achievement
RQ	Research Quantum
RQU	Recognition Quality Unit (Higher Education Division – DEST)
RRTMR	Research and Research Training Management Reports
RSL	Recent school leaver
RTS	Research Training Scheme (DEST)

S	
SCA	Sydney College of the Arts
SCEQ	Sydney Course Experience Questionnaire
SCM	Sydney Conservatorium of Music
SCR	Science Capability Review
SDF	Strategic Development Fund
SEG	Senior Executive Group
SES	Socioeconomic status
SI	Scholarship Index
SLE	Student Learning Entitlement
SNA	Safety net adjustment
SPIRT	Strategic Partnerships with Industry – Research and Training
SPR	Student Progress Rate
SRC	Students' Representative Council
SSR	Student–staff ratio
STABEX	Study Abroad Exchange (database)
SUPRA	Sydney University Postgraduate Students' Representative Association
SUSport	Sydney Uni Sport & Fitness

T	
TAFE	Technical and Further Education
TOEFL	Test of English as a foreign language
TPI	Teaching Performance Indicator

U	
UAC	Universities Admissions Centre
UMAP	University Mobility in Asia and the Pacific
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UPA	University Postgraduate Awards

V	
VCAC	Vice-Chancellor's Advisory Committee
VET	Vocational Education and Training

W	
WAM	Weighted Average Mark
WRP	Workplace Reform Program
WTO	World Trade Organization

Y	
YFE	Year of first enrolment

Glossary

For a table of commonly used acronyms and abbreviations that appear in University documents and publications, see 'Abbreviations'.

This glossary describes terminology in use at the University of Sydney.

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

A

Academic Board
The senior academic body within the University. In conjunction with faculties, the Academic Board has responsibility for approving new or amended courses and endorsing faculty development of units of study. The board is also responsible for the formulation and review of policies, guidelines and procedures in relation to academic matters. For further information, see the *University of Sydney (Academic Governance) Rule 2003 (as amended)*.

Academic Consortium 21 (AC21)
An international network, of which the University is a member, comprising educational, research and industrial organisations throughout the world with the objective of encouraging the further advancement of global cooperation to the benefit of higher education and to contribute to world and regional society.

Academic cycle
The program of teaching sessions offered over a year. Currently the cycle runs from the enrolment period for Semester One to the completion of the processing of results at the end of Semester Two.
See also 'Academic year', 'Stage'.

Academic dishonesty
Academic dishonesty occurs when a student presents another person's ideas, findings or written work as his or her own by copying or reproducing them without due acknowledgement of the source and with intent to deceive the examiner. Academic dishonesty also covers recycling, fabrication of data, engaging another person to complete an assessment or cheating in exams.
See also 'Plagiarism'.

Academic record
The complete academic history of a student at the University. It includes, among other things: personal details; all units of study and courses taken; assessment results (marks and grades); awards and prizes obtained; infringements of progression rules; approvals for variation in course requirements and course leave; thesis and supervision details.

Access to a student's academic record is restricted to authorised University staff and is not released to a third party without the written authorisation of the student.
See also 'Academic transcript'.

Academic transcript
A printed statement setting out a student's academic record at the University. There are two forms of academic transcript: external and internal.
See also 'Academic record', 'External transcript', 'Internal transcript'

Academic year
The current calendar year in which a student is enrolled.
See also 'Academic cycle', 'Stage'.

Ad eundem gradum
Long-standing full-time members of the University's academic and general staff who are not graduates of the University may be considered by Senate, upon their retirement, for admission *Ad eundem gradum* ('to the same degree') to an appropriate degree of the University.

Admission
Governed by the University's admission policy, this is the process for identifying applicants eligible to receive an initial offer of enrolment in a course at the University. Admission to most courses is based on performance in the HSC, with applicants ranked on the basis of their UAI. Other criteria such as a portfolio, interview, audition, or results in standard tests may also be taken into account for certain courses.

Admission basis
The main criterion used by a faculty in assessing an application for admission to a course. The criteria used include, among other things, previous secondary, TAFE or tertiary studies; work experience; special admission; and the Universities Admission Index (UAI).

Admission (Deferment)
An applicant who receives an offer of admission to a course may apply to defer enrolment in that course for one semester or one academic cycle.

Admission mode
A classification based on how a student was admitted to a course, for example 'UAC' or 'direct'.

Admission period
The period during which applications for admission to courses are considered.

Admission year
The year the student expects to begin the course.
See also 'Commencement date'.

Advanced diplomas
See 'Award course'.

Advanced standing
See 'Credit'.

Adviser
A member of academic staff appointed in an advisory role for some postgraduate coursework students.
See also 'Associate supervisor', 'Instrumental supervisor/teacher', 'Research supervisor', 'Supervision'.

Aegrotat
In exceptional circumstances involving serious illness or death of a student prior to completion of their course, the award of aegrotat and posthumous degrees and diplomas may be conferred.

Alumni
See 'Graduate'

Alumni sidneiensis
A searchable database of graduates of the University from 1857 to 30 years prior to the current year.

Annual average mark (AAM)
The average mark over all units of study attempted in a given academic year (equivalent to the calendar year).
The formula for this calculation is:

$$AAM = \frac{\sum (marks \times credit\ point\ value)}{\sum (credit\ point\ value)}$$

(sums over all units of study completed in the selected period)

Where the mark is the actual mark obtained by the student for the unit of study, or in the case of a failing grade with no mark – 0. Pass/fail assessed subjects and credit transfer subjects (from another institution) are excluded from these calculations. However, the marks from all attempts at a unit of study are included.

Annual progress report
A form used to monitor a research student's progress each year. The form provides for comments by the student, the supervisor, the head of the department and the dean (or their nominee). The completed form is attached to the student's official file.

Annual Report
The University's yearly financial and audit report, submitted to the NSW Parliament. It also includes a broad range of the University's activities and the strength of their performance in relation to the University's stated roles, values and goals.

Appeals
Students may lodge an appeal against academic or disciplinary decisions.

Appeals against an academic decision
A student may appeal to the Student Appeals Body against a decision by the University that affects the academic assessment or progress of a student within his or her award course, including a decision:

(a) to exclude a student in accordance with the *University of Sydney (Coursework) Rule 2000 (as amended)*
(b) not to readmit or re-enrol a student following exclusion in accordance with the *University of Sydney (Coursework) Rule 2000 (as amended)*
(c) to terminate a student's candidature for a postgraduate award.
See also 'Student Appeals Body'.

Appeal against a disciplinary decision
A student may appeal to the Student Disciplinary Appeals Committee against a determination being:

(a) a finding by the Vice-Chancellor or the student Proctorial Board that the student is guilty of misconduct
(b) the imposition of a penalty upon the student by the Vice-Chancellor or the Student Proctorial Board
(c) an order made by the Vice-Chancellor or the Student Proctorial Board.
See also 'Student Disciplinary Appeals Committee'.

Assessment
The process of measuring the performance of students in units of study and courses. Performance may be assessed by examinations, essays, laboratory projects, assignments, theses, treatises or dissertations.
See also 'Result processing', 'Result processing schedule'.

