The University of Sydney

Faculty of Science Handbook 2004

University dates

University semester and vacation dates 2004

Summer School	
Lectures begin	Monday 5 January
Lectures end	Friday 20 February
Semester 1	
Lectures begin	Monday 8 March
AVCC Common Week/non-teaching Easter Period	Friday 9 April to Friday 16 April
Last day of lectures	Friday 11 June
Study vacation: 1 week beginning	Monday 14 June to Friday 18 June
Examination period	Monday 21 June to Saturday 3 July
Semester ends	Saturday 3 July
AVCC Common week/non-teaching period	Monday 5 July to Friday 9 July
Semester 2	
Lectures begin	Monday 26 July
AVCC Common Week/non-teaching period	Monday 27 September to Friday 1 October
Last day of lectures	Friday 29 October
Study vacation	Monday 1 November to Friday 5 November
Examination period	Monday 8 November to Saturday 20 November
Semester ends	Saturday 20 November

Last dates for withdrawal or discontinuation 2004

Semester 1 units of study.	
Last day to add a unit	Friday 19 March
Last day for withdrawal	Wednesday 31 March
Last day to discontinue without failure (DNF)	Friday 30 April
Last day to discontinue (Discontinued – Fail)	Friday 11 June
Semester 2 units of study.	
Last day to add a unit	Friday 6 August
Last day for withdrawal	Tuesday 31 August
Last day to discontinue without failure (DNF)	Friday 17 September
Last day to discontinue (Discontinued – Fail)	Friday 29 October
Withdrawal from intensive units of study offered at any time.	
Last day to withdraw from an intensive unit with a duration of less than six weeks.	Close of business on the first teaching day.
Last day to withdraw from an intensive unit with a duration of six weeks or more but less than that of a standard semester.	Close of business on the fourteenth day after teaching has commenced.

University semester and vacation dates 2004–2006 are listed on the University Web site at www.usyd.edu.au/fstudent/undergrad/apply/scm/dates.shtml.

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NSW 2006
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The information in this handbook is subject to approval and/or change by the appropriate faculty of the University. Students should always check the accuracy of the information with faculty staff.

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Introduction

This is the Faculty of Science handbook. In it you will find a store of information about things you need to know about the Faculty and the University. In particular, it will help you to find out who are the people in your Faculty, the requirements for degrees in the Faculty and the ways that these can be satisfied.

Chapter 1 is the 'who and where' of the Faculty, names and locations of people and offices you are likely to need to contact during the year.

Chapter 2 contains 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 this chapter in conjunction with chapters 3 and 5.

Chapter 3 contains 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 5.

Chapter 4 introduces the Faculty's Talented Student Program and gives contact details for coordinators in participating departments and schools.

In chapter 5 you will find the fine print, the undergraduate degree resolutions (rules) covering your degree. The information in this chapter takes precedence over all other information in chapters 2 and 3. 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.

Postgraduate students should look at the coloured pages, chapters 6 and 7, for enrolment information regarding their degrees. Chapter 6 contains enrolment advice and, for coursework students, unit of study information. Like chapter 5, chapter 7 contains the degree resolutions or rules, only for postgraduate degrees. You should make sure you read the resolutions pertaining to your degree. It will probably prove useful to read this in conjunction with the information in chapter 6.

Chapter 8 contains scholarships and prizes information for both undergraduate and postgraduate students.

In chapter 9 the staff of the Faculty are listed under their School or Department.

General University Information and the Glossary are handy reference pages for all sorts of services on campus or to explain that obscure term.

The Science Subject Area Index is a useful reference tool for students who know what they want to study, but don't know quite how it fits into the Faculty structure. Use it to help you locate the department or school that best serves your interests or needs.

Message from the Dean

Australia has recognised the importance of innovation, and science is its major source. The early part of the 21st century offers exciting opportunities and challenges for science. New inter-disciplinary approaches are evolving to solve a wide range of environmental, marine, health and technology related problems. In the post-genomic era, with access to advanced computing and new research techniques, science is at the basis of major technological developments. Science also uses these developments to address the human side through social, environmental and medical applications. There are many challenges for those who choose a science or a science-related career now. Opportunities also exist to combine science with commerce, arts, education, engineering, law and nursing, giving a new angle to a career in science.

Science has a key role to play in the sustainable development and the protection of our planet from further degradation, and in its restoration. Science must also tackle the problems of the conservation of existing energy sources and the development of new ones as well as the control of disease and the promotion of health. Science is critical to understanding human behaviour, computers and systems in society, and how these interact with the biological and physical environment. Who in 1900 would have imagined the scientific advances of the 20th century? And who can predict where science will take us in the next 100 years? Just as the past 100 years have seen a revolution in transport and information technology, there will be many (as yet unimaginable) developments in these areas and in other areas such as biotechnology, information science and neuroscience during the next decades.

Science impacts on all areas of our life. Scientists study the small electrical potentials of the brain as well as the massive electrical charges generated in the upper atmosphere. Science is concerned with the structure of the universe, the structure of the ocean bed, the structure of a butterfly wing, as well as the structure of an atom. It is concerned with thinking and theorising as well as with applying knowledge in all sorts of inventive ways.

Adaptable, well-trained, critical and creative scientists will always be at a premium. The degree programs offered in science at The University of Sydney are of exceptional quality and produce scientists and science-based professionals of the highest calibre. Many of our academic staff have won excellence in teaching awards, and the Faculty has exceptional research strength. The science degree programs at The University of Sydney are designed to offer challenges and excitement at a range of different levels, including the Talented Students' Program, Advanced Science degree and the BSc with its specialist streams that provide more directed science training, including in some cases, opportunities for industry placements. The Faculty of Science has excellent links with industry and a wide range of employers and will provide opportunities throughout your degree to explore career options.

In designing the degree programs we have been particularly careful to ensure that you can specialise if you wish, but that you don't have to make that decision before having completed a general first year in Science. The first year experience in Science 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. The variety of innovative teaching methods used across the Faculty help ensure that you will 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 aim to help you expand your interest in finding out how things function, develop lifelong strategies for learning new approaches, and gain skills to explore and use information in a wide range of contexts.

Don Taylor, Acting Dean.

1 Contact information

Information in this section is accurate as at 1 October, 2003.

The Faculty of Science

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Email: faculty@science.usyd.edu.au
Web: www.science.usyd.edu.au

■ Bachelor degree program coordinators

BSc (Advanced Maths):	A/Prof Charles Macaskill
BSc (Bioinformatics):	Dr Lars Jermin
BSc (Environmental):	Dr Craig Barnes, Dr Philip McManus
BSc (Marine Science):	Dr Craig Barnes, Dr Adele Pile
BSc (Molecular Biology & Genetics):	A/Prof Merlin Crossley
BSc (Molecular Biotechnology):	Prof Anthony Weiss
BSc (Nutrition):	A/Prof Samir Samman
B Medical Science:	A/Prof Ian Spence
B Computer Science & Technology:	Dr Geoff Kennedy
B Information Technology:	Dr Irena Koprinska
B Psychology:	Prof Robert Boakes
B Liberal Studies:	A/Prof Charles Macaskill
B Science Media & Communications:	A/Prof Charles Macaskill

■ Schools, departments, centres

Agricultural, Food & Natural Resources

Room 304, McMillan Building, A05
Phone: (02) 9351 2935
Fax: (02) 9351 2945
Email: dean@agric.usyd.edu.au
Web: www.agric.usyd.edu.au/su/agric/

Academic advisers

Agricultural Chemistry	
Undergraduate:	Dr Robert Caldwell
Honours:	Prof Ivan Kennedy
Graduate:	Dr Robert Caldwell
Soil Science	
Intermediate year:	Dr Balwant Singh
Senior :	Dr Balwant Singh
Honours:	Prof Alex McBratney
Graduate:	Dr Balwant Singh

Department of Anatomy and Histology

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Fax: (02) 9351 2813
Email: enquiries@anatomy.usyd.edu.au
Web: www.anatomy.usyd.edu.au
Head of Department: Professor Bill Webster

Academic advisers

Anatomy	
Undergraduate:	Dr John Mitrofanis, Dr Denise Donlon
Graduate:	Dr Frank Lovicu, Dr John Mitrofanis
Histology	
All years:	Prof Christopher R Murphy, A/Prof Maria Byrne

Biochemistry

see Molecular and Microbial Biosciences

Institute for Biomedical Research

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Web: www.ibr.usyd.edu.au
Director: Professor Nick Hunt

Cell Pathology

see Pathology

School of Biological Sciences

Science Road Cottage, A10
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Web: www.bio.usyd.edu.au
Head of School: Associate Professor Rosalind T Hinde

Academic advisers

Junior year:	Dr Susan Franklin
Intermediate year:	A/Prof Ben Oldroyd
Senior year:	A/Prof Ben Oldroyd
Honours year:	Dr Murray Henwood
Graduate adviser:	A/Prof Robyn Overall

School of Chemistry

School of Chemistry, F11
Phone: (02) 9351 4504
Fax: (02) 9351 3329
Email: enquiries@chem.usyd.edu.au
Web: www.chem.usyd.edu.au
Head of School: Professor Trevor Hambley

Academic advisers

Junior year:	Dr Adrian George
Intermediate year:	Dr Ron Clarke
Senior year:	A/Prof Tony Masters
Honours year:	Dr Cameron Kepert
Graduate adviser:	Dr George Bacskay

Computational Science

see Physics

Computer Science

see Information Technologies

Centre for Research on Ecological Impacts of Coastal Cities

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Phone: (02) 9351 4835
Fax: (02) 9351 6713
Email: eicc@bio.usyd.edu.au
Web: www.eicc.bio.usyd.edu.au
Director: Professor Antony J Underwood

Academic advisers

Graduate:	Prof Antony Underwood

Environmental Science

Admin: Room 469, Madsen Building, F09
Phone: (02) 9351 2972
Fax: (02) 9351 3644
Email: craigb@mail.usyd.edu.au
Web: http://www.usyd.edu.au/envsci/
Director: Dr Phil McManus

Academic advisers

Undergraduate:	Dr Craig Barnes Dr Phil McManus
Graduate:	Dr Craig Barnes

Fruit Fly Research Centre

Botany Building, A12
Phone: (02) 9351 2541
Fax: (02) 9351 7504
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Web: www.bio.usyd.edu.au/fruitfly/index.htm
Chair: Associate Professor Christopher B Gillies

School of Geosciences

Geology and Geophysics: Edgeworth David Building, F05
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Fax: (02) 9351 0184
Email: admin@es.usyd.edu.au
Web: www.geosci.usyd.edu.au/
Head of School: Professor John Connell

Academic advisers

Geography	
Junior year:	Dr Melissa R. Neave
Intermediate year:	A/Prof Phil Hirsch
Senior year:	Dr Stephen Gale
Honours year:	Dr Phil McManus
Graduate adviser:	A/Prof Deirdre Dragovich
Geology and Geophysics	
Junior year:	Mr Tom Hubble
Intermediate year:	Dr Patrice Rey
Intermediate year Environmental Geology:	Dr Gavin Birch
Senior year:	Dr Michael Hughes
Honours year:	Dr Derek Wyman
Graduate adviser:	Dr Derek Wyman

History and Philosophy of Science Unit

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Web: www.usyd.edu.au/hps/
Director: Dr Rachel Ankeny

Academic advisers

Undergraduate:	Dr Rachel Ankeny
Honours:	Jason Grossman
Graduate:	Dr Hans Pols

Immunology Unit

Blackburn Building, D06
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Email: hbriscoe@med.usyd.edu.au
Web: www.med.usyd.edu.au/medicine/immunology
Unit Head: Professor W J Britton

Academic adviser

All years:	Dr Helen Briscoe

Department of Infectious Diseases

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Phone: (02) 9351 2412
Fax: (02) 9351 4731
Email: charbour@infdis.usyd.edu.au
Web: www.usyd.edu.au/su/infdis
Head of Department: Associate Professor Colin Harbour

Academic adviser

All years:	A/Prof Colin Harbour

School of Information Technologies

Room G71, Madsen Building, F09
Phone: (02) 9351 3423
Fax: (02) 9351 3838
Email: admin@it.usyd.edu.au
Web: www.it.usyd.edu.au
Head of School: Professor David Everitt (Professor David Feng from 1 January 2004)

Academic advisers

Undergraduate:	Dr Geoffrey Kennedy
Junior Year:	Dr Josiah Poon
Intermediate Year:	Dr Kalina Jacef
Senior Year:	Dr Vera Chung
Honours year:	Dr Ian Parkin
Graduate (coursework):	Prof Albert Zomaya
Graduate (research):	Prof David Everitt

University of Sydney Institute of Marine Science

Rm 211 Edgeworth David Building F05
Admin: Room 469, Madsen Building, F09
Phone: (02) 9351 2972
Fax: (02) 9351 3644
Email: craigb@mail.usyd.edu.au
Web: www.usyd.edu.au/marine
Director: Dr Dietmar Muller

Academic advisers

Undergraduate:	Dr Craig Barnes Dr Michael Hughes Dr Adele Pile
Graduate:	Dr Craig Barnes Prof Antony Underwood

School of Mathematics and Statistics

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Phone: (02) 9351 4533
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Web: www.maths.usyd.edu.au
Head of School: Associate Professor Don Taylor

Academic advisers

Junior year:	First-year Office; Ms Sandra Britton
Intermediate year	
Applied Mathematics:	Dr D Ivers and Dr R Thompson
Mathematical Statistics:	Mrs Mary Phipps
Pure Mathematics:	Dr Roger Eyland
Senior year	
Applied Mathematics:	Dr Chris Cosgrove
Mathematical Statistics:	Dr Shelton Peiris
Pure Mathematics:	Dr Nigel O'Brian & Dr Adrian Nelson
Honours year	
Applied Mathematics:	Dr Hugh Luckock
Mathematical Statistics:	A/Prof Malcolm Quine
Pure Mathematics:	Dr Laurentiu Paunescu
Graduate adviser:	Dr David Easdown

Microbiology

See Molecular and Microbial Biosciences

Australian Key Centre for Microscopy and Microanalysis

Room LG21, Madsen Building, F09
Phone: (02) 9351 2351
Fax: (02) 9351 7682
Email: kcentre@emu.usyd.edu.au
Web: www.emu.usyd.edu.au
Director: Associate Professor Simon Ringer

Academic adviser

Graduate:	Dr Vicki Keast

School of Molecular and Microbial Biosciences

Email: hos@mmb.usyd.edu.au
Web: www.mmb.usyd.edu.au
Head of School: Professor Richard Christopherson

Biochemistry Discipline

Room 633, Biochemistry/Microbiology Building, G08
Phone: (02) 9351 2235/2597
Fax: (02) 9351 4726
Email: hod.biochem@mmb.usyd.edu.au
Head of Discipline: Professor Philip Kuchel

Microbiology Discipline

Room 501, Biochemistry/Microbiology Building, G08
Phone: (02) 9351 2536
Fax: (02) 9351 4571
Email: hod.micro@mmb.usyd.edu.au
Head of Discipline: Professor Peter Reeves

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Room 473, Biochemistry/Microbiology Building, G08
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Email: hod.hnu@mmb.usyd.edu.au
Head of Discipline: Professor Ian Caterson

Molecular Biotechnology

Room 614, Biochemistry/Microbiology Building, G08
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Fax: (02) 9351 8685
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Head of Discipline: Professor Anthony Weiss

Academic advisers

Graduate adviser:	A/Prof Alan Jones
Biochemistry	
Intermediate year Biochemistry	Dr Dale Hancock Dr Charles Collyer
Intermediate year Molecular Biology & Genetics:	A/Prof Emma Whitelaw
Medical Science:	A/Prof Arthur Conigrave
Senior year:	Mrs Jill Johnston
Honours year:	A/Prof Merlin Crossley
Human Nutrition	
Intermediate year:	Dr Diane Volker
Senior year:	A/Prof Samir Saman
Honours year:	Prof Jennie Brand Miller
Microbiology	
Intermediate year:	Dr Peter New
Senior year:	Dr Dee Carter Dr Tom Ferenci
Honours year:	Dr Tom Ferenci
BMedSc:	Mrs Helen Agus
Molecular Biotechnology	
All years	Prof Anthony Weiss

Nutrition

See School of Molecular & Microbial Sciences

Department of Pathology

Room 501, Blackburn Building, D06
Phone: (02) 9351 2414/2600
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Email: fi@pathology.usyd.edu.au
Web: www.med.usyd.edu.au/path/
Head of Department: Professor Nicholas H. Hunt

Academic advisers

Undergraduate:	Professor Nicholas Hunt A/Prof Nicholas King
Graduate:	Dr John Gibbins

Department of Pharmacology

Room 215, Blackburn Building, D06
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Fax: (02) 9351 3868
Email: nimmir@pharmacol.usyd.edu.au
Web: www.usyd.edu.au/su/pharmacology/
Head of Department: Associate Professor Ewan Mylecharane

Academic advisers

Pharmacology	
Intermediate year:	Dr Hilary Lloyd
Senior year:	A/Prof Ian Spence Professor Graham Johnston
Honours year:	A/Prof Robin Allan
Graduate adviser:	Dr Robert Vandenberg

School of Physics

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Web: www.physics.usyd.edu.au
Head of School: Associate Professor Brian James

Academic advisers

Junior year:	Dr John O'Byrne
Intermediate year:	Dr Gordon Robertson
Senior year:	A/Prof Tim Bedding
Honours year:	Dr Anne Green
Graduate adviser:	Dr Geraint Lewis
Computational Science:	Dr Mike Wheatland

Department of Physiology

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Email: enquiries@physiol.usyd.edu.au
Web: www.physiol.usyd.edu.au
Head of Department: Associate Professor Rebecca Mason

Academic advisers

Intermediate year:	Dr Miriam Frommer
Medical Science:	Mrs Franciose Janod Groves
Senior year:	Dr Joseph Hoh Dr Bill Phillips Mrs Irene Schneider
Honours year:	Prof David Allen
Graduate adviser:	Professor M. Bennett

Key Centre for Polymer Colloids

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Email: gilbert@chem.usyd.edu.au
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Director: Professor Robert G Gilbert

School of Psychology

Room 410, Griffith Taylor Building, A19
Phone: (02) 9351 2872
Fax: (02) 9351 2603
Email:Email: enquiries@psych.usyd.edu.au
Web: www.psych.usyd.edu.au
Head of School: Professor Ian Curthoys

Academic advisers

Junior year:	Dr Julie Hatfield
Intermediate year:	A/Prof Joel Michell
Senior year:	A/Prof Joel Michell
Honours year:	Prof Sally Andrews
GradDipSc(Psych): Doctor of Clinical Psych: Graduate adviser:	Dr Alan Craddock Dr Caroline Hunt Dr David Grayson

2 Undergraduate enrolment advice and policies

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 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 5. The tables of undergraduate units of study available for each degree and unit descriptions appear in chapter 3.

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'?

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 of the Science Handbook 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 (and Advanced), Bachelor of Computer Science and Technology (and Advanced), Bachelor of Information Technology, Bachelor of Science in Media and Communications and the Bachelor of Liberal Studies (Advanced and International).

How many credit points should I take per semester?

You should take 24 credit points each semester if you are a full time student. If you take less 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. The degree summaries and sample programs in this chapter assume you will enrol full time.

Do I need to be full time?

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 check carefully 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.

International students are required to be full 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. Lists of available units of study will be available on enrolment day, or in each faculty's handbook.

Also –- available are undergraduate units from any other faculty at the university. The onus however is on you to get written permission from the relevant department and bring it to the Faculty of Science.

But –- 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 credit for previous tertiary study?

Yes. The amount of credit you can receive depends on your individual circumstances, but in general is capped at 48 credit points for a degree already completed or 96 credit points for an incomplete degree.

If you apply for credit before enrolment day and receive a letter in return specifying the credit awarded you can make your unit of study choices with this information in mind on enrolment day itself. You should bring this letter with you.

If you do not apply for credit before enrolment day you will have to make unit of study choices as if you have had no previous university study. You should then apply that day for your credit request to be processed. Because of the large numbers of applications received at enrolment there can be a considerable delay in processing your application. It is in your best interests to apply in the year preceding your planned enrolment.

The Faculty must sight originals of your academic transcripts, as well as unit of study descriptions clearly indicating credit point value or hours per week, and length of units you want credited. You may only apply for credit ONCE in your degree.

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 98.8 and a result in band 6 in at least one HSC Science subject area, and/or a result in band E4 of 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.

■ Science at Orange

Courses offered at Orange

The Faculty of Science offers the first year of the Bachelor of Science, Bachelor of Computer Science and Technology and the Bachelor of Liberal Studies at the Orange campus.

Units of study

The units of study that are available at Orange may be obtained by visiting the Orange campus Web site at www.orange.usyd.edu.au

Continuing at the Camperdown campus

In order to transfer to the Camperdown campus of The University of Sydney, students must normally successfully complete at least 36 credit points of units of study at Orange.

■ Bachelor of Science (BSc)

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 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 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 elective units of study from Science, Arts, Economics, Engineering 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: chapter 3);
- 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;
- no more than 18 credit points from units in which a grade of Pass (Concessional) has been awarded (Pass (Concessional) is awarded for Junior units of study only) Note: Pass (Concessional) will no longer be awarded by the Faculty of Science from 2004; and
- 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 32 credit points in any one semester without permission;
- before being admitted 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, 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; and
- 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 chapter 3. Unit descriptions follow the tables. You may also wish to refer to the handbooks of other faculties as the degree resolutions allow.

Pass (Concessional)

Pass (Concessional) will no longer be awarded by the Faculty of Science from 2004.

Honours

There will be Honours courses in all Science subject areas. Please refer to 'Honours in the Faculty of Science' in this chapter, and to 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 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 Dean.

Universities Admissions Index (UAI)

The minimum UAI for admission to the course varies from year to year. You should not be deceived about the level of difficulty of the BSc degree course.

Degree resolutions

See chapter 5.

■ 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

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			
		8	8	4	4			24
	2	Major 1 Intermediate 2XXX	Major 2 Intermediate or Science elective	Elective	Elective			
		8	8	4	4			24
Year 3	1	Major 1 3XXX	Major 2 or elective	Major 2 or elective	Major 2 or elective			
		12	4	4	4			24
	2	Major 1 3XXX	Major 2 or elective	Major 2 or elective	Major 2 or elective			
		12	4	4	4			24
							Total credit points:	144

Require: 144cp total, min. 96cp Science, min 36cp Junior Science incl. 12cp Maths, max. 60cp Junior, one major.

particular Science Subject Area. Students should also consult Table I: Bachelor of Science and school/department advisers for further information on major requirements.

Agricultural Chemistry

Major not offered at the Advanced level.
12 credit points of Junior units of study in each of Biology + Chemistry + Mathematics + 12 credit points from one of Physics, Geology or Geography.

Anatomy and Histology

Major not offered at the Advanced level.
12 credit points of Junior units of study in either Biology or Psychology + 12 credit points of Mathematics + 24 credit points from Junior Chemistry, or Junior Physics, Mathematics or from units of study selected in consultation with an adviser.

Biochemistry

Major offered at the Advanced level.
12 credit points of Junior units of study in each of Biology + Chemistry + Mathematics +12 credit points from units of study selected in consultation with an adviser.

Biology

Planning for a Biology major

12 credit points of Junior Biology are needed to enrol in Intermediate units of study in Biology. Students intending to major in Biology should take at least 16 credit points of Intermediate Biology. The Biology major is also offered at the Advanced level.

Recommended Junior combinations for a Biology major

BIOL (1001 or 1101 or 1901) + BIOL (1002 or 1902) + 12 credit points of Junior units of study in Chemistry + Mathematics +12 credit points from units of study selected in consultation with an adviser.

Junior Biology Information

BIOL 1001 – Concepts in Biology is an introductory unit recommended for students who have not studied HSC biology.
BIOL 1101 – Biology – Ecosystems to Genes is recommended for students who have HSC biology.
BIOL 1002 – Living Systems is suitable for students who want to go onto plant, animal or molecular biology.
BIOL 1003 – Human Biology is suitable for students who specifically want to go onto human related units of study.

Assumed knowledge

A biology bridging course is recommended for students who have not studied HSC biology.

Advanced Biology

If you have a UAI of at least 93 and an HSC Biology result in the 90th percentile or better, or Distinction or better in a University level Biology unit you are eligible to enrol in Advanced units of study in Junior Biology. It is not necessary to enrol in both semester 1 and semester 2 Advanced units of study.

Related Junior subject areas

It is recommended that you take 12 Junior credit points of Chemistry, preferably CHEM 1101 and CHEM 1102, or their equivalent, if you intend to proceed into any Intermediate year Biology, Biochemistry or Molecular Biology and Genetics units of study.

Cell Pathology

Major not offered at the Advanced level.
12 credit points of Junior units of study in each of Chemistry + Physics + Mathematics + Biology 1001 or 1101 or 1901 + Biology 1002 or 1003 or 1902 or 1903.

Chemistry

Planning for a Chemistry major

12 credit points of Junior Chemistry are needed to enrol in Intermediate units of study in Chemistry. Students intending to major in Chemistry should take at least 16 credit points of Intermediate Chemistry. The Chemistry major is also offered at the Advanced level.

Recommended Junior combinations for a Chemistry major

12 credit points of Junior units of study in each of Chemistry + Mathematics + 24 credit points from other areas of study selected in consultation with an adviser.

Junior Chemistry Information

CHEM 1001 and 1002 are recommended for students whose Chemistry background is weak or non-existent.

CHEM 1101 and 1102 are recommended for students who have HSC Chemistry. Students intending to enrol in Intermediate and Senior Chemistry should take this level or higher.

Assumed knowledge

A chemistry bridging course is recommended for students who have not studied chemistry for the HSC and wish to take Chemistry 1A and 1B or higher.

Advanced Chemistry and Special Studies

If you have a UAI of at least 93 and an HSC chemistry result in the 80th percentile or better, you are eligible to choose Advanced Chemistry units. The Special Studies Program is designed for the truly exceptional Chemistry student and entry is by invitation only. The minimum requirement for entry to CHEM 1903 is a UAI of 98.7 and an HSC result in the 94th percentile or better.

Computational Science

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). In addition, a variety of Junior and Intermediate units of study offered across the Faculty provide a solid basis for Senior studies and sufficient knowledge to apply Computational Science

in specific areas of science. The Computational Science major is also offered at the Advanced level.

Recommended Junior combinations for a Computational Science major

COSC 1001 + COSC 1002 + SOFT 1001 + SOFT 1002 + 12 credit points of Junior Mathematics + 18 credit points selected in consultation with an adviser.

Junior Computational Science information

Junior COSC units of study are useful for later studies in computational science, but are not prerequisites.

Advanced Computational Science

Junior COSC units of study are also offered at the Advanced level. To enrol in COSC 1901 (Advanced) or COSC 1902 (Advanced) you must have a UAI of 90 or more, or have a Distinction or better in another Junior COSC or SOFT unit.

Assumed knowledge

See individual units for entry requirements.

Computer Science

Major offered at the Advanced level.
SOFT 1001 + SOFT 1002 + MATH 1001 + MATH 1002 + MATH 1005 + (MATH 1003 or MATH 1004) + 24 credit points of other Junior units of study. (Each of the above units of study can be replaced by the corresponding Advanced unit of study).

Financial Mathematics and Statistics

Major offered at the Advanced level.
MATH 1001+MATH 1002+MATH 1003+MATH 1005+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.

Geography

Major not offered at the Advanced level.
12 credit points of Junior units of study in each of Geography + Mathematics + either Geology or Biology l00l or 1101 or 1901 or 1002 or 1902 + either Chemistry or Physics.

Geology

Major not offered at the Advanced level.
12 credit points of Junior units of study in each of Geology + Chemistry or Physics + Mathematics + two units of study selected in consultation with an adviser.

Geophysics

Major not offered at the Advanced level.
12 credit points of Junior units of study in each of Geology + Physics + Mathematics + two units of study selected in consultation with an adviser.

History and Philosophy of Science

Planning for a major in History and Philosophy of Science

Currently History and Philosophy of Science is not available as Junior units of study. 24 credit points of Junior study are needed to enrol in Intermediate units of study in the History and Philosophy of Science. Students intending to major in History and Philosophy of Science must take 8 credit points of Intermediate History and Philosophy of Science. We strongly encourage pursuit of a double major in History and Philosophy of Science and another area of Science, with completion of the appropriate Junior units of study for that major.

Recommended Junior combinations

12 credit points of Junior units of study in 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 elective units of study from History, Philosophy, Gender Studies, Physics, Psychology, or other related areas of study in arts or science in consultation with an History and Philosophy of Science adviser about appropriate combinations of electives to help prepare for an History and Philosophy of Science major.

Related Junior subject areas

Students interested in related topics should consider taking the unit Concepts and Issues in Physical Science (PHYS 1600) which serves as useful background for further studies in History and Philosophy of Science and counts as an Arts elective

Immunobiology

Major not offered at the Advanced level.
Immunology is offered at Intermediate and Senior levels. 24 credit points of Junior units of study from any of the science discipline areas is required for Intermediate study in Immunology. We recommend these include: BIOL 1001 or 1101 or 1901 and BIOL 1002 or 1902 or 1003 or 1903 and MATH 1015 or MATH 1005 or 1905 and CHEM 1001 and 1002 or CHEM 1101 / 1901 and 1102 / 1902. For the Immunobiology major the minimum requirement is Senior Immunology, IMMU 3002 and 12 credit points from the elective Senior units of study listed in Table I. Intermediate studies must include Introductory Immunology, IMMU 2001. MBLG 2001/2901 is highly recommended and students should note the prerequisites for each elective to determine their choice of concurrent Intermediate study units.

Information Systems

Major not offered at the Advanced level.
ISYS 1003 + 6 credit points of a language unit (ENGL 1005 or LNGS [1001 or 1002 or 1005]) +12 credit points of Junior Mathematics units of study + 24 credit points selected in consultation with an adviser.

Marine Science

Major not offered at the Advanced level.
Biology 1001 or 1101 or 1901 + Biology 1002 or 1902 + 12 credit points of Junior units of study in each of Geosciences + Mathematics + Chemistry or Physics + Mathematics.

Mathematics

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 16 credit points of Intermediate Mathematics. The Maths major is also offered at the Advanced level.

Recommended Junior combinations for a Mathematics major

MATH 1001/1901/1906 + MATH 1002/1902 + MATH 1003/ 1903/1907+ MATH (1004/1904 or 1005/1905) + 36 other Junior credit points.

Junior Mathematics information

If you have HSC Mathematics: MATH 1011, 1012, 1013 and 1015 (all Life Sciences). Note that no progression to later year Mathematics is possible, except in very special circumstances.

If you have HSC Mathematics Extension 1: MATH 1001, 1002 and two from MATH 1003, 1004 or 1005 (all Normal).

Advanced Mathematics and Special Studies

If you have HSC Mathematics extension 2, you are eligible to choose MATH 1901, 1902, 1903 or 1904.

If you have HSC Mathematics extension 2, or a result in Band E2 or better of HSC Mathematics Extension 1 you are eligible to choose MATH 1905.

If you have a result in Band E4 of HSC Mathematics Extension 1 you may be eligible to choose MATH 1901, 1902 and 1904. Please consult with the School's Director of First Year Studies.

If you have a UAI of at least 98.5 and a result in Band E4 of HSC Mathematics Extension 2 you are eligible to be invited into: MATH 1906 – Mathematics (Special Studies Program) A.

Assumed knowledge

Bridging courses in mathematics are recommended for students who do not have the assumed knowledge for their selected level of Mathematics study.

Mathematics in other majors

Statistics majors: must include MATH 1015/1005/1905 and MATH 1003/1903.

Computer Science majors: Should include MATH 1005/1905.

Biological and other Life Science majors: should include MATH 1015/1005/1905.

Medicinal Chemistry

Major offered at the Advanced level.
12 credit points of Junior units of study in each of Chemistry + Physics + Mathematics + Biology 1001 or 1101 or 1901 + Biology 1002 or 1003 or 1902 or 1903.

Microbiology

Major offered at the Advanced level.
12 credit points in each of Junior Biology, Chemistry and Mathematics + 12 credit points from other areas.

Nanoscience and Technology

Major offered at the Advanced level.
12 credit points in each of Chemistry, Mathematics and Physics + MECH 2300 + 8 credit points chosen in consultation with an adviser.

Neuroscience

Major possible at the Advanced level.
12 credit points of Junior Mathematics + 24 credit points from Biology, Chemistry, Computer Science, Physics or Psychology + 12 credit points chosen in consultation with an adviser.

Pharmacology

Major offered at the Advanced level.
12 credit points of Junior units of study in each of Chemistry + Physics + Mathematics + Biology 1001 or 1101 or 1901 + Biology 1002 or 1003 or 1902 or 1903.

Physics

Planning for a Physics major

12 credit points of Junior Physics are needed to enrol in Intermediate units of study in Physics. 8 credit points of Intermediate Physics in semester 1 completes a 'first pass' through Physics begun in Junior Physics. Students intending to major in Physics should take at least 16 credit points of Intermediate Physics. The Physics major is also offered at the Advanced level.

Recommended Junior combinations for a Physics major

12 credit points of Junior units of study in each of Physics + Chemistry + Mathematics (MATH 1001/1901 + MATH 1002/1902 + MATH 1003/1903 + MATH 1005/1905) + 12 credit points of other Junior units of study selected in consultation with an adviser.

Junior Physics information

Your choice of units in Junior Physics in semester 1 is governed by your Physics experience at school.

PHYS 1001 (Regular) is for those who scored 65 or more in HSC Physics (or equivalent).

PHYS 1002 (Fundamentals) is primarily for those who have not studied physics before, or who scored less than 65 in HSC Physics.

In semester 2 your choice should be determined by your interests and the direction of your future studies.

Students from any first semester option may move into either PHYS 1003 (Technological) or PHYS 1004 (Environmental & Life Science).

You may choose to study PHYS 1003 (Technological) in either semester, but we recommend completing one of the semester 1 units beforehand if possible.

Advanced Physics

Junior Physics units of study are also offered at the Advanced level.

To enrol in PHYS 1901 (Advanced) or PHYS 1902 (Advanced) you must have a UAI of 96 or more or a HSC Physics result in Band 6 (or equivalent), or have successfully completed the other Junior Physics (Advanced) unit, or have a Distinction or better in the appropriate non-Advanced Junior Physics unit.

If you have a very high UAI you may be invited to participate in activities of the Physics Talented Student Program (TSP).

Assumed knowledge

A bridging course in Physics is recommended for students who did not study Physics at the HSC.

Other Junior options

Students interested in Astronomy may enrol in PHYS 1500 (Semester 2 only). It should be noted that PHYS 1500 is a general interest course, has no maths or physics requirements and does not count towards the 12 credit points needed for progression to Intermediate Physics or the BSc (Marine Science) program. Students wishing to pursue careers in Astronomy or Astrophysics should also take other Physics units in order to progress to Intermediate Physics.

PHYS 1600 Concepts and Issues in Physics Science is offered in the Faculty of Arts. It does not count towards the 12 credit points needed for progression to Intermediate Physics. PHYS 1600 does not count as a Science unit, but as an Arts unit.

Physiology

Major offered at the Advanced level.
6 credit points of Junior Chemistry + 12 credit points of Mathematics + 18 credit points of Junior Chemistry, Biology, Physics, Psychology + 12 credit points from other areas.

Psychology

Planning for a Psychology major

12 credit points of Junior Psychology are needed to enrol in Intermediate units of study in Psychology. A major in Psychology requires 16 credit points of Intermediate Psychology plus at least 32 credit points of Senior Psychology. The Psychology major is not offered at the Advanced level.

Note: If planning to complete a second Science major with Psychology (double major) students are advised to complete 8 credit points of Senior Psychology in the second semester of year 2 (see Psychology Web page).

Recommended Junior combinations for a Psychology major

PSYC 1001 + PSYC 1002 + 12 credit points of Junior units of study in Mathematics including MATH 1015 or 1005 or 1905 (statistics) + 12 credit points of Junior Science electives + 12 credit points of Junior electives.

Junior Psychology Information

PSYC 1001 and 1002 provide an introduction to Psychology for all Psychology students.

Assumed Knowledge

All students are eligible to enrol in PSYC 1001 and 1002. There is no assumed knowledge.

Soil Science

Major not offered at the Advanced level.
12 credit points of Junior units of study in each of Chemistry + Mathematics + Physics or Computer Science + 12 credit points from other areas.

Statistics

Planning for a Statistics major

The Junior Mathematics, units MATH 1005/1905 and MATH 1001/1901/1906, are needed to enrol in Intermediate units of study in Statistics and MATH 1005/1903/1907 are required to complete a major in Statistics. Students intending to major in Statistics should take 16 credit points of Intermediate Statistics. The Statistics major is also offered at the Advanced level.

Recommended Junior combinations for a Statistics major

See entry under Mathematics.

Junior Mathematics information

See entry under Mathematics.

Advanced Mathematics and Special Studies

See entry under Mathematics.

Assumed knowledge

Bridging courses in mathematics are recommended for students who do not have the assumed knowledge for their selected level of Statistics study.

Statistics in other majors

Computer Science majors: Should include MATH 1005/1905.
Biological and other Life Science majors: should include MATH 1015/1005/1905.

■ Bachelor of Science (Advanced)

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 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 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 elective units of study from Science, Arts, Economics, Engineering or other faculties.

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			
		8	8	4	4			24
	2	Major 1 Intermediate 29XX	Major 2 Intermediate or Science elective 2XXX	Intermediate or Senior elective	Intermediate or Senior elective			
		8	8	4	4			24
Year 3	1	Major 1 39XX	Major 2 or elective 3XXX	Major 2 or elective 3XXX	Major 2 or elective 3XXX			
		12	4	4	4			24
	2	Major 1 39XX	Major 2 or elective 3XXX	Major 2 or elective 3XXX	Major 2 or elective 3XXX			
		12	4	4	4			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. 16cp Intermediate Advanced and/or TSP, min. 24cp Senior Advanced and/or TSP major.

- Advanced students usually take 24 credit points of the above at the Advanced level.
- no more than 48 credit points from Junior units of study;

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 16 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; and
- 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 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 in chapter 3. Unit descriptions follow the tables. You may also wish to refer to the handbooks of other faculties as the degree resolutions allow.

Pass (Concessional)

Pass (Concessional) will no longer be awarded by the Faculty of Science from 2004.

Honours

There are Honours courses in all Science subject areas. 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 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 from year to year.

Degree resolutions

See chapter 5.

■ Bachelor of Science (Advanced Mathematics)

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 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; and
- 12 credit points of elective units of study from Science, Arts, Economics, Engineering 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;

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 19XX	MATH 19XX	Science elective 1XXX	Science elective 1XXX	Elective		
		3	3	6	6	6		24
	2	MATH 19XX	MATH 19XX	Science elective 1XXX	Science elective 1XXX	Elective		
		3	3	6	6	6		24
Year 2	1	MATH 29XX	MATH 29XX	Major 2 Intermediate or Science elective 2XXX	Intermediate or Senior Science elective	Intermediate or Senior Elective		
		4	4	8	4	4		24
	2	MATH 29XX	MATH 29XX	Major 2 Intermediate or Science elective 2XXX	Intermediate or Senior elective	Intermediate or Senior Elective		
		4	4	8	4	4		24
Year 3	1	MATH 39XX	MATH 39XX	MATH 39XX	Major 2 or elective 3XXX	Major 2 or elective 3XXX	Major 2 or elective 3XXX	
		4	4	4	4	4	4	24
	2	MATH 39XX	MATH 39XX	MATH 39XX	Major 2 or elective 3XXX	Major 2 or elective 3XXX	Major 2 or elective 3XXX	
		4	4	4	4	4	4	24
							Total credit points:	144

Require: 144cp total, min. 96cp science, max. 48cp Junior incl. 12cp Maths, min. 48cp Senior, min. 16cp Intermediate Advanced and/or TSP Maths and/or Stats, min. 24cp Senior Advanced and/or TSP Maths and/or Stats.

- at least 16 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
- 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.

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 in chapter 3. Unit descriptions follow the tables. You may also wish to refer to the handbooks of other faculties as the degree resolutions allow.

Pass (Concessional)

Pass (Concessional) will no longer be awarded by the Faculty of Science from 2004.

Honours

There are Honours courses in Mathematics and Statistics. 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 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 from year to year.

Degree resolutions

See chapter 5.

■ Bachelor of Science (Bioinformatics)

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 5) 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; and
- 12 credit points of Junior units of study in the Science subject area of Computer Science (SOFT 1001/1901 and SOFT 1002/1902).

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 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. Consultation with the degree coordinator or a Faculty adviser is always recommended..

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	MATH 1XXX	MATH 1XXX	BIOL 1XXX	CHEM 1XXX	SOFT 1XXX		
		3	3	6	6	6		24
	2	MATH 1XXX	MATH 1XXX	BIOL 1XXX	CHEM 1XXX	SOFT 1XXX		
		3	3	6	6	6		24
Year 2	1	SOFT 2X04	MBLG 2XXX	Life Science elective	MATH/SOFT elective			
		4	8	8	4			24
	2	SOFT 2XXX	MBLG 2XXX	Life Science elective	MATH/SOFT elective			
		4	8	8	4			24
Year 3	1	SOFT 3XXX	Life Science elective	SOFT/ MATH/ PHYS elective	SOFT/ MATH/ PHYS elective			
		4	12	4	4			24
	2	BINF 3001	Life Science elective	SOFT/ MATH/ PHYS elective				
		8	12	4				24
							Total credit points:	144

Require: 144cp total, and units of study as per Table IA.

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.

Pass (Concessional)

Pass (Concessional) will no longer be awarded by the Faculty of Science from 2004.

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 3.

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 may be permitted to transfer from other courses offered by the Faculty of Science or any of its streams into the BSc (Bioinformatics) with the permission of the Dean.

Universities Admissions Index (UAI)

The minimum UAI for admission into the course varies from year to year.

Degree resolutions

See chapter 5.

■ Bachelor of Science (Environmental)

Summary of requirements

The requirements for the degree are set out in Table IB: Bachelor of Science (Environmental) (see chapter 3) and the Senate and Faculty Resolutions (see chapter 5) 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:

- ENVI 1001 and ENVI 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; and
- 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, ENVI 2001 and ENVI 2002;
- the Senior Environmental Science units of study, ENVI 3001 and ENVI 3002.

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. Consultation with the degree coordinator or a Faculty adviser is always recommended. Students can also check the Environmental Science Web site for further information: www.usyd.edu.au/envsci

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 3. Unit descriptions follow the tables.

Pass (Concessional)

Pass (Concessional) will no longer be awarded by the Faculty of Science from 2004.

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 3.

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.

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	MATH 1XXX	MATH 1XXX	ENVI 1001	BIOL 1XXX	CHEM 1XXX		
		3	3	6	6	6		24
	2	MATH 1XXX	MATH 1XXX	ENVI 1002	BIOL 1XXX	CHEM1XXX		
		3	3	6	6	6		24
Year 2	1	ENVI 2001	Table IB elective	Table IB elective				
		8	8	8				24
	2	ENVI 2002	Table IB elective	Table IB elective				
		8	8	8				24
Year 3	1	ENVI 3001	Table IB elective					
		12	12					24
	2	ENVI 3002	Table IB elective					
		12	12					24
							Total credit points:	144

Require: 144cp total, and units of study as per Table IB.

Transferring into the BSc (Environmental)

Students may be permitted to transfer from other courses offered by the Faculty of Science or any of its streams into the BSc (Environmental) with the permission of the Dean. You may also discuss your plans with the Environmental Science Administrative Coordinator (see chapter 1 for contact details).

Universities Admissions Index (UAI)

The minimum UAI for admission into the course varies from year to year

Degree resolutions

See chapter 5.

■ Bachelor of Science (Marine Science)

Summary of requirements

The requirements for the degree are set out in Table IC: Bachelor of Science (Marine Science) (see chapter 3) and the Senate and Faculty Resolutions (see chapter 5) 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 Geography and/or Geology;
- 6 credit points of Junior units of study in the Science subject area of Physics; and
- 6 credit points of Junior units of study in the Science subject area of Chemistry;
- 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:

- 16 credit points from Intermediate Marine Science units of study;
- 36 credit points from Senior Marine Science units of study; and
- no more than 48 credit points from Junior units of study.

Major in Tropical Marine Science

You should also note that a major strand of study is available in Tropical Marine Science within this degree program. A major strand of study in Tropical Marine Science must include:

- 36 credit points from Senior units of study in Marine Science and/or Tropical Marine Network Program (NTMP) including at least 18 credit points from NTMP units of study;
- no more than 30 credit points may be from NTMP units of study;

The NTMP units of study are offered in block/intensive mode during Easter and July breaks and there are only a limited number of places available in each. Students may enrol in NTMP units of study starting in their Intermediate year (students must contact the Faculty Office for permission to enrol in these units of study) but places are not guaranteed and will be assigned based on merit. The NTMP units of study are conducted at the following field stations in Queensland: North Stradbroke Island, Heron Island, Lizard Island, Orpheus Island, and One Tree Island, and students are responsible for their own travel and accommodation costs. Consult The University of Sydney Institute for Marine Science (USIMS) for further information.

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	MATH 1XXX	MATH 1XXX	PHYS 1XXX	BIOL 1XXX	GEOL/GEOG		
		3	3	6	6	6		24
	2	MATH 1XXX	MATH 1XXX	CHEM 1X01	BIOL 1XXX	GEOL/GEOG		
		3	3	6	6	6		24
Year 2	1	MARS 2001	MARS 2003	BIOL 2XXX	Science elective			
		4	4	8	8			24
	2	MARS 2002	MARS 2004	BIOL 2XXX	Science elective			
		4	4	8	8			24
Year 3	1	MARS 3XXX	MARS 3XXX	MARS 3XXX	Table IC elective			
		6	6	6	6			24
	2	MARS 3XXX	MARS 3XXX	MARS 3XXX	Table IC elective			
		6	6	6	6			24
							Total credit points:	144

Require: 144cp total, and units of study as per Table IC.

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. Consultation with a Faculty or USIMS adviser is always recommended. Students can also check the Marine Science Web site for further information at www.usyd.edu.au/marine.

Pass (Concessional)

Pass (Concessional) will no longer be awarded by the Faculty of Science from 2004.

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. Unit descriptions follow the tables.

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 3.

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) with permission of the Dean.

Universities Admissions Index (UAI)

The minimum UAI for admission into the course varies from year to year.

Degree resolutions

See chapter 5.

■ Bachelor of Science (Molecular Biology and Genetics)

This is an Advanced degree program.

Summary of requirements

The requirements for the degree are set out in Table ID: Bachelor of Science (Molecular Biology and Genetics) (see chapter 3) and the Senate and Faculty Resolutions (see chapter 5) 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 requiring HSC Maths Extension 1 or 2 and include some statistics);
- Biology (1001 or 1101 or 1901) and (1904 or 1905);
- 12 credit points of Junior units of study in the Science subject area of Chemistry (CHEM 1907 and 1909 is the preferred option); and
- 12 credit points of elective Junior Science units of study: Physics or Computer Science are recommended.
- Advanced students usually take 24 credit points of the above at the Advanced level.

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 of which at least 16 credit points are completed at either the Advanced level or as TSP units; and
- 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.

Progression requirements

This is an Advanced degree. 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. 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. Consultation with the degree coordinator or a Faculty adviser is always recommended.

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 3. Unit descriptions follow the tables.

Pass (Concessional)

Pass (Concessional) will no longer be awarded by the Faculty of Science from 2004.

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	MATH 1XXX	MATH 1XXX	BIOL 1X01	CHEM 1907	Science elective		
		3	3	6	6	6		24
	2	MATH 1XXX	MATH 1XXX	BIOL 190X	CHEM 1909	Science elective		
		3	3	6	6	6		24
Year 2	1	MBLG 2X01	CHEM 2903	Science elective				
		8	8	8				24
	2	MBLG 2X02	MICR 2909	Science elective				
		8	8	8				24
Year 3	1	BCHM 3X01	BIOL 3X18	BIOL 3X27				
		12	6	6				24
	2	Table ID elective	Table ID elective					
		12	12					24
							Total credit points:	144

Require: 144cp total, and units of study as per Table ID.

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 3.

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

Universities Admissions Index (UAI)

The minimum UAI for admission into the course varies from year to year.

Degree resolutions

See chapter 5.

■ Bachelor of Science (Molecular Biotechnology)

This degree program is taught mainly by departments in the Faculty of Science and includes industry participation.

Summary of requirements

The requirements for the degree are set out in Table IE: Bachelor of Science (Molecular Biotechnology) (see chapter 3) and the Senate and Faculty Resolutions (see chapter 5) 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; and
- 12 credit points of elective units of study from Science, Agriculture, Arts, Economics, Engineering 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. Consultation with the degree coordinator or a Faculty adviser is always recommended.

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 3. Unit descriptions follow the tables.

Pass (Concessional)

Pass (Concessional) will no longer be awarded by the Faculty of Science from 2004.

Honours

Please refer to 'Honours in the Faculty of Science' in this chapter, and Table VI: Honours units of study in chapter 3. 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) with the permission of the Dean.

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	MATH 1XXX	MATH 1XXX	BIOL 1XXX	CHEM 1XXX	Elective		
		3	3	6	6	6		24
	2	MATH 1XXX	MATH 1XXX	BIOL 1XXX	CHEM 1XXX	Elective		
		3	3	6	6	6		24
Year 2	1	MOBT 2001	MBLG 2XXX	CHEM 2311	Table IE elective			
		4	8	4	8			24
	2	MOBT 2002	MBLG 2XXX	CHEM 2312	Elective			
		4	8	4	8			24
Year 3	1	MOBT 3001	Table IE elective 3XXX	AGCH/ BCHM/ BIOL or CHEM 3XXX				
		6	12	6				24
	2	MOBT 3002	Table IE elective 3XXX					
		12	12					24
							Total credit points:	144

Require: 144cp total, and units of study as per Table IE.

Universities Admissions Index (UAI)

The minimum UAI for admission into the course varies from year to year.

Degree resolutions

See chapter 5.

■ Bachelor of Science (Nutrition)

The requirements for the degree are set out in Table IF: Bachelor of Science (Nutrition) (see Chapter 3) and the Senate and Faculty Resolutions (see Chapter 5) wich 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 subject areas of Mathematics and Statistics;
- 12 credit points in the Science subject area of Biology;
- 12 credit points in the Science subject area of Chemistry (CHEM 1908 and CHEM 1909 preferred option); and
- 12 credit points in the Science subject areas of Computer Science, Physics or Psychology.

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. See the Bachelor of Science entry for additional information. There is also a degree planner inside the back cover. Consultation with the degree coodinator or a Faculty adviser is always recommended.

Units of study

The Science units of study available for this degree are set out in Table IF: Bachelor of Science (Nutrition) and in Table I: Bachelor of Science in chapter 3. Unit of study descriptions follow the tables.

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 Junior year and a WAM of 65 in Intermediate and Senior years, or be transferred to the BSc.

Pass (Concessional)

Pass (Concessional) will no longer be awarded by the Faculty of Science from 2004.

Honours

Please refer to 'Honours in the Faculty of Science' in this chapter, and to Table VI: Honours units of study in chapter 3. 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 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 (Nutrition)

Students may transfer from other courses offered by the Faculty of Science or any of its streams into the BSc (Nutrition) with the permission of the Dean.

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	MATH 1XXX	MATH 1XXX	BIOL 1XXX	CHEM 1908	SOFT/ PHYS/ PSYC elective		
		3	3	6	6	6		24
	2	MATH 1XXX	MATH 1XXX	BIOL 1XXX	CHEM 1909	SOFT/ PHYS/ PSYC elective		
		3	3	6	6	6		24
Year 2	1	NUTR 2901	MBLG 2X01	PHSI 2001	MICR/ CHEM/ PCOL elective			
		8	8	4	4			24
	2	NUTR 2902	BCHM 2X02	PHSI 2002	MICR/ CHEM/ PCOL elective			
		8	8	4	4			24
Year 3	1	NUTR 3901	Table IF elective 3XXX					
		12	12					24
	2	NUTR 3902	BCHM 3X02					
		12	12					24
Year 4 (Clinical*)	1	NUTR 4001						
		24						24
	2	NUTR 4002						
		24						24
Year 4 (Research*)	1	NUTR 4101	NUTR 4102					
		12	12					24
	2	NUTR 4103	NUTR 4014					
		12	12					24
							Total credit points:	192

Require: 192cp total, and units of study as per Table IF

* Students do Honours in either Nutrition and Dietetics (Clinical) or in Nutrition (Research) strands.

Universities Admissions Index (UAI)

The minimum UAI for admission into the course varies from year to year.

Degree resolutions

See chapter 5.

■ Combined BAppSc(Exercise and Sport Science)/BSc(Nutrition) degrees

See also entry for BSc(Nutrition) and Faculty of Health Sciences Handbook

Summary of requirements

The requirements for the degrees are set out in the Senate and Faculty Resolutions (see chapter 5) 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 141 credit points from Science subject areas;
- at least 13 credit points from the Science subject areas of Mathematics and Statistics;
- at least 99 credit points of units of study in Exercise and Sport Science
- an Honours year (48 credit points) in Nutrition or Nutrition and Dietetics

Units of study

Units of study are listed in Table IG; unit prerequisites are listed in Table I and Table IG, 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 following the tables in each handbook.

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 at 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

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	CHEM 1101/1908	BACH 1149	BIOS 1135	BIOS1137	EXSS1018		
		6	4	4	3	6		23
	2	CHEM 1102/1909	BIOS 1139	BIOS1133	EXSS1005	EXSS1019	EXSS1022	
		6	3	3	3	4	6	25
Year 2	1	MBLG2001	NUTR2901	BIOS2098	EXSS2019			
		8	8	3	6			25
	2	BCHM2002	NUTR 2912	MATH1013	EXSS2022			
		8	6	3	6			23
Year 3	1	MATH 1011	MATH 1015	EXSS 3939	EXSS 3031	EXSS 3021	EXSS 3023	
		3	3	4	4	4	6	24
	2	BACH 2132	EXSS 2020	EXSS 2023	EXSS 3026	EXSS 3027		
		4	4	4	6	6		24
Year 4	1	NUTR 3901	STAT 2002	EXSS 4006				
		12	4	8				24
	2	BCHM 3002/3902	NUTR 3902					
		12	12					24
BAppSc (Exercise, Sports Science and Nutrition)								
Require: 192cp total, min. 91cp Science, min. 101cp Exercise and Sport Science								

Honours in Nutrition and Dietetics

Year 5	1	NUTR 4001	
		24	24
	2	NUTR 4002	
		24	24
BAppSc(Ex & Sports Sc) & BSc (Nut) Nutrition and Dietetics Honours			Total credit points: 240
Require: 240cp total, min. 139cp Science, min. 13cp Maths, min 101cp in Exercise and Sport Science, 48cp Honours units n Nutrition & Dietetics.			

Honours in Nutrition

Year 5	1	NUTR 4101	NUTR 4102	
		12	12	24
	2	NUTR 4103	NUTR 4104	
		12	12	24
BAppSc(Ex & Sports Sc) & BSc (Nut) Nutrition Honours			Total	240
Require: 240cp total, min. 139cp Science, min 36cp Junior Science incl. 13cp Maths, min 101cp in Exercise and Sport Science, 48cp Honours units n Nutrition.				

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 from year to year.

Degree resolutions

See chapter 5

■ Combined Science/Law degrees (BSc/LLB)

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 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;
- LAWS 1006, LAWS 1010 and LAWS 1008.

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. *Students who first enrolled in a combined Science/Law degree prior to 2001 should note that the order and credit point values of some units of study have been changed as the result of adoption of new resolutions. Such students will complete their degrees under old resolutions and should consult the information on page 122 of the 2000 Faculty of Science handbook.*

For commencing 2004 students, Law units of study are taken in the following sequence:

- in the first year of attendance the student will take LAWS 1006, LAWS 1008 and LAWS 1010;
- in the second year of attendance the student will take LAWS 1002 and LAWS 1003; and
- in the third year of attendance the student will take LAWS 3000 and LAWS 3002.

In the combined Science/Law course students will spend the first three years at the Camperdown campus during which time the Science degree will be completed along with the equivalent of one year's study towards the Law degree. The remainder of the course will be completed at the Law School in the city (St James campus) over a period of two years. Full details of the units of study to be completed during this time are included 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 16 credit points of Intermediate Science units of study at either the Advanced level or as TSP units (for BSc (Advanced Mathematics) at least 16 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.

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	LAWS 1006		
		3	3	6	6	6		24
	2	MATH 1XXX	MATH 1XXX	Science elective A 1XXX	Science elective B 1XXX	LAWS 1010	LAWS 1008	
		3	3	6	6	6	0	24
Year 2	1	Major Intermediate 2XXX	Intermediate Science elective 2XXX	LAWS1002				
		8	8	8				24
	2	Major Intermediate 2XXX	Intermediate Science elective 2XXX	LAWS1003				
		8	8	8				24
Year 3	1	Major 3XXX	LAWS 3000	Science elective				
		12	10	4				26
	2	Major 3XXX	LAWS 3002					
		12	10					22
							Total credit points:	144

Require: 144cp total, min. 96cp Science, min 36cp Junior Science incl. 12cp Maths, min. 60cp Intermediate & Senior Science, one major.
Law units as per Table II.

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. 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, 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.

Pass (Concessional)

Pass (Concessional) will no longer be awarded by the Faculty of Science from 2004.

Honours

Students interested in graduating with Honours should bear the following in mind:

- 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 third year of the Combined course. Please note that the Faculty of Law generally permits only one year of suspension of candidature from the Bachelor of Laws degree (including the combined Law degree). Alternatively, it may be possible for students to defer an Honours year in Science until after the completion of the entire combined course.
- There is no separate Honours year for the degree of Bachelor of Laws. Graduation with honours in Law is based on weighted average marks (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 1st three years of the combined course while the student is completing the Science segment of the course.

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.

Universities Admissions Index (UAI)

The minimum UAI for admission into the course varies from year to year.

Degree resolutions

See chapter 5.

■ Combined Science/Arts & Arts/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 5) 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 either a BA/BSc or BSc/BA course.

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 Part A of the table of undergraduate units of study in the Faculty of Arts.

To qualify for the award of the pass degrees in the BA/BSc 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 100 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.

To qualify for the award of the pass degrees in the BSc/BA course a student normally shall satisfy the requirements for the BSc in the first six semesters of enrolment.

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 16 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 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 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 16 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. Consultation with a Faculty adviser is always recommended.

Pass (Concessional)

Pass (Concessional) will no longer be awarded by the Faculty of Science from 2004.

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 3.

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	MATH 1XXX	MATH 1XXX	Science elective A 1XXX	Science elective B 1XXX	Arts elective 1XXX		
		3	3	6	6	6		24
	2	MATH 1XXX	MATH 1XXX	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			
		8	4	4	6			22
	2	Science major Intermediate 2XXX	Intermediate Science elective 2XXX	Intermediate Science elective 2XXX	Arts elective 1XXX			
		8	8	4	6			26
Year 3	1	Science major	Elective	Arts elective				
		12	6	6				24
	2	Science major 3XXX	Elective	Arts elective 1XXX				
		12	6	6				24
Year 4	1	Elective	Arts Senior elective	Arts Senior elective major				
		8	8	8				24
	2	Int/ Senior elective	Arts Senior elective	Arts Senior elective major				
		8	8	8				24
Year 5	1	Arts Senior elective	Arts Senior elective	Arts Senior elective major				
		8	8	8				24
	2	Elective	Arts Senior elective	Arts Senior elective major				
		8	8	8				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 72cp Senior Arts including one Arts major.

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 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

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 from year to year.

Degree resolutions

See chapter 5.

■ Combined Engineering/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 5) 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:

- 80 credit points from Science subject areas and 160 credit points from prescribed Engineering units of study; 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 56 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. 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. Unit descriptions follow the tables. The Engineering units of study available for this degree are set out in tables in the Faculty of Engineering handbook.

Pass (Concessional)

Pass (Concessional) will no longer be awarded by the Faculty of Science from 2004.

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 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 Engineering 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 from year to year.

Degree resolutions

See chapter 5.

■ Double degree in Science/ Engineering

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, of which no more than 12 credit points are from units of study with the grade of Pass (Concessional); 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:

- 40 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 80 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. 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. Unit descriptions follow the tables. The Engineering units of study available for this degree are set out in tables in the Faculty of Engineering handbook.

Pass (Concessional)

Pass (Concessional) will no longer be awarded by the Faculty of Science from 2004.

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 40 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 40 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 5.

■ Combined Science/Commerce 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 5) 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 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 award of the pass degrees a student shall complete units of study to a total value of at least 240 credit points including:
- 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, not including MATH 1015/1005/1905;
  (b) ECMT 1010 and INFS 1000;
  (c) 12 credit points in Junior units of study from each of Accounting and Economics;
  (d) at least 24 credit points of Junior units of study from at least two Science subject areas other than Mathematics or Statistics; and
  (e) at least 96 credit points from Science subject areas;
- no more than 100 credit points from Junior units of study;
- at least 64 credit points of Senior units of study in Economics and Business from the list of approved majors for the BCom; and
- 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 16 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 the 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 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 16 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. Consultation with a Faculty adviser is always recommended.

Pass (Concessional)

Pass (Concessional) will no longer be awarded by the Faculty of Science from 2004.

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			
		8	4	4	6			22
	2	Science major Intermediate 2XXX	Intermediate Science elective 2XXX	Intermediate Science elective 2XXX	Commerce Junior core 1XXX			
		8	8	4	6			26
Year 3	1	Science major 3XXX	Commerce/ Science elective	Commerce Junior core 1XXX				
		12	6	6				24
	2	Science major 3XXX	Commerce/ Science elective	Commerce Junior core 1XXX				
		12	6	6				24
Year 4	1	Elective	Commerce Senior elective	Commerce Senior elective major				
		8	8	8				24
	2	Elective	Commerce Senior elective	Commerce Senior elective major				
		8	8	8				24
Year 5	1	Int/Senior elective	Commerce Senior elective	Commerce Senior elective major				
		8	8	8				24
	2	Int/Senior elective	Commerce Senior elective	Commerce Senior elective major				
		8	8	8				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 100cp Commerce, min 36cp specified Junior Commerce units, either a Commerce major (32cp) or a Commerce double major (48cp).

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 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

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 from year to year.

Degree resolutions

See chapter 5.

■ Combined Nursing/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 5) 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 Nursing and Bachelor of Science, Bachelor of Science (Advanced) or Bachelor of Science (Advanced Mathematics).

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 96 credit points from Science subject areas 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;
- a major in a Science area;
- no more than 60 credit points from Junior Science units of study;
- at least 132 credit points of units of study listed in the table of units for the degree of BN; and
- a further 12 credit points of electives taken from either Science or Nursing.

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 16 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 the 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 16 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.

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. Consultation with a Faculty adviser is always recommended.

Pass (Concessional)

Pass (Concessional) will no longer be awarded by the Faculty of Science from 2004.

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 Nursing units of study available for this degree are set out in the Faculty of Nursing 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.

Abandoning and discontinuing

Students may abandon the combined degree course and elect to complete either a BSc or a BN 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 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 Nursing.

Universities Admissions Index (UAI)

The minimum UAI for admission into the course varies from year to year.

Degree resolutions

See chapter 5.

■ 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 5) 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 Education (Secondary) and Bachelor of Science, Bachelor of Science (Advanced), Bachelor of Science (Advanced Mathematics) or Bachelor of Science (Psychology)

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;
- at least 32 credit points of units of study in Methods and Practice of Teaching; and
- 32 credit points in Teaching and Learning including successful completion of the practicum.

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;
- at least 32 credit points of units of study in Methods and Practice of Teaching; and
- 32 credit points in Teaching and Learning including successful completion of the practicum.

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 16 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 the 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 16 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)

To qualify for the award of the award of the pass degrees a student shall complete units of study to a total value of at least 244 credit points including:

Years I to III

- 48 credit points from prescribed Education units of study;
- in Year I, 12 credit points from Junior units of study in Mathematics and Statistics, Psychology and either Chemistry or Physics;
- in Year II, 16 credit points from Intermediate units of study in Psychology and 16 credit points from Intermediate units of study in Mathematics and Statistics, Chemistry or Physics;
- in Year III, 32 credit points from Senior units of study in Psychology;

Years IV & V

- 16 credit points from prescribed Education units of study;
- 16 credit points from prescribed units of study in School Counselling;
- 16 credit points from Senior units of study in either Mathematics and Statistics, Chemistry or Physics; and
- complete fourth year Honours or equivalent in Psychology (48 credit points).

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. 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. Unit descriptions follow the tables. The Education units of study available for this degree are set out in the Faculty of Education handbook.

Pass (Concessional)

Pass (Concessional) will no longer be awarded by the Faculty of Science from 2004.

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 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 Education.

Universities Admissions Index (UAI)

The minimum UAI for admission into the course varies from year to year.

Degree resolutions

See chapter 5.

■ Bachelor of Liberal Studies (BLibStud)

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 three streams - the Bachelor of Liberal Studies, Bachelor of Liberal Studies(Advanced) and the Bachelor of Liberal Studies (International). The Faculties of Arts and Science jointly administer the degree.

The requirements for the degree are set out in the Senate and Faculty Resolutions (see chapter 5) 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 28 credit points, including 16 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 ENGL 1005 and LNGS 1005);
- a minimum of 6 credit points from units of study in Mathematics and Statistics; and
- no more than 18 credit points from units in which a grade of Pass (Concessional) has been awarded (Pass (Concessional) is awarded for Junior units of study only) *Note: Pass (Concessional) will no longer be awarded by the Faculty of Science from 2004.*

You should also note the following:

- A maximum of 28 credit points may be counted towards the degree requirements from units of study offered by faculties other than the Faculties of Arts and Science and in addition to those listed in Part B of the Table of units of study for the Bachelor of Arts.
- All other units of study must come from Part A of the Table of units of study for the Bachelor of Arts or from Table I: Bachelor of Science.

B Liberal Studies (International)

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 65 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.

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 ENGL 1005 or LNGS 1005			
		6	6	6	6			24
	2	Science Junior elective A	Arts/Science Junior elective B	Language Junior elective	Maths or ENGL 1005 or LNGS 1005			
		6	6	6	6			24
Year 2	1	Science major Intermediate elective	Arts/Science Junior elective	Language Intermediate elective				
		8	6	8				22
	2	Science major Intermediate elective	Arts/Science Junior elective	Language Intermediate elective				
		8	6	8				22
Year 3	1	Science major Senior elective	Arts major Senior elective	Junior elective				
		12	8	6				26
	2	Science major Senior elective	Arts major Senior elective	Junior elective				
		12	8	6				26
Year 4	1	Arts/Science Intermediate/Senior elective	Arts major Senior elective	Intermediate/Senior elective				
		8	8	8				24
	2	Arts/Science Intermediate/Senior elective	Arts major Senior elective	Intermediate/Senior elective				
		8	8	8				24
							Total credit points:	192

Require: 192cp total, min. 120cp Intermediate and/or Senior, one Arts major and one Science major, min. 28cp non-english language incl. min. 16cp Intermediate and/or Senior, min. 6cp Mathematics and Statistics, 6cp communication skills, max 28cp non Science/Arts.

B Liberal Studies (Advanced)

To qualify for the award of the pass degree in the Bachelor of Liberal Studies (Advanced) stream, in addition to the requirements for the Bachelor of Liberal Studies degree a student must complete one of the following two patterns of enrolment. Either (1) from units in the Faculty of Science at least 16 credit points of Intermediate 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; and maintain a credit average across all units of study attempted in each calendar year OR (2) from units in the Faculty of Arts a minimum of 32 credit points and a maximum of 64 credit points in total from designated 'Advanced' units of study, a maximum of 32 credit points from 'Advanced' units of study from any one subject area, and maintain a credit average across all units of study attempted in each calendar year.

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. Consultation with an adviser from the Faculty of Arts and/or Science is always recommended. Each Faculty has an Associate Dean responsible for Liberal Studies.

Pass (Concessional)

Pass (Concessional) will no longer be awarded by the Faculty of Science from 2004.

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. 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 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 3.

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 65 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.

Transfer between the BLibStud and the BLibStud(Advanced)

Students who have completed at least 48 credit points may be permitted to transfer from the Bachelor of Liberal Studies to the Bachelor of Liberal Studies (Advanced) stream 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.

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.

Supervision

General supervision of students alternates between the Faculties of Arts and Science every two years. For 2004 the Faculty of Science is the supervising faculty.

Universities Admissions Index (UAI)

The minimum UAI for admission to the course varies from year to year.

Degree Resolutions

See chapter 5.

■ Bachelor of Computer Science and Technology (BCST)

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 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. Students can also consult the School of Information Technologies Web site at www.it.usyd.edu.au.

Enrolment guide

There will be major changes to the curriculum in 2005. These will result in a large number of changes to the units listed in Table III. Transitional arrangements will be made to enable current students to complete the requirements of the BCST under the rules listed below. These transitional arrangements will be explained in full on the School of Information Technologies Web site at www.it.usyd.edu.au/

Students should consult this Web site to assist them in selecting their units.

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 92 credit points from Table III associated with the degree of Bachelor of Information Technology, including:

Sample Bachelor of Computer Science & 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	Unit of study 6 & credit points	Total
Year 1	1	MATH 1XXX	MATH 1XXX	SOFT 1X01	Elective	Elective		
		3	3	6	6	6		24
	2	MATH 1XXX	MATH 1XXX	SOFT 1X02	Elective	Elective		
		3	3	6	6	6		24
Year 2	1	SOFT 2X04	Table III(ii) elective	MATH elective	Table III (ii/iii) IT-related elective	Elective		
		4	4	4	4	8		24
	2	SOFT 2X01	Table III(ii) elective	Table III (ii/iii) IT-related elective	Table III (ii/iii) IT-related elective	Elective		
		4	4	4	4	8		24
Year 3	1	Table III(iv/v) elective	Table III(iv/v) elective	Table III(iv/v) elective	Table III(iv/v) elective	Elective	Elective	
		4	4	4	4	4	4	24
	2	Table III(iv/v) elective	Table III(iv/v) elective	Table III(iv/v) elective	Table III(v) Project	Elective		
		4	4	4	8	4		24
							Total credit points:	144

Require: 144cp total, min. 92cp Table III, max. 72 Junior, min. 16cp Maths, 20cp Table III(i), min. 8cp Table III(ii),min. 36cp Table III(iv), min. 8cp Table III(v), min 40cp from COMP, INFO, ISYS, MULT, NETS, SOFT.

(a) at least 20 credit points from III(i)
(b) at least 8 credit points from III (ii)
(c) at least 36 credit points from III (iv) and/or III (v)
(d) at least 8 credit points from III (v)

- at least 16 credit points from the Science subject areas of Mathematics and Statistics
- at least 40 credit points from units of study which have codes starting other than INFO, COMP, ISYS, MULT, NETS, SOFT
- no more than 18 credit points from units of study in which a grade of Pass (Concessional) has been awarded. *Note: Pass (Concessional) will no longer be awarded by the Faculty of Science from 2004*
- at most 72 credit points from Junior units of study

You should also note the following:

- you can complete majors in Principles of Computer Science, Information Systems, Multimedia Technology, Networks and Systems, Software Development, Digital Systems and Computational Science as defined in Table IIIA: Bachelor of Information Technology majors, but it is not necessary to complete a major in order to qualify for 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 32 credit points in any one semester without permission
- before being permitted 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.

Plans of units of study

It is important when choosing units of study at any stage of your university career that you should consider your overall degree program. The BCST is designed as a flexible degree program which enables students with a strong interest in computing to combine a core of fundamental computer science topics with a wide range of subjects in other computationally based disciplines. There is a sample degree program below and there is also a degree planner inside the back cover. Consultation with a Faculty adviser is always recommended.

Units of study

The units of study available for this degree are set out in Table III: Bachelor of Information Technology and in Table I: Bachelor of Science in chapter 3. Unit descriptions follow the tables.

Pass (Concessional)

Pass (Concessional) will no longer be awarded by the Faculty of Science from 2004.

Honours

There will be honours in the subject areas of Computer Science and Information Systems. 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 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 for special consideration should be made in writing to the Associate Dean (Undergraduate) after discussion with staff in the Faculty Office.

Transferring into the BCST

Students may transfer from the Bachelor of Computer Science and Technology (Advanced) or the Bachelor of Information Technology into the Bachelor of Computer Science and Technology with the permission of the Dean.