Formative assessment
Used principally to provide students with feedback on their progress in learning. It reinforces successful learning, and is an opportunity for students to expose the limits in their knowledge and understanding.

Summative assessment
Used to certify competence, or to arrange students in a rank order of merit. It certifies the attainment of a standard, and is used as the basis for progression to the next part of a program, or to graduation.

Associate supervisor
A person who is appointed in addition to the supervisor of a research student, who can provide the day-to-day contact with the candidate or provide particular expertise or additional experience in supervision.
See also 'Adviser', 'Instrumental supervisor/teacher', 'Research supervisor', 'Supervision'.

Association of Pacific Rim Universities (APRU)
A consortium of leading research universities in the Pacific Rim, of which the University is a member, which aims to foster education, research and enterprise thereby contributing to the economic, scientific and cultural advancement in the Pacific Rim.

Assumed knowledge
For some units of study, a student is assumed to have passed a relevant subject in the HSC and this is called assumed knowledge. While students are generally advised against taking a unit of study for which they do not have the assumed knowledge, they are not prevented from enrolling in the unit of study.
See also 'Prerequisite'.

Attendance pattern
Attendance pattern is classified as full-time, part-time or external. It depends on the student's mode of attendance and the student load.

Attendance mode
A Department of Education, Science and Training (DEST) classification defining the manner in which a student is undertaking a course, such as internal, external, mixed or offshore.

Australian Qualifications Framework (AQF)
The framework for recognition and endorsement of qualifications established by the Ministerial Council on Education, Employment, Training and Youth Affairs (MCEETYA).

AUSTUDY
Provides financial help to students who are 25 years old or over who meet the required criteria, and are undertaking an approved full-time course at an approved institution.
See also 'Youth allowance'.

Automated Results Transfer System (ARTS)
This system was developed by the Australasian Conference of Tertiary Admissions Centres (ACTAC) to allow the electronic academic record of a student to be accessed, via an admission centre, by tertiary institutions.

Award course
See 'Course'.

B

Bachelor's degree
The highest undergraduate award offered at the University. A bachelor's degree course normally requires three or four years of full-time study or the part-time equivalent.
See also 'Award course'.

Barrier
An instruction placed on a student's record that prevents the student from re-enrolling or graduating.
See also 'Deadlines (fees)', 'Suppression of results'.

Board of studies
An academic body which supervises a course or courses, and is similar to a faculty except that it is headed by a chair rather than a dean and does not supervise PhD candidates.

Bursaries
Financial award made to a student, based primarily on need.
See also 'Scholarships'.

C

Calendar
See 'University Calendar'.

Cadigal program
A program, named in recognition of the Aboriginal people of the land on which the University is located, designed to increase the successful participation of Aboriginal and Torres Strait Islander people in degree courses in all faculties at the University of Sydney.

Campus
The grounds on which the University is situated. There are ten campuses of the University of Sydney:

- Burren Street (Institute of Transport Studies)
- Camperdown
- Darlington
- Camden (Agriculture and Veterinary Science)
- Conservatorium (Sydney Conservatorium of Music)
- Cumberland (Health Sciences)
- Mallett Street (Nursing)
- Rozelle (Sydney College of the Arts)
- St James (Law)
- Surry Hills (Dentistry)

Cancellation
Where enrolment is cancelled for non-payment of fees.

Candidature
Candidature commences when a student is admitted to a course of study leading to the award of a degree, diploma or certificate. There are maximum periods and in some cases minimum periods of candidature depending on the award course and whether the candidate is a full-time or part-time student.
See 'Course enrolment status'.

Census date
The date at which a student's enrolment, load and HECS liability are finalised before this information is reported to DEST.
See also 'HECS-HELP'.

Ceremony
See 'Graduation ceremony'.

Chancellor
The non-executive head of the University. An honorary position, the Chancellor presides over meetings of the University's governing body, the Senate, and important ceremonial occasions such as graduations.

Clinical experience
Students undertake clinical placements in a professional environment as part of their course requirements. Many require University-approved supervision. In order to undertake clinical placements a student may be required to fulfil additional requirements.

Combined course
A course which leads to two awards. For example the Arts/Law course leads to the separate awards of Bachelor of Arts and Bachelor of Laws.

Combined degree
A single program with a single set of course resolutions leading to the award of two degrees (unless otherwise specified in the resolutions).
See also 'Combined course'.

Commencement date
The date a student commences candidature.

Commonwealth Supported Place (CSP)
(Previously known as a HECS Place.) A student in a Commonwealth Supported Place makes a contribution towards the cost of their education (known as the student contribution) while the Australian Government contributes the majority of the cost.

Confirmation of Enrolment form (COE)
This form is issued to each student after enrolment, showing the course and the units of study in which the student is enrolled, together with the credit point value of the units of study and the HECS weights. Until all fees are paid, it is issued provisionally. A new confirmation of enrolment form is produced every time a student's enrolment is varied.

Conjoint ventures
Two or more institutions cooperate to provide a unit or course of study to postgraduate coursework students. Arrangements exist between individual departments at the University of Sydney and individual departments at the University of New South Wales (UNSW) and the University of Technology Sydney (UTS).

In these arrangements, students enrolled for a degree at one institution complete one or more units of study at the other institution to count towards the award program at their 'home' institution.

Continuing professional education
A process which provides a number of programs of continuing education courses for professionals as they move through their career. These programs are presently administered by the Centre for Continuing Education (CCE) and a number of departments and foundations across the University. This process supports the whole of life learning concept and involves the maintenance of a long-term relationship between the student and the University.

Convocation
The body compromising the Fellows and former Fellows of the Senate of the University of Sydney; members of the former governing bodies of the institutions with which the University has amalgamated or their predecessors; the graduates of the University of Sydney, which include graduates of the institutions with which the University has amalgamated or their predecessors; professors and other full-time members of the academic staff of the University; and principals of the incorporated colleges. This is as per clause 14 of the *University of Sydney Act 1989*.

Core unit of study
A unit of study that is compulsory for a particular course or subject area.
See also 'Unit of study'.

Corequisite
A unit of study which must be taken in the same semester or year as a given unit of study (unless it has already been completed). These are determined by the faculty or board of studies concerned, published in the faculty handbook and shown in FlexSIS.
See also 'Prerequisite', 'Waiver'.

Cotutelle Scheme
Agreement between the University and any overseas university for joint supervision and examination of a PhD student as part of an ongoing cooperative research collaboration. If successful, the student receives a doctorate from both universities with each testamur acknowledging the circumstances under which the award was made.

Course
An undertaking of study at the University of Sydney.

Award course
A formal course of study that will see attainment of a recognised award. Award courses are approved by Academic Board and endorsed by Senate. The University broadly classifies courses as undergraduate, postgraduate coursework or postgraduate research.
See also 'Bachelor's degree', 'Course rules', 'Diploma', 'Doctorate', 'Major', 'Master's degree', 'Minor', PhD, 'Stream'.

Non-award course
Studies undertaken by students who are not seeking an award from the University.
See also 'Cross-institutional enrolment'.