Universities Admissions Index (UAI)

The minimum UAI for admission to the Faculty varies from year to year.

Degree resolutions

See chapter 5.

■ Bachelor of Computer Science and Technology (Advanced)

Summary of requirements

The Bachelor Computer Science and Technology (Advanced) degree program requires the equivalent of three years of full time study. An Honours program is available and requires the equivalent of a further year of full time study. The Resolutions of the Senate and Faculty governing candidature for the degree of Bachelor of Computer Science and Technology listed in chapter 5 also govern the BCST (Advanced) degree program

Enrolment guide

There will be major changes to the curriculum in 2005. These will result in a large number of changes to the units listed in Table III. Transitional arrangements will be made to enable current students to complete the requirements of the BCST(Adv) under the rules listed below. These transitional arrangements will be explained in full on the School of Information Technologies Web site at www.it.usyd.edu.au/

Students should consult this Web site to assist them in selecting their units.

To complete your degree you must satisfy the requirements outlined for the BCST and gain credit for at least 144 credit points. The 144 credit points required for the degree must include:

- at least 16 credit points of Intermediate units of study from Table III (i) and/or III (ii) at either the Advanced level or as TSP units
- 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 taken from Table III (iv) and/or III (v)

Progression requirements

In order to enrol in the necessary number of Advanced units of study specified, students must achieve at least Distinction performance in the prerequisite units of study.

Universities Admissions Index (UAI)

The minimum UAI for admission to the Faculty varies from year to year.

Transferring into the BCST (Advanced) degree program

Students who have completed at least 48 credit points may be permitted to transfer to the BCST (Advanced) from the BCST or BIT 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.

Degree resolutions

See chapter 5.

■ Bachelor of Information Technology (BIT)

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 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. Students can also consult the School of Information Technologies Web site at www.it.usyd.edu.au.

Enrolment guide

There will be major changes to the curriculum in 2005. These will result in a large number of changes to the units listed in Table III. Transitional arrangements will be made to enable current students to complete the requirements of the BCST(Adv) under the rules listed below. These transitional arrangements will be explained in full on the School of Information Technologies Web site at www.it.usyd.edu.au/

Students should consult this Web site to assist them in selecting their units.

To complete your degree you must gain credit for at least 192 credit points. The 192 credit points required for the degree must include:

- at least 144 credit points from Table III: Bachelor of Information Technology (in chapter 3), including
  - (a) at least 20 credit points from III (i) with results of Credit or better
  - (b) at least 16 credit points from III (ii) with results of Credit or better
  - (c) at least 72 credit points from III (iv) and/or III (v)
  - (d) either INFO 3600 or INFO 4991
- at least 16 credit points are from the Science subject areas of Mathematics and/or Statistics
- at least 40 credit points are from units which have codes starting other than INFO, COMP, ISYS, MULT, NETS, SOFT
- at most 72 credit points from Junior units
- at least 84 credit points from Senior and/or Honours units

You should also note the following:

- you can complete majors in Principles of Computer Science,

Sample Bachelor of Information 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	Unit of study 6 & credit points	Total
Year 1	1	MATH 1XXX	MATH 1XXX	SOFT 1X01	Table III (iii/iv) IT related elective	Elective		
		3	3	6	6	6		24
	2	MATH 1XXX	MATH 1XXX	SOFT 1X02	Table III (iii/iv) IT related elective	Elective		
		3	3	6	6	6		24
Year 2	1	SOFT 2X04	Table III(ii) elective	Table III(ii) elective	MATH elective	Table III (iii/iv) IT related elective	Elective	
		4	4	4	4	4	4	24
	2	SOFT 2X01	Table III(ii) elective	Table III(ii) elective	Table III (iii/iv) IT related elective	Elective		
		4	4	4	4	8		24
Year 3	1	Table III(iv/v) elective	Table III(iv/v) elective	Table III(iv/v) elective	Table III(iv/v) elective	Table III(iv/v) elective	Elective	
		4	4	4	4	4	4	24
	2	Table III(iv/v) elective	Table III(iv/v) elective	Table III(iv/v) elective	Table III(iv/v) elective	Elective	Elective	
		4	4	4	4	4	4	24
Year 4	1	Table III(iv/v) elective	Table III(iv/v) elective	Table III(iv/v) elective	Table III(iv/v) elective	Elective	Elective	
		4	4	4	4	4	4	24
	2	Table III(iv/v) elective	Table III(iv/v) elective	INFO 3600/ INFO 4991	Elective			
		4	4	12	4			24
							Total credit points:	192

Require: 192cp total, min. 144cp Table III, max. 72cp Junior, min. 84cp Senior/Honours, min. 16cp Maths, min 20cp Table III(i), min. 16cp Table III(ii),min. 72cp Table III(iv/v),either INFO 3600 or INFO 4900, min 40cp from COMP, INFO, ISYS, MULT, NETS, SOFT.

Information Systems, Multimedia Technology, Networks and Systems, Software Development, Digital Systems, Language Technology* and Computational Science as defined in Table IIIA: Bachelor of Information Technology majors, but it is not necessary to complete a major in order to qualify for the degree
- 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 32 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 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.

** Subject to the approval of the Senate of the University of Sydney*

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 there is also a degree planner inside the back cover. Consultation with a Faculty adviser is always recommended.

Units of study

The units of study available for this degree are set out in Table III: Bachelor of Information Technology and in Table I: Bachelor of Science, in chapter 3 unit of study descriptions follow the tables.

Honours

The BIT may be awarded as an Honours degree. Students may enrol in the Honours course after completion of 144 credit point, if they meet the specified performance conditions. 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 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 for special consideration should be made in writing to the Associate Dean (Undergraduate) after discussion with staff in the Faculty Office.

Transferring into the BIT

Students who have completed at least 48 credit points may be permitted to transfer to the Bachelor of Information Technology degree from other degree programs, if their mark averaged over all attempted units of study is 70 or greater. A quota may apply to the number of students allowed to transfer into the BIT in a given calendar year.

Universities Admissions Index (UAI)

The minimum UAI for admission to the Faculty varies from year to year.

Degree resolutions

See chapter 5.

■ Bachelor of Medical Science (BMedSc)

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 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 Junior units of study, comprising 12 credit points each from Biology, Chemistry, Mathematics and Physics; with the permission of the Faculty 12 credit points of Biology may be replaced with Junior units of study in Computer Science or Psychology
- no more than 60 credit points from Junior units of study listed in Table IV: Bachelor of Medical Science
- 40 credit points of core Intermediate units of study
- a minimum of 36 credit points from Senior units of study taken from the subject areas of Anatomy and Histology, Biology (Genetics), Biochemistry, Cell Pathology, Immunology, Infectious Diseases, Microbiology, Pharmacology and Physiology listed in Table IV: Bachelor of Medical Science
- no more than 20 credit points from units of study other than those specified in Table IV: Bachelor of Medical Science.

Students are required to have completed at least 32 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 8 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 32 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 MATH 1003 and 1004 or 1903 and 1904 is not recommended in this degree. Students wishing to study Statistics/Calculus are advised to select from MATH 1003, 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 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 IV: Bachelor of Medical Science and in Table I: Bachelor of Science in chapter 3. Unit descriptions follow the tables.

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	MATH 1XXX	MATH 1XXX	CHEM 1XXX	PHYS 1XXX	BIOL 1XXX		
		3	3	6	6	6		24
	2	MATH 1XXX	MATH 1XXX	CHEM 1XXX	PHYS 1XXX	BIOL 1XXX		
		3	3	6	6	6		24
Year 2	1	BMED 2501	BMED 2502	BMED 2503	Elective			
		6	6	8	4			24
	2	BMED 2504	BMED 2505	BMED 2506	Elective			
		6	6	8	4			24
Year 3	1	Senior core 3XXX	Senior core 3XXX					
		12	12					24
	2	Senior core 3XXX	Senior core or elective(s)					
		12	12					24
							Total credit points:	144

Require: 144cp total, min 48cp Junior, min 40cp Intermediate core, min 36cp Senior core, no more than 20cp from units of study outside Table V.

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 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 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 would be necessary to gain admission. Students who wish to transfer must apply for admission to the BMedSc course through the Universities Admission Centre.

Universities Admissions Index (UAI)

The minimum UAI for admission to the course varies from year to year.

BMedSc degree resolutions

See chapter 5.

■ Combined Engineering/Medical Science degrees

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 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)
- 40 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.

* You cannot count any unit of study with the grade Pass (Concessional) toward the 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. 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 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 handbook.

Pass (Concessional)

Pass (Concessional) will no longer be awarded by the Faculty of Science from 2004.

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 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 Engineering.

Universities Admissions Index (UAI)

The minimum UAI for admission into the course varies from year to year.

Degree resolutions

See chapter 5.

■ Bachelor of Science in Media and Communications (BScMediaCommun)

Summary of requirements

The Bachelor of Science in Media and Communications is a four year degree in which students undertake a broad interdisciplinary education which encompasses training in a science area with training and industry experience in facets of the media (print journalism, radio, television and online media and communications). The science components are based on the units of study offered in the BSc leading to a Science major, while the media components draw on those units offered for the BA(Media & Communications) leading to a major in the area of media, and also including an industry internship with an organisation associated with science media. The degree is awarded with the grades of Pass and Honours depending on performance and fourth year stream. The requirements for the degree are set out in the Senate and Faculty Resolutions (see chapter 5 of this Handbook) 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 the Pass degree you must gain credit for at least 192 credit points. The 192 credit points required for the degree must include:

- at least 120 credit points of Intermediate or Senior units of study
- at least one Science major from those included in Table I: Bachelor of Science;
- a major in Media and Communications (normally 12 credit points from Junior units and at least 32 credit points from Intermediate and Senior units in MECO – listed in Table V: Bachelor of Science in Media and Communications);
- at least 8 credit points of Senior units from each of the areas of GOVT 2303, MECO 3003 and MECO 3005;
- 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 ENGL 1005);
- a minimum of 12 credit points from units of study in Mathematics and Statistics;
- 16 credit points from the Science Media and Communications Practice units SCMP 3001 and 3002 listed in Table V: Bachelor of Science in Media and Communications, taken in an approved industry in the fourth year of candidature.

You should also note the following:

- no more than 12 credit points from units of study in which the grade Pass (Concessional) has been awarded. Pass (Concessional) is awarded for Junior units of study only. Note: Pass (Concessional) will no longer be awarded by the Faculty of Science from 2004;.
- 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 32 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 schools/ departments);
- 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.

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 program below, and information about each major and recommended first year combinations of units of study listed under the Bachelor of Science. There is also a degree planner inside the back cover. Consultation with a Faculty adviser is always recommended.

Sample Bachelor of Science in Media and Communications (Pass degree)

	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	MECO 1001	Science elective 1XXX	ENGL 1005		
		3	3	6	6	6		24
	2	MATH 1XXX	MATH 1XXX	MECO 1003	Science elective 1XXX	Elective		
		3	3	6	6	6		24
Year 2	1	MECO 2001	Major Intermediate Science elective	Elective	Elective			
		8	8	4	4			24
	2	MECO 2002	MECO 2003	Major Intermediate Science elective				
		8	8	8				24
Year 3	1	Science major	MECO 3001	Elective				
		12	8	4				24
	2	Science major 3XXX	MECO 3002	Elective				
		12	8	4				24
Year 4	1	SCMP 3001	GOVT 2303	MECO 3005				
		8	8	8				24
	2	SCMP 3005	MECO 3003	Elective				
		8	8	8				24
							Total 192	9

Require: 192cp total, min. 12cp Maths and/or Stats, 6cp communication skills,, 16cp from Media and Communication Practice units, 8cp Senior from each of Government, Media, Law and Media, and Media Relations, min. 120cp Intermediate or Senior units, one Science major and a major in Media and Communications

Units of study

The units of study available for this degree are set out in Table V: Bachelor of Science in Media and Communications and the Science units of study are set out in Table I: Bachelor of Science in chapter 3. Unit descriptions follow the tables. You may also wish to refer to the handbooks of other faculties for details of other units of study, as allowed by the degree resolutions.

Pass (Concessional)

Pass (Concessional) will no longer be awarded by the Faculty of Science from 2004.

Honours

There will be an Honours stream in the fourth year of the Media and Communications program. To enrol in the Honours stream of the Bachelor of Science in Media and Communications degree, students shall have completed

(1) at least 144 credit points from the Bachelor of Science in Media and Communications degree including all compulsory units except the internship;
(2) a minimum of 40 credit points from Intermediate and Senior MECO units at an average grade of Credit or better; and
(3) any additional criteria set by the Program Committee Chair or Faculty.

Students are expected to complete the requirements for the honours course in Table V full-time over two consecutive semesters. However, if the Faculty is satisfied that a student is unable to attempt the honours course on a full-time basis and if the Program Committee Chair so recommends, permission may be granted to undertake honours half-time over four consecutive semesters.

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 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.

Transfer between the BScMediaCommun and the BSc

Students who have completed at least 48 credit points towards the BSc may, with the permission of the Dean, be permitted to transfer from the BSc to the BScMediaCommun if their marks over all attempted units of study average 75 or greater.

If a student enrolled in the BScMediaCommun has completed the normal requirements for the pass degree of BSc he or she may apply to take this degree provided that candidature for the BScMediaCommun is abandoned.

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 BSc, may apply to transfer candidature to the BSc.

Universities Admissions Index (UAI)

The minimum UAI for admission to the course varies from year to year.

Degree Resolutions

See chapter 5.

■ Bachelor of Psychology (BPsych)

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 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 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:

- at least 12 credit points of Junior Psychology units of study at an average grade 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
- at least 16 credit points of Intermediate Psychology units of study at an average grade of Distinction or better
- at least 36 credit points of Senior Psychology units of study (including PSYC 3201 and PSYC 3202) at an average grade of Distinction or better
- 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:

- no more than 18 credit points may be counted from units in which a grade of Pass (Concessional) has been awarded. *Note: Pass (Concessional) will no longer be awarded by the Faculty of Science from 2004.*
- 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 32 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
- 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 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 there is also 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.

Pass (Concessional)

Pass (Concessional) will no longer be awarded by the Faculty of Science from 2004.

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	PSYC 1001	MATH 1XXX	MATH 1XXX	Science elective 1XXX	Elective		
		6	3	3	6	6		24
	2	PSYC 1002	MATH 1XXX	MATH 1XXX	Science elective 1XXX	Elective		
		6	3	3	6	6		24
Year 2	1	PSYC 2111	PSYC 2112	Science elective	Elective			
		4	4	8	8			24
	2	PSYC 2113	PSYC 2114	Science elective	Elective			
		4	4	8	8			24
Year 3	1	PSYC 3202	PSYC 3XXX	PSYC 3XXX	PSYC 3XXX	PSYC 3XXX	PSYC 3XXX or elective	
		4	4	4	4	4	4	24
	2	PSYC 3201	PSYC 3XXX	PSYC 3XXX	PSYC 3XXX	PSYC 3XXX or elective	PSYC 3XXX or elective	
		4	4	4	4	4	4	24
Year 4	1	PSYC 4011	PSYC 4012					
		12	12					24
	2	PSYC 4013	PSYC 4014					
		12	12					24
							Total credit points:	192

Require: 192cp total, min 12cp Junior Psychology, min 16cp Intermediate Psychology, min 36cp Senior Psychology (incl. PSYC 3201 and PSYC 3202), min 48cp Honours Psychology, min. 96cp Science, min 12cp Maths, max 60cp Junior

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 3.

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 BPsych

Students may transfer from any degree into the BPsych with the permission of the Dean provided that they have completed at least 48 cps and have obtained a High Distinction average in at least 12 credit points of Junior Psychology units of study.

Universities Admission Index (UAI)

The minimum UAI for admission to the course varies from year to year.

Degree Resolutions

See chapter 5.

■ Honours in the Faculty of Science

Honours in the BSc (Including all streams and combined degrees), BCST, BMedSc

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 58 (or equivalent at another institution)

(4) satisfy any additional criteria set by the Head of Department concerned.

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

Honours in the BIT

Admission

To qualify to transfer into the Bachelor of Information Technology (Honours) degree, students shall

(1) have completed at least 144 credit points from the Bachelor of Information Technology degree;

(2) have completed a minimum of 24 credit points from Table III (iv) and/or III (v), or the equivalent at another institution;

(3) have achieved either a distinction average (75) in the relevant units of study in Table III (iv) and/or III (v), or a SCIWAM of at least 70;

(4) satisfy any additional criteria set by the Head of Department concerned.

To qualify for the award of the Bachelor of Information Technology (Honours) degree, students shall complete 192 credit points as outlined in Section 4 of the Resolutions, including at

least 42 credit points from Honours level units, including INFO 4990, INFO 4991, INFO 4992 and INFO 4999, with a result of at least 65 in INFO 4999. However, students who fail to meet the requirements for the award of honours and who have satisfied the requirements of the BIT will graduate with a pass BIT degree.
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.

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.

Honours in the BScMediaCommun and BLibStud

Admission
To qualify to enrol in the honours course, students shall
(1) (a) have completed the relevant degree with the grade of Credit
(b) be a pass graduate holding an equivalent qualification from another institution
(2) completed a major at Credit average in the subject area related to the intended honours course
(3) satisfy any additional criteria set by the Head or Chair of Department concerned.
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

Grades of Honours for all degrees

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 (at least 40 credit points of Honours level units of study for the BIT(Hons)).

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

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: 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.

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:

$$WAM = \frac{\sum(W_c \times M_c)}{\sum(W_c)}$$

where Wc is the weighted credit point value – ie, the product of the credit point value and 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

Ranking for postgraduate scholarships is determined by a combination of the SCIWAM and the Honours mark in the ratio 35:65.

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.

■ 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 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) before they can re-enrol.

The Faculty also resolved that, except with the prior permission of the Faculty, a student shall not be granted a suspension of candidature in order to enrol in another course of tertiary study. Candidature will lapse if a student enrols in another course of tertiary study after having been granted a suspension of candidature.

Satisfactory progress

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.

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
PCON	Pass (Concessional)* Junior units of study only. PCON (Pass Concessional) will no longer be awarded in any degree in the Faculty of Science from 2004	46–49
F	Fail	Below 46 or 50
AF	Absent Fail	
DF	Discontinued – Fail	
DNF	Discontinued – not to count as failure	

* A maximum of 18 credit points from Junior units of study with the grade of PCON may be counted for all degrees, except BScMediaCommun where the maximum is 12 credit points and BIT and BMedSc where no units with the grade of PCON may be credited.

Note: PCON (Pass Concessional) will no longer be awarded in any degree in the Faculty of Science from 2004

Honours

For Final Year Honours units of study, the following Honours grades apply from 1999. The grade of Honours is determined by the mark in the final year (Honours) course.

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[1]	

* Note that in these cases the award of the Pass degree is recommended.

Special consideration

The Faculty of Science recognises that the performance of students may be adversely affected by illness or other misadventure, and makes provision for special consideration of such disabilities when examination results are considered. Faculty intends only to compensate for sub-standard performance in assessments, which do not reflect a student's true competence in a subject, and *such provisions must not act to the disadvantage of other students*. Combined Law students should familiarise themselves with the Faculty of Law's provisions as they affect Law subjects.

Any student who believes that his/her performance has been or may be adversely affected by an occurrence of illness or misadventure may request Faculty to give special consideration to the circumstances. Such a request must be made within one week of the occurrence and must be accompanied by an appropriate medical certificate or other relevant documentary evidence.

Such certificates should state not only the nature of the illness or misadventure but also (where relevant) the opinion of the issuer as to the extent of disability involved.

Where several requests for special consideration have been received from one student, the Faculty may wish to obtain from the medical practitioner or other issuer of corroborating certificates more detail as to the precise extent of the disability. In cases where the Faculty believes that other students may be adversely affected by the giving of special consideration, it may require the applicant to obtain a professional opinion from another source.

Any student who is subject to a chronic or recurrent disability or who has been in need of, or undertaken counseling assistance should discuss the matter with a Departmental or Faculty adviser, as appropriate.

■ Discontinuation and re-enrolment –- University of Sydney (Coursework) Rule

Division 5 – Discontinuation of enrolment and suspension of candidature

12.Discontinuation of enrolment

(1) A student who wishes to discontinue enrolment in an award course or a unit of study must apply to the relevant dean and will be presumed to have discontinued enrolment from the date of that application, unless evidence is produced showing:
  (a) that the discontinuation occurred at an earlier date; and
  (b) that there was good reason why the application could not be made at the earlier time.

(2) A student who discontinues enrolment during the first year of enrolment in an award course may not re-enrol in that award course unless:
  (a) the relevant dean has granted prior permission to re-enrol; or
  (b) the student is reselected for admission to candidature for that course.

(3) No student may discontinue enrolment in an award course or unit of study after the end of classes in that award course or unit of study, unless he or she produces evidence that:
  (a) the discontinuation occurred at an earlier date; and
  (b) there was good reason why the application could not be made at the earlier time.

(4) A discontinuation of enrolment may be recorded as Withdrawn (W) or Discontinued Not To Count As Failure (DNF) where that discontinuation occurs within the time-frames specified by the University and published by the faculty, or where the student meets other conditions as specified by the relevant faculty.

■ Restrictions upon re-enrolment –- University of Sydney (Coursework) Rule

Division 6 – Unsatisfactory progress and exclusion

14. Satisfactory progress

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.

15. Requirement to show good cause

(1) For the purposes of this Rule, good cause means circumstances beyond the reasonable control of a student, which may include serious ill health or misadventure, but does not include demands of employers, pressure of employment or time devoted to non-University activities, unless these are relevant to serious ill health or misadventure. In all cases the onus is on the student to provide the University with satisfactory evidence to establish good cause. The University may take into account relevant aspects of a student's record in other courses or units of study within the University and relevant aspects of academic studies at other institutions provided that the student presents this information to the University.

(2) The relevant dean may require a student who has not made satisfactory progress to show good cause why he or she should be allowed to re-enrol.

(3) The dean will permit a student who has shown good cause to re-enrol.

16. Exclusion for failure to show good cause

The dean may, where good cause has not been established:

(1) exclude the student from the relevant course; or

(2) permit the student to re-enrol in the relevant award course subject to restrictions on units of study, which may include, but are not restricted to:
  (a) completion of a unit or units of study within a specified time;
  (b) exclusion from a unit or units of study, provided that the dean must first consult the head of the department responsible for the unit or units of study; and
  (c) specification of the earliest date upon which a student may re-enrol in a unit or units of study.

17. Applying for re-admission after exclusion

(1) A student who has been excluded from an award course or from a unit or units of study may apply to the relevant dean for readmission to the award course or re-enrolment in the unit or units of study concerned after at least 4 semesters, and that dean may readmit the student to the award course or permit the student to re-enrol in the unit or units of study concerned.

(2) With the written approval of the relevant dean, a student who has been excluded may be given credit for any work completed elsewhere in the University or in another university during a period of exclusion.

18. Appeals against exclusion

(1) In this Rule a reference to the Appeals Committee is a reference to the Senate Student Appeals Committee (Exclusions and Readmissions).

(2) (a) (i) A student who has been excluded in accordance with this Rule may appeal to the Appeals Committee.
  (ii) A student who has applied for readmission to an award course or re-enrolment in a unit of study after a period of exclusion, and who is refused readmission or re-enrolment may also apply to the Appeals Committee.
  (b) The Appeals Committee shall comprise:
    (i) 3 ex officio members (the Chancellor, the Deputy Chancellor and the Vice-Chancellor and Principal);
    (ii) the Chair and Deputy Chairs of the Academic Board;
    (iii) 2 student Fellows; and
    (iv) up to 4 other Fellows.
  (c) The Appeals Committee may meet as one or more sub-committees providing that each sub-committee shall include at least 1 member of each of the categories of:
    (i) ex officio member;
    (ii) Chair or Deputy Chair of the Academic Board;
    (iii) student Fellow; and
    (iv) other Fellows.
  (d) Three members shall constitute a quorum for a meeting of the Appeals Committee or a sub-committee.
  (e) The Appeals Committee and its sub-committees have authority to hear and determine all such appeals and must report its decision to the Senate annually.
  (f) The Appeals Committee or a sub-committee may uphold or disallow any appeal and, at its discretion, may determine the earliest date within a maximum of four semesters at which a student who has been excluded shall be permitted to apply to re-enrol.

(g) No appeal shall be determined without granting the student the opportunity to appear in person before the Appeals Committee or sub-committee considering the appeal. A student so appearing may be accompanied by a friend or adviser.

(h) The Appeals Committee or sub-committee may hear the relevant dean but that dean may only be present at those stages at which the student is permitted to be present. Similarly, the dean is entitled to be present when the Committee or sub-committee hears the student.

(i) If, due notice having been given, a student fails to attend a meeting of the Appeals Committee or sub-committee scheduled to consider that student's appeal, the Appeals Committee or sub-committee, at its discretion, may defer consideration of the appeal or may proceed to determine the appeal.

(j) A student who has been excluded in accordance with these resolutions and has lodged a timely appeal against that exclusion may re-enrol pending determination of that appeal if it has not been determined by the commencement of classes in the next appropriate semester.

■ 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; and
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. Part of the fee you pay to the SRC is allocated to your Faculty society; SCISOC uses this money to promote 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 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. Visit the Web site: 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 the dedicated research scientist in a university or research laboratory to the managing director of a large corporation, the school teacher, the technical representative, the laboratory bench worker, the production superintendent, the consultant geologist, the bird banding biologist, the actuary, the computer sales representative, the beachcomber … the list is endless and will depend on a students 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. Some of these are: 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.

3 Undergraduate tables and units of study

Table I: Bachelor of Science

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
Agricultural Chemistry				
For a major in Agricultural Chemistry, the minimum requirement is 24 credit points from Senior units of study listed in this subject area.				
■ **Intermediate units of study**				
AGCH 2001	Molecular Processes in Ecosystems	8	**P** BIOL (1002 or 1902). Students who have not satisfied the prerequisites in Biology may enrol with SOIL 2001 as a corequisite. **Q** CHEM 1002 or equivalent. **N** May not be counted with any Intermediate unit of study in Biochemistry.	1
■ **Senior units of study**				
AGCH 3024	Chemistry and Biochemistry of Foods	6	**P** MBLG (2001 and 2002); and either [CHEM (2311 and 2312) or 2903], or BCHM (2002 or 2902). **N** May not be counted with AGCH (3003 or 3005 or 3017 or 3025).	1
AGCH 3025	Chemistry and Biochemistry of Foods A	6	**P** 8 credit points of intermediate units in Agricultural Chemistry, Chemistry or Biochemistry. **N** May not be counted with AGCH (3003, 3005, 3017, 3024).	1
AGCH 3026	Chemistry and Biochemistry of Foods B	6	**C** AGCH 3025. **N** May not be counted with AGCH (3003, 3005).	1
AGCH 3030	Rural Environmental Chemistry A	6	**P** AGCH (2001 or 2002) or CHEM (2001, 2101, 2202, 2301, 2302 or 2902) or BIOCHEM (2002 or 2902) or ENVI (2001 or 2002). **N** AGCH 3020 and AGCH 3021 and AGCH 3022.	1
AGCH 3031	Rural Environmental Chemistry B	6	**P** AGCH (2001 or 2002) or CHEM (2001 or 2101 or 2202 or 2301 or 2302 or 2902) or BIOCHEM (2002 or 2902) or ENVI (2001 or 2002). **N** AGCH 3020, AGCH 3021, AGCH 3022.	2
Anatomy and Histology				
For a major in Anatomy and Histology, 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 (2001 or 2101 or 2901) is highly recommended.				
ANAT 2001	Principles of Histology	4	**P** 12 credit points of Junior Biology or Junior Psychology. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	1
ANAT 2002	Comparative Primate Anatomy	4	**A** Knowledge of basic vertebrate biology. **P** 12 credit points of Junior Biology or Junior Psychology or Junior Archaeology. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	2
ANAT 2003	Concepts in Neuroanatomy	4	**A** Background in basic mammalian biology. **P** 12 credit points of Junior Biology or Junior Psychology. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	2
ANAT 2004	Principles of Embryology	4	**Q** ANAT 2001. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	2
■ **Senior units of study**				
ANAT 3001	Microscopy and Histochemistry	12	**P** ANAT 2001. For BMedSc students: 32 credit points of Intermediate BMED units including BMED (2503, 2504, and 2505). *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	1
ANAT 3002	Cells and Development	12	**A** (i) an understanding of the basic structure of vertebrates; (ii) an understanding of elementary biochemistry and genetics. **P** ANAT 2001. For BMedSc students: 32 credit points of Intermediate BMED units including BMED (2503, 2504, and 2505). **N** May not be counted with ANAT 3003. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	2
ANAT 3003	Transmission & Scanning Electron Microsc	12	**P** ANAT 2001. For BMedSc students 32 credit points of intermediate BMED units including BMED (2503, 2504 & 2505). **N** ANAT 3002. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	2
ANAT 3004	Cranial and Cervical Anatomy	6	**P** ANAT 2002. **N** May not be counted with ANAT 3005. *NB: Not more than 12 credit points allowed from ANAT 3004, ANAT 3007 & ANAT 3008. The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	2
ANAT 3006	Forensic Osteology	6	**A** Understanding of basic human musculoskeletal anatomy. **P** ANAT 2002 or 32 credit points of Intermediate BMED units including BMED (2503, 2504 and 2505). *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	1

Table I: Bachelor of Science (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
ANAT 3007	Visceral Anatomy	6	**A** Some knowledge of basic mammalian biology. **P** ANAT (2002 or 2003) or 32 credit points of Intermediate BMED units including BMED (2503, 2504 and 2505). *NB: Not more than 12 credit points allowed from ANAT 3004, ANAT 3007 & ANAT 3008. The completion of MBLG 2001 or 2101 or 2901 is highly recommended.*	1
ANAT 3008	Musculoskeletal Anatomy	6	**P** ANAT 2002. **N** May not be counted with ANAT 3005. *NB: Not more than 12 credit points allowed from ANAT 3004, ANAT 3007 and ANAT 3008. The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	2
PHSI 3001	Neuroscience	12	**P** For BMedSc: at least 32 credit points of Intermediate BMED units including BMED (2501 and 2503 and 2505). For others: PHSI (2101 or 2001 or 2901) or ANAT 2003; and MBLG (2001 or 2101 or 2901) or BCHM (2001 or 2101 or 2901); plus at least 8 credit points of Intermediate Science units of study. **N** PHSI 3901. *NB: A minimum of 8 credit points of Intermediate Physiology and/or Anatomy is recommended.*	1
PHSI 3901	Neuroscience (Advanced)	12	**P** For BMedSc: at least 32 credit points of Intermediate BMED units including BMED (2501 and 2503 and 2505). For others: PHSI (2101 or 2001 or 2901) or ANAT 2003; and MBLG (2001 or 2101 or 2901) or BCHM (2001 or 2101 or 2901); plus at least 8 credit points of Intermediate Science units of study. **N** PHSI 3001. *NB: Department permission required for enrolment. A minimum of 8 credit points of Intermediate Physiology and/or Anatomy is recommended. Permission required for enrolment. Available to selected students who have achieved a mark of at least 65 in the prerequisite units of study.*	1
PHSI 3002	Neuroscience – Cellular and Integrative	12	**P** For BMedSc: 32 credit points of Intermediate BMED units including BMED (2501 and 2503 and 2505). For others:16 credit points of Intermediate Science units of study from Anatomy and Histology, Biochemistry, Biology, Chemistry, Computer Science, Mathematics, Microbiology, Molecular Biology and Genetics, Pharmacology, Physics, Physiology, Psychology or Statistics. **N** PHSI 3902. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	2
PHSI 3902	Neuroscience- Cellular & Integrative Adv	12	**P** For BMedSc: 32 credit points of Intermediate BMED units including BMED (2501 and 2503 and 2505). For others: Credit or better in PHSI 3001; and 16 credit points of Intermediate Science units of study from Anatomy and Histology, Biochemistry, Biology, Chemistry, Computer Science, Mathematics, Microbiology, Molecular Biology and Genetics, Pharmacology, Physics, Physiology, Psychology or Statistics. **N** PHSI 3002. *NB: Department permission required for enrolment. Permission required for enrolment. Available to selected students who have achieved a mark of at least 65 in the prerequisite units of study. The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	2

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 MBLG (2001 or 2101 or 2901) is highly recommended.

BCHM 2011	Biochemistry	8	**A** CHEM (1101 and 1102). **P** 12 credit points of Junior Chemistry. **C** Recommended concurrent units of study: MBLG (2001 or 2901) for progression to Senior Biochemistry, and/or Intermediate Chemistry. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	1
BCHM 2002	Molecules, Metabolism and Cells	8	**P** MBLG (2001 or 2901). **N** May not be counted with AGCH 2001 or BCHM (2102 or 2902).	2, Summer
BCHM 2102	Molecules, Metabolism and Cells Theory	4	**P** MBLG (2001 or 2101 or 2901). **N** May not be counted with AGCH 2001 or BCHM (2002 or 2902).	2, Summer
BCHM 2902	Molecules, Metabolism and Cells (Adv)	8	**Q** Distinction in MBLG (2001 or 2901). **N** May not be counted with AGCH 2001 or BCHM (2002 or 2102).	2
BCHM 2112	Molecules, Metabolism and Cells (Lab)	4	**P** BCHM 2102. **N** BCHM (2002 or 2902).	2

■ Senior units of study

BCHM 3001	Mol Biology and Structural Biochemistry	12	**P** A total of at least 16 credit points of Intermediate MBLG and BCHM units. For BMedSc students: 32 credit points of Intermediate BMED units including BMED (2501, 2502 and 2504). **N** May not be counted with BCHM 3901.	1
BCHM 3002	Cellular and Medical Biochemistry	12	**P** A total of at least 16 credit points of Intermediate MBLG and BCHM units. For BMedSc students 32 credit points of Intermediate BMED units including BMED (2501, 2502 and 2504). **N** May not be counted with BCHM (3902, 3004 or 3904).	2
BCHM 3005	Computational Biochemistry	4	**A** 12 credit points of Junior Chemistry. **P** 8 credit points of Intermediate Mathematics units of study. Strongly recommend two of the following: MATH (2001/2901, 2002/2902, 2003/2903, 2005/2905, 2006/2906). **N** May not be counted with BCHM 3905.	N/A in 2004
BCHM 3098	Functional Genomics and Proteomics	6	**A** BCHM 2011. **P** MBLG (2001 or 2901) or at least 32 credit points of intermediate BMED units including BMED (2501 and 2502 and 2504). *NB: Recommended unit of study for all molecular biotechnology third-year students.*	1
BCHM 3901	Mol Biology and Structural Biochem (Adv)	12	**P** Distinction in a total of at least 16 credit points from Intermediate MBLG and BCHM units. For BMedSc students: 32 credit points of Intermediate BMED units including Distinctions in BMED (2501, 2502 and 2504). **N** BCHM 3001.	1

Table I: Bachelor of Science (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
BCHM 3902	Cellular and Medical Biochemistry (Adv)	12	**P** Distinction in a total of at least 16 credit points from Intermediate MBLG and BCHM units. For BMedSc students: 32 credit points of Intermediate BMED units including Distinctions in BMED (2501, 2502 and 2504). **N** May not be counted with BCHM (3002, 3004 and 3904).	2
BCHM 3905	Computational Biochemistry (Advanced)	4	**A** 12 credit points of Junior Chemistry. **P** Credit average in 8 credit points of Intermediate Mathematics units of study. Strongly recommend two of the following: MATH (2001/2901, 2002/2902, 2003/2903, 2005/2905, 2006/2906). **N** May not be counted with BCHM 3005.	N/A in 2004

Biology

For a major in Biology, the minimum requirement is 24 credit points from Senior units of study listed in this subject area.

■ Junior units of study

BIOL 1001	Concepts in Biology	6	**A** No previous knowledge required. Students who have not taken HSC biology are recommended to take the Biology Bridging Course. **N** BIOL (1101 or 1901 or 1500).	1, Summer
BIOL 1101	Biology – Ecosystems to Genes	6	**P** HSC 2-unit Biology or equivalent. **N** BIOL(1001 or 1901 or 1500).	1
BIOL 1901	Biology- Ecosystems to Genes (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** BIOL (1001 or 1101 or 1500). *NB: Department permission required for enrolment.*	1
BIOL 1002	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 before lectures commence. **N** BIOL (1902 or 1500).	2
BIOL 1902	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** BIOL (1002 or 1904 or 1905 or 1500). *NB: Department permission required for enrolment.*	2
BIOL 1003	Human Biology	6	**A** HSC 2-unit Biology. Students who have not undertaken an HSC biology course are strongly advised to complete a biology bridging course before lectures commence. **N** BIOL (1903 or 1500) or EDUH 1016.	2, Summer
BIOL 1903	Human Biology (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** May not be counted with BIOL (1003 or 1904 or 1905 or 1500) or EDUH 1016. *NB: Department permission required for enrolment.*	2

■ Intermediate units of study

See also Molecular Biology and Genetics MBLG (2002/2902/2102). The completion of MBLG (2001 or 2101 or 2901) is highly recommended.

BIOL 2001	Invertebrate Zoology	8	**P** 12 credit points of Junior Chemistry. For students in the BSc (Marine Science) stream: 6 credit points of Junior Chemistry and either an additional 6 credit points of Junior Chemistry or 6 credit points of Junior Physics. **Q** BIOL (1001 or 1101 or 1901) and either BIOL (1002 or 1902 or 1003 or 1903) or EDUH 1016 (for BEd (Secondary) (Human Movement and Health Education)). **N** May not be counted with BIOL (2101 or 2901). *NB: The completion of MBLG (2001 or 2901 or 2101) is highly recommended. The content of BIOL (1002 or 1902) is assumed knowledge and students entering from BIOL (1003 or 1903) will need to do some preparatory reading.*	1
BIOL 2901	Invertebrate Zoology (Advanced)	8	**P** 12 credit points of Junior Chemistry. For students in the BSc (Marine Science) stream: 6 credit points of Junior Chemistry and either an additional 6 credit points of Junior Chemistry or 6 credit points of Junior Physics. **Q** Distinction average in BIOL (1001 or 1101 or 1901) and one of BIOL (1002 or 1902 or 1003 or 1903). These requirements may be varied and students with lower averages should consult the unit Executive Officer. **N** BIOL (2001 or 2101). *NB: The completion of MBLG (2001 or 2901 or 2101) is highly recommended. The content of BIOL (1002 or 1902) is assumed knowledge and students entering from BIOL (1003 or 1903) will need to do some preparatory reading.*	1
BIOL 2101	Invertebrate Zoology – Theory	4	**Q** BIOL (1001 or 1101 or 1901) and either BIOL (1002 or 1902 or 1003 or 1903) or LWSC 1002 or EDUH 1016 (for BEd (Secondary) (Human Movement and Health Education)). **N** BIOL (2001, 2901). *NB: The completion of MBLG (2001 or 2901 or 2101) is highly recommended. The content of BIOL (1002 or 1902) is assumed knowledge and students entering from BIOL (1003 or 1903) will need to do some preparatory reading. BIOL 2101 is not a prerequisite for Senior units of study in Biology.*	1
BIOL 2002	Vertebrates and their Origins	8	**P** 12 credit points of Junior Chemistry. For students in the BSc(Marine Science) stream: 6 credit points of Junior Chemistry and either an additional 6 credit points of Junior Chemistry or 6 credit points of Junior Physics. **Q** BIOL (1001 or or 1101 or 1901) and either BIOL (1002 or 1902 or 1003 or 1903) or EDUH 1016 (for BEd (Secondary) (Human Movement and Health Education)). **N** BIOL (2102 or 2902). *NB: The completion of MBLG (2001 or 2901 or 2101) is highly recommended. The content of BIOL (1002 or 1902) is assumed knowledge and students entering from BIOL (1003 or 1903) will need to do some preparatory reading.*	2

Table I: Bachelor of Science (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
BIOL 2902	Vertebrates and their Origins (Advanced)	8	**P** 12 credit points of Junior Chemistry. For students in the BSc(Marine Science) stream: 6 credit points of Junior Chemistry and either an additional 6 credit points of Junior Chemistry or 6 credit points of Junior Physics. **Q** Distinction average in BIOL (1001 or or 1101 or 1901) and one of BIOL (1002 or 1902 or 1003 or 1903). These requirements may be varied and students with lower averages should consult the unit Executive Officer. **N** BIOL (2002 or 2102). *NB: The completion of MBLG (2001 or 2901 or 2101) is highly recommended. The content of BIOL (1002 or 1902) is assumed knowledge and students entering from BIOL (1003 or 1903) will need to do some preparatory reading.*	2
BIOL 2102	Vertebrates and their Origins – Theory	4	**Q** BIOL (1001 or 1101 or 1901) and either BIOL (1002 or 1902 or 1003 or 1903) or LWSC 1002 or EDUH 1016 (for BEd (Secondary) (Human Movement and Health Education). **N** BIOL (2002, 2902). *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended. The content of BIOL (1002 or 1902) is assumed knowledge and students entering from BIOL (1003 or 1903) will need to do some preparatory reading. Not a prerequisite for Senior units of study in Biology.*	2
BIOL 2003	Plant Anatomy and Physiology	8	**P** BIOL (1001 or 1101 or 1901) and either BIOL (1002 or 1902 or 1003 or 1903) or EDUH 1016 (for BEd (Secondary) (Human Movement and Health Education)). **N** BIOL 2903. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended. The content of BIOL (1002 or 1902) is assumed knowledge and students entering from BIOL (1003 or 1903) will need to do some preparatory reading.*	2
BIOL 2903	Plant Anatomy and Physiology (Advanced)	8	**Q** Distinction average in BIOL (1001 or 1101 or 1901) and one of BIOL (1002 or 1902 or 1003 or 1903). These requirements may be varied and students with lower averages should consult the unit Executive Officer. **N** BIOL 2003. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended. The content of BIOL (1002 or 1902) is assumed knowledge and students entering from BIOL (1003 or 1903) will need to do some preparatory reading.*	2
BIOL 2004	Plant Ecology and Diversity	8	**Q** BIOL (1001 or 1101 or 1901) and either BIOL (1002 or 1902 or 1003 or 1903) or LWSC 1002 or EDUH 1016 (for BEd (Secondary) (Human Movement and Health Education)). **C** MICR 2013 for BLWSc. **N** BIOL 2904. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended. The content of Biology (1002 or 1902) is assumed knowledge and students entering from BIOL (1003 or 1903) will need to do some preparatory reading.*	1
BIOL 2904	Plant Ecology and Diversity (Advanced)	8	**Q** Distinction average in BIOL (1001 or 1101 or 1901) and one of BIOL (1002 or 1902 or 1003 or 1903). These requirements may be varied and students with lower averages should consult the unit Executive Officer. **N** BIOL 2004. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended. The content of BIOL (1002 or 1902) is assumed knowledge and students entering from BIOL (1003 or 1903) will need to do some preparatory reading.*	1
BIOL 2006	Cell Biology	8	**P** 12 credit points of Junior Chemistry. For students in the BSc(Marine Science) stream: 6 credit points of Junior Chemistry and either an additional 6 credit points of Junior Chemistry or 6 credit points of Junior Physics. **Q** BIOL (1001 or or 1101 or 1901) and either BIOL (1002 or 1902 or 1003 or 1903 or 1904 or 1905) or EDUH 1016 (for BEd (Secondary) (Human Movement and Health Education)). **N** BIOL (2106 or 2906). *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	1
BIOL 2906	Cell Biology (Advanced)	8	**P** 12 credit points of Junior Chemistry. For students in the BSc(Marine Science) stream: 6 credit points of Junior Chemistry and either an additional 6 credit points of Junior Chemistry or 6 credit points of Junior Physics. **Q** Distinction average in BIOL (1001 or 1101 or 1901) and one of BIOL (1002 or 1902 or 1003 or 1903 or 1904 or 1905). These requirements may be varied and students with lower averages should consult the unit Executive Officer. **N** BIOL (2006 or 2106). *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	1
BIOL 2106	Cell Biology – Theory	4	**P** 12 credit points of Junior Chemistry. For students in the BSc(Marine Science) stream: 6 credit points of Junior Chemistry and either an additional 6 credit points of Junior Chemistry or 6 credit points of Junior Physics. **Q** BIOL (1001 or 1101 or 1901) and either BIOL (1002 or 1902 or 1003 or 1903 or 1904) or EDUH 1016 (for BEd (Secondary) (Human Movement and Health Education)). **N** BIOL (2006 or 2906). *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	1
BIOL 2007	Entomology Introductory	8	**P** 12 credit points of Junior Chemistry. For students in the BSc(Marine Science) stream: 6 credit points of Junior Chemistry and either an additional 6 credit points of Junior Chemistry or 6 credit points of Junior Physics. **Q** BIOL (1001 or 1101 or 1901) and either BIOL (1002 or 1902 or 1003 or 1903) or EDUH 1016 (for BEd (Secondary) (Human Movement and Health Education)). *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended. The content of BIOL (1002 or 1902) is assumed knowledge and students entering from BIOL (1003 or 1903) will need to do some preparatory reading. See prerequisites for Senior units of study in Biology.*	2
■ **Senior units of study**				
BIOL 3011	Ecophysiology	6	**P** 16 credit points of Intermediate Biology including BIOL (2002 or 2003 or 2006 or 2902 or 2903 or 2906). **N** BIOL 3911. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	1a

Table I: Bachelor of Science (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
BIOL 3911	Ecophysiology (Advanced)	6	**P** Distinction average in 16 credit points of Intermediate Biology including BIOL (2002 or 2003 or 2006 or 2902 or 2903 or 2906). These requirements may be varied and students with lower averages should consult the unit Executive Officer. **N** May not be counted with BIOL 3011. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	1a
BIOL 3012	Animal Physiology	6	**P** 16 credit points of Intermediate Biology including BIOL (2002 or 2003 or 2006 or 2902 or 2903 or 2906). **N** May not be counted with BIOL 3912. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	1b
BIOL 3912	Animal Physiology (Advanced)	6	**P** Distinction average in 16 credit points of Intermediate Biology including BIOL (2002 or 2003 or 2006 or 2902 or 2903 or 2906). These requirements may be varied and students with lower averages should consult the unit Executive Officer. **N** May not be counted with BIOL 3012. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	1b
BIOL 3013	Marine Biology	6	**A** MARS 2002. **P** 16 credit points of Intermediate Biology, including BIOL (2001 or 2002 or 2003 or 2004 or 2901 or 2902 or 2903 or 2904). **N** May not be counted with BIOL 3913. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	1b
BIOL 3913	Marine Biology (Advanced)	6	**A** MARS 2002. **P** Distinction average in 16 credit points of Intermediate Biology including BIOL (2001 or 2002 or 2003 or 2004 or 2901 or 2902 or 2903 or 2904). These requirements may be varied and students with lower averages should consult the unit Executive Officer. **N** May not be counted with BIOL 3013. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	1b
BIOL 3014	Biology of Terrestrial Vertebrates	6	**P** 16 credit points of Intermediate Biology. **N** May not be counted with BIOL 3914. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	1a
BIOL 3914	Biology of Terrestrial Vertebrates (Adv)	6	**P** Distinction average in 16 credit points of Intermediate Biology. These requirements may be varied and students with lower averages should consult the unit Executive Officer. **N** May not be counted with BIOL 3014. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	1a
BIOL 3015	Plant Systematics and Biogeography	6	**P** 16 credit points of Intermediate Biology including BIOL (2004 or 2904). **N** May not be counted with BIOL 3915. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	1b
BIOL 3915	Plant Systematics and Biogeography (Adv)	6	**P** Distinction average in 16 credit points of Intermediate Biology including BIOL (2004 or 2904). These requirements may be varied and students with lower averages should consult the unit Executive Officer. **N** May not be counted with BIOL 3015. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	1b
BIOL 3017	Fungal Biology	6	**P** 16 credit points of Intermediate Biology, or 8 credit points of Intermediate Biology and 8 Intermediate credit points of either Microbiology or Geography, or their equivalent. **N** May not be counted with BIOL 3917. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	1a
BIOL 3917	Fungal Biology (Advanced)	6	**P** Distinction average in 16 credit points of Intermediate Biology, or 8 credit points of Intermediate Biology and 8 Intermediate credit points of either Microbiology or Geography, or their equivalent. **N** May not be counted with BIOL 3017. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	1a
BIOL 3018	Applications of Recombinant DNA Tech	6	**P** MBLG (2001 or 2901 and 2002 or 2902) or 16 credit points of Intermediate Biology. For BMedSc students: 32 credit points of Intermediate BMED units including BMED 2502. **N** BIOL (3918).	1a
BIOL 3918	Applications of Recombinant DNA Tech Adv	6	**P** Distinction average in MBLG (2001 or 2901 and 2002 or 2902) or in 16 credit points of Intermediate Biology. For BMedSc students: 32 credit points of Intermediate BMED units including Distinction in BMED 2502. These requirements may be varied and students with lower averages should contact the unit Executive Officer. **N** BIOL (3018).	1a
BIOL 3021	Plant Development	6	**P** 16 credit points of Intermediate Biology including BIOL (2003 or 2903 or 2006 or 2906). **N** BIOL 3931. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	2a
BIOL 3931	Plant Development (Advanced)	6	**P** Distinction average in 16 credit points of Intermediate Biology including BIOL (2003 or 2903 or 2006 or 2906). These requirements may be varied and students with lower averages should consult the unit Executive Officer. **N** May not be counted with BIOL 3021. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	2a
BIOL 3022	Plant Physiology	6	**P** 16 credit points of Intermediate Biology including BIOL (2003 or 2006 or 2903 or 2906). **N** BIOL 3932. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	2b
BIOL 3932	Plant Physiology (Advanced)	6	**P** Distinction average in 16 credit points of Intermediate Biology including BIOL (2003 or 2903 or 2006 or 2906). These requirements may be varied and students with lower averages should contact the unit Executive Officer. **N** BIOL 3022. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	2b
BIOL 3023	Ecological Methods	6	**P** 16 credit points of Intermediate Biology including BIOL (2001 or 2901 or 2002 or 2902 or 2004 or 2904). **N** May not be counted with BIOL 3923. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	2a

Table I: Bachelor of Science (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
BIOL 3923	Ecological Methods (Advanced)	6	**P** Distinction average in BIOL (2001 or 2901) and (2002 or 2902), or in 16 credit points of Intermediate Biology including BIOL (2004 or 2904). **N** May not be counted with BIOL 3023. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	2a
BIOL 3025	Evolutionary Genetics & Animal Behaviour	6	**P** 16 credit points from MBLG (2001 or 2901 or 2002 or 2902) and Intermediate Biology units. For BMedSc students 32 credit points of Intermediate BMED units including BMED 2502. **N** BIOL (3925 or 3928).	2a
BIOL 3925	Evolutionary Gen. & Animal Behaviour Adv	6	**P** Distinction average in 16 credit points from MBLG (2001 or 2901 or 2002 or 2902) and Intermediate Biology units. For BMedSc students 32 credit points of Intermediate BMED units including distinction in BMED 2502. These requirements may be varied and students with lower averages should consult the unit Executive Officer. **N** BIOL (3025 or 3928).	2a
BIOL 3026	Developmental Genetics	6	**P** MBLG (2001 or 2901 and 2002 or 2902) or 16 credit points of Intermediate Biology. For BMedSc students: 32 credit points of Intermediate BMED units including BMED 2502. **N** BIOL (3926 or 3929).	2b
BIOL 3926	Developmental Genetics (Advanced)	6	**P** Distinction average in MBLG (2001 or 2901 and 2002 or 2902) or in 16 credit points of Intermediate Biology. For BMedSc students 32 credit points of Intermediate BMED units including Distinction in BMED 2502. These requirements may be varied and students with lower averages should contact the unit Executive Officer. **N** BIOL (3026 or 3929).	2b
BIOL 3027	Bioinformatics and Genomics	6	**P** MBLG (2001 or 2101 or 2901) or 16 credit points of Intermediate Biology including BIOL (2001 or 2901 or 2004 or 2904 or 2006 or 2906). For BMedSc students: 32 credit points of Intermediate BMED units including BMED 2502. **N** BIOL 3927.	1b
BIOL 3927	Bioinformatics and Genomics (Advanced)	6	**P** Distinction in MBLG (2001 or 2101 or 2901) or Distinction average in 16 credit points of Intermediate Biology including BIOL (2001 or 2901 or 2004 or 2904 or 2006 or 2906). For BMedSc students: 32 credit points of Intermediate BMED units including Distinction in BMED 2502. These requirements may be varied and students with lower averages should contact the unit Executive Officer. **N** BIOL 3027.	1b
BIOL 3040	Marine Ecology	6	**P** 16 credit points of Intermediate Biology. **C** BIOL (3023 or 3923). **N** BIOL 3940. *NB: The completion of MBLG (2001 or 2901 or 2101) is highly recommended.*	2b
BIOL 3940	Marine Ecology (Advanced)	6	**P** Distinction average in 16 credit points of Intermediate Biology. **C** BIOL (3023 or 3923). **N** BIOL 3040. *NB: The completion of MBLG (2001 or 2901 or 2101) is highly recommended.*	2b
BIOL 3041	Terrestrial Ecology	6	**P** BIOL (2001 or 2901) and BIOL (2002 or 2902). **C** BIOL (3023 or 3923). **N** BIOL 3931. *NB: The completion of MBLG (2001 or 2901 or 2101) is highly recommended.*	2b
BIOL 3941	Terrestrial Ecology (Advanced)	6	**P** Distinction average in BIOL (2001 or 2901) and (2002 or 2902),. **C** BIOL (3023 or 3923). **N** BIOL 3041. *NB: The completion of MBLG (2001 or 2901 or 2101) is highly recommended.*	2b
BIOL 3942	Plant Ecology	6	**P** 16 credit points of Intermediate Biology including BIOL (2004 or 2904). **C** BIOL (3023 or 3923). **N** BIOL 3942.	2b
BIOL 3942	Plant Ecology (Advanced)	6	**P** Distinction average in 16 credit points of Intermediate Biology including BIOL (2004 or 2904). **C** BIOL (3023 or 3923). **N** BIOL 3042. *NB: The completion of MBLG (2001 or 2901 or 2101) is highly recommended.*	2b

Cell Pathology

For a major in Cell Pathology, the minimum requirement is 24 credit points from Senior units of study listed in this subject area.

■ Senior units of study

The completion of MBLG (2001 or 2101 or 2901) is highly recommended.

CPAT 3001	Cell Pathology A	12	**P** ANAT 2002; or BCHM 2002 or 2902; or BIOL 2006 or 2906; or both PCOL 2001 and (2002 or 2003); or PHSI 2002. For BMedSc: 32 credit points from Intermediate BMED units of study. *NB: Entry requires Departmental permission: only a small number of students can be accommodated in the laboratory facilities. The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	N/A in 2004
CPAT 3101	Pathological Basis of Human Disease	12	**P** ANAT 2001; or BCHM (2001 or 2002 or 2101 or 2102 or 2901 or 2902); or MBLG (2001 or 2101 or 2901); or BIOL (2001 or 2002 or 2006 or 2101 or 2102 or 2105 or 2106 or 2901 or 2902 or 2906); or HPSC (2001 or 2002); or MICR (2001 or 2003 or 2901); or PCOL 2001; or PHSI 2001. For BMedSc: 32 credit points from Intermediate BMED units of study. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	2

Table I: Bachelor of Science (continued)

Unit of study	CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session

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

CHEM 1001	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** May not be counted with CHEM 1101 or 1901 or 1903 or 1905 or 1906 or 1909.	1
CHEM 1002	Fundamentals of Chemistry 1B	6	**P** CHEM (1001 or 1101) or equivalent. **N** May not be counted with CHEM (1102 or 1902 or 1904 or 1907 or 1908).	2
CHEM 1101	Chemistry 1A	6	**A** HSC Chemistry and Mathematics. **C** Recommended concurrent units of study: 6 credit points of Junior Mathematics. **N** May not be counted with CHEM (1001 or 1901 or 1903 or 1905 or 1906 or 1909).	1, 2, Summer
CHEM 1102	Chemistry 1B	6	**Q** CHEM 1101 or a Distinction in CHEM 1001 or 1901 or equivalent. **C** Recommended concurrent units of study: 6 credit points of Junior Mathematics including MATH (1003 or 1903). **N** CHEM (1002 or 1902 or 1904 or 1907 or 1908).	1, 2, Summer
CHEM 1901	Chemistry 1A (Advanced)	6	**P** UAI of at least 93 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** May not be counted with CHEM (1001 or 1101 or 1903 or 1905 or 1906 or 1909). *NB: Department permission required for enrolment.*	1
CHEM 1902	Chemistry 1B (Advanced)	6	**Q** CHEM (1901 or 1903) or Distinction in CHEM 1101 or equivalent. **C** Recommended concurrent unit of study: 6 credit points of Junior Mathematics including MATH (1003 or 1903). **N** May not be counted with CHEM (1002 or 1102 or 1904 or 1907 or 1908.). *NB: Department permission required for enrolment. Entry is by invitation.*	2
CHEM 1903	Chemistry 1A (Special Studies Program)	6	**P** UAI of at least 98.7 and HSC Chemistry result in band 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** May not be counted with CHEM (1001 or 1101 or 1901 or 1905 or 1906 or 1909). *NB: Department permission required for enrolment. Entry is by invitation. This unit of study is deemed to be an Advanced unit of study.*	1
CHEM 1904	Chemistry 1B (Special Studies Program)	6	**P** Distinction in CHEM 1903. **C** Recommended concurrent units of study: 6 credit points of Junior Mathematics including MATH (1003 or 1903). **N** May not be counted with CHEM (1002 or 1102 or 1902 or 1907 or 1908). *NB: Department permission required for enrolment. Entry is by invitation. This unit of study is deemed to be an Advanced unit of study.*	2

■ Intermediate units of study

CHEM 2001	Chemistry 2 (Life Sciences)	8	**P** 6 credit points of Junior Mathematics. **Q** CHEM (1102 or 1902 or 1904 or 1909). **N** May not be counted with CHEM (2101 or 2301 or 2901 or 2903 or 2311 or 2312 or 2502).	1
CHEM 2101	Chemistry 2 (Environmental)	8	**P** 6 credit points of Junior Mathematics. **Q** CHEM (1102 or 1902 or 1904 or 1909). **N** May not be counted with CHEM (2001 or 2301 or 2901 or 2903 or 2311 or 2312 or 2502).	1
CHEM 2301	Chemistry 2A	8	**P** 6 credit points of Junior Mathematics. **Q** CHEM (1102 or 1902 or 1904 or 1909 or 1612). **N** May not be counted with CHEM (2001 or 2101 or 2901 or 2903 or 2311 or 2312 or 2502).	1
CHEM 2302	Chemistry 2B	8	**P** 6 credit points of Junior Mathematics. **Q** CHEM (1102 or 1902 or 1904 or 1909 or 1612). **N** May not be counted with CHEM (2202 or 2902).	2
CHEM 2901	Chemistry 2A (Advanced)	8	**P** 6 credit points of Junior Mathematics. **Q** WAM greater than 80 and Distinction average in CHEM (1101 or 1901 or 1903) and in Chemistry (1102 or 1902 or 1904 or 1909). **N** May not be counted with CHEM (2001 or 2101 or 2301 or 2903 or 2311 or 2312 or 2502). *NB: Department permission required for enrolment. Entry to this unit of study is by invitation. Students in the Faculty of Science Talented Students Program are automatically eligible.*	1
CHEM 2902	Chemistry 2B (Advanced)	8	**P** 6 credit points of Junior Mathematics. **Q** WAM greater than 80 and Distinction average in CHEM (1101 or 1901 or 1903) and CHEM (1102 or 1902 or 1904 or 1909). **N** May not be counted with CHEM (2202 or 2302). *NB: Department permission required for enrolment. Entry is by invitation.*	2

■ Senior units of study

CHEM 3100	Chemistry of the Main Group	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902), for students in B.Sc.(ENVI) CHEM(1102 or 1902) and ENVI 2002. **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. **N** CHEM 3190.	1
CHEM 3103	Organometallic and Catalytic Chemistry	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. **N** CHEM 3193.	1

Table I: Bachelor of Science (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
CHEM 3104	Symmetry and Vibrational Spectra	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. **N** CHEM 3194, CHEM 3304 or CHEM 3394.	1
CHEM 3105	Biol/Environ Transition Metal Chem	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902), for students in B.Sc.(ENVI) CHEM(1102 or 1902) and ENVI 2002. **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. **N** CHEM 3195.	2
CHEM 3106	Inorganic Materials Chemistry	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. **N** CHEM 3196.	2
CHEM 3107	Forensic and Analytical Chemistry	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902), for students in B.Sc.(ENVI) CHEM(1102 or 1902) and ENVI 2002. **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. **N** CHEM 3197.	2
CHEM 3108	Supramolecular Materials	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups (1 or 2) and 3. **N** CHEM 3198.	2
CHEM 3109	Transition Metal Chemistry	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. **N** CHEM 3199.	1
CHEM 3190	Chemistry of the Main Group (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902), for students in B.Sc.(ENVI) CHEM(1102 or 1902) and ENVI 2002. **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. **N** CHEM 3100.	1
CHEM 3193	Organometallic and Catalytic Chem (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. **N** CHEM 3103.	1
CHEM 3194	Symmetry and Vibrational Spectra (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. **N** CHEM 3104, CHEM 3304 or CHEM 3394.	1
CHEM 3195	Biol/Environ Transition Metal Chem (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902), for students in B.Sc.(ENVI) CHEM(1102 or 1902) and ENVI 2002. **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. **N** CHEM 3105.	2
CHEM 3196	Inorganic Materials Chemistry (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. **N** CHEM 3106.	2
CHEM 3197	Forensic and Analytical Chemistry (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902), for students in B.Sc.(ENVI) CHEM(1102 or 1902) and ENVI 2002. **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. **N** CHEM 3107.	2
CHEM 3198	Supramolecular Materials (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups (1 or 2) and 3. **N** CHEM 3108.	2
CHEM 3199	Transition Metal Chemistry (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. **N** CHEM 3109.	1
CHEM 3200	Stereochemistry and Mechanisms	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. **N** CHEM 3290.	1
CHEM 3203	Bioorganic Chemistry	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. **N** CHEM 3293.	1
CHEM 3204	Heterocyclic Chemistry	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. **N** CHEM 3294.	2

Table I: Bachelor of Science (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
CHEM 3205	Medicinal and Biological Chemistry	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. **N** CHEM 3295.	2
CHEM 3206	Radical and Pericyclic Chemistry	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. **N** CHEM 3296.	2
CHEM 3207	Synthetic Methods	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. **N** CHEM 3297.	2
CHEM 3209	Organic Structures From Spectra	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902), for students in B.Sc.(ENVI) CHEM(1102 or 1902) and ENVI 2002, for students enrolled in B.Sci.(MOBT) – MOBT 2001, MOBT 2002, CHEM 2311 and CHEM 2312. **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. **N** CHEM 3299.	1
CHEM 3290	Stereochemistry and Mechanisms (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. **N** CHEM 3200.	1
CHEM 3293	Bioorganic Chemistry (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. **N** CHEM 3203.	1
CHEM 3294	Heterocyclic Chemistry (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. **N** CHEM 3204.	2
CHEM 3295	Medicinal and Biological Chemistry (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. **N** CHEM 3205.	2
CHEM 3296	Radical and Pericyclic Chemistry (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. **N** CHEM 3206.	2
CHEM 3297	Synthetic Methods (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. **N** CHEM 3207.	2
CHEM 3299	Organic Structures From Spectra (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902), for students in B.Sc.(ENVI) CHEM(1102 or 1902) and ENVI 2002, for students enrolled in B.Sci.(MOBT) – MOBT 2001, MOBT 2002, CHEM 2311 and CHEM 2312. **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. **N** CHEM 3209.	1
CHEM 3301	Quantum Chemistry	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **N** CHEM 3391.	1
CHEM 3302	Chemical Dynamics	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **N** CHEM 3392.	1
CHEM 3303	Surfaces and Colloids	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **N** CHEM 3393.	1
CHEM 3304	Symmetry and Electronic Spectra	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **N** CHEM 3394, CHEM 3104 or CHEM 3194.	1
CHEM 3305	Atmospheric and Photochemistry	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902), for students in B.Sc.(ENVI) CHEM(1102 or 1902) and ENVI 2002. **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **N** CHEM 3395.	2
CHEM 3306	Biophysical Chemistry	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **N** CHEM 3396.	2

Table I: Bachelor of Science (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
CHEM 3307	Polymer Chemistry	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **N** CHEM 3397.	2
CHEM 3308	Physical Chemistry of Materials	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **N** CHEM 3398.	2
CHEM 3391	Quantum Chemistry (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **N** CHEM 3301.	1
CHEM 3392	Chemical Dynamics (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **N** CHEM 3302.	1
CHEM 3393	Surfaces and Colloids (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **N** CHEM 3303.	1
CHEM 3394	Symmetry and Electronic Spectra (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **N** CHEM 3304, CHEM 3104 or CHEM 3194.	1
CHEM 3395	Atmospheric and Photochemistry (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902), for students in B.Sc.(ENVI) CHEM(1102 or 1902) and ENVI 2002. **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **N** CHEM 3305.	2
CHEM 3396	Biophysical Chemistry (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **N** CHEM 3306.	2
CHEM 3397	Polymer Chemistry (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **N** CHEM 3307.	2
CHEM 3398	Physical Chemistry of Materials (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **N** CHEM 3308.	2

Computational Science

For a major in Computational Science the minimum requirement is:
(i) 12 credit points from the core Senior units of study; and
(ii) a minimum of 12 credit points from the elective Senior units of study, to be chosen from units of study listed in this subject area.

■ Junior units of study

COSC 1001	Computational Science in Matlab	3	**A** HSC Mathematics. **N** May not be counted with COSC 1901.	2
COSC 1901	Computational Science in Matlab (Adv)	3	**A** HSC Mathematics. **P** UAI of at least 90, or COSC 1902, or a distinction or better in COSC 1002, SOFT (1001, 1002, 1901 or 1902). **N** May not be counted with COSC 1001.	2
COSC 1002	Computational Science in C	3	**A** HSC Mathematics. **N** May not be counted with COSC 1902.	2
COSC 1902	Computational Science in C (Adv)	3	**A** HSC Mathematics. **P** UAI of at least 90, or COSC 1901, or a distinction or better in COSC 1001, SOFT (1001, 1002, 1901 or 1902). **N** May not be counted with COSC 1002.	2

■ Intermediate units of study

COSC 2001	Computational Science 2	6	**A** A basic knowledge of C and MATLAB. **P** 12 credit points chosen from junior Mathematics or Junior Computational Science units. **N** COSC 2901.	1
COSC 2901	Computational Science 2 (Advanced)	6	**A** A basic knowledge of C and MATLAB. **P** 12 credit points at a credit level chosen from Junior Mathematics units or Junior Mathematics and Junior Computational Science units. **N** COSC 2001.	1

Table I: Bachelor of Science (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
■ Senior core units of study				
COSC 3001	Computational Science 3A	4	**A** Programming experience in C and MATLAB. **P** 12 credit points chosen from junior Mathematics and Statistics, 6 credit points of Junior or Intermediate Computational Science units or equivalent and 16 credit points of Intermediate units in Science subject areas, not including Computational Science. **N** COSC 3901, PHYS 3301, PHYS 3901.	1
COSC 3901	Computational Science 3A (Advanced)	4	**A** Programming experience in C and MATLAB. **P** 12 credit points chosen from junior Mathematics and Statistics, 6 credit points of Junior or Intermediate Computational Science units at credit level or equivalent and 16 credit points of Intermediate units in Science subject areas, not including Computational Science. **N** COSC 3001, PHYS 3301, PHYS 3901.	1
COSC 3002	Computational Science 3B	4	**A** Programming experience in C and MATLAB. **P** 12 credit points from the Science subject areas of Junior Mathematics and Statistics, 6 credit points of Junior or Intermediate Computational Science units or equivalent, and 16 credit points of Intermediate units in Science subject areas, not including Computational Science. **N** COSC 3601, COSC 3902, PHYS 3303, PHYS 3933.	2
COSC 3902	Computational Science 3B (Advanced)	4	**A** Programming experience in C and MATLAB. **P** 12 credit points from the Science subject areas of Junior Mathematics and Statistics, 6 credit points of Junior or Intermediate Computational Science units at a credit level or equivalent, and 16 credit points of Intermediate units in Science subject areas, not including Computational Science. **N** COSC 3601, COSC 3002, PHYS 3303, PHYS 3933.	2
MATH 3016	Mathematical Computing I	4	**P** 8 credit points of Intermediate Mathematics and one of MATH 1001 or 1003 or 1901 or 1903 or 1906 or 1907. **N** May not be counted with MATH 3916.	1
MATH 3916	Mathematical Computing I (Advanced)	4	**P** 8 credit points of Intermediate Mathematics and one of MATH 1903 or 1907 or Credit in MATH 1003. **N** May not be counted with MATH 3016.	1
■ Senior elective units of study				
BCHM 3005	Computational Biochemistry	4	**A** 12 credit points of Junior Chemistry. **P** 8 credit points of Intermediate Mathematics units of study. Strongly recommend two of the following: MATH (2001/2901, 2002/2902, 2003/2903, 2005/2905, 2006/2906). **N** May not be counted with BCHM 3905.	N/A in 2004
BCHM 3905	Computational Biochemistry (Advanced)	4	**A** 12 credit points of Junior Chemistry. **P** Credit average in 8 credit points of Intermediate Mathematics units of study. Strongly recommend two of the following: MATH (2001/2901, 2002/2902, 2003/2903, 2005/2905, 2006/2906). **N** May not be counted with BCHM 3005.	N/A in 2004
BINF 3001	Bioinformatics Project	8	**P** SOFT (2004 or 2904) and 16 credit points from intermediate Biology, Biochemistry, Microbiology, Molecular Biology and Genetics and/or Pharmacology. **N** May not be counted with COMP 3206.	2
BIOL 3023	Ecological Methods	6	**P** 16 credit points of Intermediate Biology including BIOL (2001 or 2901 or 2002 or 2902 or 2004 or 2904). **N** May not be counted with BIOL 3923. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	2a
BIOL 3923	Ecological Methods (Advanced)	6	**P** Distinction average in BIOL (2001 or 2901) and (2002 or 2902), or in 16 credit points of Intermediate Biology including BIOL (2004 or 2904). **N** May not be counted with BIOL 3023. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	2a
BIOL 3027	Bioinformatics and Genomics	6	**P** MBLG (2001 or 2101 or 2901) or 16 credit points of Intermediate Biology including BIOL (2001 or 2901 or 2004 or 2904 or 2006 or 2906). For BMedSc students: 32 credit points of Intermediate BMED units including BMED 2502. **N** BIOL 3927.	1b
BIOL 3927	Bioinformatics and Genomics (Advanced)	6	**P** Distinction in MBLG (2001 or 2101 or 2901) or Distinction average in 16 credit points of Intermediate Biology including BIOL (2001 or 2901 or 2004 or 2904 or 2006 or 2906). For BMedSc students: 32 credit points of Intermediate BMED units including Distinction in BMED 2502. These requirements may be varied and students with lower averages should contact the unit Executive Officer. **N** BIOL 3027.	1b
COSC 3701	Computational Science Project	8	**A** Able to program in a standard language. **P** 16 credit points of intermediate level natural sciences plus at least one of COSC (1001 or 1901 or 1002 or 1902) or SOFT (1001 or 1901) or MATH (2003 or 2903) or PHYS (2001 or 2901 or 2002 or 2902).	N/A in 2004
GEOS 3004	Geophysics, Imaging, Oil/Ore Production	6	**P** 16 credit points of Intermediate Science units of study or CIVL 2409. **N** May not be counted with GEOP 3202.	2
GEOS 3007	Remote Sensing: Imaging the Earth	6	**P** 16 credit points of Intermediate Science units of study or CIVL 2409. **N** May not be counted with GEOL 3101.	1
MARS 3005	Marine Geophysical Data Analysis	6	**P** MARS (2001 and 2002) or 16 credit points of Intermediate Science including at least 8 credit points from Geology or Geography units of study or CIVL 2409.	1a
MARS 3006	Dynamics of Ocean Basins and Margins	6	**A** Prior completion of MARS 3005 is highly recommended. **P** MARS (2001 and 2002) or 16 credit points of Intermediate Science including at least 8 credit points from Geology or Geography units of study or CIVL 2409.	1b
MARS 3105	Coastal Oceanography & Sediment Dynamics	6	**P** MARS (2001 and 2002) or 16 credit points of Intermediate Science including at least 8 credit points from Geology or Geography units of study or CIVL 2409. **N** May not be counted with GEOL 3104.	2a

Table I: Bachelor of Science (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
MATH 3003	Ordinary Differential Equations	4	**P** 8 credit points of Intermediate Mathematics (strongly advise MATH 2002 or 2902, with 2001 or 2901). **N** MATH 3923.	1
MATH 3018	Partial Differential Equations and Waves	4	**P** MATH (2001 or 2901) and MATH (2005 or 2905). **N** May not be counted with MATH 3921.	1
MATH 3921	P D E And Waves (Advanced)	4	**P** MATH (2901 or credit in 2001) and (2905 or credit in 2005). **N** May not be counted with MATH 3018.	1
MATH 3019	Signal Processing	4	**P** MATH (2001 or 2901) and MATH (2005 or 2905). **N** May not be counted with MATH 3919.	1
MATH 3919	Signal Processing (Advanced)	4	**P** MATH 2905 or Credit in MATH 2005. **N** May not be counted with MATH 3019.	1
MULT 3004	Computer Graphics	4	**P** COMP (2111 or 2811 or 2002 or 2902) and [SOFT (2004 or 2904) or COMP (2004 or 2904)] and MATH (1002 or 1902). **N** May not be counted with MULT 3904 or COMP (3004 or 3904).	2
MULT 3904	Computer Graphics (Advanced)	4	**P** COMP (2111 or 2811 or 2002 or 2902) and [SOFT (2004 or 2904) or COMP (2004 or 2904)] and MATH (1002 or 1902) and Distinction in a MULT or SOFT unit at 2000-level or above. **N** May not be counted with MULT 3004 or COMP (3004 or 3904).	2
STAT 3002	Applied Linear Models	4	**P** STAT 2004 (or STAT 1022 for Arts students) and MATH (1002 or 1902). **N** May not be counted with STAT 3902.	1
STAT 3902	Linear Models (Advanced)	4	**P** STAT 2004 and (STAT 2903 or Credit in 2003) and (MATH 2002 or 2902). **N** May not be counted with STAT 3002.	1
STAT 3003	Time Series Analysis	4	**P** STAT (2003 or 2903). **N** May not be counted with STAT 3903.	1
STAT 3903	Time Series Analysis (Advanced)	4	**P** STAT 2903 or credit or better in STAT 2003. **N** May not be counted with STAT 3003.	1
STAT 3004	Design of Experiments	4	**P** STAT (3002 or 3902). **N** May not be counted with STAT 3904.	2
STAT 3904	Design of Experiments (Advanced)	4	**P** STAT 3902 or credit or better in STAT 3002. **N** May not be counted with STAT 3004.	2

Computer Science

For a major in Computer Science, the minimum requirement is 24 credit points from Senior units of study listed in this subject area.

■ Junior units of study

SOFT 1001	Software Development 1	6	**A** HSC Mathematics Extension 1. **N** May not be counted with SOFT 1901 or COMP (1001 or 1901).	1, 2, Summer
SOFT 1901	Software Development 1 (Adv)	6	**A** HSC Mathematics Extension 1. **Q** UAI at least that for acceptance into BSc(Adv) degree program. **N** May not be counted with SOFT 1001 or COMP (1001 or 1901). *NB: Department permission required for enrolment. NB. Entry requires departmental permission, except for students in BSc(Adv), BCST(Adv) or BIT degrees.*	1, 2
SOFT 1002	Software Development 2	6	**Q** SOFT (1001 or 1901) or COMP (1001 or 1901). **N** May not be counted with SOFT 1902 or COMP (1002 or 1902).	1, 2, Summer
SOFT 1902	Software Development 2 (Adv)	6	**Q** SOFT (1001 or 1901) or COMP (1001 or 1901) and Distinction in one of these. **N** May not be counted with SOFT 1002 or COMP (1002 or 1902). *NB: Department permission required for enrolment in Session 1.*	1, 2

■ Intermediate units of study

COMP 2003	Languages and Logic	4	**Q** [SOFT (1002 or 1902) or COMP (1002 or 1902)] and MATH (1004 or 1904 or 2009 or 2011) or ELEC 1101. **N** COMP 2903.	2
COMP 2903	Languages and Logic (Advanced)	4	**Q** [SOFT (1002 or 1902) or COMP (1002 or 1902)] and MATH (1004 or 1904 or 2009 or 2011) or ELEC 1101 and Distinction in one COMP, SOFT or MATH unit of study. **N** COMP 2003.	2
COMP 2111	Algorithms 1	4	**Q** SOFT (1002 or 1902) or COMP (1002 or 1902). **C** MATH (1004 or 1904 or 2009 or 2011). **N** May not be counted with COMP (2811 or 2002 or 2902).	1
COMP 2811	Algorithms 1 (Advanced)	4	**Q** [SOFT (1002 or 1902) or COMP (1002 or 1902)] and Distinction in one COMP, SOFT or MATH unit. **C** MATH (1004 or 1904 or 2009 or 2011). **N** May not be counted with COMP (2111 or 2002 or 2902).	1
INFO 2000	Systems Analysis and Design	4	**Q** ISYS 1003 or INFO 1000 or INFS 1000 or [COSC (1001 or 1901) and COSC (1002 or 1902)] or SOFT (1001 or 1901) or COMP (1001 or 1901). **N** May not be counted with INFO 2900.	1, Summer
INFO 2900	System Analysis and Design Advanced	4	**Q** ISYS 1003 or INFO 1000 or INFS 1000 or [COSC (1001 or 1901) and COSC (1002 or 1902)] or SOFT (1001 or 1901) or COMP (1001 or 1901) and Distinction in one INFO, ISYS or SOFT unit. **N** May not be counted with INFO 2000.	1
INFO 2005	Database Management, Introductory	4	**Q** ISYS 1003 or INFO 1000 or INFS 1000 or [COSC (1001 or 1901) and COSC (1002 or 1902)] or SOFT (1001 or 1901) or COMP (1001 or 1901). **N** May not be counted with INFO 2905.	2
INFO 2905	Database Management, Introductory (Adv)	4	**Q** ISYS 1003 or INFO 1000 or INFS 1000 or [COSC (1001 or 1901) and COSC (1002 or 1902)] or SOFT (1001 or 1901) or COMP (1001 or 1901) and Distinction in one INFO, ISYS or SOFT unit. **N** May not be counted with INFO 2005.	2

Table I: Bachelor of Science (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
NETS 2008	Computer System Organisation	4	**Q** SOFT (1001 or 1901) or COMP (1001 or 1901) or [COSC (1001 or 1901) and COSC (1002 or 1902)]. **N** May not be counted with NETS 2908 or COMP (2001 or 2901).	1
NETS 2908	Computer System Organisation (Adv)	4	**Q** SOFT (1001 or 1901) or COMP (1001 or 1901) or [COSC (1001 or 1901) and COSC (1002 or 1902)] and Distinction in one NETS or SOFT unit of study. **N** May not be counted with NETS 2008 or COMP (2001 or 2901).	1
NETS 2009	Network Organisation	4	**Q** SOFT (1001 or 1901) or COMP (1001 or 1901) or [COSC (1001 or 1901) and COSC (1002 or 1902)]. **N** May not be counted with NETS 2909.	2
NETS 2909	Network Organisation (Adv)	4	**Q** SOFT (1001 or 1901) or COMP (1001 or 1901) or [COSC (1001 or 1901) and COSC (1002 or 1902)] and Distinction in one NETS or SOFT unit of study. **N** May not be counted with NETS 2009.	2
SOFT 2001	Concurrent Programming	4	**Q** SOFT (1002 or 1902) or COMP (1002 or 1902). **N** May not be counted with SOFT 2901.	2
SOFT 2901	Concurrent Programming (Adv)	4	**Q** SOFT (1002 or 1902) or COMP (1002 or 1902) and Distinction in one of these, or in any SOFT unit at 2000-level or above. **N** May not be counted with SOFT 2001.	2
SOFT 2004	Software Development Methods 1	4	**Q** SOFT (1002 or 1902) or COMP (1002 or 1902). **N** May not be counted with SOFT 2904 or COMP (2004 or 2904).	1, Summer
SOFT 2904	Software Development Methods 1 (Adv)	4	**Q** SOFT (1002 or 1902) or COMP (1002 or 1902) and Distinction in one of these, or any SOFT unit at 2000-level or above. **N** May not be counted with SOFT 2004 or COMP (2004 or 2904).	1
■ **Senior units of study**				
COMP 3002	Artificial Intelligence	4	**P** [SOFT (2004 or 2904) or COMP (2004 or 2904)] and COMP (2003 or 2903) and 8 credit points 2000-level MATH and/or STAT and/or ECMT. **N** May not be counted with COMP 3902.	1
COMP 3902	Artificial Intelligence (Advanced)	4	**P** [SOFT (2004 or 2904) or COMP (2004 or 2904)] and COMP (2003 or 2903) and 8 credit points 2000-level MATH and/or STAT and/or ECMT and Distinction in a COMP, SOFT or MATH unit at 2000-level or above. **N** May not be counted with COMP 3002.	1
COMP 3111	Algorithms 2	4	**A** MATH 2009. **P** COMP (2111 or 2811 or 2002 or 2902) and MATH (1004 or 1904 or 2009 or 2011) and MATH (1005 or 1905). **N** May not be counted with COMP (3811 or 3001 or 3901).	1
COMP 3811	Algorithms 2 (Advanced)	4	**P** COMP (2002 or 2902 or 2111 or 2811) and MATH (1004 or 1904 or 2009 or 2011) and MATH (1005 or 1905). Also Distinction in a COMP, SOFT or MATH intermediate unit. **N** COMP (3111 or 3001 or 3901).	1
INFO 3005	Organisational Database Systems	4	**P** INFO (2000 or 2900) and INFO (2005 or 2905). **N** May not be counted with INFO 3905 or COMP (3005 or 3905).	1
INFO 3905	Organisational Database Systems (Adv)	4	**P** INFO (2000 or 2900) and INFO (2005 or 2905) and Distinction in an INFO, ISYS or SOFT unit at 2000-level or above. **N** May not be counted with COMP (3005 or 3905) or INFO 3005.	1
MULT 3004	Computer Graphics	4	**P** COMP (2111 or 2811 or 2002 or 2902) and [SOFT (2004 or 2904) or COMP (2004 or 2904)] and MATH (1002 or 1902). **N** May not be counted with MULT 3904 or COMP (3004 or 3904).	2
MULT 3904	Computer Graphics (Advanced)	4	**P** COMP (2111 or 2811 or 2002 or 2902) and [SOFT (2004 or 2904) or COMP (2004 or 2904)] and MATH (1002 or 1902) and Distinction in a MULT or SOFT unit at 2000-level or above. **N** May not be counted with MULT 3004 or COMP (3004 or 3904).	2
MULT 3018	Multimedia Interaction	4	**P** SOFT (2004 or 2904) or COMP (2004 or 2904). **N** May not be counted with MULT 3918.	1
MULT 3918	Multimedia Interaction (Advanced)	4	**P** SOFT (2004 or 2904) or COMP (2004 or 2904) and Distinction in a MULT or SOFT unit at 2000-level or above. **N** May not be counted with MULT 3018.	1
MULT 3019	Digital Media	4	**P** COMP (2111 or 2811 or 2002 or 2902) and MATH (1001 or 1901) and MATH (1002 or 1902) and MATH (1003 or 1903). **N** May not be counted with MULT 3919.	1
MULT 3919	Digital Media (Advanced)	4	**P** COMP (2111 or 2811 or 2002 or 2902) and MATH (1001 or 1901) and MATH (1002 or 1902) and MATH (1003 or 1903) and Distinction in a MULT or SOFT unit at 2000-level or above. **N** May not be counted with MULT 3019.	1
NETS 3007	Network Protocols	4	**P** [[NETS (2008 or 2908) and NETS (2009 or 2909)] or ELEC 2601] and [SOFT (2004 or 2904) or COMP (2004 or 2904)] and SOFT (2001 or 2901). **N** May not be counted with NETS 3907 or COMP (3007 or 3907).	1
NETS 3907	Network Protocols (Advanced)	4	**P** [[NETS (2008 or 2908) and NETS (2009 or 2909)] or ELEC 2601] and [SOFT (2004 or 2904) or COMP (2004 or 2904)] and SOFT (2001 or 2901) and Distinction in a NETS or SOFT unit at 2000-level or above. **N** May not be counted with NETS 3007 or COMP (3007 or 3907).	1
NETS 3009	Operating Systems	4	**P** [NETS (2008 or 2908) or ELEC 2601] and [SOFT (2004 or 2904) or COMP (2004 or 2904)] and SOFT(2001 or 2901). **N** May not be counted with NETS 3909 or COMP (3009 or 3909).	2
NETS 3909	Operating Systems (Advanced)	4	**P** [NETS (2008 or 2908) or ELEC 2601] and [SOFT (2004 or 2904) or COMP (2004 or 2904)] and SOFT(2001 or 2901) and Distinction in a NETS or SOFT unit at 2000-level or above. **N** May not be counted with NETS 3009 or COMP (3009 or 3909).	2

Table I: Bachelor of Science (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
NETS 3016	Computer and Network Security	4	**A** MATH (1004 and 1005). **P** [[NETS (2008 or 2908) and NETS (2009 or 2909)] or ELEC 2601] and [SOFT (2004 or 2904) or COMP (2004 or 2904)]. **N** May not be counted with NETS 3916 or ELEC 5610.	1
NETS 3916	Computer and Network Security (Advanced)	4	**A** MATH (1004 and 1005). **P** [[NETS (2008 or 2908) and NETS (2009 or 2909)] or ELEC 2601] and [SOFT (2004 or 2904) or COMP (2004 or 2904)] and Distinction in a NETS or SOFT unit at 2000-level or above. **N** May not be counted with NETS 3016 or ELEC 5610.	1
NETS 3017	Network Programming and Distributed Apps	4	**P** [[NETS (2008 or 2908) and NETS (2009 or 2909)] or ELEC 2601] and [SOFT (2004 or 2904) or COMP (2004 or 2904)] and SOFT (2001 or 2901). **N** May not be counted with NETS 3917 or ELEC 3604.	2
NETS 3917	Network Prog & Distributed Apps (Adv)	4	**P** [NETS (2008 or 2908) and NETS (2009 or 2909) or ELEC 2601] and [SOFT (2004 or 2904) or COMP (2004 or 2904)] and SOFT (2001 or 2901) and Distinction in a NETS or SOFT unit at 2000-level or above. **N** May not be counted with NETS 3017 or ELEC 3604.	2
SOFT 3101	Object-Oriented Software Design	4	**P** SOFT (2001 or 2901) and INFO (2000 or 2900) and INFO (2005 or 2905) and [SOFT (2004 or 2904) or COMP (2004 or 2904)]. **N** May not be counted with SOFT 3801 or COMP (3008 or 3908).	1
SOFT 3801	Object-Oriented Software Design (Adv)	4	**P** SOFT (2001 or 2901) and INFO (2000 or 2900) and INFO (2005 or 2905) and [SOFT (2004 or 2904) or COMP (2004 or 2904)] and Distinction in a SOFT or INFO unit at 2000-level or above. **N** May not be counted with SOFT 3101 or COMP (3008 or 3908).	1
SOFT 3102	User Interface Design and Programming	4	**P** [SOFT (2004 or 2904) or COMP (2004 or 2904)]. **N** SOFT 3802 or COMP (3102 or 3802).	1
SOFT 3802	User Interface Design Programming (Adv)	4	**P** [SOFT (2004 or 2904) or COMP (2004 or 2904)] and Distinction in a SOFT or INFO unit at 2000-level or above. **N** SOFT 3102 or COMP (3102 or 3802).	1
SOFT 3103	Software Validation and Verification	4	**P** [SOFT (2004 or 2904) or COMP (2004 or 2904)] and SOFT (2001 or 2901) and MATH (1005 or 1905). **N** May not be counted with SOFT 3803.	2
SOFT 3803	Software Validation & Verification (Adv)	4	**P** [SOFT (2004 or 2904 or COMP (2004 or 2904)] and SOFT (2001 or 2901) and MATH (1005 or 1905) and Distinction in a SOFT or INFO unit at 2000-level or above. **N** May not be counted with SOFT 3103.	2
SOFT 3104	Software Development Methods 2	4	**P** [SOFT (2004 or 2904) or COMP (2004 or 2904)] and SOFT (2001 or 2901). **N** May not be counted with SOFT 3804 or COMP (3100 or 3800).	1
SOFT 3804	Software Development Methods 2 (Adv)	4	**P** [SOFT (2004 or 2904) or COMP (2004 or 2904)] and SOFT (2001 or 2901) and Distinction in a SOFT or INFO unit at 2000-level or above. **N** May not be counted with SOFT 3104 or COMP (3100 or 3800).	1
SOFT 3200	Software Development Project	8	**P** [SOFT (2004 or 2904) or COMP (2004 or 2904)] and SOFT (2001 or 2901) and 8 credit points from BIT table III(ii) and 8 credit points from BIT table III(iv). **N** May not be counted with SOFT 3700.	1, 2
SOFT 3700	Software Development Project (Advanced)	8	**P** [SOFT (2004 or 2904) or COMP (2004 or 2904)] and SOFT (2001 or 2901) and 8 credit points from BIT table III(ii) and 8 credit points from BIT table III(iv) and Distinction in a 2000- or 3000- level unit from COMP, INFO, MULT, NETS, or SOFT. **N** May not be counted with SOFT 3200.	1, 2

Financial Mathematics and Statistics

Students are required to complete all the core units, or other mutually exclusive units such as their advanced equivalents.

■ Core Junior units of study

All of the following units of study.

MATH 1001	Differential Calculus	3	**A** HSC Mathematics Extension 1. **N** MATH 1011 or 1901 or 1906.	1, Summer
MATH 1002	Linear Algebra	3	**A** HSC Mathematics Extension 1. **N** MATH 1902 or 1012.	1, Summer
MATH 1003	Integral Calculus and Modelling	3	**A** HSC Mathematics Extension 2 or MATH 1001. **N** MATH 1013 or 1903 or 1907.	2, Summer
MATH 1005	Statistics	3	**A** HSC Mathematics. **N** MATH (1905 or 1015) or ECMT Junior units of study or STAT (1021 or 1022).	2, Summer
MATH 1901	Differential Calculus (Advanced)	3	**A** HSC Mathematics Extension 2 or result in Band E4 of HSC Mathematics Extension 1. **N** MATH (1011 or 1001 or 1906).	1
MATH 1902	Linear Algebra (Advanced)	3	**A** HSC Mathematics Extension 2 or result in Band E4 of HSC Mathematics Extension 1. **N** MATH (1002 or 1012).	1
MATH 1903	Integral Calculus and Modelling Advanced	3	**A** HSC Mathematics Extension 2 or Credit or better in MATH 1001/1901. **N** MATH (1003 or 1013 or 1907).	2
MATH 1905	Statistics (Advanced)	3	**A** HSC Mathematics Extension 2 or result in Band E3 or better of HSC Mathematics Extension 1. **N** MATH (1005 or 1015) or ECMT Junior units of study or STAT (1021 or 1022).	2

■ Core Intermediate units of study

All of the following units of study.

MATH 2001	Vector Calculus and Complex Variables	4	**P** MATH (1001 or 1901or 1906) and (1002 or 1902) and (1003 or 1903 or 1907). **N** MATH 2901.	1, Summer
MATH 2033	Financial Mathematics 1	4	**P** MATH (1001 or 1901 or 1906) and MATH (1002 or 1902) and MATH (1003 or 1903 or 1907) and MATH (1005 or 1905). **N** MATH 2933.	1

Table I: Bachelor of Science (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
STAT 2001	Statistical Distributions	4	**P** MATH (1001 or 1901 or 1906 or Credit in 1011) and [MATH (1005 or 1905 or 1015) or MATH (1004 or 1904)]. **N** STAT 2901.	1
STAT 2002	Data Analysis	4	**P** MATH 1005 or 1905 or 1015 (or STAT 1021 for Arts students).	1
STAT 2003	Estimation Theory	4	**P** STAT 2001 or 2901. **N** STAT 2903.	2
STAT 2004	Hypothesis Testing	4	**A** STAT 2002. **P** MATH (1005 or 1905 or 1015).	2
MATH 2901	Vector Calculus and Complex Var (Adv)	4	**P** MATH (1901 or 1906 or Credit in 1001) and (1902 or Credit in 1002) and (1903 or 1907 or Credit in 1003). **N** MATH 2001.	1
MATH 2933	Financial Mathematics 1 (Advanced)	4	**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) and MATH (1905 or credit in 1005). **N** MATH 2033.	1
STAT 2901	Introduction to Probability (Advanced)	4	**P** MATH (1903 or 1907 or Credit in 1003) and MATH (1905 or Credit in 1005). **N** STAT 2001.	1
STAT 2903	Estimation Theory (Advanced)	4	**P** STAT 2901 or Credit in STAT 2001. **N** STAT 2003.	2
■ **Intermediate elective units of study**				
MATH 2002	Matrix Applications	4	**P** MATH (1002 or 1902) or Distinction in MATH 1012. **N** MATH 2902.	1, Summer
MATH 2003	Introduction to Mathematical Computing	4	**P** MATH (1001 or 1901 or 1906) and (1002 or 1902) and (1003 or 1903 or 1907). **N** MATH 2903.	1
MATH 2010	Optimisation	4	**P** MATH (1001 or 1901 or 1906) and (1002 or 1902). **N** ECMT 3510.	2, Summer
INFO 2005	Database Management, Introductory	4	**Q** ISYS 1003 or INFO 1000 or INFS 1000 or [COSC (1001 or 1901) and COSC (1002 or 1902)] or SOFT (1001 or 1901) or COMP (1001 or 1901). **N** May not be counted with INFO 2905.	2
MATH 2902	Linear Algebra (Advanced)	4	**P** 12 credit points of Junior Mathematics, including MATH 1902 or Credit in 1002. **N** MATH 2002.	1
MATH 2903	Intro to Mathematical Computing (Adv)	4	**P** MATH (1901 or 1906 or Credit in 1001) and (1902 or Credit in 1002) and (1903 or 1907 or Credit in 1003). **N** MATH 2003.	1
INFO 2905	Database Management, Introductory (Adv)	4	**Q** ISYS 1003 or INFO 1000 or INFS 1000 or [COSC (1001 or 1901) and COSC (1002 or 1902)] or SOFT (1001 or 1901) or COMP (1001 or 1901) and Distinction in one INFO, ISYS or SOFT unit. **N** May not be counted with INFO 2005.	2
■ **Core Senior units of study**				
All of the following units of study.				
MATH 3015	Financial Mathematics 2	4	**P** 8 credit points of Intermediate Mathematics including MATH 2033 or 2933 (and strongly advise MATH 2010 and STAT (2001 or 2901)). **N** MATH 3933.	2
STAT 3002	Applied Linear Models	4	**P** STAT 2004 (or STAT 1022 for Arts students) and MATH (1002 or 1902). **N** May not be counted with STAT 3902.	1
STAT 3003	Time Series Analysis	4	**P** STAT (2003 or 2903). **N** May not be counted with STAT 3903.	1
STAT 3005	Applied Stochastic Processes	4	**P** MATH (1003 or 1903 or 1907) and STAT (2001 or 2901). **N** STAT 3905.	2
MATH 3933	Financial Mathematics 2 (Advanced)	4	**P** 8 credit points of Intermediate Mathematics including MATH 2933 or Credit in MATH 2033 (and strongly advise MATH 2010 and STAT (2001 or 2901)). **N** MATH 3015.	2
STAT 3902	Linear Models (Advanced)	4	**P** STAT 2004 and (STAT 2903 or Credit in 2003) and (MATH 2002 or 2902). **N** May not be counted with STAT 3002.	1
STAT 3903	Time Series Analysis (Advanced)	4	**P** STAT 2903 or credit or better in STAT 2003. **N** May not be counted with STAT 3003.	1
STAT 3905	Markov Processes (Advanced)	4	**P** STAT 2901 or (Credit in STAT 2001 and MATH (1003 or 1903 or 1907)). **N** STAT 3005.	2
■ **Senior elective units of study**				
At least two of the units of study listed in this subject area.				
INFO 3005	Organisational Database Systems	4	**P** INFO (2000 or 2900) and INFO (2005 or 2905). **N** May not be counted with INFO 3905 or COMP (3005 or 3905).	1
MATH 3010	Information Theory	4	**P** 8 credit points of Intermediate Mathematics (strongly advise MATH 2001 or 2901 and some probability theory).	2
MATH 3016	Mathematical Computing I	4	**P** 8 credit points of Intermediate Mathematics and one of MATH 1001 or 1003 or 1901 or 1903 or 1906 or 1907. **N** May not be counted with MATH 3916.	1
MATH 3018	Partial Differential Equations and Waves	4	**P** MATH (2001 or 2901) and MATH (2005 or 2905). **N** May not be counted with MATH 3921.	1
STAT 3001	Distribution Theory and Inference	4	**P** MATH (1003 or 1903 or 1907) and STAT (2003 or 2903). **N** STAT 3901.	1
STAT 3004	Design of Experiments	4	**P** STAT (3002 or 3902). **N** May not be counted with STAT 3904.	2

Table I: Bachelor of Science (continued)

Unit of study		CP		A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
STAT 3006	Sampling Theory and Categorical Data	4	**P**	STAT 2003 or 2903.	2
INFO 3905	Organisational Database Systems (Adv)	4	**P** **N**	INFO (2000 or 2900) and INFO (2005 or 2905) and Distinction in an INFO, ISYS or SOFT unit at 2000-level or above. May not be counted with COMP (3005 or 3905) or INFO 3005.	1
MATH 3916	Mathematical Computing I (Advanced)	4	**P** **N**	8 credit points of Intermediate Mathematics and one of MATH 1903 or 1907 or Credit in MATH 1003. May not be counted with MATH 3016.	1
MATH 3921	P D E And Waves (Advanced)	4	**P** **N**	MATH (2901 or credit in 2001) and (2905 or credit in 2005). May not be counted with MATH 3018.	1
STAT 3901	Statistical Theory (Advanced)	4	**P** **N**	(MATH 2001 or 2901) and STAT 2903. STAT 3001.	1
STAT 3904	Design of Experiments (Advanced)	4	**P** **N**	STAT 3902 or credit or better in STAT 3002. May not be counted with STAT 3004.	2

Geography

For a major in Geography, the minimum requirement is 24 credit points from Senior units of study listed in this subject area.

■ Junior units of study

GEOL 1001	Earth and its Environment	6	**A** **N**	No previous knowledge of Geology assumed. GEOL 1501.	1
GEOL 1002	Earth Processes and Resources	6	**A** **N**	No previous knowledge of Geology assumed. GEOL 1501.	2

■ Intermediate units of study

GEOG 2001	Processes in Geomorphology	8	**P**	36 credit points of Junior units of study, including GEOG 1001 or ENVI 1001 or 1002. Students enrolled in the Bachelor of Resource Economics should have 36 credit points from Junior units of study in Biology, Chemistry and Mathematics.	1
GEOG 2002	Fluvial and Coastal Geography	8	**P** **N**	36 credit points of Junior units of study, including GEOG 1001 or ENVI 1001 or 1002. Students enrolled in the Bachelor of Resource Economics should have 36 credit points from Junior units of study in Biology, Chemistry and Mathematics. May not be counted with GEOG 2302 or 2303 or MARS 2002. *NB: Other Information: As for GEOG 2001.*	2
GEOG 2101	Environmental Change and Human Response	8	**P**	36 credit points of Junior units of study, including GEOG 1001 or 1002 or ENVI 1001 or 1002. *NB: Other Information: As for GEOG 2001.*	1
GEOG 2102	Resource and Environmental Management	8	**P**	36 credit points of Junior units of study, including GEOG 1001 or 1002 or ENVI 1001 or 1002. *NB: Other Information: As for GEOG 2001.*	2
GEOG 2201	Cultural and Economic Geography	8	**P**	36 credit points of Junior units of study, including GEOG 1001 or 1002 or ENVI 1002 or ECOP 1001 or 1002. *NB: Other Information: As for GEOG 2001.*	1
GEOG 2202	Urban and Political Geography	8	**P**	36 credit points of Junior units of study, including GEOG 1001 or 1002 or ENVI 1002 or ECOP 1001 or 1002. *NB: Other Information: As for GEOG 2001.*	2
GEOG 2302	Fluvial Geomorphology	6	**P** **N**	GEOG 2001 or 36 credit points of Junior units of study including GEOG 1001 or ENVI 1001 or 1002. Students in the Bachelor of Resource Economics should have 36 credit points of Junior units of study in Biology, Chemistry and Mathematics. May not be counted with GEOG 2002 or 2303. *NB: Other Information: as for GEOG 2001.*	2
GEOG 2303	Fluvial and Groundwater Geomorphology	8	**P** **N**	GEOG 2001 or 36 credit points of Junior study including GEOG 1001 or ENVI 1001 or 1002. Students in the Bachelor of Resource Economics should have 36 credit points of study in Biology, Chemistry and Mathematics. May not be counted with GEOG 2002 or GEOG 2302. *NB: Other Information: as for GEOG 2001.*	2

■ Senior units of study

GEOG 3002	Environmental Geomorphology	12	**P**	GEOG (2001 or 2002 or 2101 or 2302 or 2303).	2
GEOG 3101	Catchment Management	12	**P**	GEOG 2001 or 2002 or 2101 or 2302 or 2303 and GEOG 2102 or 2201 or 2202.	1
GEOG 3201	Asia-Pacific Field School	12	**P**	GEOG 2101 or 2102 or 2201 or 2202.	1
GEOG 3202	Sustainable Cities and Resource Regions	12	**P**	GEOG (2102 or 2201 or 2202).	1
GEOG 3203	Globalisation and Regions in Transition	12	**P**	GEOG (2102 or 2201 or 2202).	2
MARS 3003	Coastal Depositional Environments	6	**P**	MARS (2001 and 2002) or 16 credit points of Intermediate Science including at least 8 credit points from Geology or Geography units of study.	1a
MARS 3004	Coastal Morphodynamics	6	**P** **N**	MARS (2001 and 2002) or 16 credit points of Intermediate Science including at least 8 credit points from Geology or Geography units of study. May not be counted with GEOG 3001.	1b
MARS 3103	GIS Simulation Modelling	6	**P** **N**	MARS (2001 and 2002) or 16 credit points of Intermediate Science including at least 8 credit points from Geology or Geography units of study. May not be counted with GEOG 3102.	2a
MARS 3104	Coastal Zone Management	6	**P** **N**	MARS (2001 and 2002) or 16 credit points of Intermediate Science including at least 8 credit points from Geology or Geography units of study. GEOG 3102.	2b

Table I: Bachelor of Science (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
Geology				
For a major in Geology, the minimum requirement is 24 credit points from Senior units of study listed in this subject area.				
■ **Junior units of study**				
GEOL 1001	Earth and its Environment	6	**A** No previous knowledge of Geology assumed. **N** GEOL 1501.	1
GEOL 1002	Earth Processes and Resources	6	**A** No previous knowledge of Geology assumed. **N** GEOL 1501.	2
■ **Intermediate units of study**				
GEOL 2001	Geological Hazards and Solutions	8	**P** GEOL 1002 or ENVI 1001. A candidate who has completed 24 credit points of Junior units of study in Physics and Chemistry and who has not taken Junior Geology or ENVI 1001, may apply under section 1 (4) for permission to enrol in GEOL 2001. **N** CIVL 2409.	1
GEOL 2003	Fossils and Time	4	**P** 24 credit points of Science units of study. **N** CIVL 2409.	2
GEOL 2004	Environmental Geology and Climate Change	4	**P** 24 credit points of Science units of study.	1
GEOL 2202	Geological Exploration & Resource Mgmt	8	**Q** GEOL 2001. **N** May not be counted with GEOL (2002 or 2005).	2
■ **Senior units of study**				
GEOS 3003	Structural Geology: The Dynamic Crust	6	**P** GEOL 2002 or CIVL 2409. **N** May not be counted with GEOL 3101.	1
GEOS 3004	Geophysics, Imaging, Oil/Ore Production	6	**P** 16 credit points of Intermediate Science units of study or CIVL 2409. **N** May not be counted with GEOP 3202.	2
GEOS 3005	Regolith-Sediment Geochemistry	6	**P** 16 credit points of Intermediate Science units of study or CIVL 2409.	1
GEOS 3006	Mineral Deposits & Spacial Data Analysis	6	**P** 16 credit points of Intermediate Science units of study or CIVL 2409. **N** May not be counted with GEOL 3103.	2
GEOS 3007	Remote Sensing: Imaging the Earth	6	**P** 16 credit points of Intermediate Science units of study or CIVL 2409. **N** May not be counted with GEOL 3101.	1
GEOS 3008	Field Geology and Geophysics	6	**P** GEOL 2002. **N** May not be counted with GEOL 3103.	2
MARS 3005	Marine Geophysical Data Analysis	6	**P** MARS (2001 and 2002) or 16 credit points of Intermediate Science including at least 8 credit points from Geology or Geography units of study or CIVL 2409.	1a
MARS 3006	Dynamics of Ocean Basins and Margins	6	**A** Prior completion of MARS 3005 is highly recommended. **P** MARS (2001 and 2002) or 16 credit points of Intermediate Science including at least 8 credit points from Geology or Geography units of study or CIVL 2409.	1b
MARS 3008	Energy: Science, Engineering & Economics	6	**P** MARS (2001 and 2002) or 16 credit points of Intermediate Science including at least 8 credit points from Geology or Geography units of study or CIVL 2409. **N** May not be counted with GEOL 3102.	1
MARS 3105	Coastal Oceanography & Sediment Dynamics	6	**P** MARS (2001 and 2002) or 16 credit points of Intermediate Science including at least 8 credit points from Geology or Geography units of study or CIVL 2409. **N** May not be counted with GEOL 3104.	2a
MARS 3106	Physical Marine Habitat	6	**P** MARS (2001 and 2002) or 16 credit points of Intermediate Science including at least 8 credit points from Geology or Geography units of study.	2b
Geophysics				
For a major in Geophysics, the minimum requirement is 24 credit points from Senior units of study listed in this subject area.				
■ **Senior units of study**				
GEOS 3003	Structural Geology: The Dynamic Crust	6	**P** GEOL 2002 or CIVL 2409. **N** May not be counted with GEOL 3101.	1
GEOS 3004	Geophysics, Imaging, Oil/Ore Production	6	**P** 16 credit points of Intermediate Science units of study or CIVL 2409. **N** May not be counted with GEOP 3202.	2
GEOS 3006	Mineral Deposits & Spacial Data Analysis	6	**P** 16 credit points of Intermediate Science units of study or CIVL 2409. **N** May not be counted with GEOL 3103.	2
GEOS 3007	Remote Sensing: Imaging the Earth	6	**P** 16 credit points of Intermediate Science units of study or CIVL 2409. **N** May not be counted with GEOL 3101.	1
GEOS 3008	Field Geology and Geophysics	6	**P** GEOL 2002. **N** May not be counted with GEOL 3103.	2
MARS 3005	Marine Geophysical Data Analysis	6	**P** MARS (2001 and 2002) or 16 credit points of Intermediate Science including at least 8 credit points from Geology or Geography units of study or CIVL 2409.	1a
MARS 3006	Dynamics of Ocean Basins and Margins	6	**A** Prior completion of MARS 3005 is highly recommended. **P** MARS (2001 and 2002) or 16 credit points of Intermediate Science including at least 8 credit points from Geology or Geography units of study or CIVL 2409.	1b
MARS 3008	Energy: Science, Engineering & Economics	6	**P** MARS (2001 and 2002) or 16 credit points of Intermediate Science including at least 8 credit points from Geology or Geography units of study or CIVL 2409. **N** May not be counted with GEOL 3102.	1
MARS 3105	Coastal Oceanography & Sediment Dynamics	6	**P** MARS (2001 and 2002) or 16 credit points of Intermediate Science including at least 8 credit points from Geology or Geography units of study or CIVL 2409. **N** May not be counted with GEOL 3104.	2a
MARS 3106	Physical Marine Habitat	6	**P** MARS (2001 and 2002) or 16 credit points of Intermediate Science including at least 8 credit points from Geology or Geography units of study.	2b

Table I: Bachelor of Science (continued)

Unit of study	CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session

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 study HPSC 3022 Science and Society (6cp) or HPSC 3003, Social Relations of Science (4cp) (last offered in 2003 and now superceded by HPSC 3022).

■ Intermediate units of study

HPSC 2001	What Is This Thing Called Science?	4	**P** 24 credit points of Junior units of study.	2
HPSC 2002	The Birth of Modern Science	4	**P** 24 credit points of Junior units of study.	1, Summer

■ Senior units of study

HPSC 3002	History of Biological/Medical Sciences	6	**P** HPSC (2001 and 2002) or (Credit or better in HPSC (2001 or 2002) and at least 24 credit points of Intermediate or Senior units of study).	2
HPSC 3005	History/Philosophy of Medicine	4	**A** Assumed knowledge of HPSC (2001 and 2002). **P** At least 24 credit points of Intermediate or Senior units of study.	1
HPSC 3007	Science and Ethics	4	**P** HPSC (2001 and 2002) or (Credit or better in HPSC (2001 or 2002) and at least 24 credit points of Intermediate or Senior units of study).	1
HPSC 3010	History of the Human Sciences	4	**P** HPSC (2001 and 2002) or (Credit or better in HPSC (2001 or 2002) and at least 24 credit points of Intermediate or Senior units of study).	1
HPSC 3015	History and Philosophy of Physics	6	**A** HPSC (2001 and 2002). **P** HPSC (2001 and 2002) or (Credit or better in HPSC (2001 or 2002) and at least 24 credit points of Intermediate or Senior units of study. **N** HPSC 3105.	1
HPSC 3016	History and Philosophy of Mathematics	6	**A** HPSC (2001 and 2002). **P** HPSC (2001 and 2002) or (Credit or better in HPSC (2001 or 2002) and at least 24 credit points of Intermediate or Senior units of study. **N** HPSC (3001 or 3106).	2
HPSC 3021	Philosophy and Sociology of Biology	6	**A** HPSC 2001 and HPSC 2002. **P** HPSC (2001 and 2002) or (Credit or better in HPSC (2001 or 2002) and at least 24 credit points of Intermediate or Senior units of study). **N** HPSC 3103.	2
HPSC 3022	Science and Society	6	**A** HPSC 2001 and HPSC 2002. **P** HPSC 2001 and HPSC 2002 OR a Credit or above in either HPSC 2001 or HPSC 2002 and at least 24 credit points of Intermediate or Senior units of study. **N** HPSC 3003.	1
HPSC 3100	Contemporary Issues in HPS	4	**P** HPSC (2001 and 2002) or (Credit or better in HPSC (2001 or 2002) and at least 24 credit points of Intermediate or Senior units of study).	2
HPSC 3102	History of the Biomedical Sciences	12	**P** HPSC (2001 and 2002). *NB: Available to Bachelor of Medical Science students only.*	1, 2
HPSC 3104	Medicine, Sex and Gender	4	**P** HPSC (2001 and 2002) or (Credit or better in HPSC (2001 or 2002) and at least 24 credit points of Intermediate or Senior units of study). **N** May not be counted with WMST 2006.	2

Immunobiology

For a major in Immunobiology, the minimum requirement is:
(i) IMMU 3002
(ii) a minimum of 12 credit points from the elective units of study listed in this subject area.

■ Intermediate units of study

The completion of MBLG (2001 or 2101 or 2901) is highly recommended.

IMMU 2001	Introductory Immunology	4	**A** Junior Biology and Junior Chemistry. **P** 24 credit points of Junior units of study from any of the science discipline areas. **N** BMED 2506. *NB: This is a prerequisite unit of study for IMMU 3002. The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	1

■ Senior Core units of study

IMMU 3002	Immunology	12	**A** Intermediate Biochemistry and Molecular Biology and Genetics. **P** IMMU 2001 and 8 credit points of intermediate units of study from Biochemistry or Biology or Microbiology or Molecular Biology and Genetics or Pharmacology or Physiology. **N** May not be counted with BMED 3003. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	2

■ Senior Elective units of study

BCHM 3001	Mol Biology and Structural Biochemistry	12	**P** A total of at least 16 credit points of Intermediate MBLG and BCHM units. For BMedSc students: 32 credit points of Intermediate BMED units including BMED (2501, 2502 and 2504). **N** May not be counted with BCHM 3901.	1
BCHM 3901	Mol Biology and Structural Biochem (Adv)	12	**P** Distinction in a total of at least 16 credit points from Intermediate MBLG and BCHM units. For BMedSc students: 32 credit points of Intermediate BMED units including Distinctions in BMED (2501, 2502 and 2504). **N** BCHM 3001.	1
BCHM 3002	Cellular and Medical Biochemistry	12	**P** A total of at least 16 credit points of Intermediate MBLG and BCHM units. For BMedSc students 32 credit points of Intermediate BMED units including BMED (2501, 2502 and 2504). **N** May not be counted with BCHM (3902, 3004 or 3904).	2

Table I: Bachelor of Science (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
BCHM 3902	Cellular and Medical Biochemistry (Adv)	12	**P** Distinction in a total of at least 16 credit points from Intermediate MBLG and BCHM units. For BMedSc students: 32 credit points of Intermediate BMED units including Distinctions in BMED (2501, 2502 and 2504). **N** May not be counted with BCHM (3002, 3004 and 3904).	2
BIOL 3018	Applications of Recombinant DNA Tech	6	**P** MBLG (2001 or 2901 and 2002 or 2902) or 16 credit points of Intermediate Biology. For BMedSc students: 32 credit points of Intermediate BMED units including BMED 2502. **N** BIOL (3918).	1a
BIOL 3918	Applications of Recombinant DNA Tech Adv	6	**P** Distinction average in MBLG (2001 or 2901 and 2002 or 2902) or in 16 credit points of Intermediate Biology. For BMedSc students: 32 credit points of Intermediate BMED units including Distinction in BMED 2502. These requirements may be varied and students with lower averages should contact the unit Executive Officer. **N** BIOL (3018).	1a
BIOL 3026	Developmental Genetics	6	**P** MBLG (2001 or 2901 and 2002 or 2902) or 16 credit points of Intermediate Biology. For BMedSc students: 32 credit points of Intermediate BMED units including BMED 2502. **N** BIOL (3926 or 3929).	2b
BIOL 3926	Developmental Genetics (Advanced)	6	**P** Distinction average in MBLG (2001 or 2901 and 2002 or 2902) or in 16 credit points of Intermediate Biology. For BMedSc students 32 credit points of Intermediate BMED units including Distinction in BMED 2502. These requirements may be varied and students with lower averages should contact the unit Executive Officer. **N** BIOL (3026 or 3929).	2b
BIOL 3027	Bioinformatics and Genomics	6	**P** MBLG (2001 or 2101 or 2901) or 16 credit points of Intermediate Biology including BIOL (2001 or 2901 or 2004 or 2904 or 2006 or 2906). For BMedSc students: 32 credit points of Intermediate BMED units including BMED 2502. **N** BIOL 3927.	1b
BIOL 3927	Bioinformatics and Genomics (Advanced)	6	**P** Distinction in MBLG (2001 or 2101 or 2901) or Distinction average in 16 credit points of Intermediate Biology including BIOL (2001 or 2901 or 2004 or 2904 or 2006 or 2906). For BMedSc students: 32 credit points of Intermediate BMED units including Distinction in BMED 2502. These requirements may be varied and students with lower averages should contact the unit Executive Officer. **N** BIOL 3027.	1b
CPAT 3001	Cell Pathology A	12	**P** ANAT 2002; or BCHM 2002 or 2902; or BIOL 2006 or 2906; or both PCOL 2001 and (2002 or 2003); or PHSI 2002. For BMedSc: 32 credit points from Intermediate BMED units of study. *NB: Entry requires Departmental permission: only a small number of students can be accommodated in the laboratory facilities. The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	N/A in 2004
CPAT 3101	Pathological Basis of Human Disease	12	**P** ANAT 2001; or BCHM (2001 or 2002 or 2101 or 2102 or 2901 or 2902); or MBLG (2001 or 2101 or 2901); or BIOL (2001 or 2002 or 2006 or 2101 or 2102 or 2105 or 2106 or 2901 or 2902 or 2906); or HPSC (2001 or 2002); or MICR (2001 or 2003 or 2901); or PCOL 2001; or PHSI 2001. For BMedSc: 32 credit points from Intermediate BMED units of study. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	2
MICR 3001	General and Medical Microbiology	12	**P** MBLG (2001 or 2101 or 2901) and [12 credit points of Intermediate MICR units or MICR (2011 and 2012) or MICR 2909]. For BMedSc students: 32 credit points of Intermediate BMED units including BMED 2506. **N** MICR 3901.	1
MICR 3901	General and Medical Microbiology (Adv)	12	**P** MBLG (2101 or 2001 or 2901) and [12 credit points of Intermediate MICR units including one Distinction, or MICR (2011 and 2012) including one Distinction, or Distinction in MICR 2909. For BMedSc: 32 credit points of Intermediate BMED units including Distinction in BMED 2506. **N** MICR 3001.	1
PHSI 3004	Human Cellular Physiology	12	**P** For BMedSc: 32 credit points of Intermediate BMED units including BMED (2501 and 2502 and 2504). For others: PHSI (2001 or 2101 or 2901) and PHSI (2002 or 2102 or 2902) and either MBLG (2001 or 2101 or 2901) or BCHM (2001 or 2101 or 2901). **N** PHSI 3904.	1
PHSI 3904	Human Cellular Physiology (Advanced)	12	**P** For BMedSc: 32 credit points of Intermediate BMED units including BMED (2501 and 2502 and 2504). For others: PHSI (2001 or 2101 or 2901) and PHSI (2002 or 2102 or 2902) and either MBLG (2001 or 2101 or 2901) or BCHM (2001 or 2101 or 2901). **N** PHSI 3004. *NB: Department permission required for enrolment. Permission is required for enrolment. Available to selected students who have achieved an average of at least 65 in the prerequisite units of study.*	1

Information Systems

For a major in Information Systems, the minimum requirement is 24 credit points from Senior units of study listed in this subject area.

■ Junior units of study

ISYS 1003	Foundations of Information Technology	6	**N** May not be counted with INFO 1000 or INFS 1000.	1, 2

■ Intermediate units of study

INFO 2000	Systems Analysis and Design	4	**Q** ISYS 1003 or INFO 1000 or INFS 1000 or [COSC (1001 or 1901) and COSC (1002 or 1902)] or SOFT (1001 or 1901) or COMP (1001 or 1901). **N** May not be counted with INFO 2900.	1, Summer
INFO 2900	System Analysis and Design Advanced	4	**Q** ISYS 1003 or INFO 1000 or INFS 1000 or [COSC (1001 or 1901) and COSC (1002 or 1902)] or SOFT (1001 or 1901) or COMP (1001 or 1901) and Distinction in one INFO, ISYS or SOFT unit. **N** May not be counted with INFO 2000.	1
INFO 2005	Database Management, Introductory	4	**Q** ISYS 1003 or INFO 1000 or INFS 1000 or [COSC (1001 or 1901) and COSC (1002 or 1902)] or SOFT (1001 or 1901) or COMP (1001 or 1901). **N** May not be counted with INFO 2905.	2

Table I: Bachelor of Science (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
INFO 2905	Database Management, Introductory (Adv)	4	**Q** ISYS 1003 or INFO 1000 or INFS 1000 or [COSC (1001 or 1901) and COSC (1002 or 1902)] or SOFT (1001 or 1901) or COMP (1001 or 1901) and Distinction in one INFO, ISYS or SOFT unit. **N** May not be counted with INFO 2005.	2
ISYS 2006	Information Systems in Organisations	4	**A** Use of basic PC tools such as spreadsheets, Internet, email and word processing software. **P** Credit in one of ISYS 1003 or INFS 1000 or INFO 1000. *NB: Enrolment Restriction: Entry is restricted to students who have a credit or better in one of the qualifying units.*	1
ISYS 2007	Distributed Information Systems	4	**Q** ISYS 2006 and INFO (2000 or 2900). **N** May not be counted with INFO 2007.	2
■ **Senior units of study**				
INFO 3005	Organisational Database Systems	4	**P** INFO (2000 or 2900) and INFO (2005 or 2905). **N** May not be counted with INFO 3905 or COMP (3005 or 3905).	1
INFO 3905	Organisational Database Systems (Adv)	4	**P** INFO (2000 or 2900) and INFO (2005 or 2905) and Distinction in an INFO, ISYS or SOFT unit at 2000-level or above. **N** May not be counted with COMP (3005 or 3905) or INFO 3005.	1
ISYS 3000	Information Systems Management	4	**P** ISYS 2007 or INFO 2007.	2
ISYS 3012	Project Management and Practice	4	**P** INFO (2000 or 2900).	1
ISYS 3015	Analytical Methods for IS Professionals	4	**P** [ARIN 1000 or ENGL (1050 or 1005) or LNGS (1001 or 1002 or 1005) or ECOF (1001 or 1002)] and 16 credit points of intermediate or senior units of study, including ISYS 2006 and (ISYS 2007 or INFO 2007) and INFO (2000 or 2900). *NB: Enrolment Restriction: Entry is restricted to students who have a credit or better in at least one of the Prerequisite units.*	1
ISYS 3113	Arts Informatics Systems	4	**P** INFO (2000 or 2900) and INFO (2005 or 2905) and [(ARIN 1000 or ENGL (1050 or 1005) or LNGS (1001 or 1002 or 1005) or ECOF (1001 or 1002)].	1
ISYS 3207	Information Systems Project	8	**P** ISYS 3012 and (ISYS 3015 or ARIN 2000).	2

Marine Science

For a major in Marine Science, the minimum requirement is 24 credit points from Senior units of study listed in this subject area.

■ **Intermediate units of study**				
MARS 2001	Introductory Marine Science A	4	**P** 24 credit points of Junior units of study from Science Discipline Areas. This is a qualifying unit of study for Senior Marine Science units. Some Senior electives may have additional prerequisites.	1
MARS 2002	Introductory Marine Science B	4	**P** 24 credit points of Junior units of study from Science Discipline Areas. This is a qualifying unit for Senior Marine Science units. Some Senior electives may have additional prerequisites. **N** GEOG 2002.	2
■ **Senior units of study**				
BIOL 3011	Ecophysiology	6	**P** 16 credit points of Intermediate Biology including BIOL (2002 or 2003 or 2006 or 2902 or 2903 or 2906). **N** BIOL 3911. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	1a
BIOL 3911	Ecophysiology (Advanced)	6	**P** Distinction average in 16 credit points of Intermediate Biology including BIOL (2002 or 2003 or 2006 or 2902 or 2903 or 2906). These requirements may be varied and students with lower averages should consult the unit Executive Officer. **N** May not be counted with BIOL 3011. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	1a
BIOL 3013	Marine Biology	6	**A** MARS 2002. **P** 16 credit points of Intermediate Biology, including BIOL (2001 or 2002 or 2003 or 2004 or 2901 or 2902 or 2903 or 2904). **N** May not be counted with BIOL 3913. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	1b
BIOL 3913	Marine Biology (Advanced)	6	**A** MARS 2002. **P** Distinction average in 16 credit points of Intermediate Biology including BIOL (2001 or 2002 or 2003 or 2004 or 2901 or 2902 or 2903 or 2904). These requirements may be varied and students with lower averages should consult the unit Executive Officer. **N** May not be counted with BIOL 3013. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	1b
MARS 3003	Coastal Depositional Environments	6	**P** MARS (2001 and 2002) or 16 credit points of Intermediate Science including at least 8 credit points from Geology or Geography units of study.	1a
MARS 3004	Coastal Morphodynamics	6	**P** MARS (2001 and 2002) or 16 credit points of Intermediate Science including at least 8 credit points from Geology or Geography units of study. **N** May not be counted with GEOG 3001.	1b
MARS 3005	Marine Geophysical Data Analysis	6	**P** MARS (2001 and 2002) or 16 credit points of Intermediate Science including at least 8 credit points from Geology or Geography units of study or CIVL 2409.	1a
MARS 3006	Dynamics of Ocean Basins and Margins	6	**A** Prior completion of MARS 3005 is highly recommended. **P** MARS (2001 and 2002) or 16 credit points of Intermediate Science including at least 8 credit points from Geology or Geography units of study or CIVL 2409.	1b
MARS 3008	Energy: Science, Engineering & Economics	6	**P** MARS (2001 and 2002) or 16 credit points of Intermediate Science including at least 8 credit points from Geology or Geography units of study or CIVL 2409. **N** May not be counted with GEOL 3102.	1

Table I: Bachelor of Science (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
MARS 3102	Marine Ecology	12	**P** MARS (2001 and 2002) and 16 credit points of Intermediate Biology including BIOL (2001 or 2901 or 2002 or 2902 or 2004 or 2904). **N** BIOL 3023, 3923, 3024, 3924, 3040 or 3940.	2
MARS 3103	GIS Simulation Modelling	6	**P** MARS (2001 and 2002) or 16 credit points of Intermediate Science including at least 8 credit points from Geology or Geography units of study. **N** May not be counted with GEOG 3102.	2a
MARS 3104	Coastal Zone Management	6	**P** MARS (2001 and 2002) or 16 credit points of Intermediate Science including at least 8 credit points from Geology or Geography units of study. **N** GEOG 3102.	2b
MARS 3105	Coastal Oceanography & Sediment Dynamics	6	**P** MARS (2001 and 2002) or 16 credit points of Intermediate Science including at least 8 credit points from Geology or Geography units of study or CIVL 2409. **N** May not be counted with GEOL 3104.	2a
MARS 3106	Physical Marine Habitat	6	**P** MARS (2001 and 2002) or 16 credit points of Intermediate Science including at least 8 credit points from Geology or Geography units of study.	2b

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

MATH 1011	Life Sciences Calculus	3	**A** HSC Mathematics. **N** MATH (1001 or 1901 or 1906).	1
MATH 1012	Life Sciences Algebra	3	**A** HSC Mathematics. **N** MATH (1002 or 1902).	2
MATH 1013	Differential and Difference Equations	3	**A** HSC Mathematics. **N** MATH (1003 or 1903 or 1907).	2
MATH 1015	Life Science Statistics	3	**A** HSC Mathematics. **N** MATH (1005 or 1905) or STAT (1021 or 1022) or ECMT Junior units of study.	1, Summer
MATH 1001	Differential Calculus	3	**A** HSC Mathematics Extension 1. **N** MATH 1011 or 1901 or 1906.	1, Summer
MATH 1002	Linear Algebra	3	**A** HSC Mathematics Extension 1. **N** MATH 1902 or 1012.	1, Summer
MATH 1003	Integral Calculus and Modelling	3	**A** HSC Mathematics Extension 2 or MATH 1001. **N** MATH 1013 or 1903 or 1907.	2, Summer
MATH 1004	Discrete Mathematics	3	**A** HSC Mathematics Extension 1. **N** MATH 1904 or MATH 2011.	2, Summer
MATH 1005	Statistics	3	**A** HSC Mathematics. **N** MATH (1905 or 1015) or ECMT Junior units of study or STAT (1021 or 1022).	2, Summer
MATH 1901	Differential Calculus (Advanced)	3	**A** HSC Mathematics Extension 2 or result in Band E4 of HSC Mathematics Extension 1. **N** MATH (1011 or 1001 or 1906).	1
MATH 1902	Linear Algebra (Advanced)	3	**A** HSC Mathematics Extension 2 or result in Band E4 of HSC Mathematics Extension 1. **N** MATH (1002 or 1012).	1
MATH 1903	Integral Calculus and Modelling Advanced	3	**A** HSC Mathematics Extension 2 or Credit or better in MATH 1001/1901. **N** MATH (1003 or 1013 or 1907).	2
MATH 1904	Discrete Mathematics (Advanced)	3	**A** HSC Mathematics Extension 2 or result in Band E4 of HSC Mathematics Extension 1. **N** MATH 1004 or MATH 2011.	2
MATH 1905	Statistics (Advanced)	3	**A** HSC Mathematics Extension 2 or result in Band E3 or better of HSC Mathematics Extension 1. **N** MATH (1005 or 1015) or ECMT Junior units of study or STAT (1021 or 1022).	2
MATH 1906	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** MATH (1001 or 1011 or 1901). *NB: Department permission required for enrolment.*	1
MATH 1907	Mathematics (Special Studies Program) B	3	**P** Distinction in MATH 1906; by invitation. **N** MATH (1003 or 1013 or 1903). *NB: Department permission required for enrolment.*	2

■ Intermediate units of study

MATH 2001	Vector Calculus and Complex Variables	4	**P** MATH (1001 or 1901or 1906) and (1002 or 1902) and (1003 or 1903 or 1907). **N** MATH 2901.	1, Summer
MATH 2002	Matrix Applications	4	**P** MATH (1002 or 1902) or Distinction in MATH 1012. **N** MATH 2902.	1, Summer
MATH 2003	Introduction to Mathematical Computing	4	**P** MATH (1001 or 1901 or 1906) and (1002 or 1902) and (1003 or 1903 or 1907). **N** MATH 2903.	1
MATH 2004	Lagrangian Dynamics	4	**P** MATH 2001 or 2901. **N** MATH 2904.	2
MATH 2005	Fourier Series & Differential Equations	4	**P** MATH (1001 or 1901 or 1906) and MATH (1002 or 1902) and MATH (1003 or 1903 or 1907). **N** MATH 2905.	2, Summer
MATH 2006	Nonlinear Systems and Chaos Introduction	4	**P** MATH (1001 or 1901 or 1906) and (1002 or 1902) and (1003 or 1903 or 1907) or (Credit in MATH 1011 and 1012 and 1013). **N** MATH 2906.	2
MATH 2007	Analysis	4	**P** MATH (1001 or 1901 or 1906) and (1003 or 1903 or 1907) or Distinction average in MATH 1011 and 1013. **N** MATH 2907.	2
MATH 2008	Introduction to Modern Algebra	4	**P** MATH 2002 or 2902. **N** MATH 2908 or 2918.	2
MATH 2009	Graph Theory	4	**P** 6 credit points of Junior Mathematics (at the Distinction level in Life Sciences units).	2, Summer

Table I: Bachelor of Science (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
MATH 2010	Optimisation	4	**P** MATH (1001 or 1901 or 1906) and (1002 or 1902). **N** ECMT 3510.	2, Summer
MATH 2011	Topics in Discrete Mathematics	4	**A** HSC Mathematics Extension 1. **P** 6 credit points of Junior Mathematics. **N** MATH (1004 or 1904).	1
MATH 2033	Financial Mathematics 1	4	**P** MATH (1001 or 1901 or 1906) and MATH (1002 or 1902) and MATH (1003 or 1903 or 1907) and MATH (1005 or 1905). **N** MATH 2933.	1
MATH 2901	Vector Calculus and Complex Var (Adv)	4	**P** MATH (1901 or 1906 or Credit in 1001) and (1902 or Credit in 1002) and (1903 or 1907 or Credit in 1003). **N** MATH 2001.	1
MATH 2902	Linear Algebra (Advanced)	4	**P** 12 credit points of Junior Mathematics, including MATH 1902 or Credit in 1002. **N** MATH 2002.	1
MATH 2903	Intro to Mathematical Computing (Adv)	4	**P** MATH (1901 or 1906 or Credit in 1001) and (1902 or Credit in 1002) and (1903 or 1907 or Credit in 1003). **N** MATH 2003.	1
MATH 2904	Lagrangian Dynamics (Advanced)	4	**P** MATH 2901 or Credit in MATH 2001. **N** MATH 2004.	2
MATH 2905	Mathematical Methods (Advanced)	4	**P** MATH 2901 or Credit in MATH 2001. **N** MATH 2005.	2
MATH 2906	Nonlinear Systems and Chaos (Advanced)	4	**P** MATH (1901 or 1906 or Credit in 1001) and (1902 or Credit in 1002) and (1903 or 1907 or Credit in 1003). **N** MATH 2006.	2
MATH 2907	Analysis (Advanced)	4	**P** MATH (1901 or 1906 or Credit in 1001) and (1903 or 1907 or Credit in 1003) (MATH 2901 or 2001 strongly advised). **N** MATH 2007.	2
MATH 2918	Introduction to Modern Algebra (Adv)	4	**P** MATH 2902. **N** MATH 2008 or 2908.	2
MATH 2933	Financial Mathematics 1 (Advanced)	4	**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) and MATH (1905 or credit in 1005). **N** MATH 2033.	1
■ **Senior units of study**				
MATH 3001	Topology	4	**P** 8 credit points of Intermediate Mathematics. **N** MATH 3901.	1
MATH 3002	Rings and Fields	4	**P** 8 credit points of Intermediate Mathematics (strongly advise MATH 2002 or 2902, with 2008 or 2908). **N** MATH 3902.	1
MATH 3003	Ordinary Differential Equations	4	**P** 8 credit points of Intermediate Mathematics (strongly advise MATH 2002 or 2902, with 2001 or 2901). **N** MATH 3923.	1
MATH 3005	Logic	4	**P** (for all but BCST students) 8 credit points of Intermediate Mathematics; (for BCST students) 8 credit points of Intermediate Mathematics or 12 credit points of Junior Mathematics at Advanced level.	1
MATH 3006	Geometry	4	**P** 8 credit points of Intermediate Mathematics (strongly advise MATH 1902 or 1002).	2
MATH 3007	Coding Theory	4	**P** 8 credit points of Intermediate Mathematics (strongly advise MATH 2002 or 2902).	2
MATH 3008	Real Variables	4	**P** 8 credit points of Intermediate Mathematics (strongly advise MATH 2001 or 2007 or 2901 or 2907).	2
MATH 3009	Number Theory	4	**P** 8 credit points of Intermediate Mathematics.	2
MATH 3010	Information Theory	4	**P** 8 credit points of Intermediate Mathematics (strongly advise MATH 2001 or 2901 and some probability theory).	2
MATH 3015	Financial Mathematics 2	4	**P** 8 credit points of Intermediate Mathematics including MATH 2033 or 2933 (and strongly advise MATH 2010 and STAT (2001 or 2901)). **N** MATH 3933.	2
MATH 3016	Mathematical Computing I	4	**P** 8 credit points of Intermediate Mathematics and one of MATH 1001 or 1003 or 1901 or 1903 or 1906 or 1907. **N** May not be counted with MATH 3916.	1
MATH 3018	Partial Differential Equations and Waves	4	**P** MATH (2001 or 2901) and MATH (2005 or 2905). **N** May not be counted with MATH 3921.	1
MATH 3019	Signal Processing	4	**P** MATH (2001 or 2901) and MATH (2005 or 2905). **N** May not be counted with MATH 3919.	1
MATH 3020	Nonlinear Systems and Biomathematics	4	**P** 8 credit points of Intermediate Mathematics (strongly advise MATH 2006 or 2906 or 2908 or 3003) and one of MATH (1001 or 1003 or 1901 or 1903). **N** MATH 3920.	2
MATH 3024	Elementary Cryptography and Protocols	4	**P** 12 credit points of Intermediate Mathematics. Strongly advise MATH 2008 or 2908 or 2918.	1
MATH 3901	Metric Spaces (Advanced)	4	**P** 12 credit points of Intermediate Mathematics (strongly advise MATH 2907). **N** MATH 3001.	1
MATH 3902	Algebra I (Advanced)	4	**P** 12 credit points of Intermediate Mathematics (strongly advise MATH 2902). **N** MATH 3002.	1
MATH 3903	Differential Geometry (Advanced)	4	**P** 12 credit points of Intermediate Mathematics (strongly advise MATH 2001 or 2901, with MATH 3001 or 3901).	1
MATH 3904	Complex Variable (Advanced)	4	**P** 12 credit points of Intermediate Mathematics (strongly advise MATH 2001 or 2901, with MATH 3001 or 3901).	1

Table I: Bachelor of Science (continued)

Unit of study		CP		A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
MATH 3907	Algebra II (Advanced)	4	**P**	MATH 3902 or Credit in MATH 3002, and 12 credit points of Intermediate Mathematics. *NB: This unit of study is only offered in even years.*	2
MATH 3908	Nonlinear Analysis (Advanced)	4	**P**	12 credit points of Intermediate Mathematics (strongly advise MATH 3901).	2
MATH 3909	Lebesgue Int and Fourier Analysis (Adv)	4	**P**	12 credit points of Intermediate Mathematics (strongly advise MATH 2907 and MATH 3901).	2
MATH 3912	Combinatorics (Advanced)	4	**P**	12 credit points of Intermediate Mathematics (strongly advise MATH 2902).	N/A in 2004
MATH 3914	Fluid Dynamics (Advanced)	4	**P**	MATH (2901 or credit in 2001) and MATH (2905 or credit in 2005).	1
MATH 3915	Mathematical Methods (Advanced)	4	**P**	MATH (2901 or 2905 or 2907 or 3921) or Credit in MATH (2005 or 3018).	2
MATH 3916	Mathematical Computing I (Advanced)	4	**P** **N**	8 credit points of Intermediate Mathematics and one of MATH 1903 or 1907 or Credit in MATH 1003. May not be counted with MATH 3016.	1
MATH 3917	Hamiltonian Dynamics (Advanced)	4	**P**	MATH 2904 or Credit in MATH 2004.	2
MATH 3919	Signal Processing (Advanced)	4	**P** **N**	MATH 2905 or Credit in MATH 2005. May not be counted with MATH 3019.	1
MATH 3920	Nonlinear Systems & Biomathematics (Adv)	4	**P** **N**	8 credit points of Intermediate Mathematics (strongly advise MATH 2908 or 3003) and one of MATH 1903 and 1905 or 1903 and 1904 or Credit in (MATH 1003 and 1005) or MATH (1003 and 1004). MATH 3020.	2
MATH 3921	P D E And Waves (Advanced)	4	**P** **N**	MATH (2901 or credit in 2001) and (2905 or credit in 2005). May not be counted with MATH 3018.	1
MATH 3923	Ordinary Differential Equations (Adv)	4	**P** **N**	MATH 2901 and MATH 2902. MATH 3003.	1
MATH 3925	Public Key Cryptography (Advanced)	4	**P**	12 credit points from Intermediate or senior mathematics. Strongly recommend MATH 3902.	2
MATH 3933	Financial Mathematics 2 (Advanced)	4	**P** **N**	8 credit points of Intermediate Mathematics including MATH 2933 or Credit in MATH 2033 (and strongly advise MATH 2010 and STAT (2001 or 2901)). MATH 3015.	2

Medicinal Chemistry

For a major in Medicinal Chemistry, the minimum requirement is 24 credit points from Senior units of study listed in this subject area. The completion of MBLG (2001 or 2101 or 2901) is highly recommended.

■ Core Senior units of study

CHEM 3105	Biol/Environ Transition Metal Chem	3	**P** **C** **N**	CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902), for students in B.Sc.(ENVI) CHEM(1102 or 1902) and ENVI 2002. Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. CHEM 3195.	2
CHEM 3106	Inorganic Materials Chemistry	3	**P** **C** **N**	CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. CHEM 3196.	2
CHEM 3107	Forensic and Analytical Chemistry	3	**P** **C** **N**	CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902), for students in B.Sc.(ENVI) CHEM(1102 or 1902) and ENVI 2002. Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. CHEM 3197.	2
CHEM 3108	Supramolecular Materials	3	**P** **C** **N**	CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups (1 or 2) and 3. CHEM 3198.	2
CHEM 3195	Biol/Environ Transition Metal Chem (Adv)	3	**P** **C** **N**	Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902), for students in B.Sc.(ENVI) CHEM(1102 or 1902) and ENVI 2002. Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. CHEM 3105.	2
CHEM 3196	Inorganic Materials Chemistry (Adv)	3	**P** **C** **N**	Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. CHEM 3106.	2
CHEM 3197	Forensic and Analytical Chemistry (Adv)	3	**P** **C** **N**	Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902), for students in B.Sc.(ENVI) CHEM(1102 or 1902) and ENVI 2002. Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. CHEM 3107.	2
CHEM 3198	Supramolecular Materials (Adv)	3	**P** **C** **N**	Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups (1 or 2) and 3. CHEM 3108.	2

Table I: Bachelor of Science (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
CHEM 3204	Heterocyclic Chemistry	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. **N** CHEM 3294.	2
CHEM 3205	Medicinal and Biological Chemistry	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. **N** CHEM 3295.	2
CHEM 3206	Radical and Pericyclic Chemistry	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. **N** CHEM 3296.	2
CHEM 3207	Synthetic Methods	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. **N** CHEM 3297.	2
CHEM 3294	Heterocyclic Chemistry (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. **N** CHEM 3204.	2
CHEM 3295	Medicinal and Biological Chemistry (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. **N** CHEM 3205.	2
CHEM 3296	Radical and Pericyclic Chemistry (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. **N** CHEM 3206.	2
CHEM 3297	Synthetic Methods (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. **N** CHEM 3207.	2
CHEM 3305	Atmospheric and Photochemistry	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902), for students in B.Sc.(ENVI) CHEM(1102 or 1902) and ENVI 2002. **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **N** CHEM 3395.	2
CHEM 3306	Biophysical Chemistry	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **N** CHEM 3396.	2
CHEM 3307	Polymer Chemistry	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **N** CHEM 3397.	2
CHEM 3308	Physical Chemistry of Materials	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **N** CHEM 3398.	2
CHEM 3395	Atmospheric and Photochemistry (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902), for students in B.Sc.(ENVI) CHEM(1102 or 1902) and ENVI 2002. **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **N** CHEM 3305.	2
CHEM 3396	Biophysical Chemistry (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **N** CHEM 3306.	2
CHEM 3397	Polymer Chemistry (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **N** CHEM 3307.	2
CHEM 3398	Physical Chemistry of Materials (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **N** CHEM 3308.	2
PCOL 3001	Molecular Pharmacology and Toxicology	12	**P** PCOL 2001 and PCOL (2002 or 2003); or 32 credit points from Intermediate BMED units of study. **N** PCOL 3901. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	1

Table I: Bachelor of Science (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
PCOL 3901	Molecular Pharmacology & Toxicology Adv	12	**P** Distinction average in PCOL 2001 and PCOL (2002 or 2003); or in 32 credit points from Intermediate BMED units of study. **N** PCOL 3001. *NB: Department permission required for enrolment. The completion of MBLG (2001 or 2101 or 2901) is highly recommended. Entry to this unit requires Departmental permission.*	1

Microbiology

For a major in Microbiology, 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 (2001 or 2101 or 2901) is highly recommended.

MICR 2001	Introductory Microbiology	8	**P** 6 credit points of Junior Chemistry. **Q** 6 credit points of Junior Biology. **N** MICR (2003 or 2901). *NB: It is highly recommended that students complete 12 credit points of Junior Biology and MBLG (2001 or 2101 or 2901).*	1
MICR 2002	Applied Microbiology	8	**P** MICR (2001 or 2901). **N** MICR (2004 or 2902). *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	2
MICR 2003	Theoretical Microbiology A	4	**Q** 6 credit points of Junior Biology. **N** MICR (2001 or 2901). *NB: It is highly recommended that students complete 12 credit points of Junior Biology and MBLG (2001 or 2101 or 2901).*	1
MICR 2004	Theoretical Microbiology B	4	**P** MICR (2001 or 2003 or 2901). **N** MICR (2002 or 2902). *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	2
MICR 2901	Introductory Microbiology (Advanced)	8	**Q** 6 credit points of Junior Chemistry and Distinction in 6 credit points of Junior Biology. **N** MICR (2001 or 2003). *NB: It is highly recommended that students complete 12 credit points of Junior Biology and MBLG (2001 or 2101 or 2901).*	1
MICR 2902	Applied Microbiology (Advanced)	8	**Q** Distinction in MICR (2001 or 2901). **N** MICR (2002 or 2004). *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	2

■ Senior units of study

MICR 3001	General and Medical Microbiology	12	**P** MBLG (2001 or 2101 or 2901) and [12 credit points of Intermediate MICR units or MICR (2011 and 2012) or MICR 2909]. For BMedSc students: 32 credit points of Intermediate BMED units including BMED 2506. **N** MICR 3901.	1
MICR 3002	Molecular/Environmental Microbiology	12	**P** 12 credit points of Intermediate Microbiology and MBLG (2101 or 2001 or 2901). **N** MICR (3902, 3004 or 3904).	2
MICR 3901	General and Medical Microbiology (Adv)	12	**P** MBLG (2101 or 2001 or 2901) and [12 credit points of Intermediate MICR units including one Distinction, or MICR (2011 and 2012) including one Distinction, or Distinction in MICR 2909. For BMedSc: 32 credit points of Intermediate BMED units including Distinction in BMED 2506. **N** MICR 3001.	1
MICR 3902	Molecular/Environmental Microbiology Adv	12	**P** 12 credit points of Intermediate Microbiology including one Distinction, and MBLG (2101 or 2001 or 2901). **N** MICR (3002, 3004 or 3904).	2

Molecular Biology and Genetics

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.