Coursework
An award course not designated as a research award course. While the program of study in a coursework award course may include a component of original work, other forms of instruction and learning will normally be dominant.

Research
A course in which at least 66 per cent of the overall course requirements involve students undertaking supervised research, leading to the production of a thesis or other piece of written or creative work, over a prescribed period of time.

Course alias
A unique five character alpha-numeric code which identifies a University course.

Course code
See 'Course alias'.

Course enrolment status
A student's enrolment status in a course is either 'enrolled' or 'not enrolled'. 'Not enrolled' reasons include: cancelled; suspended; under examination; or terminated.
See also 'Cancellation', 'Candidature', 'Course leave', 'Enrolment', 'Enrolment variation', 'Terminated', 'Under examination'.

Course leave
Students are permitted to apply for a period away from their course without losing their place. Course leave is formally approved by the supervising faculty for a minimum of one semester. Students on leave are regarded as having an active candidature, but they are not entitled to a student card. At undergraduate level, leave is not counted towards the total length of the course. Students who are absent from study without approved leave may be discontinued and may be required to formally reapply for admission.
See also 'Progression'.

Course rules
Rules which govern the allowable enrolment of a student in a course. Course rules may be expressed in terms of types of units of study taken, length of study, and credit points accumulated. For example, a candidate may not enrol in units of study having a total value of more than 32 credit points per semester. Course rules also govern the requirements for the award of the course, for example a candidate must have completed a minimum of 144 credit points.
See also 'Award course', 'Corequisite', 'Prerequisite'.

Course suspension
See 'Course leave'.

Course transfer
A transfer occurs when a student changes from one course in the University to another course in the University without the requirement for an application and selection process (for example from a PhD to a master's program in the same faculty).

Credit
The recognition of previous studies successfully completed at this University, or another university or tertiary institution recognised by the University of Sydney, as contributing to the requirements of the course to which the applicant requesting such recognition has been admitted. It may be granted as specified credit or non-specified credit.

Specified credit
The recognition of previously completed studies as directly equivalent to units of study.

Non-specified credit
A 'block credit' for a specified number of credit points at a particular level. These credit points may be in a particular subject area but are not linked to a specific unit of study.
See also 'Annual average mark (AAM)', 'Waiver', 'Weighted average mark (WAM)'.

Credit points
The value of the contribution each unit of study provides towards meeting course completion requirements. Each unit of study normally has a six credit point value assigned to it. The total number of credit points required for completion of award courses will be specified in the Senate Resolutions relevant to the award course.

Cross-institutional enrolment
An enrolment in units of study at one university to count towards an award course at another university. Cross-institutional enrolments incur a student-contribution liability (see Commonwealth-supported student) or tuition fee charge at the institution at which the unit of study is being undertaken.
See also 'Non-award course'.

D

Data Audit Committee (DAC)
The Data Audit Committee's role is to oversee the integrity and accuracy of the course and unit of study data as strategic University data. It also advises the Academic Board on suggested policy changes related to course and unit of study data. A subcommittee of the VCAC Enrolment Working Party, it is chaired by the Registrar, with membership including the deans, the Student Centre, FlexSIS and Planning and Statistics.

Deadlines (Enrolment variations)
See 'Enrolment variation'.

Deadlines (Fees)
The University has deadlines for the payment of fees (for example, HECS, compulsory subscriptions, course fees). Students who do not pay fees by these deadlines may have their enrolment cancelled or they may have a barrier placed on the release of their record.
See also 'Barrier', 'Cancellation'.

Dean
The head of a faculty, or the principal or director of a college (such as the Sydney Conservatorium of Music or the Sydney College of the Arts).

Dean's Certificate
A statement from the Dean certifying that all requirements, including fieldwork and practical work, have been met and that the student is eligible to graduate. Not all faculties use Dean's Certificates. In faculties that do, qualified students have 'Dean's Certificate' noted on their academic record.

Deferment (Deferral)
See also 'Admission (deferment)', 'Course leave'.

Degree
See also 'Award course', 'Bachelor's degree'.

Delivery mode
Indicates how students receive the instruction for a unit of study. The delivery mode must be recorded for each unit as distinct from the attendance mode of the student, for example an internal student may take one or more units by distance mode and an external student may attend campus for one or more units.

Distance education
Where subject matter is delivered in a more flexible manner, such as correspondence notes, a student may only attend campus if required.
See also 'Extended semester', 'Distance education', 'International – off shore'.

Intensive on-campus
Core content is delivered with support learning in an intensive (one or more days) format on campus. Participation is usually compulsory. Previously this may have been called residential, block mode, or weekend workshop.

On-campus (normal)
Attendance of scheduled lectures, tutorials etc at a campus of the University.

Department
See 'School'.

Department of Education, Science and Training (DEST)
The Federal Government department responsible for higher education.

Diploma
The award granted following successful completion of diploma course requirements. A diploma course usually requires less study than a degree course.
See also 'Award course'.

Direct admissions
For some courses, applications may be made directly to the University. Applications are received by faculties or the International Office, and considered by the relevant department or faculty body. Decisions are recorded and letters are forwarded to applicants advising them of the outcome.
See also 'Admission', 'UAC'.

Disability information
Students may inform the University of any temporary or permanent disability which affects their life as a student. Disability information is recorded but it is only available to particular authorised users because of its sensitive nature and students will be informed of its use.

Disciplinary action
Undertaken as the result of academic or other misconduct, for example plagiarism, cheating, security infringement, criminal activity.

Discipline
A defined area of study, for example, chemistry, physics, economics.

Discipline group
A DEST code used to classify units of study in terms of the subject matter being taught or being researched.

Discontinuation (course)
See 'Enrolment variation'.

Discontinuation (unit of study)
See 'Enrolment variation.

Dissertation
A written exposition of a topic which may include original argument substantiated by reference to acknowledged authorities. It is a required unit of study for some postgraduate award courses in the faculties of Architecture and Law.

Distance education
Where a student does not attend campus on a daily basis for a given course or unit of study.
See also 'Delivery mode', 'Extended semester'.

Doctorate
A high-level postgraduate award. A doctorate course normally involves research and coursework; the candidate submits a thesis that is an original contribution to the field of study. Entry to a doctorate course often requires completion of a master's degree course. Note that the doctorate course is not available in all departments at the University.
See also 'Award course', 'PhD'.

Domestic student
A student who is not an international student.
See also 'Local student'.

Double degree
A double degree is a program where students are permitted by participating faculties (and/or by specific resolutions within a single award) to transfer between courses in order to complete two awards.

Downgrade
Where a student enrolled in a PhD reverts to a master's by research, either on the recommendation of the University on the basis that the research they are undertaking is not at an appropriate level for a PhD; or at the student's own request, for personal or academic reasons.

E

Equivalent full-time student unit (EFTSU)
The equivalent full-time student unit (EFTSU) is a measure of student load based on the workload for a student undertaking a full year of study in a particular course. A student is then recorded as having generated one EFTSU.
See also 'Load', 'Stage'.