■ Intermediate units of study

MBLG 2001	Molecular Biology and Genetics A	8	**P** 12 credit points of Junior Chemistry and BIOL (1001 or 1101 or 1901) except for students co-enrolled in BCHM 2011, or with permission of the unit Coordinator. For Combined BAppSc(Exercise and Sport Science)/BSc(Nutrition) degree the completion of all Junior units listed in Table IF. **N** AGCH 2001 or BCHM (2001 or 2101 or 2901) or MBLG (2101 or 2901).	1, Summer
MBLG 2101	Molecular Biology & Genetics A (Theory)	4	**P** 12 credit points of Junior Chemistry and BIOL (1001 or 1101 or 1901). **N** AGCH 2001 or BCHM (2001 or 2101 or 2901) or MBLG (2001 or 2901).	1, Summer
MBLG 2901	Molecular Biology and Genetics A (Adv)	8	**P** 12 credit points of Junior Chemistry and BIOL (1001 or 1901) except for students co-enrolled in BCHM 2011. For Combined BAppSc(Exercise and Sport Science)/ BSc(Nutrition) degree the completion of all Junior units listed in Table IF. Also required is a Distinction or better in one of the prerequisite units of study. **N** AGCH 2001 or BCHM (2001 or 2101 or 2901) or MBLG (2001 or 2101).	1
MBLG 2002	Molecular Biology and Genetics B	8	**P** MBLG 2001 or MBLG 2901. **N** BIOL 2105 or MBLG 2102 or 2902.	2
MBLG 2102	Molecular Biology & Genetics B (Theory)	4	**P** MBLG 2001 or 2101. **N** BIOL (2005, 2105 or 2905), or MBLG (2002 or 2902).	2
MBLG 2902	Molecular Biology and Genetics B (Adv)	8	**P** Distinction or better in MBLG (2001 or 2901). This requirement may be varied and students with lower marks should consult the unit Executive Officer. **N** BIOL (2005 or 2105 or 2905 or MBLG 2002 or 2102).	2
MBLG 2111	Molecular Biology & Genetics A (Lab)	4	**P** MBLG 2101. **N** MBLG (2001 or 2901). *NB: This unit is available to students who have completed MBLG 2101 in the summer school.*	1

Table I: Bachelor of Science (continued)

Unit of study	CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session

Nanoscience and Technology

For a major in Nanoscience and Technology, students are advised to complete:
(i) Junior units: 12 credit points of non-terminating units in each of Chemistry, Mathematics and Physics, and MECH 2300; and
(ii) Intermediate units: 16 credit points of Intermediate Physics and Chemistry, and AERO 2300, MATH 2005 and MECH 3300.
Students must complete:
(iii) Senior units: a minimum of 24 credit points in at least two subject areas from the following electives:

■ Senior elective units of study

CHEM 3100	Chemistry of the Main Group	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902), for students in B.Sc.(ENVI) CHEM(1102 or 1902) and ENVI 2002. **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. **N** CHEM 3190.	1
CHEM 3103	Organometallic and Catalytic Chemistry	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. **N** CHEM 3193.	1
CHEM 3104	Symmetry and Vibrational Spectra	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. **N** CHEM 3194, CHEM 3304 or CHEM 3394.	1
CHEM 3105	Biol/Environ Transition Metal Chem	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902), for students in B.Sc.(ENVI) CHEM(1102 or 1902) and ENVI 2002. **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. **N** CHEM 3195.	2
CHEM 3106	Inorganic Materials Chemistry	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. **N** CHEM 3196.	2
CHEM 3107	Forensic and Analytical Chemistry	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902), for students in B.Sc.(ENVI) CHEM(1102 or 1902) and ENVI 2002. **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. **N** CHEM 3197.	2
CHEM 3108	Supramolecular Materials	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups (1 or 2) and 3. **N** CHEM 3198.	2
CHEM 3109	Transition Metal Chemistry	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. **N** CHEM 3199.	1
CHEM 3190	Chemistry of the Main Group (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902), for students in B.Sc.(ENVI) CHEM(1102 or 1902) and ENVI 2002. **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. **N** CHEM 3100.	1
CHEM 3193	Organometallic and Catalytic Chem (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. **N** CHEM 3103.	1
CHEM 3194	Symmetry and Vibrational Spectra (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. **N** CHEM 3104, CHEM 3304 or CHEM 3394.	1
CHEM 3195	Biol/Environ Transition Metal Chem (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902), for students in B.Sc.(ENVI) CHEM(1102 or 1902) and ENVI 2002. **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. **N** CHEM 3105.	2
CHEM 3196	Inorganic Materials Chemistry (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. **N** CHEM 3106.	2
CHEM 3197	Forensic and Analytical Chemistry (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902), for students in B.Sc.(ENVI) CHEM(1102 or 1902) and ENVI 2002. **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. **N** CHEM 3107.	2
CHEM 3198	Supramolecular Materials (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups (1 or 2) and 3. **N** CHEM 3108.	2

Table I: Bachelor of Science (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
CHEM 3199	Transition Metal Chemistry (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. **N** CHEM 3109.	1
CHEM 3200	Stereochemistry and Mechanisms	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. **N** CHEM 3290.	1
CHEM 3203	Bioorganic Chemistry	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. **N** CHEM 3293.	1
CHEM 3204	Heterocyclic Chemistry	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. **N** CHEM 3294.	2
CHEM 3205	Medicinal and Biological Chemistry	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. **N** CHEM 3295.	2
CHEM 3206	Radical and Pericyclic Chemistry	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. **N** CHEM 3296.	2
CHEM 3207	Synthetic Methods	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. **N** CHEM 3297.	2
CHEM 3209	Organic Structures From Spectra	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902), for students in B.Sc.(ENVI) CHEM(1102 or 1902) and ENVI 2002, for students enrolled in B.Sci.(MOBT) – MOBT 2001, MOBT 2002, CHEM 2311 and CHEM 2312. **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. **N** CHEM 3299.	1
CHEM 3290	Stereochemistry and Mechanisms (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. **N** CHEM 3200.	1
CHEM 3293	Bioorganic Chemistry (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. **N** CHEM 3203.	1
CHEM 3294	Heterocyclic Chemistry (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. **N** CHEM 3204.	2
CHEM 3295	Medicinal and Biological Chemistry (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. **N** CHEM 3205.	2
CHEM 3296	Radical and Pericyclic Chemistry (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. **N** CHEM 3206.	2
CHEM 3297	Synthetic Methods (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. **N** CHEM 3207.	2
CHEM 3299	Organic Structures From Spectra (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902), for students in B.Sc.(ENVI) CHEM(1102 or 1902) and ENVI 2002, for students enrolled in B.Sci.(MOBT) – MOBT 2001, MOBT 2002, CHEM 2311 and CHEM 2312. **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. **N** CHEM 3209.	1
CHEM 3301	Quantum Chemistry	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **N** CHEM 3391.	1
CHEM 3302	Chemical Dynamics	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **N** CHEM 3392.	1

Table I: Bachelor of Science (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
CHEM 3303	Surfaces and Colloids	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **N** CHEM 3393.	1
CHEM 3304	Symmetry and Electronic Spectra	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **N** CHEM 3394, CHEM 3104 or CHEM 3194.	1
CHEM 3305	Atmospheric and Photochemistry	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902), for students in B.Sc.(ENVI) CHEM(1102 or 1902) and ENVI 2002. **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **N** CHEM 3395.	2
CHEM 3306	Biophysical Chemistry	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **N** CHEM 3396.	2
CHEM 3307	Polymer Chemistry	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **N** CHEM 3397.	2
CHEM 3308	Physical Chemistry of Materials	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **N** CHEM 3398.	2
CHEM 3391	Quantum Chemistry (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **N** CHEM 3301.	1
CHEM 3392	Chemical Dynamics (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **N** CHEM 3302.	1
CHEM 3393	Surfaces and Colloids (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **N** CHEM 3303.	1
CHEM 3394	Symmetry and Electronic Spectra (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **N** CHEM 3304, CHEM 3104 or CHEM 3194.	1
CHEM 3395	Atmospheric and Photochemistry (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902), for students in B.Sc.(ENVI) CHEM(1102 or 1902) and ENVI 2002. **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **N** CHEM 3305.	2
CHEM 3396	Biophysical Chemistry (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **N** CHEM 3306.	2
CHEM 3397	Polymer Chemistry (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **N** CHEM 3307.	2
CHEM 3398	Physical Chemistry of Materials (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **N** CHEM 3308.	2
MECH 3310	Mechanics of Solids 2	4	**P** AERO 2300 Mechanics of Solids 1 and MATH 2005.	1
MECH 3610	Team Project	2	**P** 30 credit points of second year units of study.	2
MECH 4310	Advanced Engineering Materials	6	**P** MECH 3300 Materials 2. **N** MECH 4315 Advanced Aerospace Materials.	2
PHYS 3011	Electromagnetism/Quantum Mechanics	4	**P** 16 points of Intermediate Physics and 8 credit points of intermediate mathematics. **N** PHYS 3003, 3014, 3015, 3200, 3903, 3911, 3914, 3915.	1
PHYS 3911	Electromagnetism/Quantum Mechanics (Adv)	4	**P** 16 points of Intermediate Physics with a credit average and 8 credit points of intermediate mathematics. **N** PHYS (3003 or 3011 or 3014 or 3015 or 3200 or 3903 or 3914 or 3915).	1
PHYS 3012	Condensed Matter Physics/ Optics	4	**A** 8 credit points of intermediate mathematics. **P** 16 credit points of intermediate Physics. **N** PHYS 3004, 3005, 3006, 3107, 3904, 3905, 3906, 3014, 3015, 3912, 3914, 3915.	1

Table I: Bachelor of Science (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
PHYS 3912	Condensed Matter Physics/ Optics (Adv)	4	**A** 8 credit points of Intermediate Mathematics. **P** 16 credit points of Intermediate Physics. **N** PHYS (3004 or 3005 or 3006 or 3012 or 3014 or 3015 or 3107 or 3904 or 3905 or 3906 or 3914 or 3915).	1
PHYS 3014	Topics in Physics A	4	**A** 8 credit points of Intermediate Mathematics. **P** 16 credit points of intermediate Physics. **N** PHYS 3003, 3004, 3005, 3011, 3012, 3013, 3015, 3200, 3903, 3904, 3905, 3911, 3912, 3913, 3914, 3915. *NB: Department permission required for enrolment. Approval required by the Senior Physics Coordinator prior to enrolment.*	1
PHYS 3914	Topics in Physics A (Adv)	4	**A** 8 credit points of Intermediate Mathematics. **P** 16 credit points of Intermediate Physics. **N** PHYS (3003 or 3004 or 3005 or 3011 or 3012 or 3013 or 3014 or 3015 or 3200 or 3903 or 3904 or 3905 or 3911 or 3912 or 3913 or 3915).	1
PHYS 3015	Topics in Physics B	6	**A** 8 credit points of Intermediate Mathematics. **P** 16 credit points of intermediate Physics. **N** PHYS 3003, 3004, 3005, 3011, 3012, 3013, 3014, 3200, 3903, 3904, 3905, 3911, 3912, 3913, 3914, 3915.	1
PHYS 3915	Topics in Physics B (Adv)	6	**A** 8 credit points of Intermediate Mathematics. **P** 16 credit points of Intermediate Physics. **N** PHYS (3003 or 3004 or 3005 or 3011 or 3012 or 3013 or 3014 or 3015 or 3200 or 3903 or 3904 or 3905 or 3911 or 3912 or 3913 or 3914).	1
PHYS 3016	Experimental Physics A	4	**A** 8 credit points of Intermediate Mathematics. **P** 16 credit points of Intermediate Physics. **N** PHYS (3008 or 3009 or or 3017 or 3101 or 3102 or 3105 or 3107 or 3200 or 3801 or 3908 or 3909 or 3916 or 3917).	1
PHYS 3916	Experimental Physics A (Adv)	4	**A** 8 credit points of Intermediate Mathematics. **P** 16 credit points of Intermediate Physics. **N** PHYS (3008 or 3009 or 3016 or 3017 or 3101 or 3102 or 3105 or 3107 or 3200 or 3801 or 3908 or 3909 or 3917).	1
PHYS 3017	Experimental Physics B	8	**A** 8 credit points of Intermediate Mathematics. **P** 16 credit points of Intermediate Physics. **N** PHYS (3008 or 3009 or 3016 or 3101 or 3102 or 3105 or 3107 or 3200 or 3801 or 3908 or 3909 or 3916 or 3917).	1
PHYS 3917	Experimental Physics B (Adv)	8	**A** 8 credit points of Intermediate Mathematics. **P** 16 credit points of Intermediate Physics. **N** PHYS (3008 or 3009 or 3016 or 3017 or 3101 or 3102 or 3105 or 3107 or 3200 or 3801 or 3908 or 3909 or 3916).	1
PHYS 3918	Special Projects A (Adv)	4	**A** 8 credit points of Intermediate Mathematics. **P** 16 credit points of Intermediate Physics. **N** PHYS (3103 or 3104 or 3803 or 3804).	1
PHYS 3021	Plasma Physics/Nanoscience	4	**A** 8 credit points of Intermediate Mathematics. **P** 16 credit points of intermediate Physics. **N** PHYS (3005 or 3006 or 3024 or 3025 or 3905 or 3906 or 3921 or 3924 or 3925).	2
PHYS 3921	Plasma Physics/Nanoscience (Adv)	4	**A** 8 credit points of Intermediate Mathematics. **P** 16 credit points of Intermediate Physics. **N** PHYS (3005 or 3006 or 3021 or 3024 or 3025 or 3905 or 3906 or 3924 or 3925).	2
PHYS 3024	Topics in Physics C	4	**A** 8 credit points of Intermediate Mathematics. **P** 16 credit points of intermediate Physics. **N** PHYS (3003 or 3004 or 3005 or 3021 or 3022 or 3023 or 3025 or 3200 or 3903 or 3904 or 3905 or 3921 or 3922 or 3923 or 3924 or 3925).	2
PHYS 3924	Topics in Physics C (Adv)	4	**A** 8 credit points of Intermediate Mathematics. **P** 16 credit points of Intermediate Physics. **N** PHYS (3003 or 3004 or 3005 or 3021 or 3022 or 3023 or 3024 or 3025 or 3200 or 3903 or 3904 or 3905 or 3921 or 3922 or 3923 or 3925).	2
PHYS 3025	Topics in Physics D	6	**A** 8 credit points of Intermediate Mathematics. **P** 16 credit points of intermediate Physics. **N** PHYS (3003 or 3004 or 3005 or 3021 or 3022 or 3023 or 3024 or 3200 or 3903 or 3904 or 3905 or 3921 or 3922 or 3923 or 3924 or 3925).	2
PHYS 3925	Topics in Physics D (Adv)	6	**P** 16 credit points of intermediate Physics with a credit average and 8 credit points of intermediate mathematics. **N** PHYS (3003 or 3004 or 3005 or 3021 or 3022 or 3023 or 3024 or 3025 or 3200 or 3903 or 3904 or 3905 or 3921 or 3922 or 3923 or 3924).	2
PHYS 3026	Experimental Physics C	4	**A** 8 credit points of Intermediate Mathematics. **P** 16 credit points of Intermediate Physics. **N** PHYS (3008 or 3009 or 3027 or 3101 or 3102 or 3105 or 3107 or 3200 or 3801 or 3908 or 3909 or 3926 or 3927).	2
PHYS 3926	Experimental Physics C (Adv)	4	**A** 8 credit points of Intermediate Mathematics. **P** 16 credit points of Intermediate Physics. **N** PHYS (3008 or 3009 or 3026 or 3027 or 3101 or 3102 or 3105 or 3107 or 3200 or 3801 or 3908 or 3909 or 3927).	2
PHYS 3027	Experimental Physics D	8	**A** 8 credit points of Intermediate Mathematics. **P** 16 credit points of Intermediate Physics. **N** PHYS (3008 or 3009 or 3026 or 3101 or 3102 or 3105 or 3107 or 3200 or 3801 or 3908 or 3909 or 3926 or 3927).	2
PHYS 3927	Experimental Physics D (Adv)	8	**A** 8 credit points of Intermediate Mathematics. **P** 16 credit points of Intermediate Physics. **N** PHYS (3008 or 3009 or 3026 or 3027 or 3101 or 3102 or 3105 or 3107 or 3200 or 3801 or 3908 or 3909 or 3926).	2

Table I: Bachelor of Science (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
PHYS 3928	Special Projects B (Adv)	4	**A** 8 credit points of Intermediate Mathematics. **P** 16 credit points of Intermediate Physics. **N** PHYS (3103 or 3104 or 3803 or 3804 or 3918).	2

Neuroscience

For a major in Neuroscience, students are required to complete:

■ Junior units of study

i) 12 credit points of Junior units of study from the Science Subject Area of Mathematics; and
ii) 24 credit points from Junior units of study from the Science Subject Areas of of Biology, Chemistry, Computer Science, Physics or Psychology.

■ Intermediate elective units of study

At least 24 credit points from the following units of study (ANAT 2003 is particularly recommended).

ANAT 2003	Concepts in Neuroanatomy	4	**A** Background in basic mammalian biology. **P** 12 credit points of Junior Biology or Junior Psychology. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	2
MBLG 2001	Molecular Biology and Genetics A	8	**P** 12 credit points of Junior Chemistry and BIOL (1001 or 1101 or 1901) except for students co-enrolled in BCHM 2011, or with permission of the unit Coordinator. For Combined BAppSc(Exercise and Sport Science)/BSc(Nutrition) degree the completion of all Junior units listed in Table IF. **N** AGCH 2001 or BCHM (2001 or 2101 or 2901) or MBLG (2101 or 2901).	1, Summer
MBLG 2101	Molecular Biology & Genetics A (Theory)	4	**P** 12 credit points of Junior Chemistry and BIOL (1001 or 1101 or 1901). **N** AGCH 2001 or BCHM (2001 or 2101 or 2901) or MBLG (2001 or 2901).	1, Summer
MBLG 2901	Molecular Biology and Genetics A (Adv)	8	**P** 12 credit points of Junior Chemistry and BIOL (1001 or 1901) except for students co-enrolled in BCHM 2011. For Combined BAppSc(Exercise and Sport Science)/ BSc(Nutrition) degree the completion of all Junior units listed in Table IF. Also required is a Distinction or better in one of the prerequisite units of study. **N** AGCH 2001 or BCHM (2001 or 2101 or 2901) or MBLG (2001 or 2101).	1
PCOL 2001	Pharmacology Fundamentals	4	**P** 6 credit points of Junior Chemistry and 6 credit points of Junior Biology. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	1
PCOL 2002	Intro Pharmacology: Drugs and People	4	**P** 6 credit points of Junior Chemistry and 6 credit points of Junior Biology. **N** PCOL 2003. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended. Students are strongly advised to complete PCOL 2001 before enrolling in PCOL 2002.*	2
PCOL 2003	Pharmacology: Drugs and Society	8	**P** 6 credit points of Junior Biology and 6 credit points of Junior Chemistry. **N** PCOL 2002. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended. Students are strongly advised to complete PCOL 2001 before enrolling in PCOL 2003.*	2
PHSI 2001	Basic Physiology A	4	**P** 6 credit points of Junior Chemistry plus 30 credit points from Junior Biology, Chemistry, Mathematics, Physics, Psychology units of study. **N** PHSI (2101 or 2901). *NB: Students taking combined degrees or with passes in units not listed should consult the department if they do meet the prerequisites. The completion of MBLG 2001 or 2101 or 2901 is highly recommended.*	1
PHSI 2101	Integrated Physiology A	8	**P** 6 credit points of Junior Chemistry plus 30 credit points from Junior Biology, Chemistry, Mathematics, Physics, Psychology units of study. **N** PHSI (2001 or 2901). *NB: Students taking combined degrees or with passes in units not listed should consult the department if they do meet the prerequisites. The completion of MBLG 2001 or 2101 or 2901 is highly recommended.*	1
PHSI 2901	Integrated Physiology A (Advanced)	8	**P** 6 credit points of Junior Chemistry plus 30 credit points from Junior Biology, Chemistry, Mathematics, Physics, Psychology units of study. **N** PHSI (2001 or 2101). *NB: Department permission required for enrolment. Available to selected students who have achieved at least 65 in half of their Junior units of study, including students in combined degrees or with passes in units not listed. The completion of MBLG 2001 or 2101 or 2901 is highly recommended.*	1
PHSI 2002	Basic Physiology B	4	**P** 6 credit points of Junior Chemistry plus 30 credit points from Junior Biology, Chemistry, Mathematics, Physics, Psychology units of study. **N** PHSI (2102 or 2902). *NB: Students taking combined degrees or with passes in units not listed should consult the department if they do meet the prerequisites. The completion of MBLG 2001 or 2101 or 2901 is highly recommended.*	2
PHSI 2102	Integrated Physiology B	8	**P** 6 credit points of Junior Chemistry plus 30 credit points from Junior Biology, Chemistry, Mathematics, Physics, Psychology units of study. **N** PHSI (2002 or 2902). *NB: Students taking combined degrees or with passes in units not listed should consult the department if they do meet the prerequisites. The completion of MBLG 2001 or 2101 or 2901 is highly recommended.*	2
PHSI 2902	Integrated Physiology B (Advanced)	8	**P** 6 credit points of Junior Chemistry plus 30 credit points from Junior Biology, Chemistry, Mathematics, Physics, Psychology units of study. **N** PHSI (2002 or 2102). *NB: Department permission required for enrolment. Available to selected students who have achieved at least 65 in half of their Junior units of study, including students in combined degrees or with passes in units not listed. The completion of MBLG 2001 or 2101 or 2901 is highly recommended.*	2
PSYC 2111	Learning, Neuroscience and Perception	4	**Q** PSYC 1001 and 1002 (Note: 16 credit points of Intermediate Psychology is required for Honours entry).	1
PSYC 2112	Psychological Statistics	4	**Q** PSYC 1001 and 1002 (Note: 16 credit points of Intermediate Psychology is required for Honours entry).	1

Table I: Bachelor of Science (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
PSYC 2113	Cognitive Processes & Social Psychology	4	**Q** PSYC 1001 and 1002 (Note: 16 credit points of Intermediate Psychology is required for Honours entry).	2
PSYC 2114	Personality and Individual Differences	4	**Q** PSYC 1001 and 1002 (Note: 16 credit points of Intermediate Psychology is required for Honours entry).	2

■ Senior elective units of study

At least 28 credit points from the following units of study.

PCOL 3002	Neuro- and Cardiovascular Pharmacology	12	**P** PCOL 2001 and PCOL (2002 or 2003;) or 32 credit points from Intermediate BMED units of study. **N** PCOL 3902. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	2
PCOL 3902	Neuro & Cardiovascular Pharmacology Adv	12	**P** Distinction average in PCOL 2001 and PCOL(2002 or 2003); or in 32 credit points from Intermediate BMED units of study. **N** PCOL 3002. *NB: Department permission required for enrolment. The completion of MBLG (2001 or 2101 or 2901) is highly recommended. Entry to this unit requires Departmental permission.*	2
PHSI 3001	Neuroscience	12	**P** For BMedSc: at least 32 credit points of Intermediate BMED units including BMED (2501 and 2503 and 2505). For others: PHSI (2101 or 2001 or 2901) or ANAT 2003; and MBLG (2001 or 2101 or 2901) or BCHM (2001 or 2101 or 2901); plus at least 8 credit points of Intermediate Science units of study. **N** PHSI 3901. *NB: A minimum of 8 credit points of Intermediate Physiology and/or Anatomy is recommended.*	1
PHSI 3901	Neuroscience (Advanced)	12	**P** For BMedSc: at least 32 credit points of Intermediate BMED units including BMED (2501 and 2503 and 2505). For others: PHSI (2101 or 2001 or 2901) or ANAT 2003; and MBLG (2001 or 2101 or 2901) or BCHM (2001 or 2101 or 2901); plus at least 8 credit points of Intermediate Science units of study. **N** PHSI 3001. *NB: Department permission required for enrolment. A minimum of 8 credit points of Intermediate Physiology and/or Anatomy is recommended. Permission required for enrolment. Available to selected students who have achieved a mark of at least 65 in the prerequisite units of study.*	1
PHSI 3002	Neuroscience – Cellular and Integrative	12	**P** For BMedSc: 32 credit points of Intermediate BMED units including BMED (2501 and 2503 and 2505). For others:16 credit points of Intermediate Science units of study from Anatomy and Histology, Biochemistry, Biology, Chemistry, Computer Science, Mathematics, Microbiology, Molecular Biology and Genetics, Pharmacology, Physics, Physiology, Psychology or Statistics. **N** PHSI 3902. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	2
PHSI 3902	Neuroscience- Cellular & Integrative Adv	12	**P** For BMedSc: 32 credit points of Intermediate BMED units including BMED (2501 and 2503 and 2505). For others: Credit or better in PHSI 3001; and 16 credit points of Intermediate Science units of study from Anatomy and Histology, Biochemistry, Biology, Chemistry, Computer Science, Mathematics, Microbiology, Molecular Biology and Genetics, Pharmacology, Physics, Physiology, Psychology or Statistics. **N** PHSI 3002. *NB: Department permission required for enrolment. Permission required for enrolment. Available to selected students who have achieved a mark of at least 65 in the prerequisite units of study. The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	2
PSYC 3203	Abnormal Psychology	4	**P** PSYC 2111 and PSYC (2113 or 2114). *NB: 32 credit points of Senior (third year) Psychology is required for a Psychology Major.*	2
PSYC 3204	Behavioural Neuroscience	4	**P** 8 credit points of Intermediate Psychology including PSYC 2111. *NB: 32 credit points of Senior (third year) Psychology is required for a Psychology Major.*	2
PSYC 3209	Learning and Motivation	4	**P** PSYC (2111 and 2112). *NB: 32 credit points of Senior (third year) Psychology is required for a Psychology Major.*	1
PSYC 3210	Perceptual Systems	4	**P** PSYC (2111 and 2112). *NB: 32 credit points of Senior (third year) Psychology is required for a Psychology Major.*	1
PSYC 3215	Cognitive Neuroscience & Neuropsychology	4	**P** Two of PSYC (2111, 2112, 2113). *NB: 32 credit points of Senior (third year) Psychology is required for a Psychology Major.*	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 (2001 or 2101 or 2901) is highly recommended.

PCOL 2001	Pharmacology Fundamentals	4	**P** 6 credit points of Junior Chemistry and 6 credit points of Junior Biology. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	1
PCOL 2002	Intro Pharmacology: Drugs and People	4	**P** 6 credit points of Junior Chemistry and 6 credit points of Junior Biology. **N** PCOL 2003. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended. Students are strongly advised to complete PCOL 2001 before enrolling in PCOL 2002.*	2
PCOL 2003	Pharmacology: Drugs and Society	8	**P** 6 credit points of Junior Biology and 6 credit points of Junior Chemistry. **N** PCOL 2002. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended. Students are strongly advised to complete PCOL 2001 before enrolling in PCOL 2003.*	2

Table I: Bachelor of Science (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
■ Senior units of study				
PCOL 3001	Molecular Pharmacology and Toxicology	12	**P** PCOL 2001 and PCOL (2002 or 2003); or 32 credit points from Intermediate BMED units of study. **N** PCOL 3901. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	1
PCOL 3002	Neuro- and Cardiovascular Pharmacology	12	**P** PCOL 2001 and PCOL (2002 or 2003;) or 32 credit points from Intermediate BMED units of study. **N** PCOL 3902. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	2
PCOL 3901	Molecular Pharmacology & Toxicology Adv	12	**P** Distinction average in PCOL 2001 and PCOL (2002 or 2003); or in 32 credit points from Intermediate BMED units of study. **N** PCOL 3001. *NB: Department permission required for enrolment. The completion of MBLG (2001 or 2101 or 2901) is highly recommended. Entry to this unit requires Departmental permission.*	1
PCOL 3902	Neuro & Cardiovascular Pharmacology Adv	12	**P** Distinction average in PCOL 2001 and PCOL(2002 or 2003); or in 32 credit points from Intermediate BMED units of study. **N** PCOL 3002. *NB: Department permission required for enrolment. The completion of MBLG (2001 or 2101 or 2901) is highly recommended. Entry to this unit requires Departmental permission.*	2

Physics

For a major in Physics, the minimum requirement is 24 credit points from Senior units of study listed in this subject area that must inclue PHYS 3011 or 3911 and at least 8 credit points chosen from laboratory-based and project-based units.

■ Junior units of study				
PHYS 1001	Physics 1 (Regular)	6	**A** HSC Physics MATH (1001/1901, 1002/1902, 1003/1903). MATH 1005/1905 would also be useful. **N** PHYS (1002 or 1901).	1
PHYS 1002	Physics 1 (Fundamentals)	6	**A** No assumed knowledge of Physics MATH (1001/1901, 1002/1902, 1003/1903). MATH 1005/1905 would also be useful. **N** PHYS (1001 or 1901).	1
PHYS 1003	Physics 1 (Technological)	6	**A** HSC Physics or PHYS (1001 or 1002 or 1901) or equivalent. MATH (1001/1901,1002/1902, 1003/1903). MATH 1005/1905 would also be useful. **N** PHYS (1004 or 1902).	1, 2
PHYS 1004	Physics 1 (Environmental & Life Science)	6	**A** HSC Physics or PHYS (1001 or 1002 or 1901) or equivalent. MATH (1001/1901, 1002/1902, 1003/1903). MATH 1005/1905 would also be useful. **N** PHYS (1003 or 1902).	2
PHYS 1500	Astronomy	6	**A** No assumed knowledge of Physics.	2
PHYS 1901	Physics 1A (Advanced)	6	**A** MATH (1001/1901, 1002/1902, 1003/1903). MATH 1005/1905 would also be useful. **P** UAI of at least 96, or HSC Physics result in Band 6, or PHYS 1902, or Distinction or better in PHYS 1003, 1004 or an equivalent unit. **N** PHYS (1001 or 1002).	1
PHYS 1902	Physics 1B (Advanced)	6	**A** MATH (1001/1901, 1002/1902, 1003/1903). MATH 1005/1905 would also be useful. **P** UAI of at least 96, or HSC Physics result in Band 6, or PHYS 1901, or Distinction or better in PHYS 1001, 1002 or an equivalent unit. **N** PHYS (1003 or 1004).	2
■ Intermediate units of study				
PHYS 2001	Physics 2A	8	**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 PHYS 1500 and 1600). **N** PHYS (2101 or 2103 or 2901).	1
PHYS 2002	Physics 2B	8	**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). **N** PHYS (2102 or 2104 or 2902).	2
PHYS 2105	Physics for Medical Sciences	4	**P** 12 credit points of Junior Physics, excluding PHYS (1500 & 1600).	2
PHYS 2901	Physics 2A (Advanced)	8	**A** MATH (1901/1001 and 1902/1002 and 1903/1003). MATH 1905/1005 would also be useful. **P** PHYS 1901 (or credit or better in PHYS 1001 or 1002) and PHYS 1902 (or credit or better in PHYS 1003 or 1004). **N** PHYS (2001, 2101, 2103).	1
PHYS 2902	Physics 2B (Advanced)	8	**A** MATH (1001/1901 and 1002/1902 and 1003/1903). MATH 1005/1905 would also be useful. **P** PHYS 1902 (or credit or better in PHYS 1003 or 1004) and PHYS [(1901 or 2901) or credit or better in PHYS (1001 or 1002 or 2001)]. **N** PHYS (2002, 2102, 2104).	2
■ Senior units of study				
PHYS 3011	Electromagnetism/Quantum Mechanics	4	**P** 16 points of Intermediate Physics and 8 credit points of intermediate mathematics. **N** PHYS 3003, 3014, 3015, 3200, 3903, 3911, 3914, 3915.	1
PHYS 3012	Condensed Matter Physics/ Optics	4	**A** 8 credit points of intermediate mathematics. **P** 16 credit points of intermediate Physics. **N** PHYS 3004, 3005, 3006, 3107, 3904, 3905, 3906, 3014, 3015, 3912, 3914, 3915.	1
PHYS 3013	Thermodynamics/Kinetic Theory	4	**A** 8 credit points of Intermediate Mathematics. **P** 16 credit points of intermediate Physics. **N** PHYS 3005, 3014, 3015, 3905, 3913, 3914, 3915.	1

Table I: Bachelor of Science (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
PHYS 3014	Topics in Physics A	4	**A** 8 credit points of Intermediate Mathematics. **P** 16 credit points of intermediate Physics. **N** PHYS 3003, 3004, 3005, 3011, 3012, 3013, 3015, 3200, 3903, 3904, 3905, 3911, 3912, 3913, 3914, 3915. *NB: Department permission required for enrolment. Approval required by the Senior Physics Coordinator prior to enrolment.*	1
PHYS 3015	Topics in Physics B	6	**A** 8 credit points of Intermediate Mathematics. **P** 16 credit points of intermediate Physics. **N** PHYS 3003, 3004, 3005, 3011, 3012, 3013, 3014, 3200, 3903, 3904, 3905, 3911, 3912, 3913, 3914, 3915.	1
PHYS 3016	Experimental Physics A	4	**A** 8 credit points of Intermediate Mathematics. **P** 16 credit points of Intermediate Physics. **N** PHYS (3008 or 3009 or or 3017 or 3101 or 3102 or 3105 or 3107 or 3200 or 3801 or 3908 or 3909 or 3916 or 3917).	1
PHYS 3017	Experimental Physics B	8	**A** 8 credit points of Intermediate Mathematics. **P** 16 credit points of Intermediate Physics. **N** PHYS (3008 or 3009 or 3016 or 3101 or 3102 or 3105 or 3107 or 3200 or 3801 or 3908 or 3909 or 3916 or 3917).	1
PHYS 3021	Plasma Physics/Nanoscience	4	**A** 8 credit points of Intermediate Mathematics. **P** 16 credit points of intermediate Physics. **N** PHYS (3005 or 3006 or 3024 or 3025 or 3905 or 3906 or 3921 or 3924 or 3925).	2
PHYS 3022	Astrophysics/High Energy Physics	4	**P** 16 credit points of intermediate Physics and 8 credit points of intermediate mathematics. **N** PHYS (3005 or 3006 or 3024 or 3025 or 3105 or 3905 or 3906 or 3922 or 3924 or 3925).	2
PHYS 3023	Biological & Medical Physics	4	**A** 8 credit points of Intermediate Mathematics. **P** 16 credit points of Intermediate Physics or Intermediate Biochemistry, 12 credit points of Junior units from Mathematics and Statistics and 12 credit points of Junior Physics. **N** PHYS (3006 or 3024 or 3025 or 3906 or 3923 or 3924 or 3925).	2
PHYS 3024	Topics in Physics C	4	**A** 8 credit points of Intermediate Mathematics. **P** 16 credit points of intermediate Physics. **N** PHYS (3003 or 3004 or 3005 or 3021 or 3022 or 3023 or 3025 or 3200 or 3903 or 3904 or 3905 or 3921 or 3922 or 3923 or 3924 or 3925).	2
PHYS 3025	Topics in Physics D	6	**A** 8 credit points of Intermediate Mathematics. **P** 16 credit points of intermediate Physics. **N** PHYS (3003 or 3004 or 3005 or 3021 or 3022 or 3023 or 3024 or 3200 or 3903 or 3904 or 3905 or 3921 or 3922 or 3923 or 3924 or 3925).	2
PHYS 3026	Experimental Physics C	4	**A** 8 credit points of Intermediate Mathematics. **P** 16 credit points of Intermediate Physics. **N** PHYS (3008 or 3009 or 3027 or 3101 or 3102 or 3105 or 3107 or 3200 or 3801 or 3908 or 3909 or 3926 or 3927).	2
PHYS 3911	Electromagnetism/Quantum Mechanics (Adv)	4	**P** 16 points of Intermediate Physics with a credit average and 8 credit points of intermediate mathematics. **N** PHYS (3003 or 3011 or 3014 or 3015 or 3200 or 3903 or 3914 or 3915).	1
PHYS 3912	Condensed Matter Physics/ Optics (Adv)	4	**A** 8 credit points of Intermediate Mathematics. **P** 16 credit points of Intermediate Physics. **N** PHYS (3004 or 3005 or 3006 or 3012 or 3014 or 3015 or 3107 or 3904 or 3905 or 3906 or 3914 or 3915).	1
PHYS 3913	Thermodynamics/Kinetic Theory (Adv)	4	**A** 8 credit points of Intermediate Mathematics. **P** 16 credit points of Intermediate Physics. **N** PHYS (3005 or 3013 or 3014 or 3015 or 3905 or 3914 or 3915).	1
PHYS 3914	Topics in Physics A (Adv)	4	**A** 8 credit points of Intermediate Mathematics. **P** 16 credit points of Intermediate Physics. **N** PHYS (3003 or 3004 or 3005 or 3011 or 3012 or 3013 or 3014 or 3015 or 3200 or 3903 or 3904 or 3905 or 3911 or 3912 or 3913 or 3915).	1
PHYS 3915	Topics in Physics B (Adv)	6	**A** 8 credit points of Intermediate Mathematics. **P** 16 credit points of Intermediate Physics. **N** PHYS (3003 or 3004 or 3005 or 3011 or 3012 or 3013 or 3014 or 3015 or 3200 or 3903 or 3904 or 3905 or 3911 or 3912 or 3913 or 3914).	1
PHYS 3916	Experimental Physics A (Adv)	4	**A** 8 credit points of Intermediate Mathematics. **P** 16 credit points of Intermediate Physics. **N** PHYS (3008 or 3009 or 3016 or 3017 or 3101 or 3102 or 3105 or 3107 or 3200 or 3801 or 3908 or 3909 or 3917).	1
PHYS 3917	Experimental Physics B (Adv)	8	**A** 8 credit points of Intermediate Mathematics. **P** 16 credit points of Intermediate Physics. **N** PHYS (3008 or 3009 or 3016 or 3017 or 3101 or 3102 or 3105 or 3107 or 3200 or 3801 or 3908 or 3909 or 3916).	1
PHYS 3921	Plasma Physics/Nanoscience (Adv)	4	**A** 8 credit points of Intermediate Mathematics. **P** 16 credit points of Intermediate Physics. **N** PHYS (3005 or 3006 or 3021 or 3024 or 3025 or 3905 or 3906 or 3924 or 3925).	2
PHYS 3922	Astrophysics/High Energy Physics (Adv)	4	**P** 16 credit points of intermediate physics with a credit average and 8 credit points of intermediate mathematics. **N** PHYS (3005 or 3006 or 3022 or 3024 or 3025 or 3105 or 3905 or 3906 or 3924 or 3925).	2
PHYS 3923	Biological & Medical Physics (Adv)	4	**A** 8 credit points of Intermediate Mathematics. **P** 16 credit points of Intermediate Physics or Intermediate Biochemistry with a credit average and 12 credit points of Junior units from Mathematics and Statistics and 12 credit points of Junior Physics. **N** PHYS (3006 or 3906).	2
PHYS 3924	Topics in Physics C (Adv)	4	**A** 8 credit points of Intermediate Mathematics. **P** 16 credit points of Intermediate Physics. **N** PHYS (3003 or 3004 or 3005 or 3021 or 3022 or 3023 or 3024 or 3025 or 3200 or 3903 or 3904 or 3905 or 3921 or 3922 or 3923 or 3925).	2

Table I: Bachelor of Science (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
PHYS 3925	Topics in Physics D (Adv)	6	**P** 16 credit points of intermediate Physics with a credit average and 8 credit points of intermediate mathematics. **N** PHYS (3003 or 3004 or 3005 or 3021 or 3022 or 3023 or 3024 or 3025 or 3200 or 3903 or 3904 or 3905 or 3921 or 3922 or 3923 or 3924).	2
PHYS 3926	Experimental Physics C (Adv)	4	**A** 8 credit points of Intermediate Mathematics. **P** 16 credit points of Intermediate Physics. **N** PHYS (3008 or 3009 or 3026 or 3027 or 3101 or 3102 or 3105 or 3107 or 3200 or 3801 or 3908 or 3909 or 3927).	2
PHYS 3927	Experimental Physics D (Adv)	8	**A** 8 credit points of Intermediate Mathematics. **P** 16 credit points of Intermediate Physics. **N** PHYS (3008 or 3009 or 3026 or 3027 or 3101 or 3102 or 3105 or 3107 or 3200 or 3801 or 3908 or 3909 or 3926).	2
PHYS 3928	Special Projects B (Adv)	4	**A** 8 credit points of Intermediate Mathematics. **P** 16 credit points of Intermediate Physics. **N** PHYS (3103 or 3104 or 3803 or 3804 or 3918).	2

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

PHSI 2001	Basic Physiology A	4	**P** 6 credit points of Junior Chemistry plus 30 credit points from Junior Biology, Chemistry, Mathematics, Physics, Psychology units of study. **N** PHSI (2101 or 2901). *NB: Students taking combined degrees or with passes in units not listed should consult the department if they do meet the prerequisites. The completion of MBLG 2001 or 2101 or 2901 is highly recommended.*	1
PHSI 2101	Integrated Physiology A	8	**P** 6 credit points of Junior Chemistry plus 30 credit points from Junior Biology, Chemistry, Mathematics, Physics, Psychology units of study. **N** PHSI (2001 or 2901). *NB: Students taking combined degrees or with passes in units not listed should consult the department if they do meet the prerequisites. The completion of MBLG 2001 or 2101 or 2901 is highly recommended.*	1
PHSI 2901	Integrated Physiology A (Advanced)	8	**P** 6 credit points of Junior Chemistry plus 30 credit points from Junior Biology, Chemistry, Mathematics, Physics, Psychology units of study. **N** PHSI (2001 or 2101). *NB: Department permission required for enrolment. Available to selected students who have achieved at least 65 in half of their Junior units of study, including students in combined degrees or with passes in units not listed. The completion of MBLG 2001 or 2101 or 2901 is highly recommended.*	1
PHSI 2002	Basic Physiology B	4	**P** 6 credit points of Junior Chemistry plus 30 credit points from Junior Biology, Chemistry, Mathematics, Physics, Psychology units of study. **N** PHSI (2102 or 2902). *NB: Students taking combined degrees or with passes in units not listed should consult the department if they do meet the prerequisites. The completion of MBLG 2001 or 2101 or 2901 is highly recommended.*	2
PHSI 2102	Integrated Physiology B	8	**P** 6 credit points of Junior Chemistry plus 30 credit points from Junior Biology, Chemistry, Mathematics, Physics, Psychology units of study. **N** PHSI (2002 or 2902). *NB: Students taking combined degrees or with passes in units not listed should consult the department if they do meet the prerequisites. The completion of MBLG 2001 or 2101 or 2901 is highly recommended.*	2
PHSI 2902	Integrated Physiology B (Advanced)	8	**P** 6 credit points of Junior Chemistry plus 30 credit points from Junior Biology, Chemistry, Mathematics, Physics, Psychology units of study. **N** PHSI (2002 or 2102). *NB: Department permission required for enrolment. Available to selected students who have achieved at least 65 in half of their Junior units of study, including students in combined degrees or with passes in units not listed. The completion of MBLG 2001 or 2101 or 2901 is highly recommended.*	2

■ Senior units of study

PHSI 3001	Neuroscience	12	**P** For BMedSc: at least 32 credit points of Intermediate BMED units including BMED (2501 and 2503 and 2505). For others: PHSI (2101 or 2001 or 2901) or ANAT 2003; and MBLG (2001 or 2101 or 2901) or BCHM (2001 or 2101 or 2901); plus at least 8 credit points of Intermediate Science units of study. **N** PHSI 3901. *NB: A minimum of 8 credit points of Intermediate Physiology and/or Anatomy is recommended.*	1
PHSI 3901	Neuroscience (Advanced)	12	**P** For BMedSc: at least 32 credit points of Intermediate BMED units including BMED (2501 and 2503 and 2505). For others: PHSI (2101 or 2001 or 2901) or ANAT 2003; and MBLG (2001 or 2101 or 2901) or BCHM (2001 or 2101 or 2901); plus at least 8 credit points of Intermediate Science units of study. **N** PHSI 3001. *NB: Department permission required for enrolment. A minimum of 8 credit points of Intermediate Physiology and/or Anatomy is recommended. Permission required for enrolment. Available to selected students who have achieved a mark of at least 65 in the prerequisite units of study.*	1
PHSI 3002	Neuroscience – Cellular and Integrative	12	**P** For BMedSc: 32 credit points of Intermediate BMED units including BMED (2501 and 2503 and 2505). For others:16 credit points of Intermediate Science units of study from Anatomy and Histology, Biochemistry, Biology, Chemistry, Computer Science, Mathematics, Microbiology, Molecular Biology and Genetics, Pharmacology, Physics, Physiology, Psychology or Statistics. **N** PHSI 3902. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	2

Table I: Bachelor of Science (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
PHSI 3902	Neuroscience- Cellular & Integrative Adv	12	**P** For BMedSc: 32 credit points of Intermediate BMED units including BMED (2501 and 2503 and 2505). For others: Credit or better in PHSI 3001; and 16 credit points of Intermediate Science units of study from Anatomy and Histology, Biochemistry, Biology, Chemistry, Computer Science, Mathematics, Microbiology, Molecular Biology and Genetics, Pharmacology, Physics, Physiology, Psychology or Statistics. **N** PHSI 3002. *NB: Department permission required for enrolment. Permission required for enrolment. Available to selected students who have achieved a mark of at least 65 in the prerequisite units of study. The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	2
PHSI 3003	Heart and Circulation	12	**A** PHSI (2001 or 2101 or 2901) and BCHM (2002 or 2102 or 2902). **P** For BMedSc: 32 credit points of Intermediate BMED units including BMED (2501 and 2503 and 2505). For others: PHSI (2002 or 2102 or 2902) and MBLG (2001 or 2101 or 2901) plus at least 8 credit points of Intermediate Science units of study. **N** PHSI 3903. *NB: A minimum of 8 credit points of Intermediate Physiology and BCHM (2002 or 2102 or 2902) are strongly recommended.*	2
PHSI 3903	Heart and Circulation (Advanced)	12	**A** PHSI (2001 or 2101 or 2901) and BCHM (2002 or 2102 or 2902). **P** For BMedSc: 32 credit points of Intermediate BMED units including BMED (2501 and 2503 and 2505). For others: PHSI (2002 or 2102 or 2902) and MBLG (2001 or 2101 or 2901) plus at least 8 credit points of Intermediate Science units of study. **N** PHSI 3003. *NB: Department permission required for enrolment. A minimum of 8 credit points of Intermediate Physiology and BCHM (2002 or 2102 or 2902) are strongly recommended. Permission required for enrolment. Available to selected students who have achieved a mark of at least 65 in the prerequisite units of study.*	2
PHSI 3004	Human Cellular Physiology	12	**P** For BMedSc: 32 credit points of Intermediate BMED units including BMED (2501 and 2502 and 2504). For others: PHSI (2001 or 2101 or 2901) and PHSI (2002 or 2102 or 2902) and either MBLG (2001 or 2101 or 2901) or BCHM (2001 or 2101 or 2901). **N** PHSI 3904.	1
PHSI 3904	Human Cellular Physiology (Advanced)	12	**P** For BMedSc: 32 credit points of Intermediate BMED units including BMED (2501 and 2502 and 2504). For others: PHSI (2001 or 2101 or 2901) and PHSI (2002 or 2102 or 2902) and either MBLG (2001 or 2101 or 2901) or BCHM (2001 or 2101 or 2901). **N** PHSI 3004. *NB: Department permission required for enrolment. Permission is required for enrolment. Available to selected students who have achieved an average of at least 65 in the prerequisite units of study.*	1

Psychology

For a major in Psychology, the minimum requirement is 16 credit points of Intermediate and 32 credit points from Senior units of study listed in this subject area.

■ Junior units of study

PSYC 1001	Psychology 1001	6		1, Summer
PSYC 1002	Psychology 1002	6		2, Summer

■ Intermediate units of study

PSYC 2111	Learning, Neuroscience and Perception	4	**Q** PSYC 1001 and 1002 (Note: 16 credit points of Intermediate Psychology is required for Honours entry).	1
PSYC 2112	Psychological Statistics	4	**Q** PSYC 1001 and 1002 (Note: 16 credit points of Intermediate Psychology is required for Honours entry).	1
PSYC 2113	Cognitive Processes & Social Psychology	4	**Q** PSYC 1001 and 1002 (Note: 16 credit points of Intermediate Psychology is required for Honours entry).	2
PSYC 2114	Personality and Individual Differences	4	**Q** PSYC 1001 and 1002 (Note: 16 credit points of Intermediate Psychology is required for Honours entry).	2

■ Senior units of study

PSYC 3201	Statistics and Psychometrics	4	**P** 8 credit points of Intermediate Psychology including PSYC 2112. *NB: 32 credit points of Senior (third year) Psychology is required for a Psychology Major.*	2
PSYC 3202	History and Philosophy of Psychology	4	**P** 12 credit points of Intermediate Psychology. *NB: 32 credit points of Senior (third year) Psychology is required for a Psychology Major.*	1
PSYC 3203	Abnormal Psychology	4	**P** PSYC 2111 and PSYC (2113 or 2114). *NB: 32 credit points of Senior (third year) Psychology is required for a Psychology Major.*	2
PSYC 3204	Behavioural Neuroscience	4	**P** 8 credit points of Intermediate Psychology including PSYC 2111. *NB: 32 credit points of Senior (third year) Psychology is required for a Psychology Major.*	2
PSYC 3205	Cognition, Language and Thought	4	**P** PSYC (2112 and 2113). *NB: 32 credit points of Senior (third year) Psychology is required for a Psychology Major.*	1
PSYC 3206	Developmental Psychology	4	**P** 8 credit points of Intermediate Psychology. *NB: 32 credit points of Senior (third year) Psychology is required for a Psychology Major.*	1
PSYC 3208	Intelligence	4	**P** PSYC (2112 and 2114). *NB: 32 credit points of Senior (third year) Psychology is required for a Psychology Major.*	N/A in 2004

Table I: Bachelor of Science (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
PSYC 3209	Learning and Motivation	4	**P** PSYC (2111 and 2112). *NB: 32 credit points of Senior (third year) Psychology is required for a Psychology Major.*	1
PSYC 3210	Perceptual Systems	4	**P** PSYC (2111 and 2112). *NB: 32 credit points of Senior (third year) Psychology is required for a Psychology Major.*	1
PSYC 3211	Psychological Assessmt. & Organisational	4	**P** PSYC (2112 and 2114). **N** PSYC 3207 (except with permission from the Head of Department). *NB: 32 credit points of Senior (third year) Psychology is required for a Psychology Major.*	2
PSYC 3212	Social Psychology	4	**P** 8 credit points of Intermediate Psychology including PSYC 2113. *NB: 32 credit points of Senior (third year) Psychology is required for a Psychology Major.*	1
PSYC 3214	Communication and Counselling	4	**P** PSYC (2113 and 2114). *NB: 32 credit points of Senior (third year) Psychology is required for a Psychology Major.*	2
PSYC 3215	Cognitive Neuroscience & Neuropsychology	4	**P** Two of PSYC (2111, 2112, 2113). *NB: 32 credit points of Senior (third year) Psychology is required for a Psychology Major.*	2
PSYC 3216	Health and Safety Psychology Principles	4	**P** PSYC (2111 and 2112). *NB: 32 credit points of Senior (third year) Psychology is required for a Psychology Major.*	N/A in 2004

Soil Science

For a major in Soil Science, the minimum requirement is 24 credit points from Senior units of study listed in this subject area.

■ Intermediate units of study

SOIL 2001	Soil Properties and Processes	8	**P** CHEM 1002 or equivalent and 12 credit points of Junior Mathematics or PHYS 1003 or 1004.	1
SOIL 2002	Soil Resources and Conservation	8	**P** SOIL 2001 or GEOL (1002 or 2004) or GEOG 1001 or ENVI 2001. **N** May not be counted with GEOG 3002.	2

■ Senior units of study

SOIL 3001	Environmental Soil Science A	12	**P** SOIL 2001.	1
SOIL 3002	Environmental Soil Science B	12	**P** SOIL 2001; and AGCH 2001 or CHEM (2001 or 2101 or 2202 or 2301 or 2302) or BCHM (2002 or 2902).	2

Statistics

For a major in Statistics, the minimum requirement is 24 credit points from Senior units of study listed in this subject area.

■ Intermediate units of study

STAT 2001	Statistical Distributions	4	**P** MATH (1001 or 1901 or 1906 or Credit in 1011) and [MATH (1005 or 1905 or 1015) or MATH (1004 or 1904)]. **N** STAT 2901.	1
STAT 2002	Data Analysis	4	**P** MATH 1005 or 1905 or 1015 (or STAT 1021 for Arts students).	1
STAT 2003	Estimation Theory	4	**P** STAT 2001 or 2901. **N** STAT 2903.	2
STAT 2004	Hypothesis Testing	4	**A** STAT 2002. **P** MATH (1005 or 1905 or 1015).	2
STAT 2901	Introduction to Probability (Advanced)	4	**P** MATH (1903 or 1907 or Credit in 1003) and MATH (1905 or Credit in 1005). **N** STAT 2001.	1
STAT 2903	Estimation Theory (Advanced)	4	**P** STAT 2901 or Credit in STAT 2001. **N** STAT 2003.	2

■ Senior units of study

STAT 3001	Distribution Theory and Inference	4	**P** MATH (1003 or 1903 or 1907) and STAT (2003 or 2903). **N** STAT 3901.	1
STAT 3002	Applied Linear Models	4	**P** STAT 2004 (or STAT 1022 for Arts students) and MATH (1002 or 1902). **N** May not be counted with STAT 3902.	1
STAT 3003	Time Series Analysis	4	**P** STAT (2003 or 2903). **N** May not be counted with STAT 3903.	1
STAT 3903	Time Series Analysis (Advanced)	4	**P** STAT 2903 or credit or better in STAT 2003. **N** May not be counted with STAT 3003.	1
STAT 3004	Design of Experiments	4	**P** STAT (3002 or 3902). **N** May not be counted with STAT 3904.	2
STAT 3904	Design of Experiments (Advanced)	4	**P** STAT 3902 or credit or better in STAT 3002. **N** May not be counted with STAT 3004.	2
STAT 3005	Applied Stochastic Processes	4	**P** MATH (1003 or 1903 or 1907) and STAT (2001 or 2901). **N** STAT 3905.	2
STAT 3006	Sampling Theory and Categorical Data	4	**P** STAT 2003 or 2903.	2
STAT 3901	Statistical Theory (Advanced)	4	**P** (MATH 2001 or 2901) and STAT 2903. **N** STAT 3001.	1
STAT 3902	Linear Models (Advanced)	4	**P** STAT 2004 and (STAT 2903 or Credit in 2003) and (MATH 2002 or 2902). **N** May not be counted with STAT 3002.	1

Table I: Bachelor of Science (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
STAT 3905	Markov Processes (Advanced)	4	**P** STAT 2901 or (Credit in STAT 2001 and MATH (1003 or 1903 or 1907)). **N** STAT 3005.	2
STAT 3907	Multivariate Analysis (Advanced)	4	**P** STAT 3902 and either STAT (3001 or 3901).	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 BSc 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 General Statistical Methods 1 (STAT 1021) or General Statistical Methods 2 (STAT 1021) or Econometrics or any other unit of study deemed to be mutually exclusive with units of study listed in this Table. Students enrolled in the combined BSc/BCom program may enrol in Econometrics 1A (ECMT 1010).

Table IA: Bachelor of Science (Bioinformatics)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite 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; and
(ii) 12 credit points from Junior units of study in each of the Science Subject Areas of Biology, Chemistry and Computer Science.

B. Intermediate units of study

Candidates are required to enrol in and complete:
(i) SOFT (2004 or 2904) and at least 4 credit points of Intermediate units of study in the Science Subject Area of Computer Science;
(ii) MBLG (2001 or 2901);
(iii) at least 16 credit points from MBLG (2002 or 2102 or 2902) or from other Intermediate units of study from the Science Subject Areas of Biochemistry, Biology, Microbiology or Pharmacology; and
(iv) a further 16 credit points of additional units of study at the Intermediate level chosen from the Science Subject Areas of Computer Science, Computational Science, Statistics or from the following Mathematics units of study: MATH 2002/2902, MATH 2003/2903, MATH 2006/2906, MATH 2010.

C. Senior units of study

Candidates are required to enrol in and complete:
(i) BINF 3001 Bioinformatics Project and at least 4 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 and/or Pharmacology; 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, Computational Science, Statistics or from the following Mathematics and Physics units of study: MATH 3007, MATH 3010, MATH 3016/3916, MATH 3020/3920, COSC 3001/3901, COSC 3002/3902.

BINF 3001	Bioinformatics Project	8	**P** SOFT (2004 or 2904) and 16 credit points from intermediate Biology, Biochemistry, Microbiology, Molecular Biology and Genetics and/or Pharmacology. **N** May not be counted with COMP 3206.	2

Table IB: Bachelor of Science (Environmental)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session

A. Junior units of study

Candidates are required to enrol in and complete:
(i) ENVI 1001 and ENVI 1002;
(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.

ENVI 1001	Global Geology	6	*NB: This unit of study is available to students in the Bachelor of Science (Environmental) and the Bachelor of Land & Water Science only.*	1
ENVI 1002	Geomorphic Environments and Change	6	*NB: This unit of study is available to students in the Bachelor of Science (Environmental) and the Bachelor of Land & Water Science only.*	2

B. Intermediate units of study

Candidates are required to enrol in and complete:
(i) ENVI 2001 and ENVI 2002; and
(ii) 32 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.

ENVI 2001	Biological Environmental Processes	8	**P** ENVI 1001 and ENVI 1002. *NB: This unit of study is available to students in the Bachelor of Science (Environmental) only.*	1
ENVI 2002	Physical Environmental Processes	8	**P** ENVI 1001 and ENVI 1002. *NB: This unit of study is available to students in the Bachelor of Science (Environmental) only.*	2

Table IB: Bachelor of Science (Environmental) (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session

C. Senior units of study

Candidates are required to enrol in and complete:
(i) ENVI 3001 and ENVI 3002; and
(ii) 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. Students wishing to enrol in Chemistry in semester 1 should enrol in CHEM (3100 or 3190) and CHEM (3209 or 3299). Students enrolling in chemistry in semester 2 should enrol in any two of CHEM (3105 or 3195), CHEM (3107 or 3197) and CHEM (3305 or 3395).

ENVI 3001	Environmental Law and Planning	12	**P** ENVI 2001 and 2002. *NB: This unit of study is available to students in the Bachelor of Science (Environmental) and the Bachelor of Science (Marine Science) only.*	1
ENVI 3002	Environmental Assessment	12	**P** ENVI 2001 and 2002. *NB: This unit of study is available to students in the Bachelor of Science (Environmental) and the Bachelor of Science (Marine Science) only.*	2
ENVI 3003	Law and the Environment	4	**P** Entry by permission of Course Coordinator only. **N** ENVI 3001. *NB: Department permission required for enrolment. This unit of study is available to Study Abroad students and students enrolled in the Bachelor of Science (Marine Science), Bachelor of Resource Economics and Bachelor of Land & Water Science only.*	1
ENVI 3004	Environmental Impact Assessment	4	**P** Entry by permission of Course Coordinator only. **N** ENVI 3002. *NB: Department permission required for enrolment. This unit of study is availabe to Study Abroad students and students enrolled in the Bachelor of Science (Marine Science), Bachelor of Resource Economics and Bachelor of Land & Water Science only.*	2
AGCH 3030	Rural Environmental Chemistry A	6	**P** AGCH (2001 or 2002) or CHEM (2001, 2101, 2202, 2301, 2302 or 2902) or BIOCHEM (2002 or 2902) or ENVI (2001 or 2002). **N** AGCH 3020 and AGCH 3021 and AGCH 3022.	1
AGCH 3031	Rural Environmental Chemistry B	6	**P** AGCH (2001 or 2002) or CHEM (2001 or 2101 or 2202 or 2301 or 2302 or 2902) or BIOCHEM (2002 or 2902) or ENVI (2001 or 2002). **N** AGCH 3020, AGCH 3021, AGCH 3022.	2
CHEM 3100	Chemistry of the Main Group	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902), for students in B.Sc.(ENVI) CHEM(1102 or 1902) and ENVI 2002. **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. **N** CHEM 3190.	1
CHEM 3190	Chemistry of the Main Group (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902), for students in B.Sc.(ENVI) CHEM(1102 or 1902) and ENVI 2002. **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. **N** CHEM 3100.	1
CHEM 3209	Organic Structures From Spectra	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902), for students in B.Sc.(ENVI) CHEM(1102 or 1902) and ENVI 2002, for students enrolled in B.Sci.(MOBT) – MOBT 2001, MOBT 2002, CHEM 2311 and CHEM 2312. **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. **N** CHEM 3299.	1
CHEM 3299	Organic Structures From Spectra (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902), for students in B.Sc.(ENVI) CHEM(1102 or 1902) and ENVI 2002, for students enrolled in B.Sci.(MOBT) – MOBT 2001, MOBT 2002, CHEM 2311 and CHEM 2312. **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. **N** CHEM 3209.	1
CHEM 3105	Biol/Environ Transition Metal Chem	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902), for students in B.Sc.(ENVI) CHEM(1102 or 1902) and ENVI 2002. **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. **N** CHEM 3195.	2
CHEM 3195	Biol/Environ Transition Metal Chem (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902), for students in B.Sc.(ENVI) CHEM(1102 or 1902) and ENVI 2002. **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. **N** CHEM 3105.	2
CHEM 3107	Forensic and Analytical Chemistry	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902), for students in B.Sc.(ENVI) CHEM(1102 or 1902) and ENVI 2002. **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. **N** CHEM 3197.	2
CHEM 3197	Forensic and Analytical Chemistry (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902), for students in B.Sc.(ENVI) CHEM(1102 or 1902) and ENVI 2002. **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. **N** CHEM 3107.	2

Table IB: Bachelor of Science (Environmental) (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
CHEM 3305	Atmospheric and Photochemistry	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902), for students in B.Sc.(ENVI) CHEM(1102 or 1902) and ENVI 2002. **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **N** CHEM 3395.	2
CHEM 3395	Atmospheric and Photochemistry (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902), for students in B.Sc.(ENVI) CHEM(1102 or 1902) and ENVI 2002. **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **N** CHEM 3305.	2
PHYS 3600	Energy and the Environment	4	**P** ENVI 2002 or 12 credit points of Junior Physics. *NB: This unit of study is available to students in the Bachelor of Science (Environmental) only.*	1

Table IC: Bachelor of Science (Marine Science)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite 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) 6 credit points of Junior units of study from the Science Subject Area of Physics (excluding PHYS 1500); and
(v) CHEM 1001 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) MARS 2001, MARS 2002, MARS 2003 and MARS 2004;
(ii) 16 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) 16 credit points of Intermediate units of study from Science Subject Areas and/or Civil Engineering units of study CIVL 3401 and CIVL 3402.
Approved students may substitute up to 12 credit points from the Tropical Marine Network Program (NTMP) units of study from section C of this table (no more than 30 credit points of NTMP units may count toward the degree).

MARS 2001	Introductory Marine Science A	4	**P** 24 credit points of Junior units of study from Science Discipline Areas. This is a qualifying unit of study for Senior Marine Science units. Some Senior electives may have additional prerequisites.	1
MARS 2002	Introductory Marine Science B	4	**P** 24 credit points of Junior units of study from Science Discipline Areas. This is a qualifying unit for Senior Marine Science units. Some Senior electives may have additional prerequisites. **N** GEOG 2002.	2
MARS 2003	Marine Science Field School	4	**P** 48 credit points of Junior units of study from Science Subject Areas. **C** MARS 2001. *NB: This unit of study is available to students in the Bachelor of Science (Marine Science) and the Bachelor of Resource Economics only.*	1a
MARS 2004	Marine Techniques	4	**P** 48 credit points of units of study from Junior Science Subject Areas and MARS 2003. **C** MARS 2002. *NB: This unit of study is available to students in the Bachelor of Science (Marine Science) and the Bachelor of Resource Economics only.*	2

C. Senior units of study

Bachelor of Science (Marine Science)

Candidates majoring in Marine Science are required to enrol in and complete:
(i) at least 36 credit points of senior units of study from MARS and/or BIOL units from this table; and
(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 or Tropical Marine Network Program (NTMP) units.
NB: No more than 30 credit points of NTMP units may count toward the degree.

Bachelor of Science (Marine Science) – Tropical Marine Science

Approved candidates majoring in Tropical Marine Science are required to enrol in and complete:
(i) at least 36 credit points from Senior units of study from MARS, BIOL and/or NTMP units from this table of which at least 18 credit points must be from NTMP units; and
(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 or NTMP units.
NB: No more than 30 credit points of NTMP units may count toward the degree.

BIOL 3011	Ecophysiology	6	**P** 16 credit points of Intermediate Biology including BIOL (2002 or 2003 or 2006 or 2902 or 2903 or 2906). **N** BIOL 3911. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	1a
BIOL 3911	Ecophysiology (Advanced)	6	**P** Distinction average in 16 credit points of Intermediate Biology including BIOL (2002 or 2003 or 2006 or 2902 or 2903 or 2906). These requirements may be varied and students with lower averages should consult the unit Executive Officer. **N** May not be counted with BIOL 3011. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	1a

Table IC: Bachelor of Science (Marine Science) (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
BIOL 3013	Marine Biology	6	**A** MARS 2002. **P** 16 credit points of Intermediate Biology, including BIOL (2001 or 2002 or 2003 or 2004 or 2901 or 2902 or 2903 or 2904). **N** May not be counted with BIOL 3913. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	1b
BIOL 3913	Marine Biology (Advanced)	6	**A** MARS 2002. **P** Distinction average in 16 credit points of Intermediate Biology including BIOL (2001 or 2002 or 2003 or 2004 or 2901 or 2902 or 2903 or 2904). These requirements may be varied and students with lower averages should consult the unit Executive Officer. **N** May not be counted with BIOL 3013. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	1b
MARS 3003	Coastal Depositional Environments	6	**P** MARS (2001 and 2002) or 16 credit points of Intermediate Science including at least 8 credit points from Geology or Geography units of study.	1a
MARS 3004	Coastal Morphodynamics	6	**P** MARS (2001 and 2002) or 16 credit points of Intermediate Science including at least 8 credit points from Geology or Geography units of study. **N** May not be counted with GEOG 3001.	1b
MARS 3005	Marine Geophysical Data Analysis	6	**P** MARS (2001 and 2002) or 16 credit points of Intermediate Science including at least 8 credit points from Geology or Geography units of study or CIVL 2409.	1a
MARS 3006	Dynamics of Ocean Basins and Margins	6	**A** Prior completion of MARS 3005 is highly recommended. **P** MARS (2001 and 2002) or 16 credit points of Intermediate Science including at least 8 credit points from Geology or Geography units of study or CIVL 2409.	1b
MARS 3008	Energy: Science, Engineering & Economics	6	**P** MARS (2001 and 2002) or 16 credit points of Intermediate Science including at least 8 credit points from Geology or Geography units of study or CIVL 2409. **N** May not be counted with GEOL 3102.	1
MARS 3102	Marine Ecology	12	**P** MARS (2001 and 2002) and 16 credit points of Intermediate Biology including BIOL (2001 or 2901 or 2002 or 2902 or 2004 or 2904). **N** BIOL 3023, 3923, 3024, 3924, 3040 or 3940.	2
MARS 3103	GIS Simulation Modelling	6	**P** MARS (2001 and 2002) or 16 credit points of Intermediate Science including at least 8 credit points from Geology or Geography units of study. **N** May not be counted with GEOG 3102.	2a
MARS 3104	Coastal Zone Management	6	**P** MARS (2001 and 2002) or 16 credit points of Intermediate Science including at least 8 credit points from Geology or Geography units of study. **N** GEOG 3102.	2b
MARS 3105	Coastal Oceanography & Sediment Dynamics	6	**P** MARS (2001 and 2002) or 16 credit points of Intermediate Science including at least 8 credit points from Geology or Geography units of study or CIVL 2409. **N** May not be counted with GEOL 3104.	2a
MARS 3106	Physical Marine Habitat	6	**P** MARS (2001 and 2002) or 16 credit points of Intermediate Science including at least 8 credit points from Geology or Geography units of study.	2b
NTMP 3001	Coral Reef Ecosystems	6	**A** General concepts in Biology. **P** MARS (2003 and 2001) plus 16 credit points from Intermediate Science units of study. *NB: Department permission required for enrolment.*	2
NTMP 3002	Marine Biotechnology	6	**A** General concepts in Biology. **P** MARS (2003 and 2001) plus 16 credit points from Intermediate Science units of study. *NB: Department permission required for enrolment.*	1
NTMP 3003	Fisheries Biology and Management	6	**A** General concepts in Biology. **P** MARS (2003 and 2001) plus 16 credit points from Intermediate Science units of study. *NB: Department permission required for enrolment.*	2
NTMP 3004	Aquaculture	6	**A** General concepts in Biology. **P** MARS (2003 and 2001) plus 16 credit points from Intermediate Science units of study. *NB: Department permission required for enrolment.*	2
NTMP 3005	Coastal Management	6	**A** General concepts in Biology. **P** MARS (2003 and 2001) plus 16 credit points from Intermediate Science units of study. *NB: Department permission required for enrolment.*	2
NTMP 3006	Coastal Oceanography	6	**A** General concepts in Biology. **P** MARS (2003 and 2001) plus 16 credit points from Intermediate Science units of study. *NB: Department permission required for enrolment.*	1

Table ID: Bachelor of Science (Molecular Biology and Genetics)

Unit of study	CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session

A. Junior units of study

Candidates are required to enrol in and complete:
(i) (a) BIOL (1001 or 1101 or 1901) and BIOL (1904 or 1905); and
(i) (b) CHEM (1101 or 1901 or 1903 or 1905 or 1906 or 1907) and CHEM (1102 or 1902 or 1904 or 1909) (The combination of CHEM 1907 and 1909 is the preferred option.);
(ii) 12 credit points of Junior units of study from the Science subject area of Mathematics (it is recommended that students take units requiring HSC Maths Extension 1 or 2 and include some statistics in their choice of Mathematics units of study); and
(iii) 12 credit points of other Junior units of study from BSc units of study (Table I). It is recommended that the extra 12 credit points be selected from Junior units of study in Physics or in Computer Science.

BIOL 1904	Living Systems Molecular (Advanced)	6	**A** HSC 2-unit Biology or BIOL 1901 or equivalent. **N** BIOL (1002 or 1003 or 1902 or 1903 or 1905 or 1500). *NB: This unit of study is available to students enrolled in the Bachelor of Science (Molecular Biology and Genetics) only.*	2
BIOL 1905	Human Biology Molecular (Advanced)	6	**A** HSC 2-unit Biology or BIOL 1901 or equivalent. **N** BIOL (1002 or 1003 or 1902 or 1903 or 1904 or 1500). *NB: This unit of study is available to students enrolled in the Bachelor of Science (Molecular Biology and Genetics) only.*	2
CHEM 1905	Chemistry 1A Molecular (Advanced)	6	**P** UAI of at least 93 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** CHEM (1001 or 1101 or 1901 or 1903 or 1906 or 1909). *NB: Department permission required for enrolment. This unit of study is available to students enrolled in the Bachelor of Science (Molecular Biology and Genetics) only.*	1
CHEM 1906	Chemistry 1A Mol (Special Studies Prog)	6	**P** UAI of at least 98.7 and HSC Chemistry result in band 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** CHEM (1001 or 1101 or 1901 or 1903 or 1905 or 1909). *NB: Department permission required for enrolment. Entry is by invitation. This unit of study is deemed to be an Advanced unit of study. This unit of study is available to students enrolled in the Bachelor of Science (Molecular Biology and Genetics) only.*	1
CHEM 1907	Chemistry 1 Life Sciences A Mol (Adv)	6	**P** UAI of at least 93 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 units of study: 6 credit points of Junior Mathematics. **N** CHEM (1002 or 1102 or 1902 or 1904 or 1908). *NB: This unit of study is available to students enrolled in the Bachelor of Science (Molecular Biology and Genetics) only.*	1
CHEM 1909	Chemistry 1 Life Sciences B Mol (Adv)	6	**P** CHEM (1907 or 1908) or equivalent. **C** Recommended concurrent units of study: 6 credit points of Junior Mathematics. **N** CHEM (1001 or 1101 or 1901 or 1903 or 1905 or 1906). *NB: 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.*	2, Summer

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 & 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 (2001 or 2901) and (2002 or 2902);
(ii) CHEM 2903;
(iii) MICR 2909; and
(iv) 16 Credit points of Intermediate science units of study (BCHM 2011 or 2002 or 2902 and BIOL 2006 or 2906 are preferred options).
Note: At least 16 credit points must be completed from Intermediate Advanced units of study.

CHEM 2903	Chemistry Life Sciences (Advanced)	8	**P** 12 credit points of Junior Mathematics. Candidates for the BSc (Molecular Biology & Genetics) must achieve a credit average in Junior units of study. Candidates for the BSc (Molecular Biotechnology) and the Bachelor of Medical Science must achieve a credit average in Junior units of study and a distinction average in Junior Chemistry units of study. **Q** CHEM (1902 or 1904 or 1909). **N** CHEM (2001 or 2101 or 2301 or 2311 or 2312 or 2502 or 2901). *NB: Department permission required for enrolment. This unit of study is available to students in the Bachelor of Medical Science, the Bachelor of Science (Molecular Biology and Genetics) and the Bachelor of Science (Molecular Biotechnology) only.*	1
MICR 2909	Fundamental and Applied Microbiology Adv	8	**P** 12 credit points of Junior Chemistry and BIOL 1901 and (1904 or 1905). **N** MICR (2001, 2002, 2901, 2902, 2003 or 2004). *NB: This unit of study is available to students enrolled in the Bachelor of Science (Molecular Biology and Genetics) only.*	2

Table ID: Bachelor of Science (Molecular Biology and Genetics) (continued)

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 & 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) Semester 1 core units of study:

(a) BCHM 3001 or 3901; and

(b) BIOL (3018 or 3918) and (3027 or 3927); and

(ii) Semester 2 elective units of study:

Select 24 credit points from BCHM (3004 or 3904), BIOL (3025 or 3928), BIOL (3026 or 3929), all of CHEM (3105 or 3195) and CHEM (3205 or 3295) and CHEM (3306 or 3396) and either of CHEM (3108 or 3198) or CHEM (3305 or 3395), MICR (3004 or 3904).

NOTE: At least 24 credit points must be completed from Senior Advanced units of study and in 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.

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
BCHM 3004	Cellular and Medical Biochemistry Mol	12	**P** A total of at least 16 credit points of Intermediate MBLG and BCHM units. **N** BCHM (3002, 3902 or 3904).	2
BCHM 3904	Cellular and Med Biochemistry Mol (Adv)	12	**P** Distinction in a total of at least 16 credit points from Intermediate MBLG and BCHM units. **N** May not be counted with BCHM (3002, 3902 or 3004). *NB: This unit of study is available to students in the Bachelor of Science (Molecular Biology and Genetics) only.*	2
BIOL 3928	Evolutionary Genetics Molecular (Adv)	6	**P** Distinction average in 16 credit points of Intermediate Biology including MBLG (2001 or 2901 and 2002 or 2902). For BMedSc students: 32 credit points of Intermediate BMED units including Distinction in BMED 2502. These requirements may be varied and students with lower averages should contact the unit Executive Officer. **N** BIOL (3025 or 3925). *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended. This unit of study is available to students enrolled in the Bachelor of Science (Molecular Biology and Genetics) and the Bachelor of Medical Science only.*	2
BIOL 3929	Developmental Genetics Molecular (Adv)	6	**P** Distinction average in 16 credit points of Intermediate Biology including MBLG (2001 or 2901 and 2002 or 2902). **N** BIOL (3026 or 3926). *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended. This unit of study is available to students enrolled in the Bachelor of Science (Molecular Biology and Genetics) only.*	2
CHEM 3105	Biol/Environ Transition Metal Chem	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902), for students in B.Sc.(ENVI) CHEM(1102 or 1902) and ENVI 2002. **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. **N** CHEM 3195.	2
CHEM 3195	Biol/Environ Transition Metal Chem (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902), for students in B.Sc.(ENVI) CHEM(1102 or 1902) and ENVI 2002. **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. **N** CHEM 3105.	2
CHEM 3205	Medicinal and Biological Chemistry	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. **N** CHEM 3295.	2
CHEM 3295	Medicinal and Biological Chemistry (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. **N** CHEM 3205.	2
CHEM 3306	Biophysical Chemistry	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **N** CHEM 3396.	2
CHEM 3396	Biophysical Chemistry (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **N** CHEM 3306.	2
CHEM 3108	Supramolecular Materials	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups (1 or 2) and 3. **N** CHEM 3198.	2
CHEM 3198	Supramolecular Materials (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups (1 or 2) and 3. **N** CHEM 3108.	2
CHEM 3305	Atmospheric and Photochemistry	3	**P** CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902), for students in B.Sc.(ENVI) CHEM(1102 or 1902) and ENVI 2002. **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **N** CHEM 3395.	2

Table ID: Bachelor of Science (Molecular Biology and Genetics) (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
CHEM 3395	Atmospheric and Photochemistry (Adv)	3	**P** Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902), for students in B.Sc.(ENVI) CHEM(1102 or 1902) and ENVI 2002. **C** Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **N** CHEM 3305.	2
MICR 3004	Molecular Biology of Pathogens Molecular	12	**P** MICR 2909. **N** MICR (3002, 3902 or 3904).	2
MICR 3904	Molecular Biology of Pathogens Mol (Adv)	12	**P** Distinction in MICR 2909. **N** MICR (3002, 3902 or 3004).	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.

Table IE: Bachelor of Science (Molecular Biotechnology)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite 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) CHEM 1908 and CHEM 1909 or at least 12 credit points of Junior units of study from the Science Subject Area of Chemistry;
(iii) at least 12 credit points of Junior units of study from the Science Subject Area of Mathematics; and
(iv) at least 12 credit points of elective units of study.

B. Intermediate units of study

Candidates are required to enrol in and complete 48 credit points of Intermediate units of study including:
(i) MOBT 2001 and MOBT 2002;
(ii) MBLG (2001 or 2901) and MBLG (2002 or 2902);
(iii) CHEM (2311 and 2312) or CHEM 2903; and
(iv) at least 8 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, Crop Sciences, Immunology, Information Systems, Mathematics, Microbiology, Nutrition, and Pharmacology.

MOBT 2001	Molecular Biotechnology 2A	4	**P** 12 credit points of Junior BIOL and 12 credit points of Junior CHEM. *NB: This unit is only available to students in the BSc (Molecular Biotechnology).*	1
MOBT 2002	Molecular Biotechnology 2B	4	**P** MOBT 2001. *NB: This unit of study is only available to students in the BSc (Molecular Biotechnology).*	2
CHEM 2311	Chemistry 2 (Biological Sciences) Theory	4	**P** 12 credit points of Junior Chemistry. **N** CHEM (2001 or 2101 or 2301 or 2901 or 2903 or 2502). *NB: This unit of study is available to students in the Bachelor of Medical Science and the Bachelor of Science (Molecular Biotechnology) only.*	1
CHEM 2312	Chemistry 2 (Biological Sciences) Prac	4	**P** 12 credit points of Junior Chemistry. **C** CHEM 2311. **N** CHEM (2001 or 2101 or 2301 or 2901 or 2903 or 2502). *NB: This unit of study is available to students in the Bachelor of Medical Science and the Bachelor of Science (Molecular Biotechnology) only.*	1, 2
CHEM 2903	Chemistry Life Sciences (Advanced)	8	**P** 12 credit points of Junior Mathematics. Candidates for the BSc (Molecular Biology & Genetics) must achieve a credit average in Junior units of study. Candidates for the BSc (Molecular Biotechnology) and the Bachelor of Medical Science must achieve a credit average in Junior units of study and a distinction average in Junior Chemistry units of study. **Q** CHEM (1902 or 1904 or 1909). **N** CHEM (2001 or 2101 or 2301 or 2311 or 2312 or 2502 or 2901). *NB: Department permission required for enrolment. This unit of study is available to students in the Bachelor of Medical Science, the Bachelor of Science (Molecular Biology and Genetics) and the Bachelor of Science (Molecular Biotechnology) only.*	1

C. Senior units of study

Candidates are required to enrol in and complete 48 credit points of Senior units of study including:
(i) MOBT 3001 and MOBT 3002;
(ii) at least 6 credit points from one of: AGCH 3024, BCHM 3098, BIOL 3027, CHEM 3401 + (either CHEM 3209 or CHEM 3299); and
(iii) 24 credit points from Senior units of study, which must include at least 12 credit points from the Subject areas of: Agricultural Chemistry, Animal Science, Biochemistry, Biological Sciences, Chemical Engineering, Chemistry, Computational Science, Computer Science, Crop Sciences, Immunology, Information Systems, Mathematics, Microbiology, Nutrition and Pharmacology.

MOBT 3001	Molecular Biotechnology 3A	6	**P** MBLG 2002 and MOBT 2002 and [CHEM (2311 and 2312) or 2903]. *NB: This unit of study is only available to students in the BSc (Molecular Biotechnology).*	1
MOBT 3002	Molecular Biotechnology 3B	12	**P** MOBT 3001. *NB: This unit of study is only available to students in the BSc (Molecular Biotechnology).*	2
AGCH 3024	Chemistry and Biochemistry of Foods	6	**P** MBLG (2001 and 2002); and either [CHEM (2311 and 2312) or 2903], or BCHM (2002 or 2902). **N** May not be counted with AGCH (3003 or 3005 or 3017 or 3025).	1
BIOL 3027	Bioinformatics and Genomics	6	**P** MBLG (2001 or 2101 or 2901) or 16 credit points of Intermediate Biology including BIOL (2001 or 2901 or 2004 or 2904 or 2006 or 2906). For BMedSc students: 32 credit points of Intermediate BMED units including BMED 2502. **N** BIOL 3927.	1b

Table IE: Bachelor of Science (Molecular Biotechnology) (continued)

Unit of study		CP		A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
BCHM 3098	Functional Genomics and Proteomics	6	**A** **P**	BCHM 2011. MBLG (2001 or 2901) or at least 32 credit points of intermediate BMED units including BMED (2501 and 2502 and 2504). *NB: Recommended unit of study for all molecular biotechnology third-year students.*	1
CHEM 3209	Organic Structures From Spectra	3	**P** **C** **N**	CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902), for students in B.Sc.(ENVI) CHEM(1102 or 1902) and ENVI 2002, for students enrolled in B.Sci.(MOBT) – MOBT 2001, MOBT 2002, CHEM 2311 and CHEM 2312. Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. CHEM 3299.	1
CHEM 3299	Organic Structures From Spectra (Adv)	3	**P** **C** **N**	Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902), for students in B.Sc.(ENVI) CHEM(1102 or 1902) and ENVI 2002, for students enrolled in B.Sci.(MOBT) – MOBT 2001, MOBT 2002, CHEM 2311 and CHEM 2312. Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. CHEM 3209.	1
CHEM 3401	Molecular Modelling and Drug Design	3	**P** **C** **N**	MOBT 2001, MOBT 2002, CHEM 2311 and CHEM 2312. Enrollment in B.Sc.(Molecular Biotechnology) and CHEM 3209 or CHEM 3299. May not be counted for degree other than B.Sc.(Molecular Biotechnology).	1

Table IF: Bachelor of Science (Nutrition)

Unit of study		CP		A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session

The Bachelor of Science (Nutrition) is a 4 year Honours degree. To complete the degree, a candidate must gain Credit for at least 192 credit points including the Honours course in either Nutrition and Dietetics, or Nutrition.

A. Junior units of study

Candidates are required to enrol in and complete:
(i) BIOL (1001 or or 1101 or 1901) and BIOL (1002 or 1902 or 1003 or 1903);
(ii) Life Sciences Chemistry [CHEM (1908 and 1909)] or [CHEM (1101 or 1901 or 1903) and CHEM (1102 or 1902 or 1904)];
(iii) 12 credit points of Junior units of study from the Science Subject Area of: Mathematics; and
(iv) 12 credit points of other Junior units of study from the Science Subject Areas of: Computer Science, Physics or Psychology.

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 Junior 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. 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) NUTR 2901 and 2902;
(ii) MBLG (2001 or 2901) and BCHM (2002 or 2902);
(iii) PHSI 2001 and 2002; and
(iv) MICR 2011 and 2012 or at least 8 credit points of Intermediate units of study (4 credit points each semester) from the Science Subject Areas of Chemistry or Pharmacology.

NUTR 2901	Introductory Food Science (Advanced)	8	**P**	CHEM (1101 or 1901 or 1903 or 1909) and CHEM (1102 or 1902 or 1904 or 1908) and BIOL (1001 or 1901) 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 table 1F.	1
NUTR 2902	Introductory Nutritional Science (Adv)	8	**P**	NUTR 2901.	2
MICR 2011	Introductory Microbiology (Nutrition)	4	**P**	BIOL (1001 or 1101 or 1901) and BIOL (1002 or 1003 or 1902 or 1903) and 6 credit points of Junior Chemistry. *NB: This unit of study is available to students enrolled in the Bachelor of Science (Nutrition) only.*	1
MICR 2012	Applied Microbiology (Nutrition)	4	**P** **N**	MICR 2011. MICR (2002 or 2902 or 2004). *NB: This unit of study is available to students enrolled in the Bachelor of Science (Nutrition) only.*	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 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) NUTR 3901 and 3902;
(ii) BCHM 3002 or 3902; and
(iii) AGCH (3025 and 3026) or 12 credit points from the following Senior units of study: BCHM 3001, BCHM 3901, MICR 3001, PHSI 3001 or PHSI 3901.

NUTR 3901	Nutrition in Individuals (Advanced)	12	**P**	NUTR 2902.	1
NUTR 3902	Nutrition in Populations (Advanced)	12	**P**	NUTR 2902.	2

Table IF: Bachelor of Science (Nutrition) (continued)

Unit of study	CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session

D. Honours units of study

In order to proceed to the Honours year, candidates must achieve a WAM of at least 65 in the Senior year, and results of at least Credit (65) in NUTR 3901 and NUTR 3902

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) Nutrition and Dietetics Honours: NUTR 4001; and NUTR 4002 OR

(ii) Bachelor of Science (Nutrition) Nutrition Honours: NUTR 4101, 4102, 4103 and 4104.

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 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 2901, NUTR 2912, NUTR 3901 and NUTR 3902, 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, the BAppSc(ExSpSc) or the BAppSc(ExSpSc&Nutr).

Junior units of study

Candidates are required to enrol in and complete in their first year:

(i)CHEM 1101 and 1102;

(ii)BIOS 1133, 1135, 1137 and 1139;

(ii)EXSS 1005, 1018, 1019 and 1022; and

(iii)BACH 1149.

For information on units offered by the Faculty of Health Sciences, please refer to the Handbook of the Faculty of Health Sciences.

CHEM 1101	Chemistry 1A	6	**A** HSC Chemistry and Mathematics. **C** Recommended concurrent units of study: 6 credit points of Junior Mathematics. **N** May not be counted with CHEM (1001 or 1901 or 1903 or 1905 or 1906 or 1909).	1, 2, Summer
CHEM 1102	Chemistry 1B	6	**Q** CHEM 1101 or a Distinction in CHEM 1001 or 1901 or equivalent. **C** Recommended concurrent units of study: 6 credit points of Junior Mathematics including MATH (1003 or 1903). **N** CHEM (1002 or 1902 or 1904 or 1907 or 1908).	1, 2, Summer
CHEM 1908	Chemistry 1 Life Sciences A (Advanced)	6	**P** UAI of at least 93 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 units of study: 6 credit points of Junior Mathematics. **N** CHEM (1002 or 1102 or 1902 or 1904 or 1907). *NB: Department permission required for enrolment. This unit of study is available to students enrolled in the Bachelor of Medical Science, the Bachelor of Science (Nutrition) and the Bachelor of Science (Molecular Biotechnology) only.*	1, Summer
CHEM 1909	Chemistry 1 Life Sciences B Mol (Adv)	6	**P** CHEM (1907 or 1908) or equivalent. **C** Recommended concurrent units of study: 6 credit points of Junior Mathematics. **N** CHEM (1001 or 1101 or 1901 or 1903 or 1905 or 1906). *NB: 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.*	2, Summer
MATH 1011	Life Sciences Calculus	3	**A** HSC Mathematics. **N** MATH (1001 or 1901 or 1906).	1
MATH 1013	Differential and Difference Equations	3	**A** HSC Mathematics. **N** MATH (1003 or 1903 or 1907).	2
MATH 1015	Life Science Statistics	3	**A** HSC Mathematics. **N** MATH (1005 or 1905) or STAT (1021 or 1022) or ECMT Junior units of study.	1, Summer

Intermediate units of study

Candidates are required to enrol in and complete in their second year:

(i)EXSS 2019 and 2022;

(ii)NUTR 2901 and 2912;

(ii)MBLG 2001, BIOS 2098, BCHM 2002; and

(iii)MATH 1013.

For information on units offered by the Faculty of Health Sciences, please refer to the Handbook of the Faculty of Health Sciences.

BCHM 2002	Molecules, Metabolism and Cells	8	**P** MBLG (2001 or 2901). **N** May not be counted with AGCH 2001 or BCHM (2102 or 2902).	2, Summer
MBLG 2001	Molecular Biology and Genetics A	8	**P** 12 credit points of Junior Chemistry and BIOL (1001 or 1101 or 1901) except for students co-enrolled in BCHM 2011, or with permission of the unit Coordinator. For Combined BAppSc(Exercise and Sport Science)/BSc(Nutrition) degree the completion of all Junior units listed in Table IF. **N** AGCH 2001 or BCHM (2001 or 2101 or 2901) or MBLG (2101 or 2901).	1, Summer
NUTR 2901	Introductory Food Science (Advanced)	8	**P** CHEM (1101 or 1901 or 1903 or 1909) and CHEM (1102 or 1902 or 1904 or 1908) and BIOL (1001 or 1901) 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 table 1F.	1
NUTR 2912	Nutritional Science Fundamentals (Adv)	6	**P** NUTR 2901. *NB: Only available to students enrolled in the Combined program BAppSc(Exercise Sport Science)/BSc(Nutrition).*	2
STAT 2002	Data Analysis	4	**P** MATH 1005 or 1905 or 1015 (or STAT 1021 for Arts students).	1

Table IF: Bachelor of Science (Nutrition) (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
Senior units of study				
Candidates are required to enrol in and complete in their third year: (i)EXSS 2020, 2023, 3021, 3023, 3026, 3027, 3030 and 3031; (ii)MATH 1011 and 1015; (iii)BACH 2132. Candidates are required to enrol in and complete in their fourth year: (i)NUTR 3901 and 3902; (ii)STAT 2002 and EXSS 4006; (iii)BCHM 3002 or 3902.				
BCHM 3002	Cellular and Medical Biochemistry	12	**P** A total of at least 16 credit points of Intermediate MBLG and BCHM units. For BMedSc students 32 credit points of Intermediate BMED units including BMED (2501, 2502 and 2504). **N** May not be counted with BCHM (3902, 3004 or 3904).	2
BCHM 3902	Cellular and Medical Biochemistry (Adv)	12	**P** Distinction in a total of at least 16 credit points from Intermediate MBLG and BCHM units. For BMedSc students: 32 credit points of Intermediate BMED units including Distinctions in BMED (2501, 2502 and 2504). **N** May not be counted with BCHM (3002, 3004 and 3904).	2
NUTR 3901	Nutrition in Individuals (Advanced)	12	**P** NUTR 2902.	1
NUTR 3902	Nutrition in Populations (Advanced)	12	**P** NUTR 2902.	2
Honours units of study				
Candidates intending to graduate with Honours in Nutrition and Dietetics are required to enrol in and complete in their fifth year: (i)NUTR 4001 and 4002 Candidates intending to graduate with Honours in Nutrition are required to enrol in and complete in their fifth year: (i)NUTR 4101 and 4102 and 4103 and 4104.				
NUTR 4001	Clinical Nutritional Science A	24	*NB: Department permission required for enrolment.*	1
NUTR 4002	Clinical Nutritional Science B	24	*NB: Department permission required for enrolment.*	2
NUTR 4101	Nutrition Research A	12	*NB: Department permission required for enrolment.*	1, 2
NUTR 4102	Nutrition Research B	12	**C** NUTR 4101.	1, 2
NUTR 4103	Nutrition Research C	12	**C** NUTR 4102.	1, 2
NUTR 4104	Nutrition Research D	12	**C** NUTR 4103.	1, 2

Table II: Law units of study

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
LAWS 1006	Foundations of Law	6	*NB: Unit is part of the Combined Law program.*	1
LAWS 1010	Torts	6	**P** Legal Institutions. **N** LAWS 3001 Torts. *NB: Unit is part of the Combined Law program for students commencing in 2004.*	2
LAWS 1008	Legal Research	0		1, 2
LAWS 1002	Contracts	8	**P** Legal Institutions.	1, 2, Summer
LAWS 1003	Criminal Law	8		1, 2
LAWS 3000	Federal Constitutional Law	10	**P** Legal Institutions. *NB: Unit is part of the Combined Law program.*	1
LAWS 3002	Law, Lawyers and Justice	10	*NB: Unit is part of the Combined Law program for re-enrolling students in 2004.*	2

Table III: Bachelor of Information Technology

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
Table III(i) Core Software Development				
■ **Junior units of study**				
SOFT 1001	Software Development 1	6	**A** HSC Mathematics Extension 1. **N** May not be counted with SOFT 1901 or COMP (1001 or 1901).	1, 2, Summer
SOFT 1901	Software Development 1 (Adv)	6	**A** HSC Mathematics Extension 1. **Q** UAI at least that for acceptance into BSc(Adv) degree program. **N** May not be counted with SOFT 1001 or COMP (1001 or 1901). *NB: Department permission required for enrolment. NB. Entry requires departmental permission, except for students in BSc(Adv), BCST(Adv) or BIT degrees.*	1, 2

Table III: Bachelor of Information Technology (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
SOFT 1002	Software Development 2	6	**Q** SOFT (1001 or 1901) or COMP (1001 or 1901). **N** May not be counted with SOFT 1902 or COMP (1002 or 1902).	1, 2, Summer
SOFT 1902	Software Development 2 (Adv)	6	**Q** SOFT (1001 or 1901) or COMP (1001 or 1901) and Distinction in one of these. **N** May not be counted with SOFT 1002 or COMP (1002 or 1902). *NB: Department permission required for enrolment in Session 1.*	1, 2
■ **Intermediate units of study**				
SOFT 2001	Concurrent Programming	4	**Q** SOFT (1002 or 1902) or COMP (1002 or 1902). **N** May not be counted with SOFT 2901.	2
SOFT 2901	Concurrent Programming (Adv)	4	**Q** SOFT (1002 or 1902) or COMP (1002 or 1902) and Distinction in one of these, or in any SOFT unit at 2000-level or above. **N** May not be counted with SOFT 2001.	2
SOFT 2004	Software Development Methods 1	4	**Q** SOFT (1002 or 1902) or COMP (1002 or 1902). **N** May not be counted with SOFT 2904 or COMP (2004 or 2904).	1, Summer
SOFT 2904	Software Development Methods 1 (Adv)	4	**Q** SOFT (1002 or 1902) or COMP (1002 or 1902) and Distinction in one of these, or any SOFT unit at 2000-level or above. **N** May not be counted with SOFT 2004 or COMP (2004 or 2904).	1

Table III(ii) Foundation Electives

■ **Intermediate units of study**				
COMP 2003	Languages and Logic	4	**Q** [SOFT (1002 or 1902) or COMP (1002 or 1902)] and MATH (1004 or 1904 or 2009 or 2011) or ELEC 1101. **N** COMP 2903.	2
COMP 2903	Languages and Logic (Advanced)	4	**Q** [SOFT (1002 or 1902) or COMP (1002 or 1902)] and MATH (1004 or 1904 or 2009 or 2011) or ELEC 1101 and Distinction in one COMP, SOFT or MATH unit of study. **N** COMP 2003.	2
COMP 2111	Algorithms 1	4	**Q** SOFT (1002 or 1902) or COMP (1002 or 1902). **C** MATH (1004 or 1904 or 2009 or 2011). **N** May not be counted with COMP (2811 or 2002 or 2902).	1
COMP 2811	Algorithms 1 (Advanced)	4	**Q** [SOFT (1002 or 1902) or COMP (1002 or 1902)] and Distinction in one COMP, SOFT or MATH unit. **C** MATH (1004 or 1904 or 2009 or 2011). **N** May not be counted with COMP (2111 or 2002 or 2902).	1
INFO 2000	Systems Analysis and Design	4	**Q** ISYS 1003 or INFO 1000 or INFS 1000 or [COSC (1001 or 1901) and COSC (1002 or 1902)] or SOFT (1001 or 1901) or COMP (1001 or 1901). **N** May not be counted with INFO 2900.	1, Summer
INFO 2900	System Analysis and Design Advanced	4	**Q** ISYS 1003 or INFO 1000 or INFS 1000 or [COSC (1001 or 1901) and COSC (1002 or 1902)] or SOFT (1001 or 1901) or COMP (1001 or 1901) and Distinction in one INFO, ISYS or SOFT unit. **N** May not be counted with INFO 2000.	1
INFO 2005	Database Management, Introductory	4	**Q** ISYS 1003 or INFO 1000 or INFS 1000 or [COSC (1001 or 1901) and COSC (1002 or 1902)] or SOFT (1001 or 1901) or COMP (1001 or 1901). **N** May not be counted with INFO 2905.	2
INFO 2905	Database Management, Introductory (Adv)	4	**Q** ISYS 1003 or INFO 1000 or INFS 1000 or [COSC (1001 or 1901) and COSC (1002 or 1902)] or SOFT (1001 or 1901) or COMP (1001 or 1901) and Distinction in one INFO, ISYS or SOFT unit. **N** May not be counted with INFO 2005.	2
ISYS 2006	Information Systems in Organisations	4	**A** Use of basic PC tools such as spreadsheets, Internet, email and word processing software. **P** Credit in one of ISYS 1003 or INFS 1000 or INFO 1000. *NB: Enrolment Restriction: Entry is restricted to students who have a credit or better in one of the qualifying units.*	1
ISYS 2007	Distributed Information Systems	4	**Q** ISYS 2006 and INFO (2000 or 2900). **N** May not be counted with INFO 2007.	2
NETS 2008	Computer System Organisation	4	**Q** SOFT (1001 or 1901) or COMP (1001 or 1901) or [COSC (1001 or 1901) and COSC (1002 or 1902)]. **N** May not be counted with NETS 2908 or COMP (2001 or 2901).	1
NETS 2908	Computer System Organisation (Adv)	4	**Q** SOFT (1001 or 1901) or COMP (1001 or 1901) or [COSC (1001 or 1901) and COSC (1002 or 1902)] and Distinction in one NETS or SOFT unit of study. **N** May not be counted with NETS 2008 or COMP (2001 or 2901).	1
NETS 2009	Network Organisation	4	**Q** SOFT (1001 or 1901) or COMP (1001 or 1901) or [COSC (1001 or 1901) and COSC (1002 or 1902)]. **N** May not be counted with NETS 2909.	2
NETS 2909	Network Organisation (Adv)	4	**Q** SOFT (1001 or 1901) or COMP (1001 or 1901) or [COSC (1001 or 1901) and COSC (1002 or 1902)] and Distinction in one NETS or SOFT unit of study. **N** May not be counted with NETS 2009.	2

Table III(iii) Junior and Intermediate IT-related Electives

■ **Junior units of study**				
ACCT 1003	Financial Accounting Concepts	6	**N** Terminating unit. Cannot be counted with ACCT 1001 and ACCT 1002.	1
ACCT 1004	Management Accounting Concepts	6	**N** Terminating unit. Cannot be counted with ACCT 1001 and ACCT 1002.	2
ARIN 1000	History and Theory of Informatics	6	**C** ISYS 1003. *NB: Available to BA Informatics, BCST and BIT students only.*	1
CLAW 1001	Commercial Transactions A	6		1, 2

Table III: Bachelor of Information Technology (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
CLAW 1002	Commercial Transactions B	6	**P** CLAW 1001.	2
COSC 1001	Computational Science in Matlab	3	**A** HSC Mathematics. **N** May not be counted with COSC 1901.	2
COSC 1901	Computational Science in Matlab (Adv)	3	**A** HSC Mathematics. **P** UAI of at least 90, or COSC 1902, or a distinction or better in COSC 1002, SOFT (1001, 1002, 1901 or 1902). **N** May not be counted with COSC 1001.	2
COSC 1002	Computational Science in C	3	**A** HSC Mathematics. **N** May not be counted with COSC 1902.	2
COSC 1902	Computational Science in C (Adv)	3	**A** HSC Mathematics. **P** UAI of at least 90, or COSC 1901, or a distinction or better in COSC 1001, SOFT (1001, 1002, 1901 or 1902). **N** May not be counted with COSC 1002.	2
DECO 1001	Digital Image Representation and Design	3	*NB: Permission required unless enrolled in the Bachelor of Design Computing or the Bachelor of Design (Architecture). Non Architecture students may apply directly to the Faculty of Architecture on a quota basis.*	1
DECO 1002	Web-based Design Information Systems	4	**A** DECO 1001 or equivalent. **N** DESC 9123. *NB: Permission required unless enrolled as an undergraduate in the faculty of Architecture. Non Architecture students may apply directly to the Faculty of Architecture on a quota basis.*	2
DECO 1003	CAD Modelling	4	*NB: Permission required unless enrolled as an undergraduate in the faculty of Architecture. Non Architecture students may apply directly to the Faculty of Architecture on a quota basis.*	2
DECO 1004	Understanding Design	3	*NB: Permission required unless enrolled in the Bachelor of Design Computing or the Bachelor of Design (Architecture). Non Architecture students may apply directly to the Faculty of Architecture on a quota basis.*	1
DESA 1201	Principles of ArchiCAD	6	**N** DESC 9100. *NB: Permission required unless enrolled in the Bachelor of Design Computing or the Bachelor of Design (Architecture). Non Architecture students may apply directly to the Faculty of Architecture on a quota basis.*	1, 2
DESA 1202	Principles of AutoCAD	6	**N** DESC 9101. *NB: Permission required unless enrolled in the Bachelor of Design Computing or the Bachelor of Design (Architecture). Non Architecture students may apply directly to the Faculty of Architecture on a quota basis.*	1, 2
ELEC 1101	Foundations of Computer Systems	6	**A** HSC Maths extension 1.	1, Summer
ELEC 1102	Foundations of Electronic Circuits	6	**A** HSC Physics 2 units, MATH 1001 Differential Calculus.	2
INFS 1000	Business Information Systems Foundations	6	**P** None. **N** ISYS 1003.	1, 2, Summer
ISYS 1003	Foundations of Information Technology	6	**N** May not be counted with INFO 1000 or INFS 1000.	1, 2
MATH 1011	Life Sciences Calculus	3	**A** HSC Mathematics. **N** MATH (1001 or 1901 or 1906).	1
MATH 1012	Life Sciences Algebra	3	**A** HSC Mathematics. **N** MATH (1002 or 1902).	2
MATH 1013	Differential and Difference Equations	3	**A** HSC Mathematics. **N** MATH (1003 or 1903 or 1907).	2
MATH 1015	Life Science Statistics	3	**A** HSC Mathematics. **N** MATH (1005 or 1905) or STAT (1021 or 1022) or ECMT Junior units of study.	1, Summer
MATH 1001	Differential Calculus	3	**A** HSC Mathematics Extension 1. **N** MATH 1011 or 1901 or 1906.	1, Summer
MATH 1901	Differential Calculus (Advanced)	3	**A** HSC Mathematics Extension 2 or result in Band E4 of HSC Mathematics Extension 1. **N** MATH (1011 or 1001 or 1906).	1
MATH 1002	Linear Algebra	3	**A** HSC Mathematics Extension 1. **N** MATH 1902 or 1012.	1, Summer
MATH 1902	Linear Algebra (Advanced)	3	**A** HSC Mathematics Extension 2 or result in Band E4 of HSC Mathematics Extension 1. **N** MATH (1002 or 1012).	1
MATH 1003	Integral Calculus and Modelling	3	**A** HSC Mathematics Extension 2 or MATH 1001. **N** MATH 1013 or 1903 or 1907.	2, Summer
MATH 1903	Integral Calculus and Modelling Advanced	3	**A** HSC Mathematics Extension 2 or Credit or better in MATH 1001/1901. **N** MATH (1003 or 1013 or 1907).	2
MATH 1004	Discrete Mathematics	3	**A** HSC Mathematics Extension 1. **N** MATH 1904 or MATH 2011.	2, Summer
MATH 1904	Discrete Mathematics (Advanced)	3	**A** HSC Mathematics Extension 2 or result in Band E4 of HSC Mathematics Extension 1. **N** MATH 1004 or MATH 2011.	2
MATH 1005	Statistics	3	**A** HSC Mathematics. **N** MATH (1905 or 1015) or ECMT Junior units of study or STAT (1021 or 1022).	2, Summer
MATH 1905	Statistics (Advanced)	3	**A** HSC Mathematics Extension 2 or result in Band E3 or better of HSC Mathematics Extension 1. **N** MATH (1005 or 1015) or ECMT Junior units of study or STAT (1021 or 1022).	2

Table III: Bachelor of Information Technology (continued)

Unit of study		CP		A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
■ Intermediate units of study					
ARIN 2100	Web Tools	8	**P**	18 junior credit points. *NB: Available to students enolled in the BA Informatics and, with departmental permission, to BA students.*	2, Summer
CLAW 2006	Legal Issues for eCommerce	8	**P**	48 credit points at level 1000.	1, 2
COSC 2001	Computational Science 2	6	**A** **P** **N**	A basic knowledge of C and MATLAB. 12 credit points chosen from junior Mathematics or Junior Computational Science units. COSC 2901.	1
COSC 2901	Computational Science 2 (Advanced)	6	**A** **P** **N**	A basic knowledge of C and MATLAB. 12 credit points at a credit level chosen from Junior Mathematics units or Junior Mathematics and Junior Computational Science units. COSC 2001.	1
DECO 2001	3D Modelling and Photorealism	4		*NB: Permission required unless enrolled as an undergraduate in the faculty of Architecture. Non Architecture students may apply directly to the Faculty of Architecture on a quota basis.*	1
DECO 2002	Interactive Multimedia Design	4	**N**	DESC 9068. *NB: Permission required unless enrolled as an undergraduate in the faculty of Architecture. Non Architecture students may apply directly to the Faculty of Architecture on a quota basis.*	1
DECO 2003	Knowledge-Based Design	4	**A**	SOFT 1001 or equivalent. *NB: Permission required unless enrolled as an undergraduate in the faculty of Architecture. Non Architecture students may apply directly to the Faculty of Architecture on a quota basis.*	1
DECO 2004	Product Modelling	4	**A**	INFO 2005 and DECO 2003. *NB: Permission required unless enrolled as an undergraduate in the faculty of Architecture. Non Architecture students may apply directly to the Faculty of Architecture on a quota basis.*	2
DECO 2005	Computer-Supported Collaborative Design	4		*NB: Permission required unless enrolled as an undergraduate in the faculty of Architecture. Non Architecture students may apply directly to the Faculty of Architecture on a quota basis.*	2
DECO 2007	Elective – Design Computing 2	4			N/A in 2004
DECO 2601	Design Grammars	4	**A**	DECO 2003 and either COMP 1001or SOFT 1001. *NB: Permission required unless enrolled as an undergraduate in the faculty of Architecture. Non Architecture students may apply directly to the Faculty of Architecture on a quota basis.*	2
DECO 2602	Evolutionary Design	4	**A**	COMP 1001 or SOFT 1001. *NB: Permission required unless enrolled as an undergraduate in the faculty of Architecture. Non Architecture students may apply directly to the Faculty of Architecture on a quota basis.*	2
DECO 2603	Agents in Design	4	**A**	COMP 1001 or SOFT 1001. *NB: Permission required unless enrolled as an undergraduate in the faculty of Architecture. Non Architecture students may apply directly to the Faculty of Architecture on a quota basis.*	1
DECO 2604	Design Computing Prep Hons Research	4	**P**	96 credit points and minimum WAM of 65. *NB: Department permission required for enrolment.*	2
DECO 2605	History of Animation	4		*NB: Permission required unless enrolled as an undergraduate in the faculty of Architecture. Non Architecture students may apply directly to the Faculty of Architecture on a quota basis.*	1
DECO 2606	Real Time 3D Multimedia	6	**A**	Fundamental software development and digital multimedia skills. *NB: Permission required unless enrolled as an undergraduate in the Faculty of Architecture. Non Architecture students may apply directly to the Faculty of Architecture on a quota basis.*	2
DECO 2607	Sound Design	4		*NB: Permission required unless enrolled in the Bachelor of Design Computing. Next preference to other students in the Architecture Faculty. Non Architecture students may apply directly to the Faculty of Architecture on a quota basis.*	1
ELEC 2101	Circuit Analysis	4	**A** **N**	ELEC 1102 Foundations of Electronic Circuits. ELEC 2001 Electrical and Electronic Engineering and ELEC 2003 Electrical and Electronic Engineering A.	1
ELEC 2301	Signals and Systems	4	**A** **N**	MATH 1001 Differential Calculus, and MATH 1002 Linear Algebra, and MATH 1003 Integral Calculus and Modelling. MATH 3019 Signal Processing and MATH 3919 Signal Processing (Adv).	2
ELEC 2401	Introductory Electronics	4	**A** **N**	ELEC 1102 Foundations of Electronic Circuits. ELEC 2001 Electrical and Electronic Engineering, and ELEC 2003 Electrical and Electronic Engineering A.	2
ELEC 2601	Microcomputer Systems	4	**A** **N**	ELEC 1101 Foundations of Computer Systems. MECH 2701 Mechatronics 2.	1
INFS 2000	Business Information Systems	8	**P** **N**	ACCT 1002 or 1004 and INFS 1000 or ISYS 1003. ACCT 2003.	1, 2
INFS 2005	Business Process Integration & Modelling	8	**P**	INFS 2000 or ACCT 2003.	2
MATH 2001	Vector Calculus and Complex Variables	4	**P** **N**	MATH (1001 or 1901or 1906) and (1002 or 1902) and (1003 or 1903 or 1907). MATH 2901.	1, Summer
MATH 2901	Vector Calculus and Complex Var (Adv)	4	**P** **N**	MATH (1901 or 1906 or Credit in 1001) and (1902 or Credit in 1002) and (1903 or 1907 or Credit in 1003). MATH 2001.	1

Table III: Bachelor of Information Technology (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
MATH 2002	Matrix Applications	4	**P** MATH (1002 or 1902) or Distinction in MATH 1012. **N** MATH 2902.	1, Summer
MATH 2902	Linear Algebra (Advanced)	4	**P** 12 credit points of Junior Mathematics, including MATH 1902 or Credit in 1002. **N** MATH 2002.	1
MATH 2003	Introduction to Mathematical Computing	4	**P** MATH (1001 or 1901 or 1906) and (1002 or 1902) and (1003 or 1903 or 1907). **N** MATH 2903.	1
MATH 2903	Intro to Mathematical Computing (Adv)	4	**P** MATH (1901 or 1906 or Credit in 1001) and (1902 or Credit in 1002) and (1903 or 1907 or Credit in 1003). **N** MATH 2003.	1
MATH 2004	Lagrangian Dynamics	4	**P** MATH 2001 or 2901. **N** MATH 2904.	2
MATH 2904	Lagrangian Dynamics (Advanced)	4	**P** MATH 2901 or Credit in MATH 2001. **N** MATH 2004.	2
MATH 2005	Fourier Series & Differential Equations	4	**P** MATH (1001 or 1901 or 1906) and MATH (1002 or 1902) and MATH (1003 or 1903 or 1907). **N** MATH 2905.	2, Summer
MATH 2905	Mathematical Methods (Advanced)	4	**P** MATH 2901 or Credit in MATH 2001. **N** MATH 2005.	2
MATH 2006	Nonlinear Systems and Chaos Introduction	4	**P** MATH (1001 or 1901 or 1906) and (1002 or 1902) and (1003 or 1903 or 1907) or (Credit in MATH 1011 and 1012 and 1013). **N** MATH 2906.	2
MATH 2906	Nonlinear Systems and Chaos (Advanced)	4	**P** MATH (1901 or 1906 or Credit in 1001) and (1902 or Credit in 1002) and (1903 or 1907 or Credit in 1003). **N** MATH 2006.	2
MATH 2007	Analysis	4	**P** MATH (1001 or 1901 or 1906) and (1003 or 1903 or 1907) or Distinction average in MATH 1011 and 1013. **N** MATH 2907.	2
MATH 2907	Analysis (Advanced)	4	**P** MATH (1901 or 1906 or Credit in 1001) and (1903 or 1907 or Credit in 1003) (MATH 2901 or 2001 strongly advised). **N** MATH 2007.	2
MATH 2008	Introduction to Modern Algebra	4	**P** MATH 2002 or 2902. **N** MATH 2908 or 2918.	2
MATH 2918	Introduction to Modern Algebra (Adv)	4	**P** MATH 2902. **N** MATH 2008 or 2908.	2
MATH 2009	Graph Theory	4	**P** 6 credit points of Junior Mathematics (at the Distinction level in Life Sciences units).	2, Summer
MATH 2010	Optimisation	4	**P** MATH (1001 or 1901 or 1906) and (1002 or 1902). **N** ECMT 3510.	2, Summer
MATH 2011	Topics in Discrete Mathematics	4	**A** HSC Mathematics Extension 1. **P** 6 credit points of Junior Mathematics. **N** MATH (1004 or 1904).	1
STAT 2001	Statistical Distributions	4	**P** MATH (1001 or 1901 or 1906 or Credit in 1011) and [MATH (1005 or 1905 or 1015) or MATH (1004 or 1904)]. **N** STAT 2901.	1
STAT 2901	Introduction to Probability (Advanced)	4	**P** MATH (1903 or 1907 or Credit in 1003) and MATH (1905 or Credit in 1005). **N** STAT 2001.	1
STAT 2002	Data Analysis	4	**P** MATH 1005 or 1905 or 1015 (or STAT 1021 for Arts students).	1
STAT 2003	Estimation Theory	4	**P** STAT 2001 or 2901. **N** STAT 2903.	2
STAT 2903	Estimation Theory (Advanced)	4	**P** STAT 2901 or Credit in STAT 2001. **N** STAT 2003.	2
STAT 2004	Hypothesis Testing	4	**A** STAT 2002. **P** MATH (1005 or 1905 or 1015).	2

Table III(iv) Senior and Honours IT-related Electives

■ Senior units of study

ARIN 3000	Technocultures	8	**P** 18 junior credit points. *NB: Available to students enrolled in the BA Informatics and to BA students.*	2
BCHM 3005	Computational Biochemistry	4	**A** 12 credit points of Junior Chemistry. **P** 8 credit points of Intermediate Mathematics units of study. Strongly recommend two of the following: MATH (2001/2901, 2002/2902, 2003/2903, 2005/2905, 2006/2906). **N** May not be counted with BCHM 3905.	N/A in 2004
BCHM 3905	Computational Biochemistry (Advanced)	4	**A** 12 credit points of Junior Chemistry. **P** Credit average in 8 credit points of Intermediate Mathematics units of study. Strongly recommend two of the following: MATH (2001/2901, 2002/2902, 2003/2903, 2005/2905, 2006/2906). **N** May not be counted with BCHM 3005.	N/A in 2004
BIOL 3027	Bioinformatics and Genomics	6	**P** MBLG (2001 or 2101 or 2901) or 16 credit points of Intermediate Biology including BIOL (2001 or 2901 or 2004 or 2904 or 2006 or 2906). For BMedSc students: 32 credit points of Intermediate BMED units including BMED 2502. **N** BIOL 3927.	1b
COSC 3001	Computational Science 3A	4	**A** Programming experience in C and MATLAB. **P** 12 credit points chosen from junior Mathematics and Statistics, 6 credit points of Junior or Intermediate Computational Science units or equivalent and 16 credit points of Intermediate units in Science subject areas, not including Computational Science. **N** COSC 3901, PHYS 3301, PHYS 3901.	1

Table III: Bachelor of Information Technology (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
COSC 3901	Computational Science 3A (Advanced)	4	**A** Programming experience in C and MATLAB. **P** 12 credit points chosen from junior Mathematics and Statistics, 6 credit points of Junior or Intermediate Computational Science units at credit level or equivalent and 16 credit points of Intermediate units in Science subject areas, not including Computational Science. **N** COSC 3001, PHYS 3301, PHYS 3901.	1
COSC 3002	Computational Science 3B	4	**A** Programming experience in C and MATLAB. **P** 12 credit points from the Science subject areas of Junior Mathematics and Statistics, 6 credit points of Junior or Intermediate Computational Science units or equivalent, and 16 credit points of Intermediate units in Science subject areas, not including Computational Science. **N** COSC 3601, COSC 3902, PHYS 3303, PHYS 3933.	2
COSC 3902	Computational Science 3B (Advanced)	4	**A** Programming experience in C and MATLAB. **P** 12 credit points from the Science subject areas of Junior Mathematics and Statistics, 6 credit points of Junior or Intermediate Computational Science units at a credit level or equivalent, and 16 credit points of Intermediate units in Science subject areas, not including Computational Science. **N** COSC 3601, COSC 3002, PHYS 3303, PHYS 3933.	2
COMP 3002	Artificial Intelligence	4	**P** [SOFT (2004 or 2904) or COMP (2004 or 2904)] and COMP (2003 or 2903) and 8 credit points 2000-level MATH and/or STAT and/or ECMT. **N** May not be counted with COMP 3902.	1
COMP 3902	Artificial Intelligence (Advanced)	4	**P** [SOFT (2004 or 2904) or COMP (2004 or 2904)] and COMP (2003 or 2903) and 8 credit points 2000-level MATH and/or STAT and/or ECMT and Distinction in a COMP, SOFT or MATH unit at 2000-level or above. **N** May not be counted with COMP 3002.	1
COMP 3111	Algorithms 2	4	**A** MATH 2009. **P** COMP (2111 or 2811 or 2002 or 2902) and MATH (1004 or 1904 or 2009 or 2011) and MATH (1005 or 1905). **N** May not be counted with COMP (3811 or 3001 or 3901).	1
COMP 3811	Algorithms 2 (Advanced)	4	**P** COMP (2002 or 2902 or 2111 or 2811) and MATH (1004 or 1904 or 2009 or 2011) and MATH (1005 or 1905). Also Distinction in a COMP, SOFT or MATH intermediate unit. **N** COMP (3111 or 3001 or 3901).	1
COMP 3116	Programming Languages	4	**P** [SOFT (2004 or 2904) or COMP (2004 or 2904)] and COMP (2003 or 2903). **N** COMP (3816 or 3006 or 3906). *NB: Not available in 2004.*	N/A in 2004
COMP 3816	Programming Languages (Advanced)	4	**P** SOFT (2004 or 2904) or COMP (2004 or 2904) and COMP (2003 or 2903) and Distinction in a COMP, SOFT or MATH unit at 2000-level or above. **N** COMP (3116 or 3906). *NB: Not available in 2004.*	N/A in 2004
COSC 3601	Parallel Computing	4	**A** Some familiarity is assumed with Unix and a programming language (eg, C or Fortran). **P** At least one of SOFT (2004 or 2904) or COMP (2004 or 2904) or PHYS (3301 or 3901) or MATH 2903 or MATH (3016 or 3916). *NB: Not available in 2004.*	N/A in 2004
DECO 3003	Design Computing Research Opportunity	6	**A** Computer programming. **P** 96 credit points and minimum WAM of 65. *NB: Department permission required for enrolment. Non Architecture students may apply directly to the Faculty of Architecture on a quota basis.*	2
DECO 3004	Computational Models of Creative Design	4	**P** DECO 2003. *NB: Permission required unless enrolled as an undergraduate in the faculty of Architecture. Non Architecture students may apply directly to the Faculty of Architecture on a quota basis.*	2
DECO 3005	Advanced Interactive Multimedia Design	6	**A** DECO 1002 and 2002. **N** May not be counted with DESC 9142. *NB: Permission required unless enrolled as an undergraduate in the faculty of Architecture. Non Architecture students may apply directly to the Faculty of Architecture on a quota basis.*	2
DECO 3006	Principles of 3D Animation	6	**N** DESC 9019 or 9141. *NB: Department permission required for enrolment. First preference given to third year students in the Bachelor of Design Computing. Non Architecture students may apply directly to the Faculty of Architecture on a quota basis.*	1
DECO 3551	Design Computing General Elective A	6	**P** 48 credit points. *NB: Department permission required for enrolment. Submit an Independent Study Approval Form, signed by the elective supervisor, with your request to enrol.*	1, 2, Summer
DECO 3552	Design Computing General Elective B	6	**P** 48 credit points. *NB: Department permission required for enrolment. Submit an Independent Study Approval Form, signed by the elective supervisor, with your request to enrol.*	1, 2
DECO 3553	Design Computing General Elective C	6	**P** 48 credit points. *NB: Department permission required for enrolment.*	1, 2
DECO 3554	Design Computing General Elective D	6	**P** 48 credit points. *NB: Department permission required for enrolment. Submit an Independent Study Approval Form, signed by the elective supervisor, with your request to enrol.*	1, 2
EBUS 3001	Introduction to E-Commerce Systems	4	**A** COMP 1002 Introductory Computer Science or SOFT 1002 Software Development 2.	1
EBUS 3002	E-Commerce Website Programming	4	**A** EBUS 3001 Introduction to E-Commerce Systems and (SOFT 2004 Software Development Methods 1 or COMP 2004 Programming Practice).	2
ELEC 3303	Digital Signal Processing	4	**A** ELEC 2301 Signals and Systems.	1
ELEC 3401	Electronic Devices and Circuits	4	**A** ELEC 2401 Introductory Electronics.	1

Table III: Bachelor of Information Technology (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
ELEC 3402	Communications Electronics	4	**A** ELEC 3401 Electronic Devices and Circuits.	2
ELEC 3403	Switching Devices and Electronics	4	**A** ELEC 3401 Electronic Devices and Circuits.	2
ELEC 3502	Random Signals and Communications	4	**A** ELEC 2301 Signals and Systems.	1
ELEC 3503	Introduction to Digital Communications	4	**A** ELEC 2301 Signals and Systems.	2
ELEC 3504	Data Communications and the Internet	4	**A** (SOFT 2004 Software Development Methods 1 or COMP 2004 Programming Practice) and (NETS 2009 Network Organisation or ELEC 2601 Microcomputer Systems). **N** ELEC 4501 Data Communication Networks.	2
ELEC 3601	Digital Systems Design	4	**A** ELEC 2601 Microcomputer Systems, or COMP 2001 Computer Systems, or NETS 2008 Computer Systems Organisation, or NETS 2908 Computer Systems Organisation (adv) or MECH 2701 Mechatronics 2.	2
ELEC 3603	Introduction to Computing Systems	4	**A** ELEC 2601 Microcomputer Systems.	1
ELEC 3701	Management for Engineers	4	**N** Prohibition: ENGG 2003 Introduction to Engineering Management.	1
INFO 3005	Organisational Database Systems	4	**P** INFO (2000 or 2900) and INFO (2005 or 2905). **N** May not be counted with INFO 3905 or COMP (3005 or 3905).	1
INFO 3905	Organisational Database Systems (Adv)	4	**P** INFO (2000 or 2900) and INFO (2005 or 2905) and Distinction in an INFO, ISYS or SOFT unit at 2000-level or above. **N** May not be counted with COMP (3005 or 3905) or INFO 3005.	1
INFS 3000	Management Information Systems	8	**P** INFS 2000 or ACCT 2003.	1
INFS 3005	Enterprise Systems	8	**P** INFS 2005 or ACCT 2003.	1
INFS 3010	IT Assurance and Control	8	**P** INFS 2000 or ACCT 2003. **N** ACCT 3005.	1
INFS 3015	Knowledge Management Systems	8	**P** INFS 2000 or ACCT 2003 and at least 48 credit points.	1
INFS 3020	E-Commerce Business Models	8	**P** One of INFS 1000, ISYS 1003 and INFO 1000. Also at least 48 credit points. **N** ACCT 3006.	2
ISYS 3000	Information Systems Management	4	**P** ISYS 2007 or INFO 2007.	2
ISYS 3012	Project Management and Practice	4	**P** INFO (2000 or 2900).	1
ISYS 3015	Analytical Methods for IS Professionals	4	**P** [ARIN 1000 or ENGL (1050 or 1005) or LNGS (1001 or 1002 or 1005) or ECOF (1001 or 1002)] and 16 credit points of intermediate or senior units of study, including ISYS 2006 and (ISYS 2007 or INFO 2007) and INFO (2000 or 2900). *NB: Enrolment Restriction: Entry is restricted to students who have a credit or better in at least one of the Prerequisite units.*	1
ISYS 3113	Arts Informatics Systems	4	**P** INFO (2000 or 2900) and INFO (2005 or 2905) and [(ARIN 1000 or ENGL (1050 or 1005) or LNGS (1001 or 1002 or 1005) or ECOF (1001 or 1002)].	1
MARS 3103	GIS Simulation Modelling	6	**P** MARS (2001 and 2002) or 16 credit points of Intermediate Science including at least 8 credit points from Geology or Geography units of study. **N** May not be counted with GEOG 3102.	2a
MATH 3002	Rings and Fields	4	**P** 8 credit points of Intermediate Mathematics (strongly advise MATH 2002 or 2902, with 2008 or 2908). **N** MATH 3902.	1
MATH 3902	Algebra I (Advanced)	4	**P** 12 credit points of Intermediate Mathematics (strongly advise MATH 2902). **N** MATH 3002.	1
MATH 3005	Logic	4	**P** (for all but BCST students) 8 credit points of Intermediate Mathematics; (for BCST students) 8 credit points of Intermediate Mathematics or 12 credit points of Junior Mathematics at Advanced level.	1
MATH 3007	Coding Theory	4	**P** 8 credit points of Intermediate Mathematics (strongly advise MATH 2002 or 2902).	2
MATH 3009	Number Theory	4	**P** 8 credit points of Intermediate Mathematics.	2
MATH 3010	Information Theory	4	**P** 8 credit points of Intermediate Mathematics (strongly advise MATH 2001 or 2901 and some probability theory).	2
MATH 3016	Mathematical Computing I	4	**P** 8 credit points of Intermediate Mathematics and one of MATH 1001 or 1003 or 1901 or 1903 or 1906 or 1907. **N** May not be counted with MATH 3916.	1
MATH 3916	Mathematical Computing I (Advanced)	4	**P** 8 credit points of Intermediate Mathematics and one of MATH 1903 or 1907 or Credit in MATH 1003. **N** May not be counted with MATH 3016.	1
MATH 3019	Signal Processing	4	**P** MATH (2001 or 2901) and MATH (2005 or 2905). **N** May not be counted with MATH 3919.	1
MATH 3919	Signal Processing (Advanced)	4	**P** MATH 2905 or Credit in MATH 2005. **N** May not be counted with MATH 3019.	1
MATH 3024	Elementary Cryptography and Protocols	4	**P** 12 credit points of Intermediate Mathematics. Strongly advise MATH 2008 or 2908 or 2918.	1
MATH 3925	Public Key Cryptography (Advanced)	4	**P** 12 credit points from Intermediate or senior mathematics. Strongly recommend MATH 3902.	2

Table III: Bachelor of Information Technology (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
MULT 3004	Computer Graphics	4	**P** COMP (2111 or 2811 or 2002 or 2902) and [SOFT (2004 or 2904) or COMP (2004 or 2904)] and MATH (1002 or 1902). **N** May not be counted with MULT 3904 or COMP (3004 or 3904).	2
MULT 3904	Computer Graphics (Advanced)	4	**P** COMP (2111 or 2811 or 2002 or 2902) and [SOFT (2004 or 2904) or COMP (2004 or 2904)] and MATH (1002 or 1902) and Distinction in a MULT or SOFT unit at 2000-level or above. **N** May not be counted with MULT 3004 or COMP (3004 or 3904).	2
MULT 3018	Multimedia Interaction	4	**P** SOFT (2004 or 2904) or COMP (2004 or 2904). **N** May not be counted with MULT 3918.	1
MULT 3918	Multimedia Interaction (Advanced)	4	**P** SOFT (2004 or 2904) or COMP (2004 or 2904) and Distinction in a MULT or SOFT unit at 2000-level or above. **N** May not be counted with MULT 3018.	1
MULT 3019	Digital Media	4	**P** COMP (2111 or 2811 or 2002 or 2902) and MATH (1001 or 1901) and MATH (1002 or 1902) and MATH (1003 or 1903). **N** May not be counted with MULT 3919.	1
MULT 3919	Digital Media (Advanced)	4	**P** COMP (2111 or 2811 or 2002 or 2902) and MATH (1001 or 1901) and MATH (1002 or 1902) and MATH (1003 or 1903) and Distinction in a MULT or SOFT unit at 2000-level or above. **N** May not be counted with MULT 3019.	1
NETS 3007	Network Protocols	4	**P** [[NETS (2008 or 2908) and NETS (2009 or 2909)] or ELEC 2601] and [SOFT (2004 or 2904) or COMP (2004 or 2904)] and SOFT (2001 or 2901). **N** May not be counted with NETS 3907 or COMP (3007 or 3907).	1
NETS 3907	Network Protocols (Advanced)	4	**P** [[NETS (2008 or 2908) and NETS (2009 or 2909)] or ELEC 2601] and [SOFT (2004 or 2904) or COMP (2004 or 2904)] and SOFT (2001 or 2901) and Distinction in a NETS or SOFT unit at 2000-level or above. **N** May not be counted with NETS 3007 or COMP (3007 or 3907).	1
NETS 3009	Operating Systems	4	**P** [NETS (2008 or 2908) or ELEC 2601] and [SOFT (2004 or 2904) or COMP (2004 or 2904)] and SOFT(2001 or 2901). **N** May not be counted with NETS 3909 or COMP (3009 or 3909).	2
NETS 3909	Operating Systems (Advanced)	4	**P** [NETS (2008 or 2908) or ELEC 2601] and [SOFT (2004 or 2904) or COMP (2004 or 2904)] and SOFT(2001 or 2901) and Distinction in a NETS or SOFT unit at 2000-level or above. **N** May not be counted with NETS 3009 or COMP (3009 or 3909).	2
NETS 3016	Computer and Network Security	4	**A** MATH (1004 and 1005). **P** [[NETS (2008 or 2908) and NETS (2009 or 2909)] or ELEC 2601] and [SOFT (2004 or 2904) or COMP (2004 or 2904)]. **N** May not be counted with NETS 3916 or ELEC 5610.	1
NETS 3916	Computer and Network Security (Advanced)	4	**A** MATH (1004 and 1005). **P** [[NETS (2008 or 2908) and NETS (2009 or 2909)] or ELEC 2601] and [SOFT (2004 or 2904) or COMP (2004 or 2904)] and Distinction in a NETS or SOFT unit at 2000-level or above. **N** May not be counted with NETS 3016 or ELEC 5610.	1
NETS 3017	Network Programming and Distributed Apps	4	**P** [[NETS (2008 or 2908) and NETS (2009 or 2909)] or ELEC 2601] and [SOFT (2004 or 2904) or COMP (2004 or 2904)] and SOFT (2001 or 2901). **N** May not be counted with NETS 3917 or ELEC 3604.	2
NETS 3917	Network Prog & Distributed Apps (Adv)	4	**P** [NETS (2008 or 2908) and NETS (2009 or 2909) or ELEC 2601] and [SOFT (2004 or 2904) or COMP (2004 or 2904)] and SOFT (2001 or 2901) and Distinction in a NETS or SOFT unit at 2000-level or above. **N** May not be counted with NETS 3017 or ELEC 3604.	2
SOFT 3101	Object-Oriented Software Design	4	**P** SOFT (2001 or 2901) and INFO (2000 or 2900) and INFO (2005 or 2905) and [SOFT (2004 or 2904) or COMP (2004 or 2904)]. **N** May not be counted with SOFT 3801 or COMP (3008 or 3908).	1
SOFT 3801	Object-Oriented Software Design (Adv)	4	**P** SOFT (2001 or 2901) and INFO (2000 or 2900) and INFO (2005 or 2905) and [SOFT (2004 or 2904) or COMP (2004 or 2904)] and Distinction in a SOFT or INFO unit at 2000-level or above. **N** May not be counted with SOFT 3101 or COMP (3008 or 3908).	1
SOFT 3102	User Interface Design and Programming	4	**P** [SOFT (2004 or 2904) or COMP (2004 or 2904)]. **N** SOFT 3802 or COMP (3102 or 3802).	1
SOFT 3802	User Interface Design Programming (Adv)	4	**P** [SOFT (2004 or 2904) or COMP (2004 or 2904)] and Distinction in a SOFT or INFO unit at 2000-level or above. **N** SOFT 3102 or COMP (3102 or 3802).	1
SOFT 3103	Software Validation and Verification	4	**P** [SOFT (2004 or 2904) or COMP (2004 or 2904)] and SOFT (2001 or 2901) and MATH (1005 or 1905). **N** May not be counted with SOFT 3803.	2
SOFT 3803	Software Validation & Verification (Adv)	4	**P** [SOFT (2004 or 2904 or COMP (2004 or 2904)] and SOFT (2001 or 2901) and MATH (1005 or 1905) and Distinction in a SOFT or INFO unit at 2000-level or above. **N** May not be counted with SOFT 3103.	2
SOFT 3104	Software Development Methods 2	4	**P** [SOFT (2004 or 2904) or COMP (2004 or 2904)] and SOFT (2001 or 2901). **N** May not be counted with SOFT 3804 or COMP (3100 or 3800).	1
SOFT 3804	Software Development Methods 2 (Adv)	4	**P** [SOFT (2004 or 2904) or COMP (2004 or 2904)] and SOFT (2001 or 2901) and Distinction in a SOFT or INFO unit at 2000-level or above. **N** May not be counted with SOFT 3104 or COMP (3100 or 3800).	1
STAT 3001	Distribution Theory and Inference	4	**P** MATH (1003 or 1903 or 1907) and STAT (2003 or 2903). **N** STAT 3901.	1
STAT 3901	Statistical Theory (Advanced)	4	**P** (MATH 2001 or 2901) and STAT 2903. **N** STAT 3001.	1
STAT 3002	Applied Linear Models	4	**P** STAT 2004 (or STAT 1022 for Arts students) and MATH (1002 or 1902). **N** May not be counted with STAT 3902.	1

Table III: Bachelor of Information Technology (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
STAT 3902	Linear Models (Advanced)	4	**P** STAT 2004 and (STAT 2903 or Credit in 2003) and (MATH 2002 or 2902). **N** May not be counted with STAT 3002.	1
STAT 3003	Time Series Analysis	4	**P** STAT (2003 or 2903). **N** May not be counted with STAT 3903.	1
STAT 3903	Time Series Analysis (Advanced)	4	**P** STAT 2903 or credit or better in STAT 2003. **N** May not be counted with STAT 3003.	1
STAT 3004	Design of Experiments	4	**P** STAT (3002 or 3902). **N** May not be counted with STAT 3904.	2
STAT 3904	Design of Experiments (Advanced)	4	**P** STAT 3902 or credit or better in STAT 3002. **N** May not be counted with STAT 3004.	2
STAT 3005	Applied Stochastic Processes	4	**P** MATH (1003 or 1903 or 1907) and STAT (2001 or 2901). **N** STAT 3905.	2
STAT 3905	Markov Processes (Advanced)	4	**P** STAT 2901 or (Credit in STAT 2001 and MATH (1003 or 1903 or 1907)). **N** STAT 3005.	2
STAT 3006	Sampling Theory and Categorical Data	4	**P** STAT 2003 or 2903.	2
STAT 3907	Multivariate Analysis (Advanced)	4	**P** STAT 3902 and either STAT (3001 or 3901).	2
Honours units of study				
COMP 4044	Data Mining and Machine Learning	6	**A** Elementary statistics. **P** Credit average in 24 credit points of 3000-level study.	1
COMP 4045	Computational Geometry	6	**A** Data structures, analysis of algorithms. **P** Credit average in 24 credit points of 3000-level study.	1
COMP 4046	Statistical Natural Language Processing	6	**A** Concepts of linguistics, elementary statistics, AI techniques. **P** Credit average in 24 credit points of 3000-level study.	1
COMP 4048	Information Visualisation	6	**A** Discrete mathematics. **P** Credit average in 24 credit points of 3000-level study.	2
EBUS 5001	E-Commerce Application Programming	4	**A** EBUS 3001 Introduction to E-Commerce Systems. **N** ELEC 5608 Electronic Commerce.	1
EBUS 5002	E-Commerce Systems	4	**A** EBUS 5001 E-Commerce Application Programming.	2
ELEC 4301	Computer Control System Design	4	**A** ELEC 3302 Fundamentals of Feedback Control. *NB: Department permission required for enrolment.*	1
ELEC 4302	Image Processing and Computer Vision	4	**A** ELEC 2301 Signals and Systems, and ELEC 4303 Digital Signal Processing.	1
ELEC 4402	Integrated Circuit Design	4	**A** ELEC 3401 Electronic Devices and Circuits.	1
ELEC 4403	Electronic Design	6	**A** ELEC 2301 Signals and Systems, ELEC 3302 Fundamentals of Feedback Control, and ELEC 3401 Electronic Devices and Circuits. **N** ELEC 4401 Electronic Design. *NB: Department permission required for enrolment.*	1
ELEC 4501	Data Communication Networks	4	**P** Assumed Knowledge: ELEC 3502 Random Signals and Communications, and ELEC 3503 Introduction to Digital Communications. *NB: Department permission required for enrolment.*	1
ELEC 4502	Digital Communication Systems	4	**A** ELEC 3502 Random Signals and Communications, and ELEC 3503 Introduction to Digital Communications.	1
ELEC 4503	Error Control Coding	4	**A** ELEC 3502 Random Signals and Communications, and ELEC 3503 Introduction to Digital Communications.	1
ELEC 4504	Wireless Networks	4		2
ELEC 4601	Computer Design	4	**A** ELEC 3403 Switching Devices and Electronics, and ELEC 3601 Digital Systems Design. **N** MECH 4730 Computers in Real time Instrumentation and Control.	1
ELEC 4602	Real Time Computing	4	**A** ELEC 3601 Digital Systems Design or ELEC 3603 Introduction to Computing Systems.	1
ELEC 4604	Engineering Software Requirements	4	**A** COMP 3100 Software Engineering or SOFT 3104 Software Development Methods 2.	2
ELEC 4701	Project Management	4	**A** ENGG 2003 Introduction to Engineering Management or ELEC 3701 Management for Engineers.	2
ELEC 4704	Software Project Management	4	**A** (COMP 3100 Software Engineering and COMP 3205 Product Development Project) or (INFO 2000 Systems Analysis and Design and SOFT 2004 Software Development Methods 1).	1
ELEC 5501	Advanced Communication Networks	4	**A** NETS 3007 Network Protocols or ELEC 3604 Internet Engineering.	2
ELEC 5502	Satellite Communication Systems	4	**A** ELEC 3502 Random Signals and Communications, ELEC 3503 Introduction to Digital Communications and ELEC 4502 Digital Communication Systems.	2
ELEC 5503	Optical Communication Systems	4	**A** ELEC 3402 Communications Electronics, ELEC 3502 Random Signals and Communications, and ELEC 3503 Introduction to Digital Communications.	1
ELEC 5504	Cellular Radio Engineering	4	**A** ELEC 3502 Random Signals and Communications, and ELEC 3503 Introduction to Digital Communications.	1
ELEC 5505	Advanced Digital Transmissions	4	**P** Assumed Knowledge: ELEC 3502 Random Signals and Communications, and ELEC 3503 Introduction to Digital Communications.	N/A in 2004
ELEC 5506	Optical Networks	4	**A** ELEC 3502 Random Signals and Communications, and ELEC 3503 Introduction to Digital Communications.	2

Table III: Bachelor of Information Technology (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
ELEC 5521	Radio Frequency Engineering	4	**A** ELEC 2101 Circuit Analysis, and ELEC 3401 Electronic Devices and Circuits.	1
ELEC 5522	Antennas and Propagation	4	**A** MATH 2001 Complex Variables, and ELEC 3102 Engineering Electromagnetics.	2
ELEC 5601	Advanced Real Time Computing	4	**A** ELEC 4602 Real Time Computing. *NB: Department permission required for enrolment.*	2
ELEC 5603	Biologically Inspired Signal Processing	4	*NB: Department permission required for enrolment.*	2
ELEC 5604	Adaptive Pattern Recognition	4	*NB: Department permission required for enrolment.*	2
ELEC 5606	Multimedia Systems and Applications	4	**A** NETS 3007 Network Protocols or ELEC 3504 Data Communications and Internet. **N** ELEC 3604 Internet Engineering. *NB: Department permission required for enrolment. Permission required for enrolment.*	1
ELEC 5608	Electronic Commerce	4	**P** Assumed Knowledge: COMP 2002 Design and Data Structures and COMP 2004 Programming Practice.	N/A in 2004
ELEC 5610	Computer and Network Security	4	**A** (ELEC 3604 Internet Engineering and ELEC 4501 Data Communication Networks) or ELEC 3504 DataCommunications and the Internet. **N** NETS 3016 Computer and Network Security. NETS 3916 Computer and Network Security (Advance).	1
ELEC 5611	Advanced Computer Engineering	4	**A** ELEC 4601 Computer Design. *NB: Department permission required for enrolment.*	2
INFO 4010	IT Advanced Topic A	6	**P** Permission of Head of School. *NB: Department permission required for enrolment.*	1
INFO 4011	IT Advanced Topic B	6	**P** Permission of Head of School. *NB: Department permission required for enrolment.*	2
INFO 4990	IT Research Methods	6	**A** Elementary statistics.	1
ISYS 4050	Knowledge Management Systems	6	**A** Information systems concepts, database concepts. **P** Credit average in 24 credit points of 3000-level study.	1
ISYS 4051	Advanced Data Models	6	**A** Relational database concepts. **P** Credit average in 24 credit points of 3000-level study.	2
MULT 4043	Multimedia Storage, Retrieval & Delivery	6	**A** Multimedia data formats, networking concepts, database concepts. **P** Credit average in 24 credit points of 3000-level study.	1
NETS 4040	Advanced Networking Technologies	6	**A** Understanding of link layer technologies, the TCP/IP protocol stack. **P** Credit average in 24 credit points of 3000-level study. **N** ELEC (4504 and 5501).	1
NETS 4041	Network-Based High Performance Computing	6	**A** Understanding of operating systems. **P** Credit average in 24 credit points of 3000-level study.	1
NETS 4047	Pervasive Computing	6	**A** Networking concepts, operating system concepts, programming expertise. **P** Credit average in 24 credit points of 3000-level study.	2
SOFT 4042	Enterprise-Scale Software	6	**A** Relational database technology, object-oriented design, C++. **P** Credit average in 24 credit points of 3000-level study.	1