Equivalent full-time student load (EFTSL)
The equivalent full-time student load (EFTSL) for a year. It is a measure, in respect of a course of study, of the study load for a year of a student undertaking that course of study on a full-time basis.

Embedded courses
Award courses in the graduate certificate, graduate diploma and master's degree by coursework sequence which allow unit of study credit points to count in more than one of the awards, for example the Graduate Certificate in Information Technology, Graduate Diploma in Information Technology and Master of Information Technology.

Enrolment
A student enrols in a course by registering with the supervising faculty in the units of study to be taken in the coming year, semester or session.

Commencing
An enrolment is classified as commencing if a student has enrolled in a particular degree or diploma for the first time.

Continuing
Students already in a course at the University re-enrol each year or semester. Most continuing students are required to pre-enrol.
See also 'Pre-enrolment'.

Enrolment list
A list of all currently enrolled students in a particular unit of study.
See also 'Unit of study'.

Enrolment status
See 'Course enrolment status'.

Enrolment Variation
Students may vary their enrolment at the start of each semester. Each faculty determines its deadlines for variations, but student-contribution liability depends on the Commonwealth census date.
See also 'Commonwealth Supported Place'.

Examination
A set of questions or exercises evaluating on a given subject given by a department or faculty.
See also 'Examination period', 'Assessment'.

Examination period
The time set each semester for the conduct of formal examinations.

Examiner (Coursework)
The person assessing a student or group of students, for example through written/oral examination, coursework assignments, presentations.

Exchange student
Either a University of Sydney student participating in a formally agreed program involving study at an overseas university, or an overseas student studying here on the same basis. The International Office provides administrative support for some exchanges.

Exclusion
A faculty may ask a student whose academic progress is considered to be unsatisfactory to 'show good cause' why the student should be allowed to re-enrol. If the faculty deems the student's explanation unsatisfactory, or if the student does not provide an explanation, the student may be excluded either from a unit of study or from a course or faculty. An excluded student may apply to the faculty for permission to re-enrol. Normally, at least two years must have elapsed before such an application would be considered. University policy relating to exclusions is set out in the *Calendar*.
See also 'Progression', 'Senate appeals'.

Exemption
A decision made at a sub-unit of study level to allow a student to complete a unit of study without also completing all the prescribed components of coursework and/or assessment.
See also 'Credit', 'Waiver'.

Expulsion
The ultimate penalty of disciplinary action is to expel the student from the University. The effect of expulsion is:

- the student is not allowed to be admitted or to re-enrol in any course at the University
- the student does not receive their results
- the student is not allowed to graduate
- the student does not receive a transcript or testamur.

Extended semester
A distance-learning student may be allowed more time to complete a module or program if circumstances beyond the student's control, such as drought, flood or illness, affect the student's ability to complete the module or program in the specified time.
See also 'Distance education'.

External
See 'Attendance mode', 'Distance education'.

External transcript
A certified statement of a student's academic record printed on official University security paper. It includes the student's name, any credit granted, all courses the student was enrolled in and the final course result and all units of study attempted within each course together with the result. It also acknowledges prizes the student has received. Marks can be included or omitted, as required.
See also 'Academic transcript', 'Internal transcript'.

F

Faculty
A formal part of the University's academic governance structure, consisting mainly of academic staff members and headed by a dean, which is responsible for all matters concerning the award courses that it supervises. Usually, a faculty office administers the faculty and student or staff inquiries related to its courses. The *University Calendar* sets out the constitution of each of the University's faculties.
See also 'Board of Studies', 'Supervising faculty'.

Faculty handbook
The annual University publication for each faculty which provides detailed information about the faculty, its courses and resolutions.

FEE-HELP
An eligible student in a postgraduate course or in a bridging study course (for overseas-trained professionals) can apply for assistance (in the form of a loan) in paying all or some of their tuition fees.

Fee-paying students
Students who pay tuition fees to the University and are not liable for student contributions to a Commonwealth Supported Place. The Commonwealth does not contribute towards the cost of the education of fee-paying students. Annual fees vary between the faculties. Students pay a per semester fee.

Fellows of Senate
Members of the governing body of the University who are either elected, appointed or ex-officio.

Flexible learning
See 'Delivery mode', 'Distance education'.

Flexible start date
Full fee-paying distance students are not restricted to the same enrolment time frames as campus-based or Commonwealth-supported students.

Flexible Student Information System (FlexSIS)
The computer-based Flexible Student Information System at the University of Sydney.

FlexSIS holds details of courses and units of study being offered by the University and the complete academic records of all students enrolled at the University.

Formative assessment
See also 'Assessment'.

Full-time student
See 'Attendance pattern', 'EFTSU'.

G

Grade
The outcome for a unit of study linked with a mark range. For example, a mark in the range 85–100 attracts the grade 'high distinction' (HD).
See also 'Mark'.

Graduand
A student who has completed all the requirements for an award course but has not yet graduated.
See also 'Graduation', 'Potential graduand'.

Graduate
A person who holds an award from a recognised tertiary institution.
See also 'Graduand', 'Graduation'.

Graduate certificate
See 'Award course'.

Graduate diploma
See 'Award course'.

Graduate-entry degree
A bachelor's, or undergraduate degree, that requires another undergraduate degree as a prerequisite of entry. Examples of graduate-entry degrees at the University of Sydney include the Medical Program, Graduate Law and the Bachelor of Dentistry.

Graduation
The formal conferring of awards either at a ceremony or in absentia.
See also 'In absentia', 'Potential graduand'.

Graduation ceremony
A ceremony where the Chancellor confers awards upon graduands.

Group of Eight (G08)
The Group of Eight represents Australia's major research-intensive universities and membership comprises the vice-chancellors (presidents) of the Australian National University, Monash University, the University of Adelaide, the University of Melbourne, the University of New South Wales, the University of Queensland, the University of Sydney, and the University of Western Australia.

The Group of Eight works to ensure a consistent and sustainable policy environment which maximises the wide-ranging economic, social and cultural benefits to the Australian community of higher education and which ensures Australian universities are recognised as among the best in the world.

Group work
Means a formally established project to be conducted by a number of students in common, resulting in a single piece of assessment or a number of associated pieces of assessment.
See also 'Legitimate cooperation'.

H

Handbook
See 'Faculty handbook'.

Head of department/Head of school (HOD/HOS)
The head of the academic unit which has responsibility for the relevant unit of study, or equivalent program leader.

Higher Education Contribution Scheme (HECS)
The Higher Education Contribution Scheme (HECS) was the previous Commonwealth Government student loan scheme. It ceased to operate on 1 January 2005 and was replaced by HECS-HELP (see below).

HECS-HELP
An eligible student in a Commonwealth Supported Place can apply for assistance in paying their student contribution. This may take the form of a HECS-HELP loan to pay all or some of the student contribution, or a HECS-HELP discount if all (or at least $500) of the student contribution is paid by the census date.

Honorary degrees
A degree *honoris causa* (translated from the Latin as 'for the purpose of honouring') is conferred on a person whom the University wishes to honour.