Table III(v) Senior and Honours Projects

BINF 3001	Bioinformatics Project	8	**P** SOFT (2004 or 2904) and 16 credit points from intermediate Biology, Biochemistry, Microbiology, Molecular Biology and Genetics and/or Pharmacology. **N** May not be counted with COMP 3206.	2
COSC 3701	Computational Science Project	8	**A** Able to program in a standard language. **P** 16 credit points of intermediate level natural sciences plus at least one of COSC (1001 or 1901 or 1002 or 1902) or SOFT (1001 or 1901) or MATH (2003 or 2903) or PHYS (2001 or 2901 or 2002 or 2902).	N/A in 2004
INFO 3600	Major Development Project	12	**P** 36 crpts from Table III(iv) and/or III(v) of the BIT regulations. *NB: only available to students in BIT.*	1, 2
INFO 4991	IT Research Thesis A	6	**C** INFO 4990 and INFO 4992.	1, 2
INFO 4992	IT Research Thesis B	12	**C** INFO 4990 and INFO 4991.	1, 2
INFS 3090	Business Information Systems Project	8	**P** Department permission and at least 48 credit points. *NB: Department permission required for enrolment.*	1, 2
ISYS 3207	Information Systems Project	8	**P** ISYS 3012 and (ISYS 3015 or ARIN 2000).	2
SOFT 3200	Software Development Project	8	**P** [SOFT (2004 or 2904) or COMP (2004 or 2904)] and SOFT (2001 or 2901) and 8 credit points from BIT table III(ii) and 8 credit points from BIT table III(iv). **N** May not be counted with SOFT 3700.	1, 2
SOFT 3700	Software Development Project (Advanced)	8	**P** [SOFT (2004 or 2904) or COMP (2004 or 2904)] and SOFT (2001 or 2901) and 8 credit points from BIT table III(ii) and 8 credit points from BIT table III(iv) and Distinction in a 2000- or 3000- level unit from COMP, INFO, MULT, NETS, or SOFT. **N** May not be counted with SOFT 3200.	1, 2

Table IIIA: Bachelor of Information Technology Majors

Unit of study	CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
(i) Major in Principles of Computer Science			
Students are required to complete all the core units, or other mutually exclusive units such as their Advanced equivalents			
■ Core Junior units of study			
MATH 1002 Linear Algebra	3	**A** HSC Mathematics Extension 1. **N** MATH 1902 or 1012.	1, Summer
MATH 1005 Statistics	3	**A** HSC Mathematics. **N** MATH (1905 or 1015) or ECMT Junior units of study or STAT (1021 or 1022).	2, Summer
SOFT 1001 Software Development 1	6	**A** HSC Mathematics Extension 1. **N** May not be counted with SOFT 1901 or COMP (1001 or 1901).	1, 2, Summer
SOFT 1002 Software Development 2	6	**Q** SOFT (1001 or 1901) or COMP (1001 or 1901). **N** May not be counted with SOFT 1902 or COMP (1002 or 1902).	1, 2, Summer
■ Core Intermediate units of study			
The unit of study MATH 1004 or MATH 1904 may be substituted for MATH 2011 in the core.			
COMP 2003 Languages and Logic	4	**Q** [SOFT (1002 or 1902) or COMP (1002 or 1902)] and MATH (1004 or 1904 or 2009 or 2011) or ELEC 1101. **N** COMP 2903.	2
COMP 2111 Algorithms 1	4	**Q** SOFT (1002 or 1902) or COMP (1002 or 1902). **C** MATH (1004 or 1904 or 2009 or 2011). **N** May not be counted with COMP (2811 or 2002 or 2902).	1
MATH 2009 Graph Theory	4	**P** 6 credit points of Junior Mathematics (at the Distinction level in Life Sciences units).	2, Summer
MATH 2011 Topics in Discrete Mathematics	4	**A** HSC Mathematics Extension 1. **P** 6 credit points of Junior Mathematics. **N** MATH (1004 or 1904).	1
SOFT 2001 Concurrent Programming	4	**Q** SOFT (1002 or 1902) or COMP (1002 or 1902). **N** May not be counted with SOFT 2901.	2
SOFT 2004 Software Development Methods 1	4	**Q** SOFT (1002 or 1902) or COMP (1002 or 1902). **N** May not be counted with SOFT 2904 or COMP (2004 or 2904).	1, Summer
■ Core Senior units of study			
In 2004 students should take an additional Elective Senior unit of study to replace COMP 3116 (which is not available).			
COMP 3002 Artificial Intelligence	4	**P** [SOFT (2004 or 2904) or COMP (2004 or 2904)] and COMP (2003 or 2903) and 8 credit points 2000-level MATH and/or STAT and/or ECMT. **N** May not be counted with COMP 3902.	1
COMP 3111 Algorithms 2	4	**A** MATH 2009. **P** COMP (2111 or 2811 or 2002 or 2902) and MATH (1004 or 1904 or 2009 or 2011) and MATH (1005 or 1905). **N** May not be counted with COMP (3811 or 3001 or 3901).	1
COMP 3116 Programming Languages	4	**P** [SOFT (2004 or 2904) or COMP (2004 or 2904)] and COMP (2003 or 2903). **N** COMP (3816 or 3006 or 3906). *NB: Not available in 2004.*	N/A in 2004
■ Elective Senior units of study			
Students are required to complete 12 credit points from the elective units, or other mutually exclusive units such as their Advanced equivalents.			
MATH 3005 Logic	4	**P** (for all but BCST students) 8 credit points of Intermediate Mathematics; (for BCST students) 8 credit points of Intermediate Mathematics or 12 credit points of Junior Mathematics at Advanced level.	1
MATH 3007 Coding Theory	4	**P** 8 credit points of Intermediate Mathematics (strongly advise MATH 2002 or 2902).	2
MATH 3010 Information Theory	4	**P** 8 credit points of Intermediate Mathematics (strongly advise MATH 2001 or 2901 and some probability theory).	2
MATH 3024 Elementary Cryptography and Protocols	4	**P** 12 credit points of Intermediate Mathematics. Strongly advise MATH 2008 or 2908 or 2918.	1
MATH 3925 Public Key Cryptography (Advanced)	4	**P** 12 credit points from Intermediate or senior mathematics. Strongly recommend MATH 3902.	2
MULT 3004 Computer Graphics	4	**P** COMP (2111 or 2811 or 2002 or 2902) and [SOFT (2004 or 2904) or COMP (2004 or 2904)] and MATH (1002 or 1902). **N** May not be counted with MULT 3904 or COMP (3004 or 3904).	2
SOFT 3200 Software Development Project	8	**P** [SOFT (2004 or 2904) or COMP (2004 or 2904)] and SOFT (2001 or 2901) and 8 credit points from BIT table III(ii) and 8 credit points from BIT table III(iv). **N** May not be counted with SOFT 3700.	1, 2
■ Elective Honours units of study			
COMP 4044 Data Mining and Machine Learning	6	**A** Elementary statistics. **P** Credit average in 24 credit points of 3000-level study.	1
COMP 4045 Computational Geometry	6	**A** Data structures, analysis of algorithms. **P** Credit average in 24 credit points of 3000-level study.	1
COMP 4046 Statistical Natural Language Processing	6	**A** Concepts of linguistics, elementary statistics, AI techniques. **P** Credit average in 24 credit points of 3000-level study.	1
COMP 4048 Information Visualisation	6	**A** Discrete mathematics. **P** Credit average in 24 credit points of 3000-level study.	2

Table IIIA: Bachelor of Information Technology Majors (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
(ii) Major in Information Systems				
Students are required to complete all the core units, or other mutually exclusive units such as their Advanced equivalents.				
■ **Core Intermediate units of study**				
INFO 2000	Systems Analysis and Design	4	**Q** ISYS 1003 or INFO 1000 or INFS 1000 or [COSC (1001 or 1901) and COSC (1002 or 1902)] or SOFT (1001 or 1901) or COMP (1001 or 1901). **N** May not be counted with INFO 2900.	1, Summer
INFO 2005	Database Management, Introductory	4	**Q** ISYS 1003 or INFO 1000 or INFS 1000 or [COSC (1001 or 1901) and COSC (1002 or 1902)] or SOFT (1001 or 1901) or COMP (1001 or 1901). **N** May not be counted with INFO 2905.	2
ISYS 2006	Information Systems in Organisations	4	**A** Use of basic PC tools such as spreadsheets, Internet, email and word processing software. **P** Credit in one of ISYS 1003 or INFS 1000 or INFO 1000. *NB: Enrolment Restriction: Entry is restricted to students who have a credit or better in one of the qualifying units.*	1
ISYS 2007	Distributed Information Systems	4	**Q** ISYS 2006 and INFO (2000 or 2900). **N** May not be counted with INFO 2007.	2
■ **Core Senior units of study**				
ISYS 3012	Project Management and Practice	4	**P** INFO (2000 or 2900).	1
ISYS 3015	Analytical Methods for IS Professionals	4	**P** [ARIN 1000 or ENGL (1050 or 1005) or LNGS (1001 or 1002 or 1005) or ECOF (1001 or 1002)] and 16 credit points of intermediate or senior units of study, including ISYS 2006 and (ISYS 2007 or INFO 2007) and INFO (2000 or 2900). *NB: Enrolment Restriction: Entry is restricted to students who have a credit or better in at least one of the Prerequisite units.*	1
ISYS 3207	Information Systems Project	8	**P** ISYS 3012 and (ISYS 3015 or ARIN 2000).	2
■ **Elective Senior units of study**				
Students are required to complete 8 credit points from the elective units, or other mutually exclusive units such as their Advanced equivalents.				
INFO 3005	Organisational Database Systems	4	**P** INFO (2000 or 2900) and INFO (2005 or 2905). **N** May not be counted with INFO 3905 or COMP (3005 or 3905).	1
ISYS 3000	Information Systems Management	4	**P** ISYS 2007 or INFO 2007.	2
ISYS 3113	Arts Informatics Systems	4	**P** INFO (2000 or 2900) and INFO (2005 or 2905) and [(ARIN 1000 or ENGL (1050 or 1005) or LNGS (1001 or 1002 or 1005) or ECOF (1001 or 1002)].	1
■ **Elective Honours units of study**				
ISYS 4050	Knowledge Management Systems	6	**A** Information systems concepts, database concepts. **P** Credit average in 24 credit points of 3000-level study.	1
ISYS 4051	Advanced Data Models	6	**A** Relational database concepts. **P** Credit average in 24 credit points of 3000-level study.	2
(iii) Major in Multimedia Technology				
Students are required to complete all the core units, or other mutually exclusive units such as their Advanced equivalents.				
■ **Core Junior units of study**				
MATH 1001	Differential Calculus	3	**A** HSC Mathematics Extension 1. **N** MATH 1011 or 1901 or 1906.	1, Summer
MATH 1002	Linear Algebra	3	**A** HSC Mathematics Extension 1. **N** MATH 1902 or 1012.	1, Summer
MATH 1003	Integral Calculus and Modelling	3	**A** HSC Mathematics Extension 2 or MATH 1001. **N** MATH 1013 or 1903 or 1907.	2, Summer
SOFT 1001	Software Development 1	6	**A** HSC Mathematics Extension 1. **N** May not be counted with SOFT 1901 or COMP (1001 or 1901).	1, 2, Summer
SOFT 1002	Software Development 2	6	**Q** SOFT (1001 or 1901) or COMP (1001 or 1901). **N** May not be counted with SOFT 1902 or COMP (1002 or 1902).	1, 2, Summer
■ **Core Intermediate units of study**				
The unit of study MATH 3019 or MATH 3919 may be substituted for ELEC 2301 in the core.				
COMP 2111	Algorithms 1	4	**Q** SOFT (1002 or 1902) or COMP (1002 or 1902). **C** MATH (1004 or 1904 or 2009 or 2011). **N** May not be counted with COMP (2811 or 2002 or 2902).	1
ELEC 2301	Signals and Systems	4	**A** MATH 1001 Differential Calculus, and MATH 1002 Linear Algebra, and MATH 1003 Integral Calculus and Modelling. **N** MATH 3019 Signal Processing and MATH 3919 Signal Processing (Adv).	2
SOFT 2001	Concurrent Programming	4	**Q** SOFT (1002 or 1902) or COMP (1002 or 1902). **N** May not be counted with SOFT 2901.	2
SOFT 2004	Software Development Methods 1	4	**Q** SOFT (1002 or 1902) or COMP (1002 or 1902). **N** May not be counted with SOFT 2904 or COMP (2004 or 2904).	1, Summer
■ **Core Senior units of study**				
MULT 3018	Multimedia Interaction	4	**P** SOFT (2004 or 2904) or COMP (2004 or 2904). **N** May not be counted with MULT 3918.	1
MULT 3019	Digital Media	4	**P** COMP (2111 or 2811 or 2002 or 2902) and MATH (1001 or 1901) and MATH (1002 or 1902) and MATH (1003 or 1903). **N** May not be counted with MULT 3919.	1

Table IIIA: Bachelor of Information Technology Majors (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
■ Elective Senior units of study				
Students are required to complete 16 credit points from the elective units or other mutually exclusive units such as their Advanced equivalents.				
MULT 3004	Computer Graphics	4	**P** COMP (2111 or 2811 or 2002 or 2902) and [SOFT (2004 or 2904) or COMP (2004 or 2904)] and MATH (1002 or 1902). **N** May not be counted with MULT 3904 or COMP (3004 or 3904).	2
SOFT 3102	User Interface Design and Programming	4	**P** [SOFT (2004 or 2904) or COMP (2004 or 2904)]. **N** SOFT 3802 or COMP (3102 or 3802).	1
SOFT 3200	Software Development Project	8	**P** [SOFT (2004 or 2904) or COMP (2004 or 2904)] and SOFT (2001 or 2901) and 8 credit points from BIT table III(ii) and 8 credit points from BIT table III(iv). **N** May not be counted with SOFT 3700.	1, 2
■ Elective Honours units of study				
ELEC 4302	Image Processing and Computer Vision	4	**A** ELEC 2301 Signals and Systems, and ELEC 4303 Digital Signal Processing.	1
ELEC 5604	Adaptive Pattern Recognition	4	*NB: Department permission required for enrolment.*	2
ELEC 5606	Multimedia Systems and Applications	4	**A** NETS 3007 Network Protocols or ELEC 3504 Data Communications and Internet. **N** ELEC 3604 Internet Engineering. *NB: Department permission required for enrolment. Permission required for enrolment.*	1
MULT 4043	Multimedia Storage, Retrieval & Delivery	6	**A** Multimedia data formats, networking concepts, database concepts. **P** Credit average in 24 credit points of 3000-level study.	1
COMP 4048	Information Visualisation	6	**A** Discrete mathematics. **P** Credit average in 24 credit points of 3000-level study.	2

(iv) Major in Networks & Systems

Students are required to complete all the core units, or other mutually exclusive units such as their Advanced equivalents.

■ Core Junior units of study				
SOFT 1001	Software Development 1	6	**A** HSC Mathematics Extension 1. **N** May not be counted with SOFT 1901 or COMP (1001 or 1901).	1, 2, Summer
SOFT 1002	Software Development 2	6	**Q** SOFT (1001 or 1901) or COMP (1001 or 1901). **N** May not be counted with SOFT 1902 or COMP (1002 or 1902).	1, 2, Summer
■ Core Intermediate units of study				
NETS 2008	Computer System Organisation	4	**Q** SOFT (1001 or 1901) or COMP (1001 or 1901) or [COSC (1001 or 1901) and COSC (1002 or 1902)]. **N** May not be counted with NETS 2908 or COMP (2001 or 2901).	1
NETS 2009	Network Organisation	4	**Q** SOFT (1001 or 1901) or COMP (1001 or 1901) or [COSC (1001 or 1901) and COSC (1002 or 1902)]. **N** May not be counted with NETS 2909.	2
SOFT 2001	Concurrent Programming	4	**Q** SOFT (1002 or 1902) or COMP (1002 or 1902). **N** May not be counted with SOFT 2901.	2
SOFT 2004	Software Development Methods 1	4	**Q** SOFT (1002 or 1902) or COMP (1002 or 1902). **N** May not be counted with SOFT 2904 or COMP (2004 or 2904).	1, Summer
■ Core Senior units of study				
ELEC 5610 may be substituted for NETS 3016 in the core.				
NETS 3007	Network Protocols	4	**P** [[NETS (2008 or 2908) and NETS (2009 or 2909)] or ELEC 2601] and [SOFT (2004 or 2904) or COMP (2004 or 2904)] and SOFT (2001 or 2901). **N** May not be counted with NETS 3907 or COMP (3007 or 3907).	1
NETS 3009	Operating Systems	4	**P** [NETS (2008 or 2908) or ELEC 2601] and [SOFT (2004 or 2904) or COMP (2004 or 2904)] and SOFT(2001 or 2901). **N** May not be counted with NETS 3909 or COMP (3009 or 3909).	2
NETS 3016	Computer and Network Security	4	**A** MATH (1004 and 1005). **P** [[NETS (2008 or 2908) and NETS (2009 or 2909)] or ELEC 2601] and [SOFT (2004 or 2904) or COMP (2004 or 2904)]. **N** May not be counted with NETS 3916 or ELEC 5610.	1
NETS 3017	Network Programming and Distributed Apps	4	**P** [[NETS (2008 or 2908) and NETS (2009 or 2909)] or ELEC 2601] and [SOFT (2004 or 2904) or COMP (2004 or 2904)] and SOFT (2001 or 2901). **N** May not be counted with NETS 3917 or ELEC 3604.	2
■ Elective Senior units of study				
Students are required to complete 8 credit points from the elective units, or other mutually exclusive units such as their advanced equivalents.				
SOFT 3200	Software Development Project	8	**P** [SOFT (2004 or 2904) or COMP (2004 or 2904)] and SOFT (2001 or 2901) and 8 credit points from BIT table III(ii) and 8 credit points from BIT table III(iv). **N** May not be counted with SOFT 3700.	1, 2
ELEC 3502	Random Signals and Communications	4	**A** ELEC 2301 Signals and Systems.	1
ELEC 3503	Introduction to Digital Communications	4	**A** ELEC 2301 Signals and Systems.	2
ELEC 3601	Digital Systems Design	4	**A** ELEC 2601 Microcomputer Systems, or COMP 2001 Computer Systems, or NETS 2008 Computer Systems Organisation, or NETS 2908 Computer Systems Organisation (adv) or MECH 2701 Mechatronics 2.	2
ELEC 3603	Introduction to Computing Systems	4	**A** ELEC 2601 Microcomputer Systems.	1

Table IIIA: Bachelor of Information Technology Majors (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
■ Elective Honours units of study				
ELEC 4501	Data Communication Networks	4	**P** Assumed Knowledge: ELEC 3502 Random Signals and Communications, and ELEC 3503 Introduction to Digital Communications. *NB: Department permission required for enrolment.*	1
ELEC 4502	Digital Communication Systems	4	**A** ELEC 3502 Random Signals and Communications, and ELEC 3503 Introduction to Digital Communications.	1
ELEC 4503	Error Control Coding	4	**A** ELEC 3502 Random Signals and Communications, and ELEC 3503 Introduction to Digital Communications.	1
ELEC 4504	Wireless Networks	4		2
ELEC 4601	Computer Design	4	**A** ELEC 3403 Switching Devices and Electronics, and ELEC 3601 Digital Systems Design. **N** MECH 4730 Computers in Real time Instrumentation and Control.	1
ELEC 5501	Advanced Communication Networks	4	**A** NETS 3007 Network Protocols or ELEC 3604 Internet Engineering.	2
ELEC 5502	Satellite Communication Systems	4	**A** ELEC 3502 Random Signals and Communications, ELEC 3503 Introduction to Digital Communications and ELEC 4502 Digital Communication Systems.	2
ELEC 5503	Optical Communication Systems	4	**A** ELEC 3402 Communications Electronics, ELEC 3502 Random Signals and Communications, and ELEC 3503 Introduction to Digital Communications.	1
ELEC 5504	Cellular Radio Engineering	4	**A** ELEC 3502 Random Signals and Communications, and ELEC 3503 Introduction to Digital Communications.	1
ELEC 5505	Advanced Digital Transmissions	4	**P** Assumed Knowledge: ELEC 3502 Random Signals and Communications, and ELEC 3503 Introduction to Digital Communications.	N/A in 2004
ELEC 5506	Optical Networks	4	**A** ELEC 3502 Random Signals and Communications, and ELEC 3503 Introduction to Digital Communications.	2
NETS 4040	Advanced Networking Technologies	6	**A** Understanding of link layer technologies, the TCP/IP protocol stack. **P** Credit average in 24 credit points of 3000-level study. **N** ELEC (4504 and 5501).	1
NETS 4041	Network-Based High Performance Computing	6	**A** Understanding of operating systems. **P** Credit average in 24 credit points of 3000-level study.	1
NETS 4047	Pervasive Computing	6	**A** Networking concepts, operating system concepts, programming expertise. **P** Credit average in 24 credit points of 3000-level study.	2

(v) Major in Software Development

Students are required to complete all the core units, or other mutually exclusive units such as their advanced equivalents.

■ Core Junior units of study				
SOFT 1001	Software Development 1	6	**A** HSC Mathematics Extension 1. **N** May not be counted with SOFT 1901 or COMP (1001 or 1901).	1, 2, Summer
SOFT 1002	Software Development 2	6	**Q** SOFT (1001 or 1901) or COMP (1001 or 1901). **N** May not be counted with SOFT 1902 or COMP (1002 or 1902).	1, 2, Summer
■ Core Intermediate units of study				
SOFT 2001	Concurrent Programming	4	**Q** SOFT (1002 or 1902) or COMP (1002 or 1902). **N** May not be counted with SOFT 2901.	2
SOFT 2004	Software Development Methods 1	4	**Q** SOFT (1002 or 1902) or COMP (1002 or 1902). **N** May not be counted with SOFT 2904 or COMP (2004 or 2904).	1, Summer
INFO 2000	Systems Analysis and Design	4	**Q** ISYS 1003 or INFO 1000 or INFS 1000 or [COSC (1001 or 1901) and COSC (1002 or 1902)] or SOFT (1001 or 1901) or COMP (1001 or 1901). **N** May not be counted with INFO 2900.	1, Summer
INFO 2005	Database Management, Introductory	4	**Q** ISYS 1003 or INFO 1000 or INFS 1000 or [COSC (1001 or 1901) and COSC (1002 or 1902)] or SOFT (1001 or 1901) or COMP (1001 or 1901). **N** May not be counted with INFO 2905.	2
■ Core Senior units of study				
SOFT 3101	Object-Oriented Software Design	4	**P** SOFT (2001 or 2901) and INFO (2000 or 2900) and INFO (2005 or 2905) and [SOFT (2004 or 2904) or COMP (2004 or 2904)]. **N** May not be counted with SOFT 3801 or COMP (3008 or 3908).	1
SOFT 3104	Software Development Methods 2	4	**P** [SOFT (2004 or 2904) or COMP (2004 or 2904)] and SOFT (2001 or 2901). **N** May not be counted with SOFT 3804 or COMP (3100 or 3800).	1
SOFT 3200	Software Development Project	8	**P** [SOFT (2004 or 2904) or COMP (2004 or 2904)] and SOFT (2001 or 2901) and 8 credit points from BIT table III(ii) and 8 credit points from BIT table III(iv). **N** May not be counted with SOFT 3700.	1, 2
■ Elective Senior units of study				
Students are required to complete 8 credit points from the elective units, or other mutually exclusive units such as their advanced equivalents.				
EBUS 3002	E-Commerce Website Programming	4	**A** EBUS 3001 Introduction to E-Commerce Systems and (SOFT 2004 Software Development Methods 1 or COMP 2004 Programming Practice).	2
INFO 3005	Organisational Database Systems	4	**P** INFO (2000 or 2900) and INFO (2005 or 2905). **N** May not be counted with INFO 3905 or COMP (3005 or 3905).	1
ISYS 3012	Project Management and Practice	4	**P** INFO (2000 or 2900).	1
SOFT 3102	User Interface Design and Programming	4	**P** [SOFT (2004 or 2904) or COMP (2004 or 2904)]. **N** SOFT 3802 or COMP (3102 or 3802).	1
SOFT 3103	Software Validation and Verification	4	**P** [SOFT (2004 or 2904) or COMP (2004 or 2904)] and SOFT (2001 or 2901) and MATH (1005 or 1905). **N** May not be counted with SOFT 3803.	2

Table IIIA: Bachelor of Information Technology Majors (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
■ Elective Honours units of study				
EBUS 5001	E-Commerce Application Programming	4	**A** EBUS 3001 Introduction to E-Commerce Systems. **N** ELEC 5608 Electronic Commerce.	1
ELEC 4602	Real Time Computing	4	**A** ELEC 3601 Digital Systems Design or ELEC 3603 Introduction to Computing Systems.	1
ELEC 4604	Engineering Software Requirements	4	**A** COMP 3100 Software Engineering or SOFT 3104 Software Development Methods 2.	2
ELEC 4704	Software Project Management	4	**A** (COMP 3100 Software Engineering and COMP 3205 Product Development Project) or (INFO 2000 Systems Analysis and Design and SOFT 2004 Software Development Methods 1).	1
SOFT 4042	Enterprise-Scale Software	6	**A** Relational database technology, object-oriented design, C++. **P** Credit average in 24 credit points of 3000-level study.	1

(vi) Major in Digital Design

Students are required to complete all the core units, or other mutually exclusive units such as their advanced equivalents.

■ Core Junior units of study				
ELEC 1101	Foundations of Computer Systems	6	**A** HSC Maths extension 1.	1, Summer
SOFT 1001	Software Development 1	6	**A** HSC Mathematics Extension 1. **N** May not be counted with SOFT 1901 or COMP (1001 or 1901).	1, 2, Summer
SOFT 1002	Software Development 2	6	**Q** SOFT (1001 or 1901) or COMP (1001 or 1901). **N** May not be counted with SOFT 1902 or COMP (1002 or 1902).	1, 2, Summer
■ Core Intermediate units of study				
ELEC 2601	Microcomputer Systems	4	**A** ELEC 1101 Foundations of Computer Systems. **N** MECH 2701 Mechatronics 2.	1
SOFT 2001	Concurrent Programming	4	**Q** SOFT (1002 or 1902) or COMP (1002 or 1902). **N** May not be counted with SOFT 2901.	2
SOFT 2004	Software Development Methods 1	4	**Q** SOFT (1002 or 1902) or COMP (1002 or 1902). **N** May not be counted with SOFT 2904 or COMP (2004 or 2904).	1, Summer
■ Core Senior units of study				
ELEC 3601	Digital Systems Design	4	**A** ELEC 2601 Microcomputer Systems, or COMP 2001 Computer Systems, or NETS 2008 Computer Systems Organisation, or NETS 2908 Computer Systems Organisation (adv) or MECH 2701 Mechatronics 2.	2
ELEC 3603	Introduction to Computing Systems	4	**A** ELEC 2601 Microcomputer Systems.	1
■ Core Honours units of study				
ELEC 4602	Real Time Computing	4	**A** ELEC 3601 Digital Systems Design or ELEC 3603 Introduction to Computing Systems.	1
■ Elective Senior units of study				
Students are required to complete 12 credit points from the elective units, or other mutually exclusive units such as their advanced equivalents.				
ELEC 3401	Electronic Devices and Circuits	4	**A** ELEC 2401 Introductory Electronics.	1
ELEC 3403	Switching Devices and Electronics	4	**A** ELEC 3401 Electronic Devices and Circuits.	2
NETS 3009	Operating Systems	4	**P** [NETS (2008 or 2908) or ELEC 2601] and [SOFT (2004 or 2904) or COMP (2004 or 2904)] and SOFT(2001 or 2901). **N** May not be counted with NETS 3909 or COMP (3009 or 3909).	2
■ Elective Honours units of study				
ELEC 4402	Integrated Circuit Design	4	**A** ELEC 3401 Electronic Devices and Circuits.	1
ELEC 4601	Computer Design	4	**A** ELEC 3403 Switching Devices and Electronics, and ELEC 3601 Digital Systems Design. **N** MECH 4730 Computers in Real time Instrumentation and Control.	1
ELEC 5606	Multimedia Systems and Applications	4	**A** NETS 3007 Network Protocols or ELEC 3504 Data Communications and Internet. **N** ELEC 3604 Internet Engineering. *NB: Department permission required for enrolment. Permission required for enrolment.*	1
ELEC 5610	Computer and Network Security	4	**A** (ELEC 3604 Internet Engineering and ELEC 4501 Data Communication Networks) or ELEC 3504 DataCommunications and the Internet. **N** NETS 3016 Computer and Network Security. NETS 3916 Computer and Network Security (Advance).	1
ELEC 5611	Advanced Computer Engineering	4	**A** ELEC 4601 Computer Design. *NB: Department permission required for enrolment.*	2

(vii) Major in Computational Science

Students are required to complete all the core units, or other mutually exclusive units such as their advanced equivalents.

■ Core Senior units of study				
MATH 3016	Mathematical Computing I	4	**P** 8 credit points of Intermediate Mathematics and one of MATH 1001 or 1003 or 1901 or 1903 or 1906 or 1907. **N** May not be counted with MATH 3916.	1

Table IIIA: Bachelor of Information Technology Majors (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
COSC 3001	Computational Science 3A	4	**A** Programming experience in C and MATLAB. **P** 12 credit points chosen from junior Mathematics and Statistics, 6 credit points of Junior or Intermediate Computational Science units or equivalent and 16 credit points of Intermediate units in Science subject areas, not including Computational Science. **N** COSC 3901, PHYS 3301, PHYS 3901.	1
COSC 3002	Computational Science 3B	4	**A** Programming experience in C and MATLAB. **P** 12 credit points from the Science subject areas of Junior Mathematics and Statistics, 6 credit points of Junior or Intermediate Computational Science units or equivalent, and 16 credit points of Intermediate units in Science subject areas, not including Computational Science. **N** COSC 3601, COSC 3902, PHYS 3303, PHYS 3933.	2
■ **Elective Senior units of study**				
Students are required to complete 12 credit points from the elective units, or other mutually exclusive units such as their advanced equivalents.				
BCHM 3005	Computational Biochemistry	4	**A** 12 credit points of Junior Chemistry. **P** 8 credit points of Intermediate Mathematics units of study. Strongly recommend two of the following: MATH (2001/2901, 2002/2902, 2003/2903, 2005/2905, 2006/2906). **N** May not be counted with BCHM 3905.	N/A in 2004
BIOL 3023	Ecological Methods	6	**P** 16 credit points of Intermediate Biology including BIOL (2001 or 2901 or 2002 or 2902 or 2004 or 2904). **N** May not be counted with BIOL 3923. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	2a
BIOL 3027	Bioinformatics and Genomics	6	**P** MBLG (2001 or 2101 or 2901) or 16 credit points of Intermediate Biology including BIOL (2001 or 2901 or 2004 or 2904 or 2006 or 2906). For BMedSc students: 32 credit points of Intermediate BMED units including BMED 2502. **N** BIOL 3927.	1b
BINF 3001	Bioinformatics Project	8	**P** SOFT (2004 or 2904) and 16 credit points from intermediate Biology, Biochemistry, Microbiology, Molecular Biology and Genetics and/or Pharmacology. **N** May not be counted with COMP 3206.	2
COSC 3701	Computational Science Project	8	**A** Able to program in a standard language. **P** 16 credit points of intermediate level natural sciences plus at least one of COSC (1001 or 1901 or 1002 or 1902) or SOFT (1001 or 1901) or MATH (2003 or 2903) or PHYS (2001 or 2901 or 2002 or 2902).	N/A in 2004
GEOP 3201	Modelling Earth Processes	12	**P** 6 credit points of Junior Mathematics and 16 credit points of Intermediate Science units of study. **N** GEOP 3001, 3002 and 3004.	N/A in 2004
MATH 3003	Ordinary Differential Equations	4	**P** 8 credit points of Intermediate Mathematics (strongly advise MATH 2002 or 2902, with 2001 or 2901). **N** MATH 3923.	1
MATH 3018	Partial Differential Equations and Waves	4	**P** MATH (2001 or 2901) and MATH (2005 or 2905). **N** May not be counted with MATH 3921.	1
MATH 3019	Signal Processing	4	**P** MATH (2001 or 2901) and MATH (2005 or 2905). **N** May not be counted with MATH 3919.	1
MULT 3004	Computer Graphics	4	**P** COMP (2111 or 2811 or 2002 or 2902) and [SOFT (2004 or 2904) or COMP (2004 or 2904)] and MATH (1002 or 1902). **N** May not be counted with MULT 3904 or COMP (3004 or 3904).	2
STAT 3002	Applied Linear Models	4	**P** STAT 2004 (or STAT 1022 for Arts students) and MATH (1002 or 1902). **N** May not be counted with STAT 3902.	1
STAT 3003	Time Series Analysis	4	**P** STAT (2003 or 2903). **N** May not be counted with STAT 3903.	1
STAT 3004	Design of Experiments	4	**P** STAT (3002 or 3902). **N** May not be counted with STAT 3904.	2

(viii) Major in Language Technology*

Students are required to complete all the core units, or other mutually exclusive units such as their advanced equivalents. * Subject to the approval of the Senate of The University of Sydney.

■ **Core Junior units of study**				
LNGS 1001	Structure of Language	6	**N** May not be taken as well as LNGS 1004 or LNGS 1005.	1
SOFT 1001	Software Development 1	6	**A** HSC Mathematics Extension 1. **N** May not be counted with SOFT 1901 or COMP (1001 or 1901).	1, 2, Summer
SOFT 1002	Software Development 2	6	**Q** SOFT (1001 or 1901) or COMP (1001 or 1901). **N** May not be counted with SOFT 1902 or COMP (1002 or 1902).	1, 2, Summer
MATH 1004	Discrete Mathematics	3	**A** HSC Mathematics Extension 1. **N** MATH 1904 or MATH 2011.	2, Summer
MATH 1005	Statistics	3	**A** HSC Mathematics. **N** MATH (1905 or 1015) or ECMT Junior units of study or STAT (1021 or 1022).	2, Summer
■ **Core Intermediate units of study**				
Students are advised that some Senior electives require additional Intermediate units as prerequisites.				
LNGS 2001	Phonetics and Phonology	8	**P** One of LNGS 1001, LNGS 1004, LNGS 1005 and one of LNGS 1002, LNGS 1003. **N** KRNS 2317 or KRNS 2318.	2
LNGS 2002	Syntax	8	**P** One of LNGS 1001, LNGS 1004, LNGS 1005 and one of LNGS 1002, LNGS 1003. *NB: This unit is available as a designated 'Advanced' unit to students enrolled in the BA (Advanced) degree program.*	1
SOFT 2001	Concurrent Programming	4	**Q** SOFT (1002 or 1902) or COMP (1002 or 1902). **N** May not be counted with SOFT 2901.	2

Table IIIA: Bachelor of Information Technology Majors (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
SOFT 2004	Software Development Methods 1	4	**Q** SOFT (1002 or 1902) or COMP (1002 or 1902). **N** May not be counted with SOFT 2904 or COMP (2004 or 2904).	1, Summer
COMP 2003	Languages and Logic	4	**Q** [SOFT (1002 or 1902) or COMP (1002 or 1902)] and MATH (1004 or 1904 or 2009 or 2011) or ELEC 1101. **N** COMP 2903.	2
COMP 2111	Algorithms 1	4	**Q** SOFT (1002 or 1902) or COMP (1002 or 1902). **C** MATH (1004 or 1904 or 2009 or 2011). **N** May not be counted with COMP (2811 or 2002 or 2902).	1
STAT 2002	Data Analysis	4	**P** MATH 1005 or 1905 or 1015 (or STAT 1021 for Arts students).	1
STAT 2004	Hypothesis Testing	4	**A** STAT 2002. **P** MATH (1005 or 1905 or 1015).	2
■ **Core Senior units of study**				
COMP 3002	Artificial Intelligence	4	**P** [SOFT (2004 or 2904) or COMP (2004 or 2904)] and COMP (2003 or 2903) and 8 credit points 2000-level MATH and/or STAT and/or ECMT. **N** May not be counted with COMP 3902.	1
LNGS 3026	Semantics and Pragmatics	8	**P** One of LNGS 2001, LNGS 2002, LNGS 2003, LNGS 2004. **N** LNGS 3006. *NB: Compulsory for Honours students; other students may select as an option. This unit is available as a designated 'Advanced' unit to students enrolled in the BA (Advanced) degree program.*	1
SOFT 3102	User Interface Design and Programming	4	**P** [SOFT (2004 or 2904) or COMP (2004 or 2904)]. **N** SOFT 3802 or COMP (3102 or 3802).	1
SOFT 3104	Software Development Methods 2	4	**P** [SOFT (2004 or 2904) or COMP (2004 or 2904)] and SOFT (2001 or 2901). **N** May not be counted with SOFT 3804 or COMP (3100 or 3800).	1
■ **Elective units of study**				
Students are required to complete 4 credit points from the elective units, or other mutually exclusive units such as their advanced equivalents.				
COMP 3111	Algorithms 2	4	**A** MATH 2009. **P** COMP (2111 or 2811 or 2002 or 2902) and MATH (1004 or 1904 or 2009 or 2011) and MATH (1005 or 1905). **N** May not be counted with COMP (3811 or 3001 or 3901).	1
SOFT 3101	Object-Oriented Software Design	4	**P** SOFT (2001 or 2901) and INFO (2000 or 2900) and INFO (2005 or 2905) and [SOFT (2004 or 2904) or COMP (2004 or 2904)]. **N** May not be counted with SOFT 3801 or COMP (3008 or 3908).	1
SOFT 3103	Software Validation and Verification	4	**P** [SOFT (2004 or 2904) or COMP (2004 or 2904)] and SOFT (2001 or 2901) and MATH (1005 or 1905). **N** May not be counted with SOFT 3803.	2
INFO 3005	Organisational Database Systems	4	**P** INFO (2000 or 2900) and INFO (2005 or 2905). **N** May not be counted with INFO 3905 or COMP (3005 or 3905).	1
MULT 3004	Computer Graphics	4	**P** COMP (2111 or 2811 or 2002 or 2902) and [SOFT (2004 or 2904) or COMP (2004 or 2904)] and MATH (1002 or 1902). **N** May not be counted with MULT 3904 or COMP (3004 or 3904).	2
LNGS 2003	Functional Grammar and Discourse	8	**P** One of LNGS 1002, ENGL 1050, MECO 1001, LNGS 1001, LNGS 1003, LNGS 1004, LNGS 1005.	1
LNGS 2004	Discourse Analysis	8	**P** Two of LNGS 1002, ENGL 1050, MECO 1001, LNGS 1001, LNGS 1003, LNGS 1004, LNGS 1005, LNGS 2003.	2
STAT 3005	Applied Stochastic Processes	4	**P** MATH (1003 or 1903 or 1907) and STAT (2001 or 2901). **N** STAT 3905.	2
COMP 4046	Statistical Natural Language Processing	6	**A** Concepts of linguistics, elementary statistics, AI techniques. **P** Credit average in 24 credit points of 3000-level study.	1

Table IV: Bachelor of Medical Science

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
A. Junior units of study				
Biology				
BIOL 1001	Concepts in Biology	6	**A** No previous knowledge required. Students who have not taken HSC biology are recommended to take the Biology Bridging Course. **N** BIOL (1101 or 1901 or 1500).	1, Summer
BIOL 1002	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 before lectures commence. **N** BIOL (1902 or 1500).	2
BIOL 1003	Human Biology	6	**A** HSC 2-unit Biology. Students who have not undertaken an HSC biology course are strongly advised to complete a biology bridging course before lectures commence. **N** BIOL (1903 or 1500) or EDUH 1016.	2, Summer
BIOL 1101	Biology – Ecosystems to Genes	6	**P** HSC 2-unit Biology or equivalent. **N** BIOL(1001 or 1901 or 1500).	1
BIOL 1901	Biology- Ecosystems to Genes (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** BIOL (1001 or 1101 or 1500). *NB: Department permission required for enrolment.*	1

Table IV: Bachelor of Medical Science (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
BIOL 1902	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** BIOL (1002 or 1904 or 1905 or 1500). *NB: Department permission required for enrolment.*	2
BIOL 1903	Human Biology (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** May not be counted with BIOL (1003 or 1904 or 1905 or 1500) or EDUH 1016. *NB: Department permission required for enrolment.*	2
Chemistry				
CHEM 1001	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** May not be counted with CHEM 1101 or 1901 or 1903 or 1905 or 1906 or 1909.	1
CHEM 1002	Fundamentals of Chemistry 1B	6	**P** CHEM (1001 or 1101) or equivalent. **N** May not be counted with CHEM (1102 or 1902 or 1904 or 1907 or 1908).	2
CHEM 1101	Chemistry 1A	6	**A** HSC Chemistry and Mathematics. **C** Recommended concurrent units of study: 6 credit points of Junior Mathematics. **N** May not be counted with CHEM (1001 or 1901 or 1903 or 1905 or 1906 or 1909).	1, 2, Summer
CHEM 1102	Chemistry 1B	6	**Q** CHEM 1101 or a Distinction in CHEM 1001 or 1901 or equivalent. **C** Recommended concurrent units of study: 6 credit points of Junior Mathematics including MATH (1003 or 1903). **N** CHEM (1002 or 1902 or 1904 or 1907 or 1908).	1, 2, Summer
CHEM 1901	Chemistry 1A (Advanced)	6	**P** UAI of at least 93 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** May not be counted with CHEM (1001 or 1101 or 1903 or 1905 or 1906 or 1909). *NB: Department permission required for enrolment.*	1
CHEM 1902	Chemistry 1B (Advanced)	6	**Q** CHEM (1901 or 1903) or Distinction in CHEM 1101 or equivalent. **C** Recommended concurrent unit of study: 6 credit points of Junior Mathematics including MATH (1003 or 1903). **N** May not be counted with CHEM (1002 or 1102 or 1904 or 1907 or 1908.). *NB: Department permission required for enrolment. Entry is by invitation.*	2
CHEM 1903	Chemistry 1A (Special Studies Program)	6	**P** UAI of at least 98.7 and HSC Chemistry result in band 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** May not be counted with CHEM (1001 or 1101 or 1901 or 1905 or 1906 or 1909). *NB: Department permission required for enrolment. Entry is by invitation. This unit of study is deemed to be an Advanced unit of study.*	1
CHEM 1904	Chemistry 1B (Special Studies Program)	6	**P** Distinction in CHEM 1903. **C** Recommended concurrent units of study: 6 credit points of Junior Mathematics including MATH (1003 or 1903). **N** May not be counted with CHEM (1002 or 1102 or 1902 or 1907 or 1908). *NB: Department permission required for enrolment. Entry is by invitation. This unit of study is deemed to be an Advanced unit of study.*	2
CHEM 1908	Chemistry 1 Life Sciences A (Advanced)	6	**P** UAI of at least 93 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 units of study: 6 credit points of Junior Mathematics. **N** CHEM (1002 or 1102 or 1902 or 1904 or 1907). *NB: Department permission required for enrolment. This unit of study is available to students enrolled in the Bachelor of Medical Science, the Bachelor of Science (Nutrition) and the Bachelor of Science (Molecular Biotechnology) only.*	1, Summer
CHEM 1909	Chemistry 1 Life Sciences B Mol (Adv)	6	**P** CHEM (1907 or 1908) or equivalent. **C** Recommended concurrent units of study: 6 credit points of Junior Mathematics. **N** CHEM (1001 or 1101 or 1901 or 1903 or 1905 or 1906). *NB: 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.*	2, Summer
Computer Science				
SOFT 1001	Software Development 1	6	**A** HSC Mathematics Extension 1. **N** May not be counted with SOFT 1901 or COMP (1001 or 1901).	1, 2, Summer
SOFT 1002	Software Development 2	6	**Q** SOFT (1001 or 1901) or COMP (1001 or 1901). **N** May not be counted with SOFT 1902 or COMP (1002 or 1902).	1, 2, Summer
SOFT 1901	Software Development 1 (Adv)	6	**A** HSC Mathematics Extension 1. **Q** UAI at least that for acceptance into BSc(Adv) degree program. **N** May not be counted with SOFT 1001 or COMP (1001 or 1901). *NB: Department permission required for enrolment. NB. Entry requires departmental permission, except for students in BSc(Adv), BCST(Adv) or BIT degrees.*	1, 2
SOFT 1902	Software Development 2 (Adv)	6	**Q** SOFT (1001 or 1901) or COMP (1001 or 1901) and Distinction in one of these. **N** May not be counted with SOFT 1002 or COMP (1002 or 1902). *NB: Department permission required for enrolment in Session 1.*	1, 2
Mathematics				
MATH 1001	Differential Calculus	3	**A** HSC Mathematics Extension 1. **N** MATH 1011 or 1901 or 1906.	1, Summer
MATH 1002	Linear Algebra	3	**A** HSC Mathematics Extension 1. **N** MATH 1902 or 1012.	1, Summer
MATH 1003	Integral Calculus and Modelling	3	**A** HSC Mathematics Extension 2 or MATH 1001. **N** MATH 1013 or 1903 or 1907.	2, Summer

Table IV: Bachelor of Medical Science (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
MATH 1004	Discrete Mathematics	3	**A** HSC Mathematics Extension 1. **N** MATH 1904 or MATH 2011.	2, Summer
MATH 1005	Statistics	3	**A** HSC Mathematics. **N** MATH (1905 or 1015) or ECMT Junior units of study or STAT (1021 or 1022).	2, Summer
MATH 1011	Life Sciences Calculus	3	**A** HSC Mathematics. **N** MATH (1001 or 1901 or 1906).	1
MATH 1012	Life Sciences Algebra	3	**A** HSC Mathematics. **N** MATH (1002 or 1902).	2
MATH 1013	Differential and Difference Equations	3	**A** HSC Mathematics. **N** MATH (1003 or 1903 or 1907).	2
MATH 1015	Life Science Statistics	3	**A** HSC Mathematics. **N** MATH (1005 or 1905) or STAT (1021 or 1022) or ECMT Junior units of study.	1, Summer
MATH 1901	Differential Calculus (Advanced)	3	**A** HSC Mathematics Extension 2 or result in Band E4 of HSC Mathematics Extension 1. **N** MATH (1011 or 1001 or 1906).	1
MATH 1902	Linear Algebra (Advanced)	3	**A** HSC Mathematics Extension 2 or result in Band E4 of HSC Mathematics Extension 1. **N** MATH (1002 or 1012).	1
MATH 1903	Integral Calculus and Modelling Advanced	3	**A** HSC Mathematics Extension 2 or Credit or better in MATH 1001/1901. **N** MATH (1003 or 1013 or 1907).	2
MATH 1904	Discrete Mathematics (Advanced)	3	**A** HSC Mathematics Extension 2 or result in Band E4 of HSC Mathematics Extension 1. **N** MATH 1004 or MATH 2011.	2
MATH 1905	Statistics (Advanced)	3	**A** HSC Mathematics Extension 2 or result in Band E3 or better of HSC Mathematics Extension 1. **N** MATH (1005 or 1015) or ECMT Junior units of study or STAT (1021 or 1022).	2
MATH 1906	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** MATH (1001 or 1011 or 1901). *NB: Department permission required for enrolment.*	1
MATH 1907	Mathematics (Special Studies Program) B	3	**P** Distinction in MATH 1906; by invitation. **N** MATH (1003 or 1013 or 1903). *NB: Department permission required for enrolment.*	2
Physics				
PHYS 1001	Physics 1 (Regular)	6	**A** HSC Physics MATH (1001/1901, 1002/1902, 1003/1903). MATH 1005/1905 would also be useful. **N** PHYS (1002 or 1901).	1
PHYS 1002	Physics 1 (Fundamentals)	6	**A** No assumed knowledge of Physics MATH (1001/1901, 1002/1902, 1003/1903). MATH 1005/1905 would also be useful. **N** PHYS (1001 or 1901).	1
PHYS 1003	Physics 1 (Technological)	6	**A** HSC Physics or PHYS (1001 or 1002 or 1901) or equivalent. MATH (1001/1901,1002/1902, 1003/1903). MATH 1005/1905 would also be useful. **N** PHYS (1004 or 1902).	1, 2
PHYS 1004	Physics 1 (Environmental & Life Science)	6	**A** HSC Physics or PHYS (1001 or 1002 or 1901) or equivalent. MATH (1001/1901, 1002/1902, 1003/1903). MATH 1005/1905 would also be useful. **N** PHYS (1003 or 1902).	2
PHYS 1901	Physics 1A (Advanced)	6	**A** MATH (1001/1901, 1002/1902, 1003/1903). MATH 1005/1905 would also be useful. **P** UAI of at least 96, or HSC Physics result in Band 6, or PHYS 1902, or Distinction or better in PHYS 1003, 1004 or an equivalent unit. **N** PHYS (1001 or 1002).	1
PHYS 1902	Physics 1B (Advanced)	6	**A** MATH (1001/1901, 1002/1902, 1003/1903). MATH 1005/1905 would also be useful. **P** UAI of at least 96, or HSC Physics result in Band 6, or PHYS 1901, or Distinction or better in PHYS 1001, 1002 or an equivalent unit. **N** PHYS (1003 or 1004).	2
Psychology				
PSYC 1001	Psychology 1001	6		1, Summer
PSYC 1002	Psychology 1002	6		2, Summer

B. Intermediate units of study

■ Core units of study

BMED 2501	Cells and Cell Communication	6	**P** 12 credit points of Junior Mathematics, 12 credit points of Junior Chemistry, 12 credit points of Junior Physics, and 12 credit points of Junior Biology or 12 credit points of Junior Computer Science or 12 credit points of Junior Psychology.	1
BMED 2502	Genes and Genetic Engineering	6	**P** 12 credit points of Junior Mathematics, 12 credit points of Junior Chemistry, 12 credit points of Junior Physics, and 12 credit points of Junior Biology or 12 credit points of Junior Computer Science or 12 credit points of Junior Psychology.	1
BMED 2503	Regulation of the Internal Environment	8	**P** 12 credit points of Junior Mathematics, 12 credit points of Junior Chemistry, 12 credit points of Junior Physics, and 12 credit points of Junior Biology or 12 credit points of Junior Computer Science or 12 credit points of Junior Psychology.	1
BMED 2504	Digestion, Absorption and Metabolism	6	**P** 12 credit points of Junior Mathematics, 12 credit points of Junior Chemistry, 12 credit points of Junior Physics, and 12 credit points of Junior Biology or 12 credit points of Junior Computer Science or 12 credit points of Junior Psychology.	2
BMED 2505	Interaction with External Environment	6	**P** 12 credit points of Junior Mathematics, 12 credit points of Junior Chemistry, 12 credit points of Junior Physics, and 12 credit points of Junior Biology or 12 credit points of Junior Computer Science or 12 credit points of Junior Psychology.	2
BMED 2506	Microbes and Body Defence Systems	8	**P** 12 credit points of Junior Mathematics, 12 credit points of Junior Chemistry, 12 credit points of Junior Physics, and 12 credit points of Junior Biology or 12 credit points of Junior Computer Science or 12 credit points of Junior Psychology.	2

Table IV: Bachelor of Medical Science (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session

C. Senior units of study

Students may complete their Senior year by taking 48 credit points of Senior core units from this table. They may, however, elect to take 36 credit points of Senior core units and another Intermediate or Senior elective unit. Details of recommended units offered in the Faculty of Science may be found in Table I and Table ID. Students should consult the relevant faculty handbook for units from other faculties. Units which may NOT be taken as electives are listed with the unit descriptions later in this chapter.

■ Core units of study

Anatomy and Histology

ANAT 3001	Microscopy and Histochemistry	12	**P** ANAT 2001. For BMedSc students: 32 credit points of Intermediate BMED units including BMED (2503, 2504, and 2505). *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	1
ANAT 3002	Cells and Development	12	**A** (i) an understanding of the basic structure of vertebrates; (ii) an understanding of elementary biochemistry and genetics. **P** ANAT 2001. For BMedSc students: 32 credit points of Intermediate BMED units including BMED (2503, 2504, and 2505). **N** May not be counted with ANAT 3003. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	2
ANAT 3003	Transmission & Scanning Electron Microsc	12	**P** ANAT 2001. For BMedSc students 32 credit points of intermediate BMED units including BMED (2503, 2504 & 2505). **N** ANAT 3002. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	2
ANAT 3005	Topographical Anatomy	12	**P** BMED (2101 and 2102) or 32 credit points of Intermediate BMED units including BMED (2503 and 2504 and 2505). **N** ANAT (3004 or 3008). *NB: This unit of study is available to students enrolled in the Bachelor of Medical Science only.*	2

Biochemistry

BCHM 3001	Mol Biology and Structural Biochemistry	12	**P** A total of at least 16 credit points of Intermediate MBLG and BCHM units. For BMedSc students: 32 credit points of Intermediate BMED units including BMED (2501, 2502 and 2504). **N** May not be counted with BCHM 3901.	1
BCHM 3901	Mol Biology and Structural Biochem (Adv)	12	**P** Distinction in a total of at least 16 credit points from Intermediate MBLG and BCHM units. For BMedSc students: 32 credit points of Intermediate BMED units including Distinctions in BMED (2501, 2502 and 2504). **N** BCHM 3001.	1
BCHM 3002	Cellular and Medical Biochemistry	12	**P** A total of at least 16 credit points of Intermediate MBLG and BCHM units. For BMedSc students 32 credit points of Intermediate BMED units including BMED (2501, 2502 and 2504). **N** May not be counted with BCHM (3902, 3004 or 3904).	2
BCHM 3902	Cellular and Medical Biochemistry (Adv)	12	**P** Distinction in a total of at least 16 credit points from Intermediate MBLG and BCHM units. For BMedSc students: 32 credit points of Intermediate BMED units including Distinctions in BMED (2501, 2502 and 2504). **N** May not be counted with BCHM (3002, 3004 and 3904).	2
BCHM 3098	Functional Genomics and Proteomics	6	**A** BCHM 2011. **P** MBLG (2001 or 2901) or at least 32 credit points of intermediate BMED units including BMED (2501 and 2502 and 2504). *NB: Recommended unit of study for all molecular biotechnology third-year students.*	1

Biology

BIOL 3018	Applications of Recombinant DNA Tech	6	**P** MBLG (2001 or 2901 and 2002 or 2902) or 16 credit points of Intermediate Biology. For BMedSc students: 32 credit points of Intermediate BMED units including BMED 2502. **N** BIOL (3918).	1a
BIOL 3918	Applications of Recombinant DNA Tech Adv	6	**P** Distinction average in MBLG (2001 or 2901 and 2002 or 2902) or in 16 credit points of Intermediate Biology. For BMedSc students: 32 credit points of Intermediate BMED units including Distinction in BMED 2502. These requirements may be varied and students with lower averages should contact the unit Executive Officer. **N** BIOL (3018).	1a
BIOL 3025	Evolutionary Genetics & Animal Behaviour	6	**P** 16 credit points from MBLG (2001 or 2901 or 2002 or 2902) and Intermediate Biology units. For BMedSc students 32 credit points of Intermediate BMED units including BMED 2502. **N** BIOL (3925 or 3928).	2a
BIOL 3925	Evolutionary Gen. & Animal Behaviour Adv	6	**P** Distinction average in 16 credit points from MBLG (2001 or 2901 or 2002 or 2902) and Intermediate Biology units. For BMedSc students 32 credit points of Intermediate BMED units including distinction in BMED 2502. These requirements may be varied and students with lower averages should consult the unit Executive Officer. **N** BIOL (3025 or 3928).	2a
BIOL 3026	Developmental Genetics	6	**P** MBLG (2001 or 2901 and 2002 or 2902) or 16 credit points of Intermediate Biology. For BMedSc students: 32 credit points of Intermediate BMED units including BMED 2502. **N** BIOL (3926 or 3929).	2b
BIOL 3926	Developmental Genetics (Advanced)	6	**P** Distinction average in MBLG (2001 or 2901 and 2002 or 2902) or in 16 credit points of Intermediate Biology. For BMedSc students 32 credit points of Intermediate BMED units including Distinction in BMED 2502. These requirements may be varied and students with lower averages should contact the unit Executive Officer. **N** BIOL (3026 or 3929).	2b
BIOL 3027	Bioinformatics and Genomics	6	**P** MBLG (2001 or 2101 or 2901) or 16 credit points of Intermediate Biology including BIOL (2001 or 2901 or 2004 or 2904 or 2006 or 2906). For BMedSc students: 32 credit points of Intermediate BMED units including BMED 2502. **N** BIOL 3927.	1b

Table IV: Bachelor of Medical Science (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
BIOL 3927	Bioinformatics and Genomics (Advanced)	6	**P** Distinction in MBLG (2001 or 2101 or 2901) or Distinction average in 16 credit points of Intermediate Biology including BIOL (2001 or 2901 or 2004 or 2904 or 2006 or 2906). For BMedSc students: 32 credit points of Intermediate BMED units including Distinction in BMED 2502. These requirements may be varied and students with lower averages should contact the unit Executive Officer. **N** BIOL 3027.	1b
BIOL 3928	Evolutionary Genetics Molecular (Adv)	6	**P** Distinction average in 16 credit points of Intermediate Biology including MBLG (2001 or 2901 and 2002 or 2902). For BMedSc students: 32 credit points of Intermediate BMED units including Distinction in BMED 2502. These requirements may be varied and students with lower averages should contact the unit Executive Officer. **N** BIOL (3025 or 3925). *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended. This unit of study is available to students enrolled in the Bachelor of Science (Molecular Biology and Genetics) and the Bachelor of Medical Science only.*	2
Cell Pathology				
CPAT 3001	Cell Pathology A	12	**P** ANAT 2002; or BCHM 2002 or 2902; or BIOL 2006 or 2906; or both PCOL 2001 and (2002 or 2003); or PHSI 2002. For BMedSc: 32 credit points from Intermediate BMED units of study. *NB: Entry requires Departmental permission: only a small number of students can be accommodated in the laboratory facilities. The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	N/A in 2004
CPAT 3101	Pathological Basis of Human Disease	12	**P** ANAT 2001; or BCHM (2001 or 2002 or 2101 or 2102 or 2901 or 2902); or MBLG (2001 or 2101 or 2901); or BIOL (2001 or 2002 or 2006 or 2101 or 2102 or 2105 or 2106 or 2901 or 2902 or 2906); or HPSC (2001 or 2002); or MICR (2001 or 2003 or 2901); or PCOL 2001; or PHSI 2001. For BMedSc: 32 credit points from Intermediate BMED units of study. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	2
Immunology				
BMED 3003	Immunology	12	**P** 32 credit points of Intermediate BMED units including BMED 2506. **N** IMMU 3002.	2
Infectious Diseases				
BMED 3004	Infectious Diseases	12	**P** 32 credit points of Intermediate BMED units including BMED 2506.	2
Microbiology				
MICR 3001	General and Medical Microbiology	12	**P** MBLG (2001 or 2101 or 2901) and [12 credit points of Intermediate MICR units or MICR (2011 and 2012) or MICR 2909]. For BMedSc students: 32 credit points of Intermediate BMED units including BMED 2506. **N** MICR 3901.	1
MICR 3901	General and Medical Microbiology (Adv)	12	**P** MBLG (2101 or 2001 or 2901) and [12 credit points of Intermediate MICR units including one Distinction, or MICR (2011 and 2012) including one Distinction, or Distinction in MICR 2909. For BMedSc: 32 credit points of Intermediate BMED units including Distinction in BMED 2506. **N** MICR 3001.	1
MICR 3003	Molecular Biology of Pathogens	12	**P** 32 credit points of Intermediate BMED units including BMED 2506. **N** MICR 3903. *NB: It is strongly recommended that students also enrol in MICR 3001.*	2
MICR 3903	Molecular Biology of Pathogens Advanced	12	**P** 32 credit points of Intermediate BMED units including Distinction or better in BMED 2506. **N** MICR 3003. *NB: It is strongly recommended that students also enrol in MICR 3001.*	2
Pharmacology				
PCOL 3001	Molecular Pharmacology and Toxicology	12	**P** PCOL 2001 and PCOL (2002 or 2003); or 32 credit points from Intermediate BMED units of study. **N** PCOL 3901. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	1
PCOL 3901	Molecular Pharmacology & Toxicology Adv	12	**P** Distinction average in PCOL 2001 and PCOL (2002 or 2003); or in 32 credit points from Intermediate BMED units of study. **N** PCOL 3001. *NB: Department permission required for enrolment. The completion of MBLG (2001 or 2101 or 2901) is highly recommended. Entry to this unit requires Departmental permission.*	1
PCOL 3002	Neuro- and Cardiovascular Pharmacology	12	**P** PCOL 2001 and PCOL (2002 or 2003;) or 32 credit points from Intermediate BMED units of study. **N** PCOL 3902. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	2
PCOL 3902	Neuro & Cardiovascular Pharmacology Adv	12	**P** Distinction average in PCOL 2001 and PCOL(2002 or 2003); or in 32 credit points from Intermediate BMED units of study. **N** PCOL 3002. *NB: Department permission required for enrolment. The completion of MBLG (2001 or 2101 or 2901) is highly recommended. Entry to this unit requires Departmental permission.*	2
Physiology				
PHSI 3001	Neuroscience	12	**P** For BMedSc: at least 32 credit points of Intermediate BMED units including BMED (2501 and 2503 and 2505). For others: PHSI (2101 or 2001 or 2901) or ANAT 2003; and MBLG (2001 or 2101 or 2901) or BCHM (2001 or 2101 or 2901); plus at least 8 credit points of Intermediate Science units of study. **N** PHSI 3901. *NB: A minimum of 8 credit points of Intermediate Physiology and/or Anatomy is recommended.*	1

Table IV: Bachelor of Medical Science (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
PHSI 3901	Neuroscience (Advanced)	12	**P** For BMedSc: at least 32 credit points of Intermediate BMED units including BMED (2501 and 2503 and 2505). For others: PHSI (2101 or 2001 or 2901) or ANAT 2003; and MBLG (2001 or 2101 or 2901) or BCHM (2001 or 2101 or 2901); plus at least 8 credit points of Intermediate Science units of study. **N** PHSI 3001. *NB: Department permission required for enrolment. A minimum of 8 credit points of Intermediate Physiology and/or Anatomy is recommended. Permission required for enrolment. Available to selected students who have achieved a mark of at least 65 in the prerequisite units of study.*	1
PHSI 3002	Neuroscience – Cellular and Integrative	12	**P** For BMedSc: 32 credit points of Intermediate BMED units including BMED (2501 and 2503 and 2505). For others:16 credit points of Intermediate Science units of study from Anatomy and Histology, Biochemistry, Biology, Chemistry, Computer Science, Mathematics, Microbiology, Molecular Biology and Genetics, Pharmacology, Physics, Physiology, Psychology or Statistics. **N** PHSI 3902. *NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	2
PHSI 3902	Neuroscience- Cellular & Integrative Adv	12	**P** For BMedSc: 32 credit points of Intermediate BMED units including BMED (2501 and 2503 and 2505). For others: Credit or better in PHSI 3001; and 16 credit points of Intermediate Science units of study from Anatomy and Histology, Biochemistry, Biology, Chemistry, Computer Science, Mathematics, Microbiology, Molecular Biology and Genetics, Pharmacology, Physics, Physiology, Psychology or Statistics. **N** PHSI 3002. *NB: Department permission required for enrolment. Permission required for enrolment. Available to selected students who have achieved a mark of at least 65 in the prerequisite units of study. The completion of MBLG (2001 or 2101 or 2901) is highly recommended.*	2
PHSI 3003	Heart and Circulation	12	**A** PHSI (2001 or 2101 or 2901) and BCHM (2002 or 2102 or 2902). **P** For BMedSc: 32 credit points of Intermediate BMED units including BMED (2501 and 2503 and 2505). For others: PHSI (2002 or 2102 or 2902) and MBLG (2001 or 2101 or 2901) plus at least 8 credit points of Intermediate Science units of study. **N** PHSI 3903. *NB: A minimum of 8 credit points of Intermediate Physiology and BCHM (2002 or 2102 or 2902) are strongly recommended.*	2
PHSI 3903	Heart and Circulation (Advanced)	12	**A** PHSI (2001 or 2101 or 2901) and BCHM (2002 or 2102 or 2902). **P** For BMedSc: 32 credit points of Intermediate BMED units including BMED (2501 and 2503 and 2505). For others: PHSI (2002 or 2102 or 2902) and MBLG (2001 or 2101 or 2901) plus at least 8 credit points of Intermediate Science units of study. **N** PHSI 3003. *NB: Department permission required for enrolment. A minimum of 8 credit points of Intermediate Physiology and BCHM (2002 or 2102 or 2902) are strongly recommended. Permission required for enrolment. Available to selected students who have achieved a mark of at least 65 in the prerequisite units of study.*	2
PHSI 3004	Human Cellular Physiology	12	**P** For BMedSc: 32 credit points of Intermediate BMED units including BMED (2501 and 2502 and 2504). For others: PHSI (2001 or 2101 or 2901) and PHSI (2002 or 2102 or 2902) and either MBLG (2001 or 2101 or 2901) or BCHM (2001 or 2101 or 2901). **N** PHSI 3904.	1
PHSI 3904	Human Cellular Physiology (Advanced)	12	**P** For BMedSc: 32 credit points of Intermediate BMED units including BMED (2501 and 2502 and 2504). For others: PHSI (2001 or 2101 or 2901) and PHSI (2002 or 2102 or 2902) and either MBLG (2001 or 2101 or 2901) or BCHM (2001 or 2101 or 2901). **N** PHSI 3004. *NB: Department permission required for enrolment. Permission is required for enrolment. Available to selected students who have achieved an average of at least 65 in the prerequisite units of study.*	1

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				
ANAT 4011	Anatomy Honours A	12	*NB: Department permission required for enrolment.*	1, 2
ANAT 4012	Anatomy Honours B	12	**C** ANAT 4011.	1, 2
ANAT 4013	Anatomy Honours C	12	**C** ANAT 4012.	1, 2
ANAT 4014	Anatomy Honours D	12	**C** ANAT 4013.	1, 2
Biochemistry				
BCHM 4011	Biochemistry Honours A	12	*NB: Department permission required for enrolment.*	1, 2
BCHM 4012	Biochemistry Honours B	12	**C** BCHM 4011.	1, 2
BCHM 4013	Biochemistry Honours C	12	**C** BCHM 4012.	1, 2
BCHM 4014	Biochemistry Honours D	12	**C** BCHM 4013.	1, 2
Biology (Genetics)				
BIOL 4011	Biology Honours A	12	*NB: Department permission required for enrolment.*	1, 2
BIOL 4012	Biology Honours B	12	**C** BIOL 4011.	1, 2
BIOL 4013	Biology Honours C	12	**C** BIOL 4012.	1, 2

Table IV: Bachelor of Medical Science (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
BIOL 4014	Biology Honours D	12	**C** BIOL 4013.	1, 2
Cell Pathology				
CPAT 4011	Cell Pathology Honours A	12	*NB: Department permission required for enrolment.*	1, 2
CPAT 4012	Cell Pathology Honours B	12	**C** CPAT 4011.	1, 2
CPAT 4013	Cell Pathology Honours C	12	**C** CPAT 4012.	1, 2
CPAT 4014	Cell Pathology Honours D	12	**C** CPAT 4013.	1, 2
Histology and Embryology				
Students should enrol in Anatomy Honours				
Immunology				
BMED 4011	Immunology Honours A	12	*NB: Department permission required for enrolment. Immunology Honours is available to approved students from any degree program. Intending candidates should contact the Department.*	1, 2
BMED 4012	Immunology Honours B	12	**C** BMED 4011. *NB: Immunology Honours is available to approved students from any degree program. Intending candidates should contact the Department.*	1, 2
BMED 4013	Immunology Honours C	12	**C** BMED 4012. *NB: Immunology Honours is available to approved students from any degree program. Intending candidates should contact the Department.*	1, 2
BMED 4014	Immunology Honours D	12	**C** BMED 4013. *NB: Immunology Honours is available to approved students from any degree program. Intending candidates should contact the Department.*	1, 2
Infectious Diseases				
BMED 4021	Infectious Diseases Honours A	12	*NB: Department permission required for enrolment.*	1, 2
BMED 4022	Infectious Diseases Honours B	12	**C** BMED 4021.	1, 2
BMED 4023	Infectious Diseases Honours C	12	**C** BMED 4022.	1, 2
BMED 4024	Infectious Diseases Honours D	12	**C** BMED 4023.	1, 2
Microbiology				
MICR 4011	Microbiology Honours A	12	*NB: Department permission required for enrolment.*	1, 2
MICR 4012	Microbiology Honours B	12	**C** MICR 4011.	1, 2
MICR 4013	Microbiology Honours C	12	**C** MICR 4012.	1, 2
MICR 4014	Microbiology Honours D	12	**C** MICR 4013.	1, 2
Pharmacology				
PCOL 4011	Pharmacology Honours A	12	*NB: Department permission required for enrolment.*	1, 2
PCOL 4012	Pharmacology Honours B	12	**C** PCOL 4011.	1, 2
PCOL 4013	Pharmacology Honours C	12	**C** PCOL 4012.	1, 2
PCOL 4014	Pharmacology Honours D	12	**C** PCOL 4013.	1, 2
Physiology				
PHSI 4011	Physiology Honours A	12	*NB: Department permission required for enrolment.*	1, 2
PHSI 4012	Physiology Honours B	12	**C** PHSI 4011.	1, 2
PHSI 4013	Physiology Honours C	12	**C** PHSI 4012.	1, 2
PHSI 4014	Physiology Honours D	12	**C** PHSI 4013.	1, 2

Table V: Bachelor of Science in Media and Communications

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
■ **Junior units of study**				
ENGL 1005	Language and Image	6	**N** ENGL 1050.	1, 2
MECO 1001	Introduction to Media Studies 1	6	*NB: Available to BA(Media and Commun) and BSc (Media & Commun) students only.*	2

Table V: Bachelor of Science in Media and Communications (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
MECO 1003	Principles of Media Writing	6	**N** MECO 2002. *NB: Available to BA(Media and Commun) and BSc (Media & Commun) students only.*	1
■ **Senior units of study**				
GOVT 2303	Media Politics	8	**P** Two GOVT 1000 level units of study or MECO 2003.	N/A in 2004
MECO 2001	Radio Broadcasting	8	**P** 12 junior credit points of Media & Communications units; ENGL 1050 or 1005 or LNGS 1005. *NB: Available to BA(Media and Commun) and BSc (Media & Commun) students only.*	1
MECO 2002	Writing for Print Media	8	**P** 12 junior credit points of Media & Communications units; ENGL 1050 or 1005 or LNGS 1005. **N** MECO 1003. *NB: Available to BA(Media and Commun) and BSc (Media & Commun) students only.*	N/A in 2004
MECO 2003	Media Relations	8	**P** 12 junior credit points of Media & Communications units; ENGL 1050 or 1005 or LNGS 1005. *NB: Available to BA(Media and Commun) and BSc (Media & Commun) students only.*	2
MECO 3001	Video Production	8	**P** 12 junior credit points of MECO units; ENG1005 or ENGL 1050 or LNS1005. *NB: Available to BA(Media and Commun) and BSc (Media & Commun) students only.*	1, 2
MECO 3002	Online Media Production	8	**P** MECO 3001. *NB: Available to BA(Media and Commun) and BSc (Media & Commun) students only.*	2
MECO 3003	Media, Law and Ethics	8	**P** 12 junior credit points of MECO units; ENGL 1005 or ENGL 1050 or LNGS 1005. *NB: Available to BA(Media and Commun) and BSc (Media & Commun) students only.*	2
MECO 3005	Media Globalisation	8	**P** 12 junior credit points of MECO units; ENG1005 or ENGL 1050 or LNGS 1005. *NB: NB: Available to BA (Media & Communication) and BSc (Media & Comm) students only.*	1
MECO 3701	Media and Communications Internship	8	**P** MECO 3002 and MECO 3003. *NB: Available to BA(Media and Commun) and BSc (Media & Commun) students only.*	1, 2
MECO 3702	Internship Project	8	**P** MECO 3002 & MECO 3003. **C** MECO 3701. *NB: Available to BA(Media and Commun) and BSc (Media & Cmmunications) students only.*	1, 2

Table VI: Honours units of study

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
Agricultural Chemistry Honours				
AGCH 4021	Agricultural Chemistry Honours A	12	*NB: Department permission required for enrolment.*	1, 2
AGCH 4022	Agricultural Chemistry Honours B	12	**C** AGCH 4021.	1, 2
AGCH 4023	Agricultural Chemistry Honours C	12	**C** AGCH 4022.	1, 2
AGCH 4024	Agricultural Chemistry Honours D	12	**C** AGCH 4023.	1, 2
Anatomy and Histology Honours				
ANAT 4011	Anatomy Honours A	12	*NB: Department permission required for enrolment.*	1, 2
ANAT 4012	Anatomy Honours B	12	**C** ANAT 4011.	1, 2
ANAT 4013	Anatomy Honours C	12	**C** ANAT 4012.	1, 2
ANAT 4014	Anatomy Honours D	12	**C** ANAT 4013.	1, 2
Biochemistry Honours				
BCHM 4011	Biochemistry Honours A	12	*NB: Department permission required for enrolment.*	1, 2
BCHM 4012	Biochemistry Honours B	12	**C** BCHM 4011.	1, 2
BCHM 4013	Biochemistry Honours C	12	**C** BCHM 4012.	1, 2
BCHM 4014	Biochemistry Honours D	12	**C** BCHM 4013.	1, 2
Biology Honours				
BIOL 4011	Biology Honours A	12	*NB: Department permission required for enrolment.*	1, 2
BIOL 4012	Biology Honours B	12	**C** BIOL 4011.	1, 2
BIOL 4013	Biology Honours C	12	**C** BIOL 4012.	1, 2
BIOL 4014	Biology Honours D	12	**C** BIOL 4013.	1, 2

Table VI: Honours units of study (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
Chemistry Honours				
CHEM 4011	Chemistry Honours A	12	*NB: Department permission required for enrolment.*	1, 2
CHEM 4012	Chemistry Honours B	12	**C** CHEM 4011.	1, 2
CHEM 4013	Chemistry Honours C	12	**C** CHEM 4012.	1, 2
CHEM 4014	Chemistry Honours D	12	**C** CHEM 4013.	1, 2
Computational Science Honours				
COSC 4001	Computational Science Honours A	12	*NB: Department permission required for enrolment.*	1, 2
COSC 4002	Computational Science Honours B	12	**C** COSC 4001.	1, 2
COSC 4003	Computational Science Honours C	12	**C** COSC 4002.	1, 2
COSC 4004	Computational Science Honours D	12	**C** COSC 4003.	1, 2
Computer Science Honours				
COMP 4044	Data Mining and Machine Learning	6	**A** Elementary statistics. **P** Credit average in 24 credit points of 3000-level study.	1
COMP 4045	Computational Geometry	6	**A** Data structures, analysis of algorithms. **P** Credit average in 24 credit points of 3000-level study.	1
COMP 4046	Statistical Natural Language Processing	6	**A** Concepts of linguistics, elementary statistics, AI techniques. **P** Credit average in 24 credit points of 3000-level study.	1
COMP 4048	Information Visualisation	6	**A** Discrete mathematics. **P** Credit average in 24 credit points of 3000-level study.	2
INFO 4010	IT Advanced Topic A	6	**P** Permission of Head of School. *NB: Department permission required for enrolment.*	1
INFO 4011	IT Advanced Topic B	6	**P** Permission of Head of School. *NB: Department permission required for enrolment.*	2
INFO 4990	IT Research Methods	6	**A** Elementary statistics.	1
INFO 4991	IT Research Thesis A	6	**C** INFO 4990 and INFO 4992.	1, 2
INFO 4992	IT Research Thesis B	12	**C** INFO 4990 and INFO 4991.	1, 2
INFO 4999	Computer Science Honours Result	0	**P** Permission of the Head of Department. *NB: Department permission required for enrolment.*	1, 2
ISYS 4050	Knowledge Management Systems	6	**A** Information systems concepts, database concepts. **P** Credit average in 24 credit points of 3000-level study.	1
ISYS 4051	Advanced Data Models	6	**A** Relational database concepts. **P** Credit average in 24 credit points of 3000-level study.	2
MULT 4043	Multimedia Storage, Retrieval & Delivery	6	**A** Multimedia data formats, networking concepts, database concepts. **P** Credit average in 24 credit points of 3000-level study.	1
NETS 4040	Advanced Networking Technologies	6	**A** Understanding of link layer technologies, the TCP/IP protocol stack. **P** Credit average in 24 credit points of 3000-level study. **N** ELEC (4504 and 5501).	1
NETS 4041	Network-Based High Performance Computing	6	**A** Understanding of operating systems. **P** Credit average in 24 credit points of 3000-level study.	1
NETS 4047	Pervasive Computing	6	**A** Networking concepts, operating system concepts, programming expertise. **P** Credit average in 24 credit points of 3000-level study.	2
SOFT 4042	Enterprise-Scale Software	6	**A** Relational database technology, object-oriented design, C++. **P** Credit average in 24 credit points of 3000-level study.	1
Cell Pathology Honours				
CPAT 4011	Cell Pathology Honours A	12	*NB: Department permission required for enrolment.*	1, 2
CPAT 4012	Cell Pathology Honours B	12	**C** CPAT 4011.	1, 2
CPAT 4013	Cell Pathology Honours C	12	**C** CPAT 4012.	1, 2
CPAT 4014	Cell Pathology Honours D	12	**C** CPAT 4013.	1, 2
Geography Honours				
GEOG 4011	Geography Honours A	12	*NB: Department permission required for enrolment.*	1, 2
GEOG 4012	Geography Honours B	12	**C** GEOG 4011.	1, 2
GEOG 4013	Geography Honours C	12	**C** GEOG 4012.	1, 2
GEOG 4014	Geography Honours D	12	**C** GEOG 4013.	1, 2

Table VI: Honours units of study (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
Geology Honours				
GEOL 4011	Geology Honours A	12	*NB: Department permission required for enrolment.*	1, 2
GEOL 4012	Geology Honours B	12	**C** GEOL 4011.	1, 2
GEOL 4013	Geology Honours C	12	**C** GEOL 4012.	1, 2
GEOL 4014	Geology Honours D	12	**C** GEOL 4013.	1, 2
Geophysics Honours				
GEOP 4011	Geophysics Honours A	12	*NB: Department permission required for enrolment.*	1, 2
GEOP 4012	Geophysics Honours B	12	**C** GEOP 4011.	1, 2
GEOP 4013	Geophysics Honours C	12	**C** GEOP 4012.	1, 2
GEOP 4014	Geophysics Honours D	12	**C** GEOP 4013.	1, 2
History and Philosophy of Science Honours				
HPSC 4101	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. *NB: Department permission required for enrolment.*	1
HPSC 4102	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. *NB: Department permission required for enrolment.*	1, 2
HPSC 4103	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. *NB: Department permission required for enrolment.*	2
HPSC 4104	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. *NB: Department permission required for enrolment.*	1, 2
HPSC 4105	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. *NB: Department permission required for enrolment.*	1
HPSC 4106	Research Project A	12	**P** Available only to students admitted to HPS Honours and Graduate Diploma in Science (History and Philosophy of Science). **C** Must be taken in conjunction with HPSC 4107 Research Project B in the following semester. *NB: Department permission required for enrolment.*	1, 2
HPSC 4107	Research Project B	12	**P** Available only to students admitted to HPS Honours and Graduate Diploma in Science (History and Philosophy of Science). **C** HPSC 4999 (for Honours students only). *NB: Department permission required for enrolment.*	1, 2
HPSC 4999	History & Philosophy of Science Honours	0	**P** Available only to students admitted to HPS Honours. *NB: Department permission required for enrolment.*	1, 2
Immunology Honours				
BMED 4011	Immunology Honours A	12	*NB: Department permission required for enrolment. Immunology Honours is available to approved students from any degree program. Intending candidates should contact the Department.*	1, 2
BMED 4012	Immunology Honours B	12	**C** BMED 4011. *NB: Immunology Honours is available to approved students from any degree program. Intending candidates should contact the Department.*	1, 2
BMED 4013	Immunology Honours C	12	**C** BMED 4012. *NB: Immunology Honours is available to approved students from any degree program. Intending candidates should contact the Department.*	1, 2
BMED 4014	Immunology Honours D	12	**C** BMED 4013. *NB: Immunology Honours is available to approved students from any degree program. Intending candidates should contact the Department.*	1, 2
Information Systems Honours				
ISYS 4301	Information Systems Honours A	12	*NB: Department permission required for enrolment.*	1, 2
ISYS 4302	Information Systems Honours B	12	**C** ISYS 4301.	1, 2
ISYS 4303	Information Systems Honours C	12	**C** ISYS 4302.	1, 2
ISYS 4304	Information Systems Honours D	12	**C** ISYS 4303.	1, 2
Marine Sciences Honours				
MARS 4011	Marine Sciences Honours A	12	*NB: Department permission required for enrolment.*	1, 2

Table VI: Honours units of study (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
MARS 4012	Marine Sciences Honours B	12	**C** MARS 4011.	1, 2
MARS 4013	Marine Sciences Honours C	12	**C** MARS 4012.	1, 2
MARS 4014	Marine Sciences Honours D	12	**C** MARS 4013.	1, 2
Pure Mathematics Honours				
MATH 4301	Pure Mathematics Honours A	12	*NB: Department permission required for enrolment.*	1, 2
MATH 4302	Pure Mathematics Honours B	12	**C** MATH 4301.	1, 2
MATH 4303	Pure Mathematics Honours C	12	**C** MATH 4302.	1, 2
MATH 4304	Pure Mathematics Honours D	12	**C** MATH 4303.	1, 2
Applied Mathematics Honours				
MATH 4401	Applied Mathematics Honours A	12	*NB: Department permission required for enrolment.*	1, 2
MATH 4402	Applied Mathematics Honours B	12	**C** MATH 4401.	1, 2
MATH 4403	Applied Mathematics Honours C	12	**C** MATH 4402.	1, 2
MATH 4404	Applied Mathematics Honours D	12	**C** MATH 4403.	1, 2
Molecular Biotechnology Honours				
MOBT 4011	Molecular Biotechnology Honours A	12	*NB: Department permission required for enrolment.*	1, 2
MOBT 4012	Molecular Biotechnology Honours B	12	**C** MOBT 4011.	1, 2
MOBT 4013	Molecular Biotechnology Honours C	12	**C** MOBT 4012.	1, 2
MOBT 4014	Molecular Biotechnology Honours D	12	**C** MOBT 4013.	1, 2
Microbiology Honours				
MICR 4011	Microbiology Honours A	12	*NB: Department permission required for enrolment.*	1, 2
MICR 4012	Microbiology Honours B	12	**C** MICR 4011.	1, 2
MICR 4013	Microbiology Honours C	12	**C** MICR 4012.	1, 2
MICR 4014	Microbiology Honours D	12	**C** MICR 4013.	1, 2
Nutrition and Dietetics Honours				
NUTR 4001	Clinical Nutritional Science A	24	*NB: Department permission required for enrolment.*	1
NUTR 4002	Clinical Nutritional Science B	24	*NB: Department permission required for enrolment.*	2
Nutrition Honours				
NUTR 4101	Nutrition Research A	12	*NB: Department permission required for enrolment.*	1, 2
NUTR 4102	Nutrition Research B	12	**C** NUTR 4101.	1, 2
NUTR 4103	Nutrition Research C	12	**C** NUTR 4102.	1, 2
NUTR 4104	Nutrition Research D	12	**C** NUTR 4103.	1, 2
Pharmacology Honours				
PCOL 4011	Pharmacology Honours A	12	*NB: Department permission required for enrolment.*	1, 2
PCOL 4012	Pharmacology Honours B	12	**C** PCOL 4011.	1, 2
PCOL 4013	Pharmacology Honours C	12	**C** PCOL 4012.	1, 2
PCOL 4014	Pharmacology Honours D	12	**C** PCOL 4013.	1, 2
Physiology Honours				
PHSI 4011	Physiology Honours A	12	*NB: Department permission required for enrolment.*	1, 2
PHSI 4012	Physiology Honours B	12	**C** PHSI 4011.	1, 2
PHSI 4013	Physiology Honours C	12	**C** PHSI 4012.	1, 2
PHSI 4014	Physiology Honours D	12	**C** PHSI 4013.	1, 2

Table VI: Honours units of study (continued)

Unit of study		CP	A: Assumed knowledge P: Prerequisite Q: Qualifying C: Corequisite N: Prohibition	Session
Physics Honours				
PHYS 4011	Physics Honours A	12	*NB: Department permission required for enrolment.*	1, 2
PHYS 4012	Physics Honours B	12	**C** PHYS 4011.	1, 2
PHYS 4013	Physics Honours C	12	**C** PHYS 4012.	1, 2
PHYS 4014	Physics Honours D	12	**C** PHYS 4013.	1, 2
Psychology Honours				
PSYC 4011	Psychology Honours A	12	*NB: Department permission required for enrolment.*	1, 2
PSYC 4012	Psychology Honours B	12	**C** PSYC 4011.	1, 2
PSYC 4013	Psychology Honours C	12	**C** PSYC 4012.	1, 2
PSYC 4014	Psychology Honours D	12	**C** PSYC 4013.	1, 2
Soil Science Honours				
SOIL 4021	Soil Science Honours A	12	*NB: Department permission required for enrolment.*	1, 2
SOIL 4022	Soil Science Honours B	12	**C** SOIL 4021.	1, 2
SOIL 4023	Soil Science Honours C	12	**C** SOIL 4022.	1, 2
SOIL 4024	Soil Science Honours D	12	**C** SOIL 4023.	1, 2
Mathematical Statistics Honours				
STAT 4201	Mathematical Statistics Honours A	12	*NB: Department permission required for enrolment.*	1, 2
STAT 4202	Mathematical Statistics Honours B	12	**C** STAT 4201.	1, 2
STAT 4203	Mathematical Statistics Honours C	12	**C** STAT 4202.	1, 2
STAT 4204	Mathematical Statistics Honours D	12	**C** STAT 4203.	1, 2

■ Units of study descriptions

The units of study in this section generally are organised alphabetically by department or school, except for those listed below.
- COMP, INFO, ISYS, NETS, MULT and SOFT can be found under the Information Technologies entry.
- NTMP can be found under the Marine Science entry.
- STAT can be found under the Mathematics and Statistics entry.

■ Aerospace, Mechanical and Mechatronic Engineering

The School of Aerospace, Mechanical and Mechatronic Engineering is part of the Faculty of Engineering. In addition to providing professional training in aerospace, mechanical 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 Faculty Building.

■ Agricultural Chemistry and Soil Science

Agricultural Chemistry

Studies in the disciplines of Agricultural Chemistry and Soil Science are offered by the School of Land, Water and Crop Sciences in the Faculty of Agriculture.

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. Emphasis is placed on the chemistry of molecules of biological, agricultural and environmental significance both naturally occurring (eg, in foods and natural fibres), and chemically synthesised (eg, insecticides and herbicides). The biochemistry is planned around the relationship between living organisms and their environment and includes sections on the metabolism of inorganic and synthetic materials by animals, plants and micro-organisms.

The units of study available are: AGCH 2001 Molecular Processes in Ecosystems (8 credit points Intermediate); AGCH 3025 and AGCH 3026, Chemistry and Biochemistry of Foods A and B respectively (6 credit points Senior each); AGCH 3020, AGCH 3021 and AGCH 3022, Chemistry and Biochemistry of Ecosystems A, B and C respectively (4 credit points Senior each); AGCH 3024 Chemistry and Biochemistry of Foods (6 credit points Senior); and Agricultural Chemistry Honours. The unit of study AGCH 3012 is only available to students enrolled in the Bachelor of Science (Environmental) and students seeking further information should consult the relevant Tables earlier in this chapter as well as degree information in chapter 2 of this handbook.

AGCH 2001 **Molecular Processes in Ecosystems**

8 credit points. Dr Lees, Dr Caldwell (Coordinator). **Session**: 1. **Classes**: 4 lec & 4 prac/wk. **Prerequisite**: BIOL (1002 or 1902). Students who have not satisfied the prerequisites in Biology may enrol with SOIL 2001 as a corequisite. **Qualifier**: CHEM 1002 or equivalent. **Prohibition**: May not be counted with any Intermediate unit of study in Biochemistry. **Assessment**: One 3hr exam, prac, assignments.

This is an introductory unit of study consisting of aspects of chemistry and biochemistry relevant in studies of basic and applied biological sciences including agriculture and the environment. The unit of study introduces students to biophysical, biological and environmental chemistry. Lecture topics include: energy in the biosphere; the interaction of radiation and matter; solutions of neutral solutes and electrolytes; emulsions, foams and gels; the biological chemistry of carbohydrates, lipids, amino acids and proteins (including enzymes); nucleic acids; the metabolism of simple sugars, fatty acids and amino acids; the mechanisms of energy release and transduction; the basic pathway of carbon fixation in photosynthesis. Emphasis is given to the theory, principles and practice of the basic analytical techniques which underpin the more advanced instrumental methods used in many laboratory based disciplines.

Practical: Seven laboratory sessions cover aspects of analytical and biophysical chemistry including: elemental analysis of foods, spectrophotometry, chromatographic techniques, preparation of buffers, fundamentals of pH measurement; emulsions, foams and gels. An additional five laboratory sessions are concerned with the properties of carbohydrates, lipids, amino acids, proteins and nucleic acids. Laboratory classes include instruction in the safe handling of chemicals and safe practices in chemical laboratories.

AGCH 3024 **Chemistry and Biochemistry of Foods**

6 credit points. Assoc Prof Copeland. **Session**: 1. **Classes**: 3 lec & 1 tut/wk. 8x3hr pracs. **Prerequisite**: MBLG (2001 and 2002); and either [CHEM (2311 and 2312) or 2903], or BCHM (2002 or 2902). **Prohibition**: May not be counted with AGCH (3003 or 3005 or 3017 or 3025). **Assessment**: One 2hr exam (50%), One major assignment (25%), Practical Reports (25%).

This unit of study aims to give students an understanding of the constituents of foods and fibres. The lecture topics cover: the chemistry, biochemistry and processing behaviour of major food constituents – oligosaccharides, polysaccharides, lipids and proteins; the relationship between molecular structure of constituents and their functionality in foods; natural fibres and gel-forming biopolymers – uses in foods, importance in dietary fibre and commercial products; enzymes in foods and food processing; wheat flour doughs and protein chemistry during baking and cooking; flavour chemistry and the chemistry and biochemistry of anti-nutritional and toxic constituents of plants and foods.

The practical exercises in this unit of study will focus on the characterisation of food hydrocolloids in terms of particle size distribution, molecular weight distribution, and molecular structure. Each practical will incorporate a tutorial introducing the background to the characterisation technique employed. Particular emphasis will be placed on the development of practical skills and critical thinking about the implications of experimental data. Students should emerge with a good understanding of the fundamental basis of hydrocolloid characterisation, some familiarity with a broad range of commonly used techniques, and good skills in assessment and processing of experimental data.

The tutorials will provide an introduction to each of the practical exercises, and will also cover topical issues in food science, including food quality, food labelling and food security and genetically modified foods.

AGCH 3025 **Chemistry and Biochemistry of Foods A**

6 credit points. Dr Edith Lees. **Session**: 1. **Classes**: 3 lec, 1 tut/wk; 24hr prac. **Prerequisite**: 8 credit points of intermediate units in Agricultural Chemistry, Chemistry or Biochemistry. **Prohibition**: May not be counted with AGCH (3003, 3005, 3017, 3024). **Assessment**: One 2hr theory exam, one 1hr theory of prac exam, assignment, prac reports.

This unit of study aims to give students an understanding of the constituents of foods and fibres. The lecture topics cover:

- the chemistry, biochemistry and processing behaviour of major food constituents – oligosaccharides, polysaccharides, lipids and proteins;
- the relationship between molecular structure of constituents and their functionality in foods;
- natural fibres and gel-forming biopolymers – uses in foods, importance in dietary fibre and commercial products;
- enzymes in foods and food processing;
- wheat flour doughs and protein chemistry during baking and cooking;
- anti-nutritional and toxic constituents of plants and foods; and
- flavour chemistry

The laboratory exercises aim to give students an understanding of the methods used in the analysis of foods and other biological materials, and will include:

- analysis of carbohydrates including starch and dietary fibre;
- spectroscopic, enzymic, and chromatographic methods.

AGCH 3026 **Chemistry and Biochemistry of Foods B**

6 credit points. Dr Edith Lees. **Session**: 1. **Classes**: 2hr lec/seminar/workshop/wk; site visits; 24 hr prac. **Corequisite**: AGCH 3025. **Prohibition**: May not be counted with AGCH (3003, 3005). **Assessment**: Oral presentations (2), written assignments (2), 1 hr theory of prac exam, prac reports.

This unit of study aims to give students an understanding of global food systems and global food security. In the lecture/seminar/workshop component topics covered will include the sustainable production of major food crops; the role of genetically modified crops in food sustainability and quality; principles and methods in food quality control and assessment; chemical and biochemical aspects of food quality in relation to food processing and nutritional values.

The laboratory exercises aim to give students an understanding of the methods used in the analysis of foods and other biological materials, and will include:

- analysis and examination of protein functionality in foods;
- spectroscopic, enzymic, and chromatographic methods.

AGCH 3030 **Rural Environmental Chemistry A**

6 credit points. Prof Kennedy (Coordinator), Dr Caldwell, Prof Copeland. **Session**: 1. **Classes**: 6-day field trip in orientation week, 21 hr lec & 25 hr prac. **Prerequisite**: AGCH (2001 or 2002) or CHEM (2001, 2101, 2202, 2301, 2302 or 2902) or BIOCHEM (2002 or 2902) or ENVI (2001 or 2002). **Prohibition**: AGCH 3020 and AGCH 3021 and AGCH 3022. **Assessment**: One 2 hr exam, field trip and laboratory reports.

This unit commences with a field trip to the Namoi and the Macquarie Valleys, where agriculture largely based on irrigation has been developed. Environmental impacts on vegetation, soil and water of agricultural enterprises such as cotton farming and human settlement will be assessed in a professional field trip report. Field observations on pH, nutrient and salt content, pesticide, heavy metal content and microbial content will be made on water, sediment, soils and in constructed wetlands, with samples returned for more detailed laboratory analysis at the University. Lectures will complement the field trip, including environmental chemistry of heavy metals, their effects on organisms, 4; mechanisms of tolerance and phytoremediation, 2; risk assessment of pesticides including herbicides, their mode of action and environmental fate, 5; analysis and monitoring of pesticide residues by GC, GC-MS and immunoassay (ELISA), 3; maximum residue limits (MRLs) and residue surveys, 2; remediation of pesticides in ecosystems, 2; design of new pesticides and means of pest control, 3. Laboratory sessions will be related to these lecture topics, including 6–7 sessions on atomic absorption analysis for nutrients and heavy metals, mercury analysis, pesticide analysis by GLC, HPLC, MS and ELISA.

AGCH 3031 **Rural Environmental Chemistry B**

6 credit points. Prof Kennedy (Coordinator), Dr Caldwell, Prof Copeland. **Session**: 2. **Classes**: 5-day field trip in AVCC common break; 21 hr lec and 30 hr prac and project. **Prerequisite**: AGCH (2001 or 2002) or CHEM (2001 or 2101 or 2202 or 2301 or 2302 or 2902) or BIOCHEM (2002 or 2902) or ENVI (2001 or 2002). **Prohibition**: AGCH 3020, AGCH 3021, AGCH 3022. **Assessment**: One 2 hr exam, field-trip report and laboratory reports.

This field-oriented course will (i) provide understanding of chemical and biochemical processes in rural ecosystems and their sustainability, with particular reference to global warming, (ii) include a field trip and professional report to illustrate relevant case studies at several centres in eastern Australia (Canberra, Snowy Mountains, Murray and Murrumbidgee catchments) specialising in research related to global warming, acidification and water quality including salinisation (iii) conduct laboratory sessions and group research project to study a problem in a professional setting. Practical solutions will be sought by students, based on a field theory of action in ecosystems. Lectures will cover the environmental carbon, nitrogen and sulphur cycles, including bioenergetics of autotrophic and heterotrophic action, 2; photosynthesis, 2; nitrification and denitrification, 2; biological nitrogen fixation, 2; sulphur metabolism, 1; production of greenhouse gases, 1; pH balancing and efficient nutrient uptake, 1; acidification of ecosystems and effects on plants and animals, 3; remediation and control of greenhouse emissions, 2; bioremediation of acidification and salinisation, 2. The laboratory sessions and the group project will illustrate these environmental processes, including greenhouse gas production, methane and NOx, photosynthesis and nitrogen fixation, and monitoring of endocrine-disrupting compounds including pesticides using GLC, HPLC and ELISA.

Agricultural Chemistry Honours

The fourth year unit of study 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 unit of study are obtained. The unit of study consists of a research project (with submission of a dissertation), two essays, an oral presentation and attendance at specialist lectures and seminars in agricultural, biological and environmental chemistry. The essays and oral presentation are selected from a list of topics in basic and applied biological and environmental chemistry, and food science. 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 in legumes and associated with wheat, insect metabolism, the biochemistry and environmental chemistry of pesticides and herbicides, acidification of ecosystems including the mechanism of aluminium phytotoxicity, residue analysis in foods and other aspects of food science, 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.

SOIL 2001 **Soil Properties and Processes**

8 credit points. Dr Cattle. **Session**: 1. **Classes**: 3 lec, 1 tut, 3hr prac/wk; and 1 day of fieldwork. **Prerequisite**: CHEM 1002 or equivalent and 12 credit points of Junior Mathematics or PHYS 1003 or 1004. **Assessment**: One 3hrwritten exam, one 2hr prac exam, quizzes and prac exercises.

This unit of study is concerned with the fundamental properties of soil, the factors of soil formation, and the processes that operate in the soil system. The components of the unit of study are pedology, soil physics and soil chemistry. These components are synthesised by reference to common soil profiles. The study of soil in the field starts with field description and assessment of essential characteristics. The physics of water and gas movement, temperature, density, swelling and strength are considered. Soil chemistry includes properties of organic matter, cation exchange capacity, nitrogen, phosphorus, potassium and acidity. Common soil types of New South Wales are studied in relation to their formation, properties and classification.

Textbooks

White RE. Priciples and Practice of Soil Science: The Soil as a Natural Resource. Blackwell Science, 1997

SOIL 2002 **Soil Resources and Conservation**

8 credit points. Dr Singh. **Session**: 2. **Classes**: 4 lec & 3hr prac/wk; 5 days in the field in the week prior to the commencement of the July Semester. **Prerequisite**: SOIL 2001 or GEOL (1002 or 2004) or GEOG 1001 or ENVI 2001. **Prohibition**: May not be counted with GEOG 3002. **Assessment**: One 3hr exam, reports on field and lab work.

Lectures on classification of soil, soil survey, pedological processes, geomorphology and soil stratigraphy, geostatistics and their application to land evaluation for rural purposes, the forms of land degradation occurring in Australia, the management of the soil environment and processes and management conducive to sustainable soil husbandry. Five days' field work in the last week of the mid-year break will take place at a country location and involves landscape description and the description, mapping and sampling of soil profiles for the purpose of assessing land-use capability and field variability of soil properties. The field-work component is a compulsory part of the unit of study.

Practical: Thirty-six hours of laboratory work involves routine physical, chemical and statistical analyses of samples taken in the field relevant to assessment of the land-use potential and the

quantification of the soil variability and soil degradation at the survey site.

SOIL 3001 Environmental Soil Science A

12 credit points. Prof. McBratney (Coordinator), Dr Cattle. **Session**: 1. **Classes**: 3 lec, 1 tut & 6hr prac)/wk, 10 days in the field. **Prerequisite**: SOIL 2001. **Assessment**: Two 2hr exams, field and prac reports, problem sets, mini-lectures.

The soil science specialisation trains people for careers in professional soil science and extension. It provides an excellent background for entry into all aspects of soil science research ranging from physics through mineralogy and chemistry to pedology. Increasing emphasis is being given to aspects of soil sustainability and environmental soil science in order that graduates can meet the growing national demands in this area.

This unit of study covers physics and pedology.

Physics

The emphasis is to examine the quantitative aspects of soil physics particularly in relation to the transfer of energy, gas, water, solids and solutes in soil. Lecture and lab topics include heat flow, gas movement, soil water energetics, saturated and unsaturated flow of soil water, infiltration, solute movement, water and wind erosion as well as the fundamentals of numerical computer modelling of soil physical processes.

Five days' field-work, in the week prior to the beginning of the February Semester, involves field measurement of soil physical properties such as shear and tensile strength, electrical resistivity, hydraulic conductivity and infiltration rates and moisture content

Pedology

The main part of this unit of study the pedological characterisation of a number of contrasting soil profiles sampled during the pre-semester field-trip. This 5-day field-trip is made 2 weeks prior to the beginning of the February semester and involves the study and sampling of soil through central and northern NSW. The methods of study include particle-size analysis and extraction of a fine-sand fraction for optical identification and quantification of the mineral species present. X-ray diffraction is used to identify the clay minerals and elucidate mineralogical transformations. Scanning electron microscopy is used to examine surface features and mineral composition. The unit of study includes a weathering study which traces the changes from a rock parent material up through the soil profile. Thin sections of the rock and profile are examined and the main features identified and quantified. The data from micromorphological investigations and clay mineral assessments are used to provide an understanding of the pedogenesis of the particular soil samples.

A detailed study, including exercises, is made of the USDA soil classification system, Soil Taxonomy, and the Australian Soil Classification.

Reference books

FitzPatrick EA. Soils. Longman, 1980
FitzPatrick EA. Micromorphology of Soils. Chapman & Hall, 1984
Isbell RF. The Australian Soil Classification, CSIRO Publishing, 1996
Kirkman D, & Powers WL. Advanced Soil Physics. Wiley 1972
Loveday J (ed.). Methods for Analysis of Irrigated Soils. C.A.B., 1974
Richler J. The Soil as a Reactor. Catena Verlag, 1987
Young A & Young R Soils in the Australian Landscape. Oxford University Press, 2001

SOIL 3002 Environmental Soil Science B

12 credit points. Dr Singh, Prof. McBratney, Dr Cattle. **Session**: 2. **Classes**: 3 lec, 1 tut & 8hr prac/wk. **Prerequisite**: SOIL 2001; and AGCH 2001 or CHEM (2001 or 2101 or 2202 or 2301 or 2302) or BCHM (2002 or 2902). **Assessment**: Two 2hr exams, lab reports, problem sets, essays.

This soil science specialisation trains people for careers in professional soil science and extension. It provides an excellent background for entry into all aspects of soil science research ranging from physics through mineralogy and chemistry to pedology. Increasing emphasis is being given to aspects of soil sustainability and environmental soil science in order that graduates can meet the growing national demands in this area. This unit of study covers advanced soil chemistry and methods of soil analysis.

Soil Chemistry: The lecture topics include the structure and chemistry of inorganic components, surface charge of soil minerals, chemistry of soil organic matter, ion exchange, ion sorption, soil solution-solid phase equilibria and redox chemist of soils.

Methods: Topics to be covered will include the use of algorithms and simulation modelling in soil science, techniques for soil structural assessment, techniques for dating the age of soil materials, and the use of electron microscopy and X-ray based techniques in soil science. Practicals will involve the writing of computer programs for modelling applications, soil structural assessment of samples using image analysis, radiocarbon dating of field samples, and the use of electron microscopy and X-ray diffraction to identify soil constituents.

Reference books

Evangelou V P Environmental Soils and Water Chemistry. John Wiley & Sons New York. 1998
Lindsay W L Chemical Equilibria in Soils.John Wiley & Sons New York. 1979
McBride M B Environmental Chemistry of Soils. Oxford University Press New York. 1994
Sparks D L Environmental Soil Chemistry. Academic Press London. 1995
Sposito G The Chemistry of Soils. Oxford University Press New York. 1989

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 Department 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 Department is in the Anderson Stuart Building. The Department Office is on the first floor, Room S463.

Noticeboards

The noticeboards are situated near Rooms W225, S431 and 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 Departmental 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 Department and on the advisability of various combinations of subjects.

Registration

All students should register with the Department. Please consult the Departmental 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.

ANAT 2001 Principles of Histology

4 credit points. A/Prof Byrne. **Session**: 1. **Classes**: 4hr/wk, usually 2 lec & 2 prac. **Prerequisite**: 12 credit points of Junior Biology or Junior Psychology. **Assessment**: One 1hr exam, one 1hr prac exam, 2 theory quizzes, 2 prac quizzes.

NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended

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. Instruction also includes a focus on practical applications of histological techniques and analysis for research.

Textbooks

Ross MH, Romrell LJ, & Kaye G I. Histology: A Text and Atlas. (3rd edn), Williams & Wilkins, 1995
Histology Practical Book (consult Departmental noticeboards)

Reference Books

Alberts B et al. Molecular Biology of the Cell. Garland: N.Y.,1994

The histology text and practical book are to be purchased before the first practical class

ANAT 2002 Comparative Primate Anatomy

4 credit points. Dr Denise Donlon. **Session**: 2. **Classes**: 4hr/wk, usually 2 lec & 2 prac/tut. **Assumed knowledge**: Knowledge of basic vertebrate biology. **Prerequisite**: 12 credit points of Junior Biology or Junior Psychology or Junior Archaeology. **Assessment**: One 1hr theory exam (50%), one 1hr prac exam (30%), quizzes and worksheets (20%).

NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.

This unit of study 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 hand in manipulation and locomotion, bipedalism, climbing and brachiation in apes, and the changes in pelvic anatomy associated with bipedalism and their obstetric consequences.

Textbooks

Kapit, W & Elson, LM. The Anatomy Colouring Book. Addison-Wesley, 1993

Reference Books

Aiello, L & Dean, C. An Introduction to Human Evolutionary Anatomy. Academic Press, 1990

Zihlman AL. The Human Evolution Colouring Book. Barnes & Noble Books: Sydney, 1982

ANAT 2003 Concepts in Neuroanatomy

4 credit points. Dr John Mitrofanis. **Session**: 2. **Classes**: 2hrs lec & 2hr prac/wk. **Assumed knowledge**: Background in basic mammalian biology. **Prerequisite**: 12 credit points of Junior Biology or Junior Psychology. **Assessment**: One 1.5hr theory exam; one 1-hr prac exam.

NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.

This unit of study introduces students to the structural organization of the central nervous system, exploring the anatomy, histology, and aspects of the chemical architecture of the mammalian brain and spinal cord. Some comparison is made with invertebrate species. Students are introduced to the structural and neurochemical specializations of neurons and their micro-environment. Other topics considered include special senses, the autonomic and peripheral nervous system, the development and aging of the primate brain. This unit of study will be of general interest to students studying science and related disciplines, and will prepare students for neuroscience study at higher levels.

ANAT 2004 Principles of Embryology

4 credit points. Ms R Arnold. **Session**: 2. **Classes**: 2hrs lec & 2hrs prac/wk. **Qualifier**: ANAT 2001. **Assessment**: One 1hr theory exam, one 1hr prac exam, one 1200 word essay.

NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.

This unit of study covers the normal early development of whole embryos along with the later development of selected organ systems. The unit is based on human and pig development but other vertebrate species are considered as well. Emphasis is placed on mechanisms guiding development and on the experimental methods used to elucidate these mechanisms. The unit of study also includes an introduction to teratology and a few of the more common or interesting anomalies of development.

ANAT 3001 Microscopy and Histochemistry

12 credit points. Prof Chris Murphy, Ms R Arnold. **Session**: 1. **Classes**: 4hr lec & 8hr lab/wk. **Prerequisite**: ANAT 2001. For BMedSc students: 32 credit points of Intermediate BMED units including BMED (2503, 2504, and 2505). **Assessment**: 3hr theory exam, 1hr prac exam, practical reports and/or essays.

NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.

The aims of the unit of study are to provide understanding of why biological tissues need to be specially prepared for microscopic examination, how differing processing methods can yield different types of morphological information; to allow students to understand different types and modalities of microscopes, how they function and the differing information they can provide; to develop an understanding of why biological material needs to be stained for microscopic examination; to allow students to understand how biological material becomes stained; to develop understanding of the chemical information provided by biological staining methods and allow students to develop skills in diverse histochemical staining procedures – dyes, enzymes and antibodies.

Textbooks

Kiernan, JA. Histological and Histochemical Methods (3rd edn), Butterworth, 1999.

ANAT 3002 Cells and Development

12 credit points. Dr Frank Lovicu. **Session**: 2. **Classes**: 12hr/wk. **Assumed knowledge**: (i) an understanding of the basic structure of vertebrates; (ii) an understanding of elementary biochemistry and genetics. **Prerequisite**: ANAT 2001. For BMedSc students: 32 credit points of Intermediate BMED units including BMED (2503, 2504, and 2505). **Prohibition**: May not be counted with ANAT 3003. **Assessment**: Theory exam and practical assignments.

NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.

The main emphasis of this unit of study concerns the mechanisms that control animal development. Fertilization, cleavage, gastrulation and the formation of the primary germ layers are examined in a range of animals, mainly vertebrates. The parts played by inductive cell and tissue interactions in differentiation, morphogenesis and pattern formation are studied at cellular and molecular levels. The unit of study also covers the design of experimental procedures using appropriate molecular and cellular techniques to answer developmental questions.

Textbooks

Gilbert SF. Developmental Biology. (6th edn) Sinauer Associates Inc: Sunderland, Mass. 2000

ANAT 3003 Transmission & Scanning Electron Microsc

12 credit points. Dr M. Anne Swan, Dr Allan Jones. **Session**: 2. **Classes**: 4 hrs lec & 8 hrs lab/wk. **Prerequisite**: ANAT 2001. For BMedSc students 32 credit points of intermediate BMED units including BMED (2503, 2504 & 2505). **Prohibition**: ANAT 3002. **Assessment**: 2x2hr theory exams, practical reports and a project.

NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.

The course is run conjointly by the Department of Anatomy & Histology and the Electron Microscope unit. The course will provide training in the theory and practice of operating 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 undertake research and apply their knowledge to complete a project on electron microscopy of a biological sample. Students will also receive theoretical and practical training in laser scanning confocal microscopy including the use of fluorescent probes to visualise cell organelles and cellular processes.

Textbooks

Bozzola JJ and Russell LD. Electron Microscopy (2nd Ed.), Jones and Bartlett Publishers, 1999.

Reference book

John C. Russ. The Image Processing Handbook (3rd Ed), CRC Press, 1998.

ANAT 3004 Cranial and Cervical Anatomy

6 credit points. Ms Robin Arnold. **Session**: 2. **Classes**: 1 lec, 2hr dissection, 3hr prac/tut. **Prerequisite**: ANAT 2002. **Prohibition**: May not be counted with ANAT 3005. **Assessment**: One 1.5hr theory exam, one 1hr prac exam, one 2500 word essay, continuous assessment (10%).

NB: Not more than 12 credit points allowed from ANAT 3004, ANAT 3007 & ANAT 3008. The completion of MBLG (2001 or 2101 or 2901) 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. Dissection classes enable 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

Mackinnon and Morris. OxfordTextbook of Functional Anatomy, Vol 3: Head & Neck. Oxford University Press. 1990

An anatomy atlas such as Clemente, C.O. A Regional Atlas of the Human Body. Williams and Wilkins.

ANAT 3006 Forensic Osteology

6 credit points. Dr Donlon. **Session**: 1. **Classes**: 2 lec, 2hr tut & 2hr prac/week. **Assumed knowledge**: Understanding of basic human musculoskeletal anatomy. **Prerequisite**: ANAT 2002 or 32 credit points of

Intermediate BMED units including BMED (2503, 2504 and 2505). **Assessment**: 1hr theory exam, 1/2 hr prac exam, continuous assessment, case study.

NB: The completion of MBLG (2001 or 2101 or 2901) 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 WM. Human Osteology: A laboratory and field manual. 4th edition. Missouri Archaeological Society: Missouri,1995.

ANAT 3007 **Visceral Anatomy**

6 credit points. Ms R Arnold. **Session**: 1. **Classes**: 2hrs lec & 4hrs prac/wk. **Assumed knowledge**: Some knowledge of basic mammalian biology. **Prerequisite**: ANAT (2002 or 2003) or 32 credit points of Intermediate BMED units including BMED (2503, 2504 and 2505). **Assessment**: One 1.5hr theory exam, one 1hr prac exam, one 1200 word essay.

NB: Not more than 12 credit points allowed from ANAT 3004, ANAT 3007 & ANAT 3008. The completion of MBLG 2001 or 2101 or 2901 is highly recommended.

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.

ANAT 3008 **Musculoskeletal Anatomy**

6 credit points. Dr R Ward. **Session**: 2. **Classes**: 2 lec, 2 x2 hr tut/prac/wk. **Prerequisite**: ANAT 2002. **Prohibition**: May not be counted with ANAT 3005. **Assessment**: One assignment, 1hr prac exam, 1.5hr theory exam.

NB: Not more than 12 credit points allowed from ANAT 3004, ANAT 3007 and ANAT 3008. The completion of MBLG (2001 or 2101 or 2901) is highly recommended.

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.

Textbooks

Mackinnon and Morris. Oxford Textbook of Functional Anatomy, Vol. 1 (Musculoskeletal). Oxford University Press. 1990

Clemente, C.O. A Regional Atlas of the Human Body. Williams and Wilkins

ANAT 3005 **Topographical Anatomy**

12 credit points. Dr Robin Arnold. **Session**: 2. **Classes**: 3 lec & 9 tut or prac/wk. **Prerequisite**: BMED (2101 and 2102) or 32 credit points of Intermediate BMED units including BMED (2503 and 2504 and 2505). **Prohibition**: ANAT (3004 or 3008). **Assessment**: One 3hr exam, one prac exam, one 2500w essay.

NB: This unit of study is available to students enrolled in the Bachelor of Medical Science only.

This unit of study comprises two strands of topographical anatomy – head and neck anatomy and musculo-skeletal anatomy. The anatomy of the head and neck region will be studied in one lecture, one tutorial and one dissection class per week. The unit of study includes study of the human skull and upper vertebral column and the associated musculatures; the anatomy and functional anatomy of the eye, ear, nose and sinuses; larynx and pharynx are also covered. Emphasis is given to the composition and distribution of the twelve cranial nerves. Musculoskeletal anatomy is covered in two lectures and two tutorials/practical sessions per week. The musculoskeletal system of the trunk and lower limb is studied with particular reference to posture and locomotion. This is contrasted with the structural specialisation of the upper limb for its manipulative and tactile functions.

Textbooks

Mackinnon and Morris. OxfordTextbook of Functional Anatomy, Vol 3: Head & Neck. Oxford University Press. 1990

Clemente, C.O. A Regional Atlas of the Human Body. Williams and Wilkins.

Anatomy Honours and Graduate Diploma

This unit of study provides the opportunity for the student 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. To qualify for this unit of study the student must obtain an appropriate standard in Senior Anatomy or Histology or Neuroscience.

Histology Honours and Graduate Diploma

Histology Honours may be taken by students who have completed, to the required standard, at least one of the Senior semester units of study in Histology offered by the Department of Anatomy and Histology. Students who have taken only one of the semester units of study may be restricted to particular Honours projects that are related to that unit of study.

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 Department of Anatomy and Histology. The department also contributes to the teaching of the Graduate degrees in Applied Science (Neuroscience).

■ Biochemistry

The discipline teaches biochemistry and molecular biology to Science students from an intermediate level. This includes the fundamental principles governing the structure, function and interactions of biological molecules and leads to an understanding of the molecular nature of living systems.

The comprehensive intermediate program in biochemistry includes Biochemistry (BCHM 2011–8 credit points), Molecules, Metabolism and Cells (BCHM 2002–8 credit points) and a faculty unit of study Molecular Biology & Genetics A (MBLG 2001–8 credit points). For those students who have not completed junior biology but have completed 12 credit points of Junior Chemistry the combination of BCHM 2011 and MBLG 2001 allows students to enter the Biochemistry program and progress to the Senior units of study. For those students who have completed both junior Biology and Chemistry, MBLG 2001 and BCHM 2002, constitute a basic intermediate program in biochemistry which also leads to the Senior units of study. The Senior program consists of Molecular Biology And Structural Biochemistry (BCHM 3001–12 credit points), Functional Genomics and Proteomics (BCHM 3098–6 credit points) and Cellular and Medical Biochemistry (BCHM 3002–12 credit points). Taken together the combination of BCHM 3001 and BCHM 3002 constitute a major in Biochemistry. In addition BCHM 3098 links core biochemistry to recent innovations in biomedical science and biotechnology. Advanced units of study based on four one-semester units of study, MBLG 2901, BCHM 2902, BCHM 3901 and BCHM 3902 are available to qualified students. Additional theory only Intermediate units of study are offered in MBLG 2101 (4 credit points) and BCHM 2102 (4 credit points). The units of study BCHM 3004 and 3904 are only available to students in the Bachelor of Science (Molecular Biology and Genetics) degree and students seeking further information should consult the relevant Tables earlier in this chapter as well as degree information in chapter 2 of this handbook.

Advice on units of study

Students are strongly advised to discuss unit of study choices with members of staff present among faculty advisers during the enrolment period. This applies even to students enrolling in Junior units of study and who are contemplating taking Biochemistry in a subsequent year. Certain Junior units of study are recommended depending upon the related area of Biochemistry in which a student may wish to study in their Senior year. School advisers listed in the handbook should be

consulted during the period prior to enrolment and during orientation.

Summer School

This School 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/

Biochemistry Intermediate units of study

BCHM 2011 Biochemistry

8 credit points. Dr Collyer, Dr Hancock. **Session**: 1. **Classes**: 3 lec & 5 hr prac/wk. **Assumed knowledge**: CHEM (1101 and 1102). **Prerequisite**: 12 credit points of Junior Chemistry. **Corequisite**: Recommended concurrent units of study: MBLG (2001 or 2901) for progression to Senior Biochemistry, and/or Intermediate Chemistry. **Assessment**: One 3hr exam, one 2hr theory of prac exam and prac tasks.

NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.

This unit provides an introduction to the physical and chemical activities of proteins, the role of carbohydrates, and the functioning of membranes in cells. 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 complements the protein science presented in MBLG 2001 and BCHM 2002 and is ideally suited to students studying intermediate Chemistry together with Biochemistry. The practical course nurtures technical skills in biochemistry that include protein preparation, the analysis of protein structure, protein-protein interactions and functional assays.

Textbooks

Mathews, Van Holde & Ahern, Biochemistry, 3rd Edition Addison Wesley Longman 2000

or Garrett RH & Grisham CM. Biochemistry. 2nd Ed. Saunders 1999

Resource Manual for Biochemistry 2 Practical Sessions, Sem 2

BCHM 2002 Molecules, Metabolism and Cells

8 credit points. Dr Denyer, Dr Hancock, Biochemistry staff. **Session**: 2, Summer. **Classes**: 3 lec & 5 prac/wk & voluntary tutorials. **Prerequisite**: MBLG (2001 or 2901). **Prohibition**: May not be counted with AGCH 2001 or BCHM (2102 or 2902). **Assessment**: One 3hr exam, one 2hr theory of prac exam, prac tasks.

This unit of study aims to describe how cells work at the molecular level. The chemical reactions which occur inside cells is described in the first series of lectures, Cellular Metabolism. Aspects of the molecular architecture of cells which enable them to function and communicate are described in the second half of the unit of study, Molecular Aspects of Cell Biology. At every stage the unit of study relates how the function of each individual cell is coordinated and integrated with other cells, especially in humans.

Cellular Metabolism: How cells extract energy from fuel molecules like fatty acids and carbohydrates. The regulation of energy metabolism. How the body selects which fuels to use under different circumstances such as starvation and exercise. The metabolic inter-relationships of the muscle, brain, adipose tissue and liver. The role of hormones in coordinating the regulation of fuel utilisation and the mobilisation of fuel stores. How cells lay down stores of fuels. The synthesis and storage of fat and carbohydrate. The digestion of fats, starches and sugars and the use of ingested materials to make new cellular components. Synthesis and use of biochemical building blocks. The strategies and mechanisms involved in biochemical reactions and the involvement of coenzymes and vitamins in biological inter-conversions.

Molecular Aspects of Cell Biology: Sub-cellular engineering; cytoskeleton and molecular motors. Intracellular motion and the mechanism of muscle contraction. Cell membranes and cell walls. Transport across cell membranes. Communication between cells via cell surface receptors. The molecular mechanism of hormone action and the transduction of cellular signals.

Practical: The practical component complements the theory component of BCHM 2002 by exposing students to experiments which investigate the effects of diet on the constituents of urine, the diagnosis of chronic disease using blood enzyme patterns, the measurement of glucose metabolism using radioactive tracers and the design of biochemical assays. During the unit of study, the generic skills developed in the practical component of MBLG 2001 will be 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. The techniques of radioisotope handling, enzyme and metabolite assay design, spectrophotometry and metabolic flux measurement will be taught as well as the basic laboratory abilities mastered in MBLG 2001.

Textbooks

Garrett RH & Grisham CM. Biochemistry. Saunders 1999

Resource Manual for Biochemistry 2 Practical Sessions, Sem 2

Study Resource for Biochemistry 2002 (Study Guides and Past Papers)

BCHM 2102 Molecules, Metabolism and Cells Theory

4 credit points. Dr Denyer, Dr Hancock, Biochemistry staff. **Session**: 2, Summer. **Classes**: 3 lec/wk. **Prerequisite**: MBLG (2001 or 2101 or 2901). **Prohibition**: May not be counted with AGCH 2001 or BCHM (2002 or 2902). **Assessment**: One 3hr exam.

This unit of study comprises just the lecture component of BCHM 2002.

Textbooks

Garrett RH & Grisham CM. Biochemistry. Saunders 1999

Study Resource for Biochemistry 2002 (Study Guides and Past Papers)

BCHM 2902 Molecules, Metabolism and Cells (Adv)

8 credit points. Dr Denyer, Dr Hancock, Biochemistry staff. **Session**: 2. **Classes**: 3 lec & 5 prac/wk, voluntary tutorials & advanced tutorials. **Qualifier**: Distinction in MBLG (2001 or 2901). **Prohibition**: May not be counted with AGCH 2001 or BCHM (2002 or 2102). **Assessment**: One 3hr & one 1hr theory exam, one 2hr theory of prac exam, prac tasks, special assignments.

The lecture and practical components are the same as for BCHM 2002. Selected students will be set special advanced assignments, and attend advanced tutorials.

Textbooks

Garrett RH & Grisham CM. Biochemistry. Saunders 1999

Resource Manual for Biochemistry 2 Practical Sessions, Sem 2

Study Resource for Biochemistry 2002 (Study Guides and Past Papers)

BCHM 2112 Molecules, Metabolism and Cells (Lab)

4 credit points. Dr Dale Hancock. **Session**: 2. **Classes**: 1 tut & 3 prac/wk. **Prerequisite**: BCHM 2102. **Prohibition**: BCHM (2002 or 2902). **Assessment**: One 2hr exam and 4 prac assessment tasks.

This unit of study comprises the laboratory component of BCHM 2002.

Textbooks

Laboratory Resource Manual

Biochemistry Senior units of study

BCHM 3001 Mol Biology and Structural Biochemistry

12 credit points. Dr Easterbrook-Smith, Mrs Johnston, Biochemistry staff. **Session**: 1. **Classes**: 4 lec & 8 prac/wk. **Prerequisite**: A total of at least 16 credit points of Intermediate MBLG and BCHM units. For BMedSc students: 32 credit points of Intermediate BMED units including BMED (2501, 2502 and 2504). **Prohibition**: May not be counted with BCHM 3901. **Assessment**: One 3hr exam, one 2hr exam, prac work.

This unit of study is designed to build on the units of study MBLG 2001 and BCHM 2002. It provides comprehensive training in molecular biology (with emphasis on eukaryotic systems) and structural biochemistry.

The lectures are divided into two topic areas. The Molecular Biology section provides a thorough description of modern molecular biology, particularly the molecular basis of cell cycle control, the biochemistry of apoptosis, proteins that mediate gene expression, investigating promotor activity and enhancer action, the biochemical basis of differentiation of eukaryotic cells, the molecular basis of imprinting, the role of RNA in gene expression and molecular techniques for understanding regulation. The Structural Biochemistry section addresses the important areas of protein structure and protein folding in vivo, ligand binding, macromolecular interactions and examples of structure based drug design.

Practical: The practical component is designed to complement the lecture series and to provide students with experience in a wide range of techniques used in molecular biology and protein biochemistry laboratories. Practical classes run for an average of 8 hours over 2 days. Students are allocated to the Monday/Tuesday class or to the Wednesday/Thursday class according to their other subjects.

Textbooks

Lewin B.Genes VII. OUP. 2000

Branden C. and Tooze J. Introduction to Protein Structure. 2nd edition, 1999, Garland

BCHM 3002 Cellular and Medical Biochemistry

12 credit points. Dr Easterbrook-Smith, Mrs Johnston, Biochemistry staff. **Session**: 2. **Classes**: 4 lec & 8 prac/wk. **Prerequisite**: A total of at least 16 credit points of Intermediate MBLG and BCHM units. For BMedSc

students 32 credit points of Intermediate BMED units including BMED (2501, 2502 and 2504). **Prohibition**: May not be counted with BCHM (3902, 3004 or 3904). **Assessment**: One 3hr exam, one 2hr exam, prac work.

This unit of study is designed to build on the units of study MBLG 2001 and BCHM 2002. It involves the integration of basic knowledge in Biochemistry and Molecular Biology to give an understanding at the molecular level, of the function of cells and the body as a whole.

The lectures are divided into several areas including: signal transduction and the molecular basis of cell:cell interactions, the biochemistry of membrane transport, phagocytosis and receptormediated endocytosis, protein trafficking in eukaryotic cells,

molecular immunology and its applications to cellular biochemistry, medical molecular biology, and links between intermediary metabolism and cellular biochemistry The biochemical basis of some diseases, especially cancer and diabetes, will be used to illustrate many of these topics.

Practical: The practical component is designed to complement the lecture series and to provide students with experience in a wide range of techniques used in modern biochemistry laboratories. Practical classes run for an average of 8 hours over 2 days. Students are allocated to the Monday/Tuesday class or to the Wednesday/Thursday class according to their other subjects.

Practical: The practical component is designed to complement the lecture series and to provide students with experience in a wide range of techniques used in modern biochemistry laboratories. Practical classes run for an average of 8 hours over 2 days. Students are allocated to the Monday/Tuesday class or to the Wednesday/Thursday class according to their other subjects.

Textbooks

Cooper GM. The Cell: A Molecular Approach. ASM Press, 2000

BCHM 3004 **Cellular and Medical Biochemistry MoI**

12 credit points. Dr S B Easterbrook-Smith. **Session**: 2. **Classes**: 4 lec & 8 prac/wk & 4 seminars. **Prerequisite**: A total of at least 16 credit points of Intermediate MBLG and BCHM units. **Prohibition**: BCHM (3002, 3902 or 3904). **Assessment**: One 3hr & one 2 h exam, prac work.

This unit of study is the same as BCHM 3002, except for the addition of four special molecular biology and genetics discussion sessions.

Textbooks

As for BCHM 3002.

BCHM 3005 **Computational Biochemistry**

4 credit points. Dr Peter Mulquiney, Prof Philip Kuchel. **Session**: N/A in 2004. **Classes**: Average 1.5 lec & 2.5 prac/wk. **Assumed knowledge**: 12 credit points of Junior Chemistry. **Prerequisite**: 8 credit points of Intermediate Mathematics units of study. Strongly recommend two of the following: MATH (2001/2901, 2002/2902, 2003/2903, 2005/2905, 2006/2906). **Prohibition**: May not be counted with BCHM 3905. **Assessment**: Project report 50%, 2 hr exam 50 %.

The behaviour of cells and organs is the result of large and complex networks of molecular processes. To fully appreciate how these molecular events result in physiological function at the cellular level, and in turn, at the tissue and organ levels, computational analysis is required.

This unit provides an introduction to the theory and techniques used to develop computational models of biochemical and cellular processes. The unit will cover the kinetics of single enzyme reactions, transport processes and ion channels; coupled enzymic reactions; linear and branched arrays of reactions with positive and negative feed-back and feed forward control; and the underlying numerical procedures used in solving arrays of non-linear differential equations. Then a systematic development of metabolic control theory will be given. We will also cover techniques for parameter estimation and will finish the unit by examining models of a number of important biochemical and physiological processes such as: cardiac action potential wave propagation, calcium oscillations and waves, the regulation of gene expression, and cell signaling processes. A major component of assessment will be a project carried out in the second half of the unit.

Textbooks

Mulquiney, PJ & Kuchel PW, Modelling Metabolism with Mathematica (prior to publication in 2003, available on-line or as a CD from Dr Peter J. Mulquiney or Professor Philip W. Kuchel).

BCHM 3098 **Functional Genomics and Proteomics**

6 credit points. Dr K Downard. **Session**: 1. **Classes**: 3 lec & 1 tut/wk, 4 workshops or major assignments. **Assumed knowledge**: BCHM 2011. **Prerequisite**: MBLG (2001 or 2901) or at least 32 credit points of intermediate BMED units including BMED (2501 and 2502 and 2504). **Assessment**: One 3 hour theory exam, tutorials, and workshops/assignments.

NB: Recommended unit of study for all molecular biotechnology third-year students.

This unit of study will introduce students to the emerging fields of functional genomics and proteomics and will focus on principles and methodologies associated with mapping of genomes, understanding gene function and expression, and identifying the structure and function of the proteins that these genes express. The course consists of four sections or modules on Functional Genomics, Structural Genomics, Proteomics, and Bioinformatics and Computational Biochemistry. Each section or module comprises approximately 10 lectures, tutorials and one-day workshop or assignment and will cover the following areas: mapping and sequencing of the human genome, complexity of the human genome compared to prokaryotes, protein expression in eukaryotes and prokaryotes, levels and implications for proteome analysis, introduction to protein identification, introduction to functional genomics, Rosetta stone concept, gene technology including expressed sequence tags, serial analysis gene expression (SAGE), microbead technology, cDNA and olignucleotide microarrays, statistical analysis and clustering methods, mutagenesis screens, two and three-hybrid screening, experimental methods used in structural genomics – xray and nmr spectroscopy, protein domains and organization, protein-protein interactions, global versus functional proteomics, protein recovery from cells and tissues, platforms and technologies for automated protein identification and quantitation, two-dimensional gel electrophoresis, visualisation methods, robotic gel excision and blotting, mass spectrometry, mass maps and sequence tags, tandem mass spectrometry and protein sequencing, automation and sample handling, membranes and other supports, protein microarrays and protein chips, genome and protein databases, HTML and other Web based languages, tools for sequence identification and alignment, scoring factors, protein structure prediction, homology and other modelling methods, threading, visualisation tools and dynamic simulations of protein folding.

Textbooks

Gibson and Muse, A Primer in Genome Science, Sinauer Associates Inc., 2002

Pennington and Dunn (eds.) Proteomics – from protein sequence to function, Springer-Verlag 2001

BCHM 3901 **Mol Biology and Structural Biochem (Adv)**

12 credit points. Dr Easterbrook-Smith, Mrs Johnston, Biochemistry staff. **Session**: 1. **Classes**: 4 lec & 8 prac/wk & 4 seminars. **Prerequisite**: Distinction in a total of at least 16 credit points from Intermediate MBLG and BCHM units. For BMedSc students: 32 credit points of Intermediate BMED units including Distinctions in BMED (2501, 2502 and 2504). **Prohibition**: BCHM 3001. **Assessment**: One 3hr exam, one 2hr exam, assignment, prac work.

The lecture and practical components of this unit of study are the same as for BCHM 3001. Qualified students will attend seminars/practical classes related to the topics covered in the core lectures in this unit of study.

Textbooks

Lewin B. Genes VII, OUP. 2000

Branden C. and Tooze J. Introduction to Protein Structure. 2nd edition, 1999, Garland.

BCHM 3902 **Cellular and Medical Biochemistry (Adv)**

12 credit points. Dr Easterbrook-Smith, Mrs Johnston, Biochemistry staff. **Session**: 2. **Classes**: 4 lec & 8 prac/wk & 4 seminars. **Prerequisite**: Distinction in a total of at least 16 credit points from Intermediate MBLG and BCHM units. For BMedSc students: 32 credit points of Intermediate BMED units including Distinctions in BMED (2501, 2502 and 2504). **Prohibition**: May not be counted with BCHM (3002, 3004 and 3904). **Assessment**: One 3hr exam, one 2hr exam, assignment, prac work.

The lecture and practical components of this units of study are the same as for BCHM 3002. Qualified students will attend seminars/practical classes related to the topics covered in the core lectures in this unit of study.

Textbooks

Cooper GM. The Cell: A Molecular Approach. ASM Press. 2000

BCHM 3904 **Cellular and Med Biochemistry MoI (Adv)**

12 credit points. Dr Easterbrook-Smith, Mrs Johnston, Biochemistry staff. **Session**: 2. **Classes**: 4 lec & 8hr/wk & 4 seminars. **Prerequisite**: Distinction in a total of at least 16 credit points from Intermediate MBLG and BCHM units. **Prohibition**: May not be counted with BCHM (3002, 3902 or 3004). **Assessment**: One 3hr exam, one 2hr exam, assignment, prac work.

NB: This unit of study is available to students in the Bachelor of Science (Molecular Biology and Genetics) only.
This unit of study is the same as BCHM 3002/3902 except for the addition of seminars and discussions in this discipline.
Textbooks
Cooper GM. The Cell: A Molecular Approach. ASM Press, 2000

BCHM 3905 **Computational Biochemistry (Advanced)**

4 credit points. Dr Peter Mulquiney, Prof Philip Kuchel. **Session**: N/A in 2004. **Classes**: Average 1.5 lec & 2.5 prac/wk. **Assumed knowledge**: 12 credit points of Junior Chemistry. **Prerequisite**: Credit average in 8 credit points of Intermediate Mathematics units of study. Strongly recommend two of the following: MATH (2001/2901, 2002/2902, 2003/2903, 2005/2905, 2006/2906). **Prohibition**: May not be counted with BCHM 3005. **Assessment**: Project report 50%, 2 h exam 50 %.

The behaviour of cells and organs is the result of large and complex networks of molecular processes. To fully appreciate how these molecular events result in physiological function at the cellular level, and in turn, at the tissue and organ levels, computational analysis is required.

This unit provides an introduction to the theory and techniques used to develop computational models of biochemical and cellular processes. The unit will cover the kinetics of single enzyme reactions, transport processes and ion channels; coupled enzymic reactions; linear and branched arrays of reactions with positive and negative feed-back and feed forward control; and the underlying numerical procedures used in solving arrays of non-linear differential equations. Then a systematic development of metabolic control theory will be given. We will also cover techniques for parameter estimation and will finish the unit by examining models of a number of important biochemical and physiological processes such as: cardiac action potential wave propagation, calcium oscillations and waves, the regulation of gene expression, and cell signaling processes. A major component of assessment will be a project carried out in the second half of the unit.
Textbooks
Mulquiney, PJ & Kuchel PW, Modelling Metabolism with Mathematica (prior to publication in 2003, available on-line or as a CD from Dr Peter J. Mulquiney or Professor Philip W. Kuchel).

Biochemistry Honours

Dr Crossley, Biochemistry Staff

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 is not normally available). It provides the opportunity for research on a project supervised by a particular staff member, as well as the study of advanced and developing aspects of Biochemistry. During the year each student is required to write one essay, for which there is a choice of topics. Assessment of the year's work is based largely on the student's performance on the research project, and a written report on the project. During the second semester of the Senior Biochemistry units of study students are invited to apply for permission to enrol in the Honours units of study and are provided with a list of possible research projects. Potential research topics currently offered to students include:

- Anticancer drugs: synthesis and mechanism of action.
- Biochemistry of cellular signal transduction
- The cause of diabetes and/or obesity
- Structure and function of clusterin, a molecular chaperonin
- X-ray crystallography of proteins and drug DNA complexes
- Metabolic pathways in boar spermatozoa
- NMR studies of the solution structure of DNA binding proteins
- NMR studies of membrane transport and metabolism in cells
- Eukaryotic transcription factors
- Bioavailability of trace elements and biochemical indicators of their nutritional status
- The effect of fibre on blood and urinary estrogens
- Proteomics
- Bioinformatics
- Protein structure modeling
- Mass Spectroscopy
- Genomics
- Chromosome replication and cell division in bacteria
- Molecular biology of humans and yeasts
- Gene expression in transgenic mice
- Nutrition and cardiovascular risk factors
- Effects of dietary fatty acids on platelet function
- Glycaemic index of foods; oligosaccharides in human milk.

Students must arrange to speak with potential supervisors. An application form is attached to the list of possible research projects provided to students or is available from the Honours coordinator and they are asked to provide the names of at least four supervisors in order of preference. A decision on the Honours intake is made before Christmas. An attempt is made to assign students to the supervisor of their choice but this will not always be possible. In difficult cases there is further discussion with the student.

The usual requirement for acceptance into the Honours program is a pass at the Credit level in 12 credit points of Senior Biochemistry. Additionally, strong students with relevant training (ie, Chemistry, Biology and Medical Sciences) may be admitted by permission of the Head of School. It should be noted that the number of students accepted into the Honours program may be limited because of resource restrictions (eg, 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 Table at the end of this chapter.

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 even 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 BSc (Bioinformatics) students with knowledge in key areas of relevance to Bioinformatics. Hence, in the first year of their study, students devote time to units of study offered by the School of Mathematics and Statistics, School of Biological Sciences, School of Chemistry, and School of Information Technologies (see Table 1A). In the second and third year of their study, students divide time equally between the biosciences and the computational sciences (including mathematics and statistics), choosing units of study from those offered by the School of Biological Sciences, Molecular and Microbial Biosciences, Information Technologies, Mathematics and Statistics, Physics and the Department of Pharmacology(see Table 1A).

In the third year of their study, the students complete a unit of study (ie, BINF 3001 Bioinformatics Project) that is designed specifically with the aim to give them a chance to do real research, supervised by scientists from the bio-medical disciplines.

BINF 3001 **Bioinformatics Project**

8 credit points. Dr Lars Jermiin, A/Prof Ian Spence. **Session**: 2. **Classes**: 1 hr meeting with supervisor and 7hr project work/wk; 3–4 introductory lectures given by supervisor. **Prerequisite**: SOFT (2004 or 2904) and 16 credit points from intermediate Biology, Biochemistry, Microbiology, Molecular Biology and Genetics and/or Pharmacology. **Prohibition**: May not be counted with COMP 3206. **Assessment**: Quality of proposal (10%), application (50%), and report (40%). The assessment is done at a group level (groups comprose several students) for quality of proposal and application, and at the individual level for the report.

This unit of study is building on a real-case scenario involving an IT company and its clients, employers and employees. The client (ie, a university researcher with an interest inn bioinformatics) contacts the company with the aim to obtain a bioinformatics application that will assist him/her in the pursuit of new avenues of research and service provision. Terms of reference are drafted with the project managers (ie, the academics responsible for the unit of study) of the IT company, and are then presented to a small group of employees (ie, the students), who design and implement a plan of how to write and deliver the software.

■ Biological Sciences

Advice on units of study

Members of the Biology staff are normally present among Faculty Advisers during enrolment week. Any student needing advice before enrolling should make an appointment to see a Departmental adviser from the School of Biological Sciences.

Assistance during semester
The offices of Junior year Biology staff are on the 5th floor of Carslaw. Students can make appointments by signing the form on the door of the offices of members of the academic staff members. Students are strongly advised to get acquainted with the staff and to use this service.
Summer School: January-February.
This School 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

BIOL 1001 Concepts in Biology
6 credit points. **Session**: 1, Summer. **Classes**: 3 lec & 3 hrs prac/wk. **Assumed knowledge**: No previous knowledge required. Students who have not taken HSC biology are recommended to take the Biology Bridging Course. **Prohibition**: BIOL (1101 or 1901 or 1500). **Assessment**: One 2.5hr exam, assignments, classwork.
Concepts in Biology is an introduction to the major themes of modern biology. Starting with interactions between organisms in biological communities, we move on to the diversity of microorganisms. This is followed by introductory cell biology, which particularly emphasises how cells obtain and use energy, and leads into an introduction to molecular biology through the role of DNA in protein synthesis and development. The genetics of organisms is then discussed, leading to consideration of theories of evolution and the origins of the diversity of modern organisms. It is recommended that BIOL (1001 or 1101 or 1901) be taken before all Semester 2 Junior units of study in Biology.
Textbooks
Knox R B et al. Biology. McGraw-Hill, 2nd ed, 2001.

BIOL 1101 Biology – Ecosystems to Genes
6 credit points. **Session**: 1. **Classes**: 3 lec & 3 hrs. prac/wk. **Prerequisite**: HSC 2-unit Biology or equivalent. **Prohibition**: BIOL(1001 or 1901 or 1500). **Assessment**: One 2.5hr exam, assignments, classwork.
Biology – Ecosystems to Genes builds on a satisfactory prior knowledge of the HSC 2-unit biology course. A brief revision of the basic concepts of the high school course is given. Biology – Ecosystems to Genes builds on the main themes introduced in HSC biology to provide a background to the breadth of biology, including genetics of organisms, theories of evolution/origins of diversity of modern organisms, diversity of microorganisms, cell biology with emphasis on how cells obtain and use energy, modern molecular biology and interactions between organisms in biological communities. It is recommended that BIOL (1001 or 1101 or 1901) be taken before all other Junior units of study in Biology
Textbooks
Knox R B et al. Biology. McGraw-Hill, 2nd ed, 2001

BIOL 1901 Biology- Ecosystems to Genes (Advanced)
6 credit points. **Session**: 1. **Classes**: 3 lec & 3 hrs prac/wk. **Prerequisite**: 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. **Prohibition**: BIOL (1001 or 1101 or 1500). **Assessment**: One 2.5hr exam, assignments, classwork.
NB: Department permission required for enrolment.
This unit of study is a more demanding alternative component of Biology – Ecosystems to Genes.

BIOL 1002 Living Systems
6 credit points. **Session**: 2. **Classes**: 3 lec, 1 sessions independent study & 2 hrs. prac/wk. **Assumed knowledge**: HSC 2-unit Biology. Students who have not undertaken an HSC biology course are strongly advised to complete a biology bridging course before lectures commence. **Prohibition**: BIOL (1902 or 1500). **Assessment**: One 2.5hr exam, assignments, classwork.
Living Systems deals with the biology of all sorts 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. It is recommended that BIOL (1001 or 1101 or 1901) be taken before this unit of study. This unit of study, together with BIOL (1001 or 1101 or 1901) provides entry to all Intermediate units of study in biology in the School of Biological Sciences.
Textbooks
Knox R B et al. Biology. McGraw-Hill, 2nd ed, 2001.

BIOL 1902 Living Systems (Advanced)
6 credit points. **Session**: 2. **Classes**: 3 lec, 1 session independent study & 2 hrs. prac/wk. **Prerequisite**: 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. **Prohibition**: BIOL (1002 or 1904 or 1905 or 1500). **Assessment**: One 2.5hr exam, assignments, classwork.
NB: Department permission required for enrolment.
This unit of study is a more demanding alternative component of Living Systems.

BIOL 1003 Human Biology
6 credit points. **Session**: 2, Summer. **Classes**: 2 lec, 1 session independent study & 3 prac/wk. **Assumed knowledge**: HSC 2-unit Biology. Students who have not undertaken an HSC biology course are strongly advised to complete a biology bridging course before lectures commence. **Prohibition**: BIOL (1903 or 1500) or EDUH 1016. **Assessment**: One 2.5hr exam, assignment, classwork.
This unit of study provides an introduction to human evolution and ecology, cell biology, physiology and anatomy, through both lectures and practical work. It begins with human evolution, human population dynamics and the impact of people on the environment. The unit of study includes human nutrition, distribution of essential requirements to and from the cells, control of body functions and defence mechanisms. After discussion of reproduction and development, it concludes with some modern studies and research in biotechnology and human genetics. It is recommended that BIOL (1001 or 1101 or 1901) be taken before this unit of study. Enrolment may be restricted by the availability of places. This unit of study, together with BIOL (1001 o r1101 or 1901), provides entry to Intermediate units of study in Biology, but the content of BIOL (1002 or 1902) is assumed knowledge for BIOL (2001 or 2002 or 2003 and 2004) and students entering from BIOL (1003 or 1903) will need to do some preparatory reading.
Textbooks
Seeley, RR et al. Essentials of Anatomy and Physiology. McGraw Hill, 4th ed, 2002
Benjamin C L. et al. Human Biology. McGraw Hill, 2000 (Chapters 19, 20, 21, 22)

BIOL 1903 Human Biology (Advanced)
6 credit points. **Session**: 2. **Classes**: 2 lec, 1 session independent study & 3 hrs prac/wk. **Prerequisite**: 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. **Prohibition**: May not be counted with BIOL (1003 or 1904 or 1905 or 1500) or EDUH 1016. **Assessment**: One 2.5hr exam, assignment, classwork.
NB: Department permission required for enrolment.
This unit of study is a more demanding alternative component of Human Biology.
Textbooks
Seeley, RR et al. Essentials of Anatomy and Physiology. McGraw Hill, 4th ed, 2002
Benjamin C L. et al. Human Biology. McGraw Hill, 2000 (Chapters 19, 20, 21, 22)

BIOL 1904 Living Systems Molecular (Advanced)
6 credit points. **Session**: 2. **Classes**: 3 lec, 1session independent study & 2hrs prac/wk, & 5 discussion sessions. **Assumed knowledge**: HSC 2-unit Biology or BIOL 1901 or equivalent. **Prohibition**: BIOL (1002 or 1003 or 1902 or 1903 or 1905 or 1500). **Assessment**: One 2.5hr exam, assignments, classwork and an assignment based on discussion sessions.
NB: This unit of study is available to students enrolled in the Bachelor of Science (Molecular Biology and Genetics) only.
This unit of study is the same as BIOL 1902 except for the addition of 5 special molecular biology and genetics discussion sessions, which consist of topical seminars and discussions in this discipline. An essay based on these discussions can be included as part of the assessment of the unit of study.