Honours
Some degrees may be completed 'with honours'. This may involve the completion of a separate honours year, additional work in the later years of the course or meritorious achievement over all years of the course. Honours are awarded in a class (Class I, Class II – which may have two divisions or, Class III).

NSW Higher School Certificate (HSC)
The NSW Higher School Certificate (HSC), which is normally completed at the end of year 12 of secondary school. The UAI (Universities Admission Index) is a rank out of 100 that is computed from a student's performance in the HSC.

I

In absentia
Latin for 'in the absence of'. Awards are conferred *in absentia* when graduands do not, or cannot, attend the graduation ceremony scheduled for them. Those who have graduated *in absentia* may later request that they be presented to the Chancellor at a graduation ceremony.
See also 'Graduation'.

Instrumental supervisor/teacher
All students at the Sydney Conservatorium of Music have an instrumental teacher appointed.
See also 'Adviser', 'Associate supervisor', 'Research supervisor', 'Supervision'.

Internal mode
See 'Attendance mode'.

Internal transcript
A record of a student's academic record for the University's own internal use. It includes the student's name, student identifier (SID), address, all courses in which the student was enrolled and the final course result, and all units of study attempted within each course, together with the unit of study result.
See also 'Academic transcript', 'External transcript'.

International student
Any student who is not an Australian or New Zealand citizen or a permanent resident of Australia is an international student. An international student is required to hold a visa that allows study in Australia and may be liable for international tuition fees.

Fee-paying
A private international student who is liable to pay tuition fees for their studies with the University.

Fee-paying – outgoing exchange
An international fee-paying student undertaking short term study at a recognised overseas institution with which the University has a student exchange agreement. Exchange study counts towards the student's University of Sydney award and students remain enrolled in their University of Sydney course during the period of exchange.

International – cross-institutional
An international fee paying student undertaking non-award study at the University on a cross-institutional basis. They are liable to pay fees for the study they undertake at the University, but there is no compliance reporting requirement, which rests with their 'home' institution.

International – sponsored
A private international student who is fully sponsored for his/her tuition; his/her sponsorship may also include overseas health cover and compulsory subscriptions.

Offshore studies
International offshore students undertake their program of study at one of the University's offshore campuses and do not enter Australia. Therefore they do not require a visa. They are distinct from international students who are on outbound exchange programs as they never enter Australia during their program of study.

Short course
An international fee-paying student undertaking a short course with the University of Sydney such as international development programs, executive training or study visits. The study undertaken by these students is non-award and generally a student visa is not required.

Sponsored award
An international student sponsored by the Australian government, undertaking a program of study at the University. Currently Australian Development Scholarships holders, funded by AusAID, are the only students in this category. These students are fully sponsored for their tuition and other costs such as travel and health cover, and are paid a stipend.

Study Abroad
An international student who is undertaking short-term study at the University under the Study Abroad scheme. Study Abroad students must have completed at least one year of study towards a degree at a recognised institution in their home country and are continuing towards the degree of their home institution.
See also 'Local student', 'Student type'.

L

Learning entitlement
Each student has a seven-year full-time period during which they can remain Commonwealth-supported. This seven year period is called their 'learning entitlement'.

Leave
See 'Course leave'.

Legitimate cooperation
Any constructive educational and intellectual practice that aims to facilitate optimal learning outcomes through student interaction.
See also 'Group work'.

Life membership
Life membership is no longer offered by the University of Sydney Union (USU). However, existing life Members continue to enjoy the right to vote in USU elections and at USU general meetings. Like all members, life members are encouraged to stand for election to the USU Board. Similarly, life members, once they have paid the appropriate annual fees, are able to enjoy the benefits of the Access Benefits program.

Load
The sum of the weights of all the units of study in which a student is enrolled. The weight is determined by the proportion of a full year's work represented by the unit of study in the degree or diploma for which the student is a candidate. Student load is measured in terms of Equivalent full-time student units (EFTSU).
See also 'Equivalent full-time student units (EFTSU)'.

Local student
Either an Australian or New Zealand citizen or Australian permanent resident. New Zealand citizens are required to pay their Higher Education Contribution Scheme (HECS) fees upfront.
See also 'Domestic student', 'International student'.

M

Major
A field of study, chosen by a student, to represent their principal interest. This would consist of specified units of study from later stages of the award course. Students select and transfer between majors by virtue of their selection of units of study. One or more majors may be awarded upon the graduand's assessment of study.
See also 'Award course', 'Minor', 'Stream'.

Major timetable clash
The term used when a student attempts to enrol in units of study which have so much overlap in the teaching times that it has been decided that students must not enrol in the units simultaneously.

Mark
An integer (rounded if necessary) from 0 to 100 indicating a student's performance in a unit of study.
See also 'Grade'.

Master's degree
A postgraduate award. Master's degree courses may be offered by coursework, research only or a combination of coursework and research. Entry to the course often requires completion of an honours year at an undergraduate level.
See also 'Award course'.

Method of candidature
A course is either a research course or a coursework course and so the methods of candidature are 'research' and 'coursework'.
See also 'Course (Coursework)', 'Course (Research)'.

Mid-year intake
Admission to degree programs for Semester Two.

Minor
Studies undertaken to support a major. Requiring a smaller number of credit points than a major, students select and transfer between minors (and majors) by virtue of their selection of units of study. One or more minors may be awarded upon the graduand's assessment of study.
See also 'Award course', 'Major', 'Stream'.

Mixed mode
See 'Attendance mode'.

MPhil
The Master of Philosophy (MPhil) is a master's by research degree offered by some (but not all) of the University's faculties.
See also 'Award course', 'Master's degree'.

Mutually exclusive units of study
See 'Prohibited combinations of units of study'.

MyUni
The University of Sydney's student portal system. It provides access to email, library services, student self-administration, support services, e-learning software such as Blackboard and WebCT, as well as information about the University and its courses.

N

Non-award course
See 'Course'.

Non-standard session
A teaching session other than the standard February and August sessions – such as Sydney Summer School or Winter School, in which units of study are delivered and assessed in an intensive mode during January or July respectively.
See also 'Semester', 'Session'.

O

Orientation Week
Orientation or 'O Week', takes place in the week before lectures begin in Semester One. During O Week, students can join various clubs, societies and organisations, register for courses with departments and take part in activities provided by the University of Sydney Union.

P

Part-time student
See also 'Attendance mode', 'Attendance pattern', 'Equivalent full-time student units (EFTSU)'.

Permanent home address
The address used for all official University correspondence with a student, both inside and outside of semester time (for example during semester breaks), unless the student provides a different address for use during the semester.
See also 'Semester address'.

PhD
The Doctor of Philosophy (PhD) and other doctorate awards are the highest awards available at the University. A PhD course is normally purely research-based; the candidate submits a thesis that is an original contribution to the field of study.
See also 'Award course', 'Doctorate'.

Plagiarism
Presenting another person's ideas, findings or work as one's own by copying or reproducing them without acknowledging the source.
See also 'Academic dishonesty'.

Policy Online
The website which provides access to the University's current policies, procedures and guidelines.

Postgraduate
A term used to describe a course leading to an award such as graduate diploma, a master's degree or PhD which usually requires prior completion of a relevant undergraduate degree (or diploma) course. A 'postgraduate' is a student enrolled in such a course.
See also 'Course (Coursework)', 'Course (Research)'.

Postgraduate Education Loans Scheme (PELS)
An interest-free loans facility for eligible students who are enrolled in fee-paying, postgraduate non-research courses. It is similar to the deferred payment arrangements available under the Higher Education Contribution Scheme (HECS). This scheme was replaced by the FEE-HELP scheme on 1 January 2005.
See also 'FEE-HELP'.

Potential graduand
A student who has been identified as being eligible to graduate on the satisfactory completion of their current studies.
See also 'Graduand', 'Graduation'.

Pre-enrolment
Pre-enrolment – also known as provisional re-enrolment – takes place in October, when students indicate their choice of unit of study enrolment for the following year. After results are approved, pre-enrolment students are regarded as enrolled in those units of study for which they are qualified. Their status is 'enrolled' and remains so provided they pay any money owing and comply with other requirements by the due date. Students who do not successfully pre-enrol in their units of study for the next regular session are required to attend the University on set dates during the January/February enrolment period.
See also 'Enrolment'.

Prerequisite
A unit of study that is required to be successfully completed before another unit of study can be attempted. Prerequisites can be mandatory (compulsory) or advisory.
See also 'Assumed knowledge', 'Corequisite', 'Waiver', 'Qualifier'.

Prizes
Awarded in recognition of outstanding performance, academic achievement or service to the community or University.

Probationary candidature
A student who is enrolled in a postgraduate course on probation for a period of time up to one year. The head of department/school is required to consider the candidate's progress during the period of probation and make a recommendation for normal candidature or otherwise to the faculty.

Professional practice
Some students undertake placement in a professional practice as part of their course requirements. This may require University-approved supervision. Professional placements are located in a wide range of professional practices environments, and may not require additional criteria to be fulfilled.

Progression
Satisfactory progression is satisfying all course and faculty rules (normally assessed on an annual basis) to enable the completion of the chosen award within the (maximum) completion time allowed.
See also 'Exclusion'.

Prohibited combinations of units of study
When two or more units of study contain a sufficient overlap of content, enrolment in any one such unit prohibits enrolment in any other identified unit.
See also 'Unit of study'.

Provisional re-enrolment
See 'Pre-enrolment'.

Q

Qualification
An academic attainment recognised by the University.

Qualifier
A mandatory (compulsory) prerequisite unit of study which must have a grade of pass or better.
See also 'Assumed knowledge', 'Corequisite', 'Prerequisite', 'Waiver'.

R

Recycling
The submission for assessment of one's own work, or of work which substantially the same, which has previously been counted towards the satisfactory completion of another unit of study, and credited towards a university degree, and where the examiner has not been informed that the student has already received credit for that work.

Registration
In addition to enrolling with the faculty in units of study, students must register with the department responsible for teaching each unit. This is normally done during Orientation Week. Note that unlike enrolment, registration is not a formal record of units attempted by the student.

Research course
See 'Course (Research)'.

Research supervisor
A supervisor is appointed to each student undertaking a research postgraduate degree. The supervisor will be a full-time member of the academic staff or a person external to the University recognised for their association with the clinical teaching or the research work of the University. A research supervisor is commonly referred to as a supervisor.
See also 'Advisor', 'Associate supervisor', 'Supervision', 'Instrumental supervisor/teacher'.

Result processing
Refers to the processing of assessment results for units of study. For each unit of study, departments/schools tabulate results for all assessment activities and assign preliminary results.
See also 'Assessment', 'Formative assessment', 'Examination period', 'Summative assessment'.

Result processing schedule
The result processing schedule will be determined for each academic cycle. All schools and faculties are expected to comply with this schedule.
See also 'Assessment', 'Examination period', 'Result processing'.

Result
The official statement of a student's performance in each unit of study attempted as recorded on the academic transcript, usually expressed as a mark and grade.
See also 'Grade', 'Mark'.

Research Training Scheme (RTS)
The RTS provides Commonwealth-funded higher degree by research (HDR) students with an 'entitlement' to a HECS exemption for the duration of an accredited HDR course, up to a maximum period of four years full-time equivalent study for a doctorate by research and two years full-time equivalent study for a master's by research.

S

Scholarships
Financial or other form of support made available to enable students to further their studies.
See also 'Bursaries'.

School
A school or academic unit shall encourage and facilitate teaching, scholarship and research, and coordinate the teaching and examining duties of members of staff in the subjects or courses of study with which it is concerned.

Semester
A half-yearly teaching session, the dates for which are determined by the Academic Board. Normally all undergraduate sessions will conform to the semesters approved by the Academic Board. Any offering of an undergraduate unit not conforming to the semester dates (non-standard session) must be given special permission by the Academic Board.
See also 'Session', 'Non-standard session'.

Semester address
The address to which all official University correspondence is sent during semester time, if it is different to the permanent address.

Senate
The governing body of the University. See the University Calendar for more details of its charter and powers.

Session
Any period of time during which a unit of study is taught. A session differs from a semester in that it need not be a six-month teaching period, but it cannot be longer than six months. Each session maps to either Semester One or Two for DEST reporting purposes.

Session offerings are approved by the relevant dean, taking into account all the necessary resources, including teaching space and staffing. The Academic Board must approve variation to the normal session pattern.
See also 'Semester', 'Non-standard teaching period'.

Session address
See 'Semester address'.

Short course
A fee-paying student undertaking a short course with the University of Sydney comprising professional development, executive training etc. The study undertaken by these students is a non-award course.

Show cause
See 'Progression', 'Exclusion'.

Special consideration
Candidates who suffer serious illness or misadventure which may affect performance in any assessment, may request that they be given special consideration in relation to the determination of their results.

Special Studies Program (SSP)
A period of release from normal duties to allow academic staff to undertake a planned program of academic activity and development.

Sponsorship
Financial support of a student by a company or government body.

Stage
A normal full-time course of study taken in a year.
See also 'Course rules', 'EFTSU', 'Progression'.

Strategic Directions
See also 'University Strategic Directions'.

Stream
A defined award course, which requires the completion of set units of study as specified by the course rules for the particular stream, in addition to the core program specified by the course rules. A stream will appear with the award course name on testamurs, eg Bachelor of Engineering in Civil Engineering (Construction Management).
See also 'Award course', 'Major', 'Minor'.

Student
Student means a person enrolled as a candidate for an award course or unit of study.

Student Appeals Body
Any student may appeal to the Student Appeals Body against an academic decision on the ground that due academic process has not been observed by the relevant faculty in relation to the academic decision.
See also 'Appeals', *University of Sydney (Student Appeals against Academic Decisions) Rule 2006*.

Student Disciplinary Appeals Committee
Any student may appeal to the Student Disciplinary Appeals Committee against a misconduct determination by the Vice-Chancellor or a Student Proctorial Board.
See also 'Appeals'.

Student identifier (SID)
A nine-digit number which uniquely identifies a student at the University.

Student ID Card
All students who enrol are issued with an identification card. The card includes the student's name, SID, the course code, a library borrower's bar code and a passport-style photo. The card identifies the student as eligible to attend classes and must be displayed at formal examinations. It must be presented to secure student concessions and to borrow books from all sections of the University Library.

Student progress rate (SPR)
A calculation which measures the rate at which load undertaken is passed annually in each award program.

Student type
Student type identifies whether a student is local or international and the type of study the student is undertaking.
See also 'International student', 'Domestic student', 'Exchange student'.

Study Abroad program
A scheme administered by the International Office which allows international students who are not part of an exchange program to take units of study at the University of Sydney, but not towards an award program. In most cases the units of study taken here are credited towards an award at their home institution.
See also 'Exchange student'.

Subject area
A unit of study may be associated with one or more subject areas. The subject area can be used to define prerequisite and course rules, for example the unit of study 'History of Momoyama and Edo Art' may count towards the requirements for the subject areas 'Art History and Theory' and 'Asian Studies'.

Summative assessment
See 'Assessment'.

Summer School
See 'Sydney Summer School'.

Supervising faculty
The faculty that has the responsibility for managing the academic administration of a particular course, such as the interpretation and administration of course rules, approving students' enrolments and variations to enrolments. Normally the supervising faculty is the faculty offering the course.

However, in the case of combined courses, one of the two faculties involved will usually be designated the supervising faculty. Further, in the case where one course is jointly offered by two or more faculties (such as the Liberal Studies course), a joint committee may make academic decisions about candidature and the student may be assigned a supervising faculty for administration.

Supervision
A one-to-one relationship between a student and a nominated member of the academic staff or a person specifically appointed to the role.
See also 'Adviser', 'Associate supervisor', 'Research supervisor', 'Instrumental supervisor/teacher'.

Suppression of results
Results for a particular student can be suppressed by the University when the student has an outstanding debt to the University; or the student is facing disciplinary action. A student may also request a suppression for personal reasons.

Suspension
See also 'Course leave'.

Sydney Summer School
A program of accelerated, intensive study running for approximately six weeks during January and February each year. Both undergraduate and postgraduate units are offered. Summer School provides an opportunity for students at Sydney and other universities to catch up on needed units of study, to accelerate completion of a course or to undertake a unit that is outside their award course.

All units attract full fees and enrolled students are also liable for compulsory subscriptions. Some fee-waiver scholarships are available.

Sydney Winter School
An intensive session offered by the University in July during the mid-year break.

T

Teaching department
See 'School'.

Teaching end date
Official finish date of formal timetabled classes.

Teaching start date
Official commencement date of formal timetabled classes.

Terminated
Term used when a student's candidature has been officially closed because they are not able to complete the course requirements.
See also 'Candidature'.

Testamur
A certificate of award provided to a graduand, usually at a graduation ceremony. The award conferred will be displayed along with other appropriate detail.

Thesis
A major work that is the product of an extended period of supervised independent research.
See also 'Course (Research)'.

Timetable
The schedule of lectures, tutorials, laboratories and other academic activities that a student must attend.

Transcript
See 'Academic transcript'.

Transfer
See 'Course transfer'.

Tuition fees
Tuition fees may be charged to students in designated tuition fee-paying courses. Students who pay fees are not liable for HECS.

U

Universities Admissions Centre (UAC)
The UAC receives and processes applications for admission to undergraduate courses at recognised universities in NSW and the ACT. Most commencing, local undergraduate students at the University apply through the UAC.

Universities Admission Index (UAI)
A measure of overall academic achievement in the HSC that assists universities in ranking applicants for university selection. The UAI is based on the aggregate of scaled marks in ten units of the HSC, and is a number between 0.00 and 100.00 with increments of 0.05.

Under examination
Indicates that a research student has submitted their written work (thesis) for assessment, and is awaiting the finalisation of the examiners' outcome and recommendation.

Undergraduate
A term used to describe both a course leading to a diploma or bachelor's degree and a student enrolled in such a course.

Unit of study
Unit of study or unit means a stand-alone component of an award course. Each unit of study is the responsibility of a department.
See also 'Prohibited combinations of unit of study'.

Unit of study enrolment status
This indicates whether the student is still actively attending the unit of study (currently enrolled) or is no longer enrolled.
See also 'Discontinuation' or 'Cancellation'.

Unit of study level
Units of study are divided into Junior, Intermediate, Senior, Honours, Year 5, and Year 6. Most majors consist of 32 Senior credit points in a subject area (either 3000 level units of study or a mix of 2000 and 3000 level units of study).

University
Unless otherwise indicated, 'University' in this document refers to the University of Sydney.

University Calendar
The annual University publication, also available online, which provides general and historical information about the University of Sydney, the statutes and regulations under which it operates and the Senate resolutions relating to constitutions in each faculty.

University Medal
A faculty may recommend the award of a University Medal to a student qualified for the award of an undergraduate honours degree (or some master's degrees), whose academic performance is judged to be outstanding.

University Strategic Directions
This refers to the University of Sydney *Strategic Plan* 2007–2010.

Upgrade
Where a student enrolled in a master's by research course is undertaking research at such a standard that either the University recommends that the student upgrade their degree to a PhD, or the student seeks to upgrade to a PhD and this is supported by the University.

V

Variation of enrolment
See 'Enrolment variation'.

Vice-Chancellor and Principal
The chief executive officer of the University, responsible for its leadership and management. The Vice-Chancellor and Principal is head of both academic and administrative divisions.

W

Waiver
In a prescribed course, a faculty may waive the prerequisite or corequisite requirement for a unit of study or the course rules for a particular student. Unlike credit, waivers do not involve a reduction in the number of credit points required for a course.
See also 'Credit', 'Exemption'.

Winter School
See 'Sydney Winter School'.

Weighted average mark (WAM)
This mark uses the unit of study credit point value in conjunction with an agreed 'weight'. The formula for this calculation is:

$$WAM = \frac{\sum (W_c \times M_c)}{\sum (W_c)}$$

Where Wc is the weighted credit point value, ie the product of the credit point value and the level of weighting of 1, 2, 3, or 4 for a first, second, third or fourth year unit of study respectively; and where Mc is the greater of 45 or the mark out of 100 for the unit of study.

The mark is the actual mark obtained by the student for the unit of study, or in the case of a failing grade with no mark – 0.

Pass/fail assessed subjects and credit transfer subjects (from another institution) are excluded from these calculations. However, the marks from all attempts at a unit of study are included. (Effective from 1 January 2004.)

In addition, faculties may adopt other average mark formulae for specific progression or entry requirements. If such a formula is not specified in the faculty resolutions, the formula outlined above is used. See also 'WAM weight'.

WAM weight
A weight assigned to each unit of study to assist in the calculation of WAMs.

Y

Year of first enrolment (YFE)
The year in which a student first enrols at the University.
See also 'Commencement date'.

Youth Allowance
Youth allowance is payable to a full-time student or trainee aged 16–24 years of age who is enrolled at an approved institution such as a school, college, TAFE or university, and undertaking at least 15 hours a week face-to-face contact.

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The University of Sydney

'09

Quick links:
www.facilities.syd.edu.au/maps
Campuses
Bicycle map
Precincts
Disability access
Parking layout

2009 handbook maps

Set a course for Handbooks online: www.usyd.edu.au/handbooks

Map Code: 0102_MAIN

Camperdown and Darlington Campuses

Directory

University buildings

O6	Aeronautical Engineering Building
J4	Anderson Stuart Building
G3	Badham Building
H3	Bank Building
L2	Baxter's Lodge
L8	Biochemistry and Microbiology Building
E6	Blackburn Building
E7	Bosch Building 1A
E7	Bosch Building 1B
H3	Brennan MacCallum Building
E6	Bruce Williams Pavilion
L6	Carslaw Building
F4	Chaplaincy
M8	Chemical Engineering Building
J5	Chemistry Building
N8	Civil Engineering Building
N9	Civil Engineering Workshop
K10	Clark Building
J9	Darlington Centre
J10	Darlington House
K9	Darlington Road Terraces
L10	Demountable Village
K5	Eastern Avenue Auditorium & Lecture Theatre Complex
L9	Economics and Business Building
H2	Edgeworth David Geology Building
G4	Education Building
G4	Education Building Annexe
H5	Edward Ford Building
N7	Electrical Engineering Building
N7	Engineering Link Building
C3	Evelyn Williams Building
K3	Fisher Library
K4	Fisher Library Stack
G2	Footbridge Theatre
C3	Gatekeeper's Lodge
J7	Gatekeeper's Lodge (City Road)
M8	Gordon Yu-Hoi Chui Building
J2	Great Hall
G3	Griffith Taylor Building
D4	H.K. Ward Gymnasium
F2	Heydon - Laurence Building
G2	Holme Building
N5	Information Technologies
K8	Institute Building
N5	International House
J10	IXL Building
D3	J.D. Stewart Building
F2	J.R.A. McMillan Building
L7	Jane Foss Russell Building
F3	John Woolley Building
F1	Mackie Building
H3	MacLaurin Hall
H2	Macleay Building
G1	Margaret Telfer Building
J6	Madsen Building
H4	Manning House
H4	Manning Squash Courts
D3	McMaster Annexe
D3	McMaster Building
O6	Mechanical Engineering Building
A2	Medical Foundation Building
K8	Merewether Building
E1	No. 1-3 Ross Street
M7	Old School Building
F4	Old Teachers' College
H3	Pharmacy Building
H6	Physics Annexe
G5	Physics Building
N8	P.N.R. Building
E6	Queen Elizabeth II Research Institute
H5	R.C. Mills Building
F2	R.D. Watt Building
D4	R.M.C. Gunn Building
M9	Raglan Street Building
N7	Rose Street Building
E2	Ross Street Building
G2	Science Road Cottage
E1	Selle House
M10	Services Building
N6	Seymour Centre
K10	Shepherd Centre
O6	Shepherd Street Carpark
K9	Storie Dixson Wing
F5	The Arena Sports Centre
J3	The Quadrangle
J5	Transient Building
L10	University Computing Centre
M9	University Sports & Aquatic Centre
D3	Veterinary Science Conference Centre
E6	Victor Coppleson Building
F3	Wallace Theatre
K7	Wentworth Building
E7	Western Avenue Carpark
M6	W.H. Maze Building
M6	Wilkinson Building

Childcare centres

K11	Boundary Lane
F9	Carillon Avenue
N9	KU Union
H1	Laurel Tree House

Colleges & residential accommodation

J10	Darlington House
K9	Darlington Road Terraces
N5	International House
L10	Mandelbaum House
A4	Sancta Sophia College
C8	St Andrew's College
B5	St John's College
L6	St Michael's College
G7	St Paul's College
E1	Selle House
D10	Sydney University Village
F7	Wesley College
G8	Women's College

Computer Access Centres

H3	Brennan
G4	Education
K3	Fisher
N7	Link
L6	McGrath (Carslaw)
H3	Pharmacy

Cultural venues

H2	Macleay Museum
J3	Nicholson Museum
N6	Seymour Centre
K7	Sir Hermann Black Gallery
M6	Tin Sheds Gallery
J2	War Memorial Art Gallery

Faculties (offices)

F2	Agriculture, Food and Natural Resources
M6	Architecture
H3	Arts
K8	Economics & Business
G4	Education and Social Work
N7	Engineering
H5	Medicine
H3	Pharmacy
L6	Science
D3	Veterinary Science

Libraries

G3	Badham
H5	Burkitt-Ford
K3	Curriculum Resources
K3	Fisher
E7	Medical
N6	Music
H5	Schaeffer Fine Arts
L7	SciTech

Retail

H3	Australia Post Office
J9	Darlington Centre
G2	Holme Building
L7	Jane Foss Russell Building
H4	Manning House
F5	The Arena Sports Centre
M9	University Copy Centre
K7	University Health Service
M9	University Sports & Aquatic Centre
M9	University Co-op Bookshop
C3	Valentine Charlton Cat Centre
C3	Veterinary Hospital & Clinic
K7	Wentworth Building

Security

M10	Emergency Services
M10	Lost Property
M10	Traffic & Parking

Sports & recreational venues

K2	Fisher Tennis Courts
D4	HK Ward Gymnasium
H5	Lawn Tennis Courts
H4	Manning Squash Courts
F5	The Arena Sports Centre
G5	The Square
E5	University Oval No. 1
E3	University Oval No. 2
M9	University Sports & Aquatic Centre

Unions & associations (offices)

K7	Students' Representative Council (SRC)
M9	Sydney University Postgraduate Representative Association (SUPRA)
M9	Sydney University Sport
G2	University of Sydney Union

University administration, centres & services

H3	Alumni Relations Office
L7	Careers Centre
L7	Cashier
D10	Centre for Continuing Education
K7	Centre for English Teaching
H3	Chancellor
L10	Computing Centre
H2	Executive Offices
J3	Information Centre
L10	Information and Communications Technology
L7	International Office
K8	Office of Development
M10	Office of University Relations (OUR)
G1	Personnel
L7	Publications Office
H3	Research Office
M10	Room Bookings & Venue Management
L7	Scholarships Unit
M10	SydneyPeople - HR Service Centre
G1	SydneyPeople - SydneyLearning
E1	SydneyPeople - Unistaff
L7	Student Centre
M10	Student Housing
L7	Student Services Unit
K8	Summer School
O5	Sydnovate
F3	United States Studies Centre
H3	University Relations (Vice Principal)
C3	Veterinary Hospital & Clinic
H2	Vice-Chancellor

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Course planner

Year	Semester	Unit of study 1 & credit points		Unit of study 2 & credit points		Unit of study 3 & credit points		Unit of study 4 & credit points		Total credit points
1	1									
	2									
2	summer									
	1									
	winter									
	2									
3	summer									
	1									
	winter									
	2									
4	summer									
	1									
	winter									
	2									
5	summer									
	1									
	winter									
	2									
								Total credit points		