BIOL 1905 Human Biology Molecular (Advanced)
6 credit points. **Session**: 2. **Classes**: 2 lec, 1session independent study & 3hr prac/wk, & 5 discussion sessions. **Assumed knowledge**: HSC 2-unit Biology or BIOL 1901 or equivalent. **Prohibition**: BIOL (1002 or 1003 or 1902 or 1903 or 1904 or 1500). **Assessment**: One 2.5hr exam, assignments, classwork and an assignment based on discussion sessions.
NB: This unit of study is available to students enrolled in the Bachelor of Science (Molecular Biology and Genetics) only.
This unit of study is the same as BIOL 1903 except for the addition of 5 special molecular biology and genetics discussion sessions, which consist of topical seminars and discussions in

this discipline. An essay based on these discussions can be included as part of the assessment of the unit of study.

Biology Intermediate units of study

Students who wish to take Intermediate Biology units of study should obtain Information for Students Considering Intermediate Biology units of study from the School Office (Science Rd Cottage, A10). Students should discuss their preferences, 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.

MBLG (2001 or 2901 or 2101) is highly recommended to be taken by Science students in combination with all 8 credit point Intermediate Biology units of study, and is a qualifying unit for BIOL (3018, 3025, 3026, 3027). Note that MBLG (2001 or 2901) is a prerequisite for students wishing to enrol in MBLG (2002 or 2902). See entry for MBLG 2002, 2902 and 2102, and under the heading Molecular Biology and Genetics.

The following Intermediate units of study are offered:

February Semester

Group 1

- BIOL 2001 Invertebrate Zoology
- BIOL 2101 Invertebrate Zoology – Theory
- BIOL 2901 Invertebrate Zoology (Advanced)

Group 3

- BIOL 2004 Plant Ecology and Diversity
- BIOL 2904 Plant Ecology and Diversity (Advanced)

Group 6

- BIOL 2006 Cell Biology
- BIOL 2106 Cell Biology – Theory
- BIOL 2906 Cell Biology (Advanced)

July Semester

Group 2

- BIOL 2002Vertebrates and their Origins
- BIOL 2102Vertebrates and their Origins – Theory
- BIOL 2902 Vertebrates and their Origins (Advanced)

Group 4

- BIOL 2003 Plant Anatomy and Physiology
- BIOL 2903 Plant Anatomy and Physiology (Advanced)

Group 5

- MBLG 2002 Molecular Biology and Genetics B
- MBLG 2102 Molecular Biology and Genetics B – Theory
- MBLG 2902 Molecular Biology and Genetics B (Advanced)

Group 7

- BIOL 2007 Introductory Entomology

Not more than one unit of study may be taken from each group. Qualifying units of study for certain Senior Biology units of study are defined as combinations of 8 credit points Intermediate Biology units of study (see the Senior unit of study descriptions or Information for Students booklets).

BIOL 2001 Invertebrate Zoology

8 credit points. A/Prof M B Thompson, Dr E L May. **Session**: 1. **Classes**: 3 lec, 1 tut & 1 prac/wk or 4 lec & 1 prac/wk. **Prerequisite**: 12 credit points of Junior Chemistry. For students in the BSc (Marine Science) stream: 6 credit points of Junior Chemistry and either an additional 6 credit points of Junior Chemistry or 6 credit points of Junior Physics. **Qualifier**: BIOL (1001 or 1101 or 1901) and either BIOL (1002 or 1902 or 1003 or 1903) or EDUH 1016 (for BEd (Secondary) (Human Movement and Health Education)). **Prohibition**: May not be counted with BIOL (2101 or 2901). **Assessment**: Mid-semester test, one 2hr theory exam, one 2hr prac exam, 1 essay, tutorial work.

NB: The completion of MBLG (2001 or 2901 or 2101) is highly recommended. The content of BIOL (1002 or 1902) is assumed knowledge and students entering from BIOL (1003 or 1903) will need to do some preparatory reading.

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 evolution, phylogeny and biodiversity and provide opportunity to develop communication skills. The unit of study is designed to be taken in conjunction with BIOL 2002 Vertebrates and their Origins; the two units of study together provide complete coverage of the diversity of animals at the level of phylum. This unit of study may be taken alone, but when taken with BIOL 2002 provides entry into certain Senior Biology units of study.

BIOL 2901 Invertebrate Zoology (Advanced)

8 credit points. A/Prof M B Thompson, Dr E L May. **Session**: 1. **Prerequisite**: 12 credit points of Junior Chemistry. For students in the BSc (Marine Science) stream: 6 credit points of Junior Chemistry and either an additional 6 credit points of Junior Chemistry or 6 credit points of Junior Physics. **Qualifier**: Distinction average in BIOL (1001 or 1101 or 1901) and one of BIOL (1002 or 1902 or 1003 or 1903). These requirements may be varied and students with lower averages should consult the unit Executive Officer. **Prohibition**: BIOL (2001 or 2101).

NB: The completion of MBLG (2001 or 2901 or 2101) is highly recommended. The content of BIOL (1002 or 1902) is assumed knowledge and students entering from BIOL (1003 or 1903) will need to do some preparatory reading.

Qualified students will participate in alternative components of BIOL 2001 Invertebrate Zoology. The content and nature of these components may vary from year to year.

BIOL 2101 Invertebrate Zoology – Theory

4 credit points. A/Prof M B Thompson, Dr E L May. **Session**: 1. **Classes**: 3 lec & 1 prac/wk. **Qualifier**: BIOL (1001 or 1101 or 1901) and either BIOL (1002 or 1902 or 1003 or 1903) or LWSC 1002 or EDUH 1016 (for BEd (Secondary) (Human Movement and Health Education)). **Prohibition**: BIOL (2001, 2901). **Assessment**: Mid-semester test, one 2hr theory exams one 1hr prac exam, optional assignment.

NB: The completion of MBLG (2001 or 2901 or 2101) is highly recommended. The content of BIOL (1002 or 1902) is assumed knowledge and students entering from BIOL (1003 or 1903) will need to do some preparatory reading. BIOL 2101 is not a prerequisite for Senior units of study in Biology.

This unit of study provides a broad background to the diversity of animals through lectures and museum-style displays. The material is presented within the conceptual framework of evolution and the principles and use of phylogeny and classification. It is suitable for students who are majoring in other areas of biology or other subjects but who wish to acquire an introduction to animal biology. The unit of study is designed to be taken with BIOL 2102 Vertebrates and their Origins – Theory. The diversity, morphology and evolution of most invertebrate phyla are presented.

BIOL 2002 Vertebrates and their Origins

8 credit points. A/Prof M B Thompson, Dr E L May. **Session**: 2. **Classes**: 3 lec, 1 tut & 3 prac/wk or 4 lec & 3 prac/wk & one field trip. **Prerequisite**: 12 credit points of Junior Chemistry. For students in the BSc(Marine Science) stream: 6 credit points of Junior Chemistry and either an additional 6 credit points of Junior Chemistry or 6 credit points of Junior Physics. **Qualifier**: BIOL (1001 or or 1101 or 1901) and either BIOL (1002 or 1902 or 1003 or 1903) or EDUH 1016 (for BEd (Secondary) (Human Movement and Health Education)). **Prohibition**: BIOL (2102 or 2902). **Assessment**: One 3hr theory exam, one 2hr prac exam, one assignment, one essay, tutorial work.

NB: The completion of MBLG (2001 or 2901 or 2101) is highly recommended. The content of BIOL (1002 or 1902) is assumed knowledge and students entering from BIOL (1003 or 1903) will need to do some preparatory reading.

This unit of study completes the grounding in the diversity of animals at the level of phylum introduced in BIOL 2001 Invertebrate Zoology by lectures, laboratory classes, and in the field with an intensive 3.5 day field trip. It focuses on vertebrates and the invertebrate phyla not covered in BIOL 2001. Lectures and discussion groups further explore concepts of evolution, phylogeny biodiversity and animal function. This unit of study complements BIOL 2001 and should preferably be taken after that unit of study. It is a prerequisite for most animal modules in Senior Biology.

BIOL 2902 Vertebrates and their Origins (Advanced)

8 credit points. A/Prof M B Thompson, Dr E L May. **Session**: 2. **Prerequisite**: 12 credit points of Junior Chemistry. For students in the BSc(Marine Science) stream: 6 credit points of Junior Chemistry and either an additional 6 credit points of Junior Chemistry or 6 credit points of Junior Physics. **Qualifier**: Distinction average in BIOL (1001 or or 1101 or 1901) and one of BIOL (1002 or 1902 or 1003 or 1903). These requirements may be varied and students with lower averages should consult the unit Executive Officer. **Prohibition**: BIOL (2002 or 2102).

NB: The completion of MBLG (2001 or 2901 or 2101) is highly recommended. The content of BIOL (1002 or 1902) is assumed knowledge and students entering from BIOL (1003 or 1903) will need to do some preparatory reading.

Qualified students will participate in alternative components of BIOL 2002 Vertebrates and their Origins. The content and nature of these components may vary from year to year.

BIOL 2102 Vertebrates and their Origins – Theory

4 credit points. A/Prof M B Thompson and Dr E L May. **Session**: 2. **Classes**: 3 lec & 1 prac/wk. **Qualifier**: BIOL (1001 or 1101 or 1901) and either BIOL (1002 or 1902 or 1003 or 1903) or LWSC 1002 or EDUH 1016 (for BEd (Secondary) (Human Movement and Health Education). **Prohibition**: BIOL (2002, 2902). **Assessment**: One 2hr theory exam, one 1hr prac exam, optional assignment.

NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended. The content of BIOL (1002 or 1902) is assumed knowledge and students entering from BIOL (1003 or 1903) will need to do some preparatory reading. Not a prerequisite for Senior units of study in Biology.

This unit of study provides an introduction to the diversity of animals at the level of phylum. It provides a broad background in the diversity of animals and an introduction to phylogeny through lectures and demonstration material in laboratory classes. It focuses on vertebrates and the invertebrate phyla not covered in BIOL 2101 Invertebrate Zoology – Theory. This unit of study is designed to be taken with BIOL 2101 and should preferably be taken after that unit of study. It is suitable for students who are concentrating on other areas of biology or other units of study but who wish to acquire a background in animal biology.

BIOL 2003 Plant Anatomy and Physiology

8 credit points. **Session**: 2. **Classes**: 2 lec, 1 prac/audiovisual & 1 tut/wk. **Prerequisite**: BIOL (1001 or 1101 or 1901) and either BIOL (1002 or 1902 or 1003 or 1903) or EDUH 1016 (for BEd (Secondary) (Human Movement and Health Education)). **Prohibition**: BIOL 2903. **Assessment**: Assessment one 2hr exam, one prac exam, practical reports.

NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended. The content of BIOL (1002 or 1902) is assumed knowledge and students entering from BIOL (1003 or 1903) will need to do some preparatory reading.

The unit of study explores basic concepts in structure-function relationships in plants and their component organs, tissues and cells. It covers fundamental processes in plant growth and development including photosynthesis, translocation, water transport, nutrition, responses to light and gravity, and the role of plant hormones. Special attention is given to the anatomy and physiology of the Australian flora and there is a focus on recent advances in plant molecular biology that have been critical in enhancing our understanding of plant systems. Lectures and self-instructional audiovisual study are augmented by group discussions and laboratory experiments. This unit of study complements BIOL 2004, leads up to advanced modules in Senior Biology including BIOL 3021 and BIOL 3022, and is essential for those seeking a career in plant molecular biology.

Textbooks

Taiz L, Zeiger E. 2002. Plant Physiology 3rd ed. Sunderland, Mass., Sinauer.

BIOL 2903 Plant Anatomy and Physiology (Advanced)

8 credit points. **Session**: 2. **Qualifier**: Distinction average in BIOL (1001 or 1101 or 1901) and one of BIOL (1002 or 1902 or 1003 or 1903). These requirements may be varied and students with lower averages should consult the unit Executive Officer. **Prohibition**: BIOL 2003.

NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended. The content of BIOL (1002 or 1902) is assumed knowledge and students entering from BIOL (1003 or 1903) will need to do some preparatory reading.

Qualified students will participate in alternative components of BIOL 2003. The content and nature of these components may vary from year to year. See prerequisites for Senior units of study in Biology.

BIOL 2004 Plant Ecology and Diversity

8 credit points. Dr McGee. **Session**: 1. **Classes**: 3 lec & 1 prac/wk, audiovisual. **Qualifier**: BIOL (1001 or 1101 or 1901) and either BIOL (1002 or 1902 or 1003 or 1903) or LWSC 1002 or EDUH 1016 (for BEd (Secondary) (Human Movement and Health Education)). **Corequisite**: MICR 2013 for BLWSc. **Prohibition**: BIOL 2904. **Assessment**: One theory exam, 1 prac exam, one report, classwork.

NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended. The content of Biology (1002 or 1902) is assumed knowledge and students entering from BIOL (1003 or 1903) will need to do some preparatory reading.

The unit of study provides an integrated overview of plant ecology and plant diversity. It examines how plants and fungi live in their natural environment, how their functions are affected by environmental changes and by other plants, and how the environment affects plant distribution. The rich diversity of plants is explored in relation to major evolutionary advances in their form and function. Practical aspects are covered in laboratory classes, audiovisual sessions, and a field trip. Each student is required to make a plant collection. This unit of study complements BIOL 2003 and leads up to plant modules in Senior Biology.

BIOL 2904 Plant Ecology and Diversity (Advanced)

8 credit points. Dr McGee. **Session**: 1. **Qualifier**: Distinction average in BIOL (1001 or 1101 or 1901) and one of BIOL (1002 or 1902 or 1003 or 1903). These requirements may be varied and students with lower averages should consult the unit Executive Officer. **Prohibition**: BIOL 2004.

NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended. The content of BIOL (1002 or 1902) is assumed knowledge and students entering from BIOL (1003 or 1903) will need to do some preparatory reading.

Qualified students will participate in alternative components of BIOL 2004. The content and nature of these components may vary from year to year. See prerequisites for Senior units of study in Biology.

BIOL 2006 Cell Biology

8 credit points. Dr J Marc. **Session**: 1. **Classes**: 3 lec & 4 prac hrs/wk. **Prerequisite**: 12 credit points of Junior Chemistry. For students in the BSc(Marine Science) stream: 6 credit points of Junior Chemistry and either an additional 6 credit points of Junior Chemistry or 6 credit points of Junior Physics. **Qualifier**: BIOL (1001 or or 1101 or 1901) and either BIOL (1002 or 1902 or 1003 or 1903 or 1904 or 1905) or EDUH 1016 (for BEd (Secondary) (Human Movement and Health Education)). **Prohibition**: BIOL (2106 or 2906). **Assessment**: One 3hr exam, pracs and assignments.

NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.

A unit of study on cell biology and development in plants and animals with emphasis on cellular functions and favouring the molecular perspective. Topics include cell and organelle structure, function and evolution, cellular development and differentiation, and embryonic development. The unit of study is given by means of lectures and laboratory classes. It is designed to complement intermediate Molecular Biology and Genetics units and leads into various senior modules in biology, including Ecophysiology, Animal Physiology, Plant Development, Plant Physiology, Terrestrial Vertebrates, and Bioinformatics.

Textbooks

Albert B, Johnson A, Lewis J, Raff M, Roberts K, Walter P. 2002. Molecular Biology of the Cell. 4th Edition. Garland Science

Alberts B, Bray D, Johnson A, Lewis J, Raff M, Roberts K, Walter P. 1998. Essential Cell Biology. Garland Publishing.

BIOL 2906 Cell Biology (Advanced)

8 credit points. Dr J Marc. **Session**: 1. **Classes**: 3 lec & 4 prac hrs/wk. **Prerequisite**: 12 credit points of Junior Chemistry. For students in the BSc(Marine Science) stream: 6 credit points of Junior Chemistry and either an additional 6 credit points of Junior Chemistry or 6 credit points of Junior Physics. **Qualifier**: Distinction average in BIOL (1001 or 1101 or 1901) and one of BIOL (1002 or 1902 or 1003 or 1903 or 1904 or 1905). These requirements may be varied and students with lower averages should consult the unit Executive Officer. **Prohibition**: BIOL (2006 or 2106). **Assessment**: One 3hr exam, pracs and assignments.

NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.

Qualifying students will participate in alternative components of BIOL 2006. The content and nature of these components may vary from year to year. This is a core intermediate unit in the BSc (Molecular Biology and Genetics) award course. See prerequisites for senior units of study in Biology.

Textbooks

Albert B, Johnson A, Lewis J, Raff M, Roberts K, Walter P. 2002, Molecular Biology of the Cell. 4th Edition. Garland Science

Alberts B, Bray D, Johnson A, Lewis J, Raff M, Roberts K, Walter P. 1998. Essential Cell Biology. Garland Publishing.

BIOL 2106 Cell Biology – Theory

4 credit points. Dr J Marc. **Session**: 1. **Classes**: 3 lec/wk. **Prerequisite**: 12 credit points of Junior Chemistry. For students in the BSc(Marine Science) stream: 6 credit points of Junior Chemistry and either an additional 6 credit points of Junior Chemistry or 6 credit points of Junior Physics. **Qualifier**: BIOL (1001 or 1101 or 1901) and either BIOL (1002 or 1902 or 1003 or 1903 or 1904) or EDUH 1016 (for BEd (Secondary) (Human Movement and Health Education)). **Prohibition**: BIOL (2006 or 2906). **Assessment**: One 3hr exam and assignments.

NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.

This unit of study provides a solid theoretical foundation in cellular and developmental biology. Topics include cell and organelle structure, function and evolution, cellular development

and differentiation, and embryonic development. It is presented in the form of lectures only; there are no tutorials or practical classes. This unit of study is not suitable for students wishing to continue with many senior modules in biology, for which BIOL 2006 and 2906 are appropriate.

Textbooks

Albert B, Johnson A, Lewis J, Raff M, Roberts K, Walter P. 2002. Molecular Biology of the Cell. 4th Edition. Garland Science

Alberts B, Bray D, Johnson A, Lewis J, Raff M, Roberts K, Walter P. 1998. Essential Cell Biology. Garland Publishing.

BIOL 2007 **Entomology Introductory**

8 credit points. Dr D Hochuli, Dr H Rose. **Session**: 2. **Classes**: 2 lec, 1–2 tut & 4 prac/wk. **Prerequisite**: 12 credit points of Junior Chemistry. For students in the BSc(Marine Science) stream: 6 credit points of Junior Chemistry and either an additional 6 credit points of Junior Chemistry or 6 credit points of Junior Physics. **Qualifier**: BIOL (1001 or 1101 or 1901) and either BIOL (1002 or 1902 or 1003 or 1903) or EDUH 1016 (for BEd (Secondary) (Human Movement and Health Education)). **Assessment**: One 3hr theory exam, assignments, insect collection.

NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended. The content of BIOL (1002 or 1902) is assumed knowledge and students entering from BIOL (1003 or 1903) will need to do some preparatory reading. See prerequisites for Senior units of study in Biology.

A general but comprehensive introduction to Insect Biology, this unit of study develops understanding of the scientific approach to insect structural diversity, identification, life histories, development, physiology, ecology, biogeography, principles of control, toxicology of insecticides and biology of major economic pests in NSW. Practicals give a working knowledge of major orders of insects economically important species, principles of collection, preservation and identification. Entomological data bases are introduced, and students do a library assignment and make and present a small collection of insects. Project work considers the use of insects in forensic investigations, insect-plant interactions and insects as tools for environmental assessment.

Biology Senior units of study

Students who intend to proceed from Intermediate to Senior Biology must:

(a) obtain Information for Students Considering Senior Biology units of study from the School Office (The Cottage, A10 Science Road). This booklet gives detailed synopses of all Senior Biology units of study.

(b) discuss their choice with a Biology Staff member before enrolling.

Sixteen 6 credit point units of study are offered. They are arranged in three compatible timetables:

Timetable 1

BIOL 3011 Ecophysiology. February Semester (first half)(MS)

BIOL 3012 Animal Physiology. February Semester (second half)

BIOL 3017 Fungal Biology. Summer Break and February Semester

BIOL 3021 Plant Development. July Semester (first half)

BIOL 3022 Plant Physiology. July Semester (second half)

(Plus Advanced versions of these – BIOL 39XX)

Timetable 2

BIOL 3013 Marine Biology. February Semester (second half)(MS)

BIOL 3014 Terrestrial Vertebrates. February Semester (first half)

BIOL 3015 Plant Systematics. February Semester (second half)

BIOL 3023 Ecology (Methods). July Semester (first half)(MS)

BIOL 3040 Marine Ecology. July Semester (second half)(MS)

BIOL 3041 Terrestrial Ecology. July Semester (second half)(MS)

BIOL 3042 Plant Ecology. July Semester (second half)(MS)

(Plus Advanced versions of these – BIOL 39XX)

Timetable 3

BIOL 3018 Applications of Recombinant DNA Technology. February Semester (first half)

BIOL 3025 Evolutionary Genetics and Animal Behaviour. July Semester (first half)

BIOL 3026 Developmental Genetics. July Semester (second half)

BIOL 3027 Bioinformatics and Genomics. February Semester (second half)

(Plus Advanced versions of these – BIOL 39XX)

Details of lectures and practical classes are given in the booklet: Information for Students Considering Senior 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 the Marine Ecology, BIOL 3040/3940. Entry to these modules would normally be based on academic performance.

The unit of study BIOL 3928 is only available to students in the Bachelor of Science (Molecular Biology and Genetics) and the Bachelor of Medical Science and BIOL 3929 is only available to students in the Bachelor of Science (Molecular Biology and Genetics). Students seeking further information about BIOL 3928 or BIOL 3929 should consult the relevant Tables earlier in this chapter as well as degree information in chapter 2 of this handbook.

Students majoring in Marine Science must do 24 credit points of units designated as Marine Science but are allowed to include from 6 to a maximum of 18 credit points of Senior Biology (from those marked MS) as part of Marine Science. If these credit points are taken as part of Marine Science 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 Senior 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 Senior Biology units of study.

BIOL 3011 **Ecophysiology**

6 credit points. Dr Seebacher. **Session**: 1a. **Classes**: 4 lec and 8 prac/wk. **Prerequisite**: 16 credit points of Intermediate Biology including BIOL (2002 or 2003 or 2006 or 2902 or 2903 or 2906). **Prohibition**: BIOL 3911. **Assessment**: One 1.5 hr exam, field trip seminar, laboratory reports.

NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.

Ecophysiology is a conceptually based unit of study that covers physiological interactions between organisms and their environments. The importance of environmental parameters, such as temperature, water, salt and pH, for biological functions, are investigated. Physiological interactions among animals, plants and fungi are discussed. Examples will have an emphasis on vertebrates and marine organisms. As part of the field component, students design their own research project to be conducted during the week-end long field trip.

BIOL 3911 **Ecophysiology (Advanced)**

6 credit points. Dr Seebacher. **Session**: 1a. **Classes**: 4 lec and 8 prac/wk. **Prerequisite**: Distinction average in 16 credit points of Intermediate Biology including BIOL (2002 or 2003 or 2006 or 2902 or 2903 or 2906). These requirements may be varied and students with lower averages should consult the unit Executive Officer. **Prohibition**: May not be counted with BIOL 3011. **Assessment**: One 1.5 hr exam, field trip seminar, independent project report.

NB: The completion of MBLG (2001 or 2101 or 2901) 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 20% of Ecophysiology). The content and nature of the independent project vary and students are encouraged to design their own project.

BIOL 3012 **Animal Physiology**

6 credit points. A/Prof Thompson. **Session**: 1b. **Classes**: 4 lec and 8 prac/wk. **Prerequisite**: 16 credit points of Intermediate Biology including BIOL (2002 or 2003 or 2006 or 2902 or 2903 or 2906). **Prohibition**: May not be counted with BIOL 3912. **Assessment**: One 1.5 hr exam, laboratory/library reports.

NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.

Animal Physiology explores aspects of the physiology of animals and how physiology is influenced by environmental

factors. The emphasis of the unit of study is vertebrate animals, although invertebrate examples will be used where appropriate. The unit of study is designed to complement Ecophysiology. Particular emphasis will be placed on energy metabolism and respiration in a range of animals and how that is affected by body mass and locomotion.

BIOL 3912 **Animal Physiology (Advanced)**

6 credit points. A/Prof Thompson. **Session**: 1b. **Classes**: 4 lec and 8 prac/wk. **Prerequisite**: Distinction average in 16 credit points of Intermediate Biology including BIOL (2002 or 2003 or 2006 or 2902 or 2903 or 2906). These requirements may be varied and students with lower averages should consult the unit Executive Officer. **Prohibition**: May not be counted with BIOL 3012. **Assessment**: One 1.5 hr exam, laboratory reports, independent project report.

NB: The completion of MBLG (2001 or 2101 or 2901) 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.

BIOL 3013 **Marine Biology**

6 credit points. **Session**: 1b. **Classes**: 4 lec & 8 prac/wk. **Assumed knowledge**: MARS 2002. **Prerequisite**: 16 credit points of Intermediate Biology, including BIOL (2001 or 2002 or 2003 or 2004 or 2901 or 2902 or 2903 or 2904). **Prohibition**: May not be counted with BIOL 3913. **Assessment**: Practical reports, paper criticisms and other assignments.

NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.

We will examine in detail processes which 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.

BIOL 3913 **Marine Biology (Advanced)**

6 credit points. **Session**: 1b. **Classes**: 4 lec & 8 prac/wk. **Assumed knowledge**: MARS 2002. **Prerequisite**: Distinction average in 16 credit points of Intermediate Biology including BIOL (2001 or 2002 or 2003 or 2004 or 2901 or 2902 or 2903 or 2904). These requirements may be varied and students with lower averages should consult the unit Executive Officer. **Prohibition**: May not be counted with BIOL 3013. **Assessment**: Practical reports, paper criticisms and other assignments.

NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.

Qualified students will participate in alternative components of the BIOL 3103 Marine Biology unit. The content and nature of these components may vary from year to year.

BIOL 3014 **Biology of Terrestrial Vertebrates**

6 credit points. **Session**: 1a. **Classes**: 4 lec & 8 prac/wk. **Prerequisite**: 16 credit points of Intermediate Biology. **Prohibition**: May not be counted with BIOL 3914. **Assessment**: One 1.5hr exam, laboratory report, seminar, one 1 hr practical examination.

NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.

This unit of study will review the biology and evolution of terrestrial vertebrate fauna, with emphasis on ecological and behavioural adaptations to the Australian environment. The adaptive radiations of amphibians, reptiles, birds and mammals will be discussed. Conservation issues involved with these taxa will also be a focus of the course. The unit aims to provide an overview of the distinctive features of the Australian environment, and how those peculiarities have shaped the way that terrestrial vertebrates have evolved in this continent.

BIOL 3914 **Biology of Terrestrial Vertebrates (Adv)**

6 credit points. **Session**: 1a. **Classes**: 4 lec & 8 prac/wk. **Prerequisite**: Distinction average in 16 credit points of Intermediate Biology. These requirements may be varied and students with lower averages should consult the unit Executive Officer. **Prohibition**: May not be counted with BIOL 3014. **Assessment**: One 1.5hr exam, laboratory report, seminar, one 1hr prac exam.

NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.

Compared to the associated unit of study BIOL 3014, the Advanced unit has less practical work but contains an independent research project.

BIOL 3015 **Plant Systematics and Biogeography**

6 credit points. Dr Henwood. **Session**: 1b. **Classes**: 4 lec & 8 prac/wk. **Prerequisite**: 16 credit points of Intermediate Biology including BIOL (2004 or 2904). **Prohibition**: May not be counted with BIOL 3915. **Assessment**: One 1.5hr exam, assignments.

NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.

This unit of study will deal with the reproductive biology, biogeography and evolution of flowering plants. Students will be introduced to the latest methodologies and data sources employed in identifying evolutionary units (both past and present) and reconstructing their phylogenetic relationships. The general application of systematics – for example in ecology and conservation – will be considered.

BIOL 3915 **Plant Systematics and Biogeography (Adv)**

6 credit points. Dr Henwood, Dr Taylor. **Session**: 1b. **Classes**: 4 lec & 8 prac/wk. **Prerequisite**: Distinction average in 16 credit points of Intermediate Biology including BIOL (2004 or 2904). These requirements may be varied and students with lower averages should consult the unit Executive Officer. **Prohibition**: May not be counted with BIOL 3015. **Assessment**: One 1.5hr exam, assignments.

NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.

See BIOL 3015.

BIOL 3017 **Fungal Biology**

6 credit points. Dr P McGee. **Session**: 1a. **Classes**: 5 lec & 15 prac in a two week intensive program immediately prior to semester one (labs run from 23 February to 5 March 2004), plus the equivalent of 30hrs self-guided study during the semester. **Prerequisite**: 16 credit points of Intermediate Biology, or 8 credit points of Intermediate Biology and 8 Intermediate credit points of either Microbiology or Geography, or their equivalent. **Prohibition**: May not be counted with BIOL 3917. **Assessment**: One 2hr take home exam, laboratory and written assignments.

NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.

Students interested in fungal ecology, environmental and rehabilitation biology, fungal biodiversity, biological control and soil microbiology will study the structure and function of fungi. Emphasis will be placed on 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 examined, emphasising the use of these interactions in vegetation restoration and biocontrol of pests and pathogens. Students will be encouraged to develop a deeper understanding of one area of Fungal Biology through independent study. Part of the learning material will be available on the Internet.

BIOL 3917 **Fungal Biology (Advanced)**

6 credit points. Dr P McGee. **Session**: 1a. **Classes**: 5 lec & 15 prac in a two week intensive program immediately prior to semester one (labs run from 23 February to 5 March 2004), plus the equivalent of 30hrs self-guided study during the semester. **Prerequisite**: Distinction average in 16 credit points of Intermediate Biology, or 8 credit points of Intermediate Biology and 8 Intermediate credit points of either Microbiology or Geography, or their equivalent. **Prohibition**: May not be counted with BIOL 3017. **Assessment**: One 2hr take home exam, laboratory and written assignments.

NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.

Qualified students will participate in alternative components of BIOL 3017 Fungal Biology. The content and nature of the components will vary each year, but will include individual research on a topic agreed on with the executive officer.

BIOL 3018 **Applications of Recombinant DNA Tech**

6 credit points. Dr B Lyon, Prof R Skurray. **Session**: 1a. **Classes**: 4 lec & 8 prac/wk. **Prerequisite**: MBLG (2001 or 2901 and 2002 or 2902) or 16 credit points of Intermediate Biology. For BMedSc students: 32 credit points of Intermediate BMED units including BMED 2502. **Prohibition**: BIOL (3918). **Assessment**: One 2 hr exam, practical report, assignment.

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.

BIOL 3918 Applications of Recombinant DNA Tech Adv

6 credit points. Dr B Lyon. **Session**: 1a. **Classes**: 4 lec & 8 prac/wk. **Prerequisite**: Distinction average in MBLG (2001 or 2901 and 2002 or 2902) or in 16 credit points of Intermediate Biology. For BMedSc students: 32 credit points of Intermediate BMED units including Distinction in BMED 2502. These requirements may be varied and students with lower averages should contact the unit Executive Officer. **Prohibition**: BIOL (3018). **Assessment**: One 2 hr exam, assignment, seminar.

Qualified students will participate in alternative components of BIOL 3018 Applications of Recombinant DNA Technology. The content and nature of these components may vary from year to year.

BIOL 3021 Plant Development

6 credit points. Dr Marc, A/Prof Overall. **Session**: 2a. **Classes**: 4 lec & 8 prac/wk. **Prerequisite**: 16 credit points of Intermediate Biology including BIOL (2003 or 2903 or 2006 or 2906). **Prohibition**: BIOL 3931. **Assessment**: One 2hr exam, assignments, one essay.

NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.

Current topics in plant development are explored to the levels of plant cell biology and plant molecular biology. Subjects covered include the development of the plant body from embryo to a seedling, organogenesis at the shoot apical meristem, leaf development, differentiation of specialized cell types, signal transduction, plant hormones, developmental responses to the environment, role of extracellular matrix in plant development, development of polarity, and intercellular communication. Advances in the molecular basis of plant development are discussed. Practical work, which uses a variety of plant material including protoplasts, suspension cultures and Arabidopsis seedlings, involves a range of cellular and molecular techniques such as advanced light microscopy, immunochemistry, protein purification and characterisation, and the Green Fluorescent Protein technology.

BIOL 3931 Plant Development (Advanced)

6 credit points. Dr Marc, A/Prof Overall. **Session**: 2a. **Classes**: 4 lec & 8 prac/wk. **Prerequisite**: Distinction average in 16 credit points of Intermediate Biology including BIOL (2003 or 2903 or 2006 or 2906). These requirements may be varied and students with lower averages should consult the unit Executive Officer. **Prohibition**: May not be counted with BIOL 3021. **Assessment**: One 2hr exam, assignments, one essay.

NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.

Qualified students will participate in alternative components of the BIOL 3021 Plant Development, representing 20% of the total assessment. The students will be exempt from one standard essay and one standard assignment, but instead will conduct an independent 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 and writing an essay on a related topic.

BIOL 3022 Plant Physiology

6 credit points. **Session**: 2b. **Classes**: 4 lec & 8 prac/wk. **Prerequisite**: 16 credit points of Intermediate Biology including BIOL (2003 or 2006 or 2903 or 2906). **Prohibition**: BIOL 3932. **Assessment**: One 2 hr exam, assignment reports.

NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.

A unit of study of lectures, practical assignments and self-guided computer based modules on the applications of plant physiology. The unit will begin with a consideration of the physiology of photosynthesis using conventional techniques and will go on to the use of the pulse amplitude modulated (PAM) fluorometer. There will follow an in-depth consideration of boundary layers in plants and the use of oxygen microelectrodes to measure photosynthesis, respiration and primary production. Experience with gas exchange analysis equipment, and self-guided modules applying knowledge of plant-water relationships and plant nutrition to practical problems in Australian agriculture, are included.

Textbooks

Taiz L, Zeiger E. 2002. Plant Physiology 3rd ed. Sunderland, Mass., Sinauer.

BIOL 3932 Plant Physiology (Advanced)

6 credit points. **Session**: 2b. **Classes**: 4 lec & 8 pract/wk. **Prerequisite**: Distinction average in 16 credit points of Intermediate Biology including BIOL (2003 or 2903 or 2006 or 2906). These requirements may be varied and students with lower averages should contact the unit Executive Officer. **Prohibition**: BIOL 3022. **Assessment**: One 2 hr exam, assignment reports.

NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.

Qualified students will participate in alternative components of BIOL 3022 Plant Physiology. The content and nature of these components may vary from year to year. Some assessment will be in an alternative form.

BIOL 3023 Ecological Methods

6 credit points. Dr Hochuli. **Session**: 2a. **Classes**: 4 lec and 8 prac/wk. **Prerequisite**: 16 credit points of Intermediate Biology including BIOL (2001 or 2901 or 2002 or 2902 or 2004 or 2904). **Prohibition**: May not be counted with BIOL 3923. **Assessment**: One 2 hr exam, laboratory reports.

NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.

The unit of study will consider ecology as a theoretical, quantitative, experimental science concerned with the analysis of patterns of distribution, abundance, dynamics, demography and life-histories of natural populations with an appraisal of the nature of scientific investigations, from a philosophical viewpoint and the practicalities of testing hypotheses in the real world. Application of ecological theory and methods to practical problems will be integrated throughout the unit of study.

Lectures will be on sound philosophical and experimental principles and useful for the more informed management, conservation and utilization of natural populations and habitats. Practical classes will deal with practical methods of determining patterns of distribution and abundance, problems of sampling, estimation of ecological variables, and methods of statistical analysis of field data. Computer simulations and analyses will be used where appropriate. Students taking BIOL 3023 only do not take the field course and will undertake coursework separate from the other students.

BIOL 3923 Ecological Methods (Advanced)

6 credit points. Dr Hochuli. **Session**: 2a. **Classes**: 4 lec and 8 prac/wk. **Prerequisite**: Distinction average in BIOL (2001 or 2901) and (2002 or 2902), or in 16 credit points of Intermediate Biology including BIOL (2004 or 2904). **Prohibition**: May not be counted with BIOL 3023. **Assessment**: One 2 hr exam, laboratory reports.

NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.

This unit of study has the same objectives as BIOL 3023 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 2. This unit of study may be taken as a part of the BSc (Advanced) program.

BIOL 3025 Evolutionary Genetics & Animal Behaviour

6 credit points. A/Prof Oldroyd. **Session**: 2a. **Classes**: 4 lec & 8 prac/wk. **Prerequisite**: 16 credit points from MBLG (2001 or 2901 or 2002 or 2902) and Intermediate Biology units. For BMedSc students 32 credit points of Intermediate BMED units including BMED 2502. **Prohibition**: BIOL (3925 or 3928). **Assessment**: One 2hr 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.

BIOL 3925 Evolutionary Gen. & Animal Behaviour Adv

6 credit points. A/Prof Oldroyd. **Session**: 2a. **Classes**: 4 lec & 8 prac/wk. **Prerequisite**: Distinction average in 16 credit points from MBLG (2001 or 2901 or 2002 or 2902) and Intermediate Biology units. For BMedSc students 32 credit points of Intermediate BMED units including distinction in BMED 2502. These requirements may be varied and students with lower averages should consult the unit Executive Officer. **Prohibition**: BIOL (3025 or 3928). **Assessment**: One 2hr exam, assignments, seminar.

Qualified students will participate in alternative components of BIOL 3025 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.

BIOL 3026 Developmental Genetics

6 credit points. Dr Saleeba, Dr Raphael, A/Prof Gillies. **Session**: 2b. **Classes**: 4 lec & 8 prac/wk. **Prerequisite**: MBLG (2001 or 2901 and 2002 or 2902) or 16 credit points of Intermediate Biology. For BMedSc students: 32 credit points of Intermediate BMED units including BMED 2502. **Prohibition**: BIOL (3926 or 3929). **Assessment**: One 2hr 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, sex determination, 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, as well as genetic counselling. Practical work complements the theoretical aspects and develops important genetical skills.

BIOL 3926 Developmental Genetics (Advanced)

6 credit points. Dr Saleeba, Dr Raphael, A/Prof Gillies. **Session**: 2b. **Classes**: 4 lec & 8 prac/wk. **Prerequisite**: Distinction average in MBLG (2001 or 2901 and 2002 or 2902) or in 16 credit points of Intermediate Biology. For BMedSc students 32 credit points of Intermediate BMED units including Distinction in BMED 2502. These requirements may be varied and students with lower averages should contact the unit Executive Officer. **Prohibition**: BIOL (3026 or 3929). **Assessment**: One 2hr exam, assignments.

Qualified students will participate in alternative components to BIOL 3026 Developmental Genetics. The content and nature of these components may vary from year to year. Some assessment will be in an alternative format.

BIOL 3027 Bioinformatics and Genomics

6 credit points. Dr Firth, Dr Jermiin, Dr Saleeba and others. **Session**: 1b. **Classes**: 4 lec & 8 prac/wk. **Prerequisite**: MBLG (2001 or 2101 or 2901) or 16 credit points of Intermediate Biology including BIOL (2001 or 2901 or 2004 or 2904 or 2006 or 2906). For BMedSc students: 32 credit points of Intermediate BMED units including BMED 2502. **Prohibition**: BIOL 3927. **Assessment**: One 2 hr exam, assignment.

A unit of study of 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, together with classical taxonomy and biodiversity.

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.

BIOL 3927 Bioinformatics and Genomics (Advanced)

6 credit points. Dr Firth, Dr Jermiin, Dr Saleeba and others. **Session**: 1b. **Classes**: 4 lec & 8 prac/wk. **Prerequisite**: Distinction in MBLG (2001 or 2101 or 2901) or Distinction average in 16 credit points of Intermediate Biology including BIOL (2001 or 2901 or 2004 or 2904 or 2006 or 2906). For BMedSc students: 32 credit points of Intermediate BMED units including Distinction in BMED 2502. These requirements may be varied and students with lower averages should contact the unit Executive Officer. **Prohibition**: BIOL 3027. **Assessment**: One 2 hr exam, assignment.

Qualified students will participate in alternative components of BIOL 3027 Bioinformatics and Genomics. The content and nature of these components may vary from year to year. Some assessment will be in alternative format.

BIOL 3928 Evolutionary Genetics Molecular (Adv)

6 credit points. Dr Oldroyd. **Session**: 2. **Classes**: 4 lec & 8 prac/wk. **Prerequisite**: Distinction average in 16 credit points of Intermediate Biology including MBLG (2001 or 2901 and 2002 or 2902). For BMedSc students: 32 credit points of Intermediate BMED units including Distinction in BMED 2502. These requirements may be varied and students with lower averages should contact the unit Executive Officer. **Prohibition**: BIOL (3025 or 3925). **Assessment**: One 2hr exam, assignments, seminar and an essay based on discussion sessions.

NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended. This unit of study is available to students enrolled in the Bachelor of Science (Molecular Biology and Genetics) and the Bachelor of Medical Science only.

This unit is the same as BIOL 3925 Evolutionary Genetics and Animal Behaviour (Advanced), except for the addition of topical seminars and discussions in this discipline.

BIOL 3929 Developmental Genetics Molecular (Adv)

6 credit points. Dr Saleeba, Dr Raphael, A/Prof Gillies. **Session**: 2. **Classes**: 4 lec & 8 prac/wk. **Prerequisite**: Distinction average in 16 credit points of Intermediate Biology including MBLG (2001 or 2901 and 2002 or 2902). **Prohibition**: BIOL (3026 or 3926). **Assessment**: One 2hr exam, assignments.

NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended. This unit of study is available to students enrolled in the Bachelor of Science (Molecular Biology and Genetics) only.

This unit is the same as BIOL 3926 Developmental Genetics (Advanced) except for the inclusion of topical items in this discipline.

BIOL 3040 Marine Ecology

6 credit points. Dr Chapman, Prof Underwood, Dr C Styan. **Session**: 2b. **Classes**: 4 lec and 8 prac/wk. **Prerequisite**: 16 credit points of Intermediate Biology. **Corequisite**: BIOL (3023 or 3923). **Prohibition**: BIOL 3940. **Assessment**: One 2 hr exam, laboratory reports, practical assignments.

NB: The completion of MBLG (2001 or 2901 or 2101) is highly recommended.

Marine Ecology explores the designs of experimental analysis of marine populations, drawing upon extensive examples from intertidal assemblages of animals and plants and from the biology of subtidal organisms in coastal habitats. No particular mathematical or statistical skills are required for this module. Much emphasis is placed on evaluation of recent studies in the literature. Laboratory classes deal with techniques of analysis and experimental manipulation of natural assemblages. The relationships between experimental marine ecology and general ecological theory are emphasised. The role of ecological science in management, conservation and exploitation of populations are emphasised. The unit of study includes a Field study (before Semester 2 starts; all details will be announced when they are available).

BIOL 3940 Marine Ecology (Advanced)

6 credit points. Dr Chapman, Prof Underwood, Dr C Styan. **Session**: 2b. **Classes**: 4 lec and 8 prac/wk. **Prerequisite**: Distinction average in 16 credit points of Intermediate Biology. **Corequisite**: BIOL (3023 or 3923). **Prohibition**: BIOL 3040. **Assessment**: One 2 hr exam, laboratory reports, practical assignments.

NB: The completion of MBLG (2001 or 2901 or 2101) is highly recommended.

This unit has the same objectives as BIOL 3030 Marine 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 unit 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 two. This unit of study may be taken as part of the BSc (Advanced).

BIOL 3041 Terrestrial Ecology

6 credit points. Dr Hochuli, Dr Dickman. **Session**: 2b. **Classes**: 4 lec and 8 prac/wk. **Prerequisite**: BIOL (2001 or 2901) and BIOL (2002 or 2902). **Corequisite**: BIOL (3023 or 3923). **Prohibition**: BIOL 3931. **Assessment**: One 2 hr exam, laboratory reports, practical assignments.

NB: The completion of MBLG (2001 or 2901 or 2101) is highly recommended.

Terrestrial Ecology considers the dynamics of ecological systems. Inter- and intra-specific competition, herbivory and predation are examined. Relationships between behavioural strategies of insect and vertebrate herbivores and predators, and the exploitation and conservation of their resources are a major focus. In addition, practical work investigates natural and exploited habitats. There is a major emphasis on the relationships between ecological science and methods for management of populations, conservation and managed exploitation of animal and plant resources and the control of pests (including biological control). The unit of study includes a Field study (before Semester 2 starts; all details will be announced when they are available).

BIOL 3941 Terrestrial Ecology (Advanced)

6 credit points. Dr Hochuli, Dr Dickman. **Session**: 2b. **Classes**: 4 lec and 8 prac/wk. **Prerequisite**: Distinction average in BIOL (2001 or 2901) and (2002 or 2902),. **Corequisite**: BIOL (3023 or 3923). **Prohibition**: BIOL 3041. **Assessment**: One 2 hr exam, laboratory reports, practical assignments.

NB: The completion of MBLG (2001 or 2901 or 2101) is highly recommended.

This unit has the same objectives as BIOL 3031 Terrestrial 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 unit 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 two. This unit of study may be taken as part of the BSc (Advanced).

BIOL 3042 Plant Ecology

6 credit points. Dr Wardle. **Session**: 2b. **Classes**: 4 lec and 8 prac/wk. **Prerequisite**: 16 credit points of Intermediate Biology including BIOL (2004 or 2904). **Corequisite**: BIOL (3023 or 3923). **Prohibition**: BIOL 3942. **Assessment**: One 2 hr exam, laboratory reports, practical assignments.

Plant Ecology integrates experimental studies, quantitative sampling and theoretical models to examine the ecological processes that produce complex interactions in natural populations. The lectures include the following topics: plants as modular individuals, demography, life history variation, reproductive ecology, dispersal, dormancy, recruitment, effects of neighbours, plant animal interactions, natural selection, ecological genetics, vegetation structure and diversity, succession and gap phase regeneration. Examples are given on the role of genetics, demography and population structure in the conservation and management of plants. The unit of study includes a Field study (before Semester 2 starts; all details will be announced when they are available).

BIOL 3942 Plant Ecology (Advanced)

6 credit points. Dr Wardle. **Session**: 2b. **Classes**: 4 lec and 8 prac/wk. **Prerequisite**: Distinction average in 16 credit points of Intermediate Biology including BIOL (2004 or 2904). **Corequisite**: BIOL (3023 or 3923). **Prohibition**: BIOL 3042. **Assessment**: One 2 hr exam, laboratory reports, practical assignments.

NB: The completion of MBLG (2001 or 2901 or 2101) is highly recommended.

This unit has the same objectives as BIOL 3032 Plant 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 unit 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 two. This unit of study may be taken as part of the BSc (Advanced).

Biology Honours

A single Honours program in Biology accommodates students who have completed 24 credit points of Senior Biology or equivalent. Information about qualifications for entry into Honours is available from the School Office (Science Road Cottage, A10).

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.

Students who have signified their intention of entering Honours will be notified of acceptance after the publication of the second semester Senior examination results. Honours students are expected to start their academic year at the beginning of February or in July.

With the permission of the Head of School and the Faculty of Science, students who have qualified to take Honours and passed 12 credit points of Junior Biology may take Biology Honours without having taken Intermediate or Senior Biology units of study. The concession is intended for students who have majored in physics, chemistry or biochemistry and wish to study biophysics or plant physiology; they should first discuss their qualifications with Associate Professor R. L. Overall.

The Honours unit of study comprises:

(a) a project in which the student investigates a problem and presents oral and written accounts of his or her research.
(b) coursework units chosen from a program offered by the School.
(c) instruction in experimental design, and other technical instruction.

Please Note: Part (c) is run in the February semester and must be taken in the calendar year of first enrolment by all students starting in February or July of that year.

The degree will be awarded on the basis of:

(a) written assignments and essays 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. Information about qualifications for entry into the Graduate Diploma is available from the School Office (Science Road Cottage, A10).

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 Junior year.

Students who have signified their intention to enter the Graduate Diploma course 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 at the beginning of February or in July.

Instruction in experimental design, and other technical instruction is run early in the February semester, and must be taken in the calendar year of first enrolment by all students starting in February or July of that year.

The composition of the Graduate Diploma course is identical to that for Honours (see Biology Honours).

Postgraduate study

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 in the School's Research Interests Handbook, which is available from the School Office (Science Road Cottage, A10) or on the School's Web site at www.bio.usyd.edu.au/

■ Cell Pathology

Cell Pathology is taught by the Department of Pathology.

Students interested in CPAT 3001 Cell Pathology A are expected to meet with Professor Hunt or Associate Professor King before enrolling, preferably during the preceding year. The Department can cater only for a small number of students in CPAT 3001 and good performance in Junior and Intermediate units of study will be essential to ensure success in this unit. The Department of Pathology is located on Level 5 of the Blackburn Building (phone (02) 9351 2414).

CPAT 3001 **Cell Pathology A**

12 credit points. Prof. Hunt, Dr Gibbins, Dr Hambly, A/Prof. King. **Session**: N/A in 2004. **Classes**: 1 tut & 11 prac/wk. **Prerequisite**: ANAT 2002; or BCHM 2002 or 2902; or BIOL 2006 or 2906; or both PCOL 2001 and (2002 or 2003); or PHSI 2002. For BMedSc: 32 credit points from Intermediate BMED units of study. **Assessment**: One 3hr exam, 4 prac reports.

NB: Entry requires Departmental permission: only a small number of students can be accommodated in the laboratory facilities. The completion of MBLG (2001 or 2101 or 2901) is highly recommended.

The unit of study Cell Pathology is particularly suited to those interested in subsequently doing research in a challenging area of biology. This unit of study will provide students with insight into alterations in cellular processes in disease and injury and equip them to apply the concepts and methods of cell biology to the study of pathology. Subjects studied include inflammation, immunopathology, cellular immunology, molecular pathophysiology and cancer biology. This unit of study would not be useful for those wishing to pursue a career in diagnostic pathology.

Tutorials and directed reading will cover the general principles of pathology, emphasising the physiological, biochemical and genetic aspects and correlation of disturbed cell function with structural and ultrastructural changes.

Laboratory work is designed to illustrate particular aspects of pathology. A range of methods that will help in later development of this area will be used. These include flow cytometry, tissue culture, molecular biology and microscopy.

CPAT 3101 **Pathological Basis of Human Disease**

12 credit points. Prof. Hunt, Dr Gibbins, Dr Hambly, A/Prof. King, Dr Pamphlett and others. **Session**: 2. **Classes**: 3hr lec, 6 hrs self directed learning or museum sessions, & 3 hr microscopic specimen prac class/wk (Total 12 hrs/wk). **Prerequisite**: ANAT 2001; or BCHM (2001 or 2002 or 2101 or 2102 or 2901 or 2902); or MBLG (2001 or 2101 or 2901); or BIOL (2001 or 2002 or 2006 or 2101 or 2102 or 2105 or 2106 or 2901 or 2902 or 2906); or HPSC (2001 or 2002); or MICR (2001 or 2003 or 2901); or PCOL 2001; or PHSI 2001. For BMedSc: 32 credit points from Intermediate BMED units of study. **Assessment**: Project Report (10%), Theory exam (60%), Practical exam (30%).

NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.

The Pathological Basis of Human Disease unit of study modules will provide a practical and theoretical background to the scientific basis of the pathogenesis of disease, including elements of forensic pathology. Areas covered in theoretical modules include: tissue responses to exogenous factors, adaptive responses to foreign agents, cardiovascular/pulmonary responses to disease, forensic science, neuropathology and cancer. Practical modules include disease specimen evaluation on a macroscopic and microscopic basis. 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. It fulfils the Pathology requirements for the Centre for Chiropractic at Macquarie University.

Textbooks

Kumar, Cotran & Robbins. Basic Pathology. 6th edition, W B Saunders, 1997.

■ Chemical Engineering

The Department of Chemical Engineering is part of the Faculty of Engineering. 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 particularly in Chemistry, but also Biochemistry, Physics or Mathematics.

The most relevant units of study are CHNG 1101 – Chemical Engineering 1A, CHNG 1102- Chemical Engineering 1B, CHNG 2101 – Chemical Engineering 2A and CHNG 2102 – Chemical Engineering 2B. Details regarding these units of study can be obtained from the Faculty of Engineering Handbook. The units of study are intended to give a science student some insight into the principles which control the design and performance of large scale industrial processing plants. As well as the above units of study, Faculty of Science students are invited to enrol in any other chemical engineering unit of study, provided they have the appropriate prerequisites.

Double Degree

Some BSc graduates, who have passed all four of the above units of study within the Department of Chemical Engineering, may obtain a Bachelor of Engineering degree in Chemical 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. Further details regarding admission to the BE in Chemical Engineering may be obtained from the Engineering Faculty Office.

■ Chemistry

Chemistry Junior units of study

Dr Adrian George

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:

CHEM 1001 Fundamentals of Chemistry 1A
CHEM 1002 Fundamentals of Chemistry 1B
CHEM 1101 Chemistry 1A
CHEM 1102 Chemistry 1B
CHEM 1901 Chemistry 1A (Advanced)
CHEM 1902 Chemistry 1B (Advanced)
CHEM 1903 Chemistry 1A (Special Studies Program)
CHEM 1904 Chemistry 1B (Special Studies Program)

CHEM 1905, CHEM 1906 and CHEM 1907 are only available to students in the Bachelor of Science (Molecular Biology and Genetics)

CHEM 1908 is only available to students in the Bachelor of Medical Science, Bachelor of Science (Nutrition) and the Bachelor of Science (Molecular Biotechnology)

CHEM 1909 is only available to students in the Bachelor of Medical Science, Bachelor of Science (Molecular Biology and Genetics), Bachelor of Science (Nutrition) and Bachelor of Science (Molecular Biotechnology)

Students seeking further information about CHEM 1905, CHEM 1906, CHEM 1907, CHEM 1908 or CHEM 1909 should consult the relevant Tables earlier in this chapter as well as degree information in chapter 2 of this handbook.

Fully detailed information about all units of study, prescribed textbooks and reference books is available from the School of Chemistry and is contained in a booklet, Information for Students, distributed at the time of enrolment.

Exercises are issued and tutorials are held at regular intervals for all units of study.

CHEM 1001 **Fundamentals of Chemistry 1A**

6 credit points. **Session**: 1. **Classes**: 3 lec & 1 tut/wk & 3hrs prac/wk for 10 wks. **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. **Prohibition**: May not be counted with CHEM 1101 or 1901 or 1903 or 1905 or 1906 or 1909. **Assessment**: A theory examination is held at the end of the semester. Students are advised at the beginning of the semester about other factors contributing to assessment in the unit of study.

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.

Practical: A series of 10 three-hour laboratory sessions, one per week for 10 weeks of the semester.

Textbooks

A booklist is contained in the booklet Information for Students distributed at enrolment. Further information can be obtained from the School.

CHEM 1002 **Fundamentals of Chemistry 1B**

6 credit points. **Session**: 2. **Classes**: 3 lec & 1 tut/wk & 3hrs prac/wk for 10 wks. **Prerequisite**: CHEM (1001 or 1101) or equivalent. **Prohibition**: May not be counted with CHEM (1102 or 1902 or 1904 or 1907 or 1908).

Assessment: A theory examination is held at the end of the semester. Students are advised at the beginning of the semester about other factors contributing to assessment in the unit of study.

CHEM 1002 builds on CHEM 1001 to provide a sound coverage of inorganic and organic chemistry.

Lectures: A series of 39 lectures, three per week throughout the semester.

Practical: A series of 10 three-hour laboratory sessions, one per week for 10 weeks of the semester.

Textbooks

A booklist is contained in the booklet Information for Students distributed at enrolment. Further information can be obtained from the School.

CHEM 1101 **Chemistry 1A**

6 credit points. **Session**: 1, 2, Summer. **Classes**: 3 lec & 1 tut/wk & 3hrs prac/wk for 10 wks. **Assumed knowledge**: HSC Chemistry and Mathematics. **Corequisite**: Recommended concurrent units of study: 6 credit points of Junior Mathematics. **Prohibition**: May not be counted with CHEM (1001 or 1901 or 1903 or 1905 or 1906 or 1909). **Assessment**: A theory examination is held at the end of the semester. Students are advised at the beginning of the semester about other factors contributing to assessment in the unit of study.

Chemistry 1A is built on a satisfactory prior knowledge of the HSC 2-unit 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.

Practical: A series of 10 three-hour laboratory sessions, one per week for 10 weeks of the semester.

Textbooks

A booklist is contained in the booklet Information for Students distributed at enrolment. Further information can be obtained from the School.

CHEM 1102 **Chemistry 1B**

6 credit points. **Session**: 1, 2, Summer. **Classes**: 3 lec & 1 tut/wk & 3hrs prac/wk for 10 wks. **Qualifier**: CHEM 1101 or a Distinction in CHEM 1001 or 1901 or equivalent. **Corequisite**: Recommended concurrent units of study: 6 credit points of Junior Mathematics including MATH (1003 or 1903). **Prohibition**: CHEM (1002 or 1902 or 1904 or 1907 or 1908). **Assessment**: A theory examination is held at the end of the semester. Students are advised at the beginning of the semester about other factors contributing to assessment in the unit of study.

Chemistry 1B is built on a satisfactory prior knowledge of Chemistry 1A and covers inorganic and organic chemistry. 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.

Practical: A series of 10 three-hour laboratory sessions, one per week for 10 weeks of the semester.

Textbooks

A booklist is contained in the booklet Information for Students distributed at enrolment. Further information can be obtained from the School.

CHEM 1901 **Chemistry 1A (Advanced)**

6 credit points. **Session**: 1. **Classes**: 3 lec & 1 tut/wk & 3hrs prac/wk for 10 wks. **Prerequisite**: UAI of at least 93 and HSC Chemistry result in band 5 or 6, or Distinction or better in a University level Chemistry unit, or by invitation. **Corequisite**: Recommended concurrent unit of study: 6 credit points of Junior Mathematics. **Prohibition**: May not be counted with CHEM (1001 or 1101 or 1903 or 1905 or 1906 or 1909). **Assessment**: A theory examination is held at the end of the semester. Students are advised at the beginning of the semester about other factors contributing to assessment in the unit of study.

NB: 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.

Practical: A series of 10 three-hour laboratory sessions, one per week for 10 weeks of the semester.

Textbooks

A booklist is contained in the booklet Information for Students distributed at enrolment. Further information can be obtained from the School.

CHEM 1902 **Chemistry 1B (Advanced)**

6 credit points. **Session**: 2. **Classes**: 3 lec & 1 tut/wk & 3hrs prac/wk for 10 wks. **Qualifier**: CHEM (1901 or 1903) or Distinction in CHEM 1101 or equivalent. **Corequisite**: Recommended concurrent unit of study: 6 credit points of Junior Mathematics including MATH (1003 or 1903). **Prohibition**: May not be counted with CHEM (1002 or 1102 or 1904 or 1907 or 1908.). **Assessment**: A theory examination is held at the end of the semester. Students are advised at the beginning of the semester about other factors contributing to assessment in the unit of study.

NB: Department permission required for enrolment. Entry is by invitation.

Chemistry 1B (Advanced) is built on a satisfactory prior knowledge of Chemistry 1A (Advanced) and covers inorganic and organic chemistry. 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.

Practical: A series of 10 three-hour laboratory sessions, one per week for 10 weeks of the semester.

Textbooks

A booklist is contained in the booklet Information for Students distributed at enrolment. Further information can be obtained from the School.

CHEM 1903 **Chemistry 1A (Special Studies Program)**

6 credit points. **Session**: 1. **Classes**: 3 lec & 1 tut/wk & 3hrs prac/wk. **Prerequisite**: UAI of at least 98.7 and HSC Chemistry result in band 6, or Distinction or better in a University level Chemistry unit, or by invitation. **Corequisite**: Recommended concurrent unit of study: 6 credit points of Junior Mathematics. **Prohibition**: May not be counted with CHEM (1001 or 1101 or 1901 or 1905 or 1906 or 1909).

NB: Department permission required for enrolment. 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 or science. 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).

CHEM 1904 **Chemistry 1B (Special Studies Program)**

6 credit points. **Session**: 2. **Classes**: 3 lec & 1 tut/wk & 3hrs prac/wk. **Prerequisite**: Distinction in CHEM 1903. **Corequisite**: Recommended concurrent units of study: 6 credit points of Junior Mathematics including MATH (1003 or 1903). **Prohibition**: May not be counted with CHEM (1002 or 1102 or 1902 or 1907 or 1908).

NB: Department permission required for enrolment. 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).

Chemistry 1B (Special Studies Program) is an acceptable prerequisite for entry into Intermediate Chemistry units of study.

CHEM 1905 **Chemistry 1A Molecular (Advanced)**

6 credit points. **Session**: 1. **Classes**: 3 lec/tut & 3hr prac/wk for 10 weeks & 7 discussion sessions. **Prerequisite**: UAI of at least 93 and HSC Chemistry result in band 5 or 6, or Distinction or better in a University level Chemistry unit, or by invitation. **Corequisite**: Recommended concurrent unit of study: 6 credit points of Junior Mathematics. **Prohibition**: CHEM (1001 or 1101 or 1901 or 1903 or 1906 or 1909). **Assessment**: One 3hr closed book exam (65%), prac reports (10%), quizzes (15%), essay based on discussion sessions (10%).

NB: Department permission required for enrolment. This unit of study is available to students enrolled in the Bachelor of Science (Molecular Biology and Genetics) only.

This unit of study is the same as Chemistry 1901 except for the addition of 7 special molecular biology and genetics discussion sessions, which consist of topical seminars and discussions in

this discipline. An essay based on these discussions is included as part of the assessment of the unit of study.

CHEM 1906 **Chemistry 1A Mol (Special Studies Prog)**

6 credit points. **Session**: 1. **Classes**: 3 lec/tut & 3hr prac/wk & 7 discussion sessions. **Prerequisite**: UAI of at least 98.7 and HSC Chemistry result in band 6, or Distinction or better in a University level Chemistry unit, or by invitation. **Corequisite**: Recommended concurrent unit of study: 6 credit points of Junior Mathematics. **Prohibition**: CHEM (1001 or 1101 or 1901 or 1903 or 1905 or 1909). **Assessment**: One 3hr closed book exam (65%), prac reports (10%), quizzes (15%), essay based on discussion sessions (10%).

NB: Department permission required for enrolment. Entry is by invitation. This unit of study is deemed to be an Advanced unit of study. This unit of study is available to students enrolled in the Bachelor of Science (Molecular Biology and Genetics) only.

This unit of study is the same as Chemistry 1903 except for the addition of 7 special molecular biology and genetics discussion sessions, which consist of topical seminars and discussions in this discipline. An essay based on these discussions is included as part of the assessment of the unit of study.

CHEM 1907 **Chemistry 1 Life Sciences A Mol (Adv)**

6 credit points. **Session**: 1. **Classes**: Total of 6hrs per week consisting on average of 3 lectures, 1 tutorial/discussion session and 2hrs of practical work. **Prerequisite**: UAI of at least 93 and HSC Chemistry result in band 5 or 6, or Distinction or better in a University level Chemistry unit, or by invitation. **Corequisite**: Recommended concurrent units of study: 6 credit points of Junior Mathematics. **Prohibition**: CHEM (1002 or 1102 or 1902 or 1904 or 1908). **Assessment**: Exam 65%, practicals 10%, quizzes 15%, essay based on discussion sessions 10%.

NB: This unit of study is available to students enrolled in the Bachelor of Science (Molecular Biology and Genetics) only.

Lectures (39 hr): 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 this applies 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/Discussions (13 hr): These will provide aspects of problem solving and will include special lectures on aspects of molecular biology and genetics from external experts.

Practical: (30 hr): These will be designed to develop practical skills based on the theory presented in the lectures.

Textbooks

A booklist is contained in the booklet Information for Students distributed at enrolment. Further information can be obtained from the School.

CHEM 1908 **Chemistry 1 Life Sciences A (Advanced)**

6 credit points. **Session**: 1, Summer. **Classes**: Total of 6hrs per week consisting on average of 3 lectures, 1 tutorial session and 2hrs of practical work. **Prerequisite**: UAI of at least 93 and HSC Chemistry result in band 5 or 6, or Distinction or better in a University level Chemistry unit, or by invitation. **Corequisite**: Recommended concurrent units of study: 6 credit points of Junior Mathematics. **Prohibition**: CHEM (1002 or 1102 or 1902 or 1904 or 1907). **Assessment**: A theory examination is held at the end of the semester. Students are advised at the beginning of the semester about other factors contributing to assessment in the unit of study.

NB: Department permission required for enrolment. This unit of study is available to students enrolled in the Bachelor of Medical Science, the Bachelor of Science (Nutrition) and the Bachelor of Science (Molecular Biotechnology) only.

Lectures (39 hr): 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 (13 hr): These will provide aspects of problem solving relevant to the theory.

Practical: Practicals (30hr) These will be designed to develop practical skills based on the theory presented in the lectures

Textbooks

A booklist is contained in the booklet Information for Students distributed at enrolment. Further information can be obtained from the School.

CHEM 1909 **Chemistry 1 Life Sciences B Mol (Adv)**

6 credit points. **Session**: 2, Summer. **Classes**: Total of 6hrs per week consisting on average of 3 lectures, 1 tutorial session and 2hrs of practical work. **Prerequisite**: CHEM (1907 or 1908) or equivalent. **Corequisite**: Recommended concurrent units of study: 6 credit points of Junior Mathematics. **Prohibition**: CHEM (1001 or 1101 or 1901 or 1903 or 1905 or 1906). **Assessment**: A theory examination is held at the end of the semester. Students are advised at the beginning of the semester about other factors contributing to assessment in the unit of study.

NB: 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 hr): 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 (13 hr): These will provide aspects of problem solving relevant to the unit of study.

Practical: (30 hr) These will be designed to develop practical skills based on the theory presented in the lectures

Textbooks

A booklist is contained in the booklet Information for Students distributed at enrolment. Further information can be obtained from the School.

Chemistry Intermediate units of study

Dr R J Clarke

The School of Chemistry offers a number of units of study to cater for the differing needs of students. The following units of study are offered:

CHEM 2001 Chemistry 2 (Life Sciences), 8 credit points
CHEM 2101 Chemistry 2 (Environmental), 8 credit points
CHEM 2301 Chemistry 2A, 8 credit points
CHEM 2302 Chemistry 2B, 8 credit points
CHEM 2901 Chemistry 2A (Advanced), 8 credit points
CHEM 2902 Chemistry 2B (Advanced), 8 credit points

The units of study CHEM 2101 (Environmental) and 2301 (2A) have common lectures and practical work. Separate tutorials are held for each unit, with tutorials for 2101 emphasising environmental applications. There are approximately 51 lectures consisting of: Modern Chemical Analysis; Mechanisms of Organic Reactions; Bonding and Spectroscopy.

CHEM 2311 and CHEM 2312 are only available to students in the Bachelor of Medical Science and the Bachelor of Science (Molecular Biotechnology).

CHEM 2903 is available only available to students in the Bachelor of Medical Science, the Bachelor of Science (Molecular Biology and Genetics) and the Bachelor of Science (Molecular Biotechnology) only.

Students seeking further information about CHEM 2311, CHEM 2312 or CHEM 2903 should consult the relevant Tables earlier in this chapter as well as degree information in chapter 2 of this handbook.

CHEM 2001 **Chemistry 2 (Life Sciences)**

8 credit points. **Session**: 1. **Classes**: 4 lec & 4hr prac/wk. **Prerequisite**: 6 credit points of Junior Mathematics. **Qualifier**: CHEM (1102 or 1902 or 1904 or 1909). **Prohibition**: May not be counted with CHEM (2101 or 2301 or 2901 or 2903 or 2311 or 2312 or 2502). **Assessment**: Theory (67%), lab exercises (33%).

This unit of study comprises approximately 51 lectures consisting of: Organic Reaction Mechanisms in Biological Systems; Chemical Analysis and Spectroscopy of Biomolecules; Chemistry of Biomaterials (biopolymers, metalloproteins, biomineralisation etc). Non-compulsory tutorials will also be provided at a rate of one per week.

Additional information: The aim of this unit of study is to provide students interested in life sciences with the chemical knowledge required for an understanding of the subject.

Practical: Practical work entails 4 hours per week for 13 weeks during the semester. Students must ensure that one complete afternoon from 1pm to 5pm, free from other commitments, is available for this practical work.

CHEM 2101 **Chemistry 2 (Environmental)**

8 credit points. **Session**: 1. **Classes**: 4 lec & 4hr prac/wk. **Prerequisite**: 6 credit points of Junior Mathematics. **Qualifier**: CHEM (1102 or 1902 or 1904 or 1909). **Prohibition**: May not be counted with CHEM (2001 or 2301 or 2901 or 2903 or 2311 or 2312 or 2502). **Assessment**: Theory (67%), lab exercises (33%).

The aim of this unit of study is to provide students interested in environmental science with the chemical knowledge required for an understanding of the area.

Practical: As for CHEM 2001.

CHEM 2301 **Chemistry 2A**

8 credit points. **Session**: 1. **Classes**: 4 lec & 4hr prac/wk. **Prerequisite**: 6 credit points of Junior Mathematics. **Qualifier**: CHEM (1102 or 1902 or 1904 or 1909 or 1612). **Prohibition**: May not be counted with CHEM (2001 or 2101 or 2901 or 2903 or 2311 or 2312 or 2502). **Assessment**: Theory (67%), lab exercises (33%).

Non-compulsory tutorials will also be provided at a rate of one per week.

Additional information: This is the main chemistry unit of study for students expecting to major in chemistry.

Practical: As for CHEM 2001.

CHEM 2302 **Chemistry 2B**

8 credit points. **Session**: 2. **Classes**: 4 lec & 4hr prac/wk. **Prerequisite**: 6 credit points of Junior Mathematics. **Qualifier**: CHEM (1102 or 1902 or 1904 or 1909 or 1612). **Prohibition**: May not be counted with CHEM (2202 or 2902). **Assessment**: Theory (67%), lab exercises (33%).

Lectures: This unit of study consists of 17 lectures in which the structure, bonding and properties of inorganic compounds and complexes will be presented; 17 lectures of physical chemistry on statistical thermodynamics and thermodynamics; and 17 lectures in organic chemistry which will include amine chemistry, electrophilic substitution and the chemistry of aromatics, the chemistry of carbonyls, nucleophilic organometallic reagents and organic synthesis and synthetic methods.

Additional information: Main chemistry unit of study for students expecting to major in chemistry.

Practical: As for CHEM 2001.

CHEM 2901 **Chemistry 2A (Advanced)**

8 credit points. **Session**: 1. **Classes**: 5 lec & 4 prac/wk. **Prerequisite**: 6 credit points of Junior Mathematics. **Qualifier**: WAM greater than 80 and Distinction average in CHEM (1101 or 1901 or 1903) and in Chemistry (1102 or 1902 or 1904 or 1909). **Prohibition**: May not be counted with CHEM (2001 or 2101 or 2301 or 2903 or 2311 or 2312 or 2502). **Assessment**: Theory (56.7%), lab exercises (33%), Advanced Assignment (10%).

NB: Department permission required for enrolment. Entry to this unit of study is by invitation. Students in the Faculty of Science Talented Students Program are automatically eligible.

Lectures and tutorials: Lectures and tutorials in CHEM 2901 (Advanced) comprise two sets: Four lectures per week in common with any other Intermediate Chemistry unit of study and one lecture per week of advanced lectures on topics that are complementary to the other units of study.

Additional information: The number of places in Chemistry 2901 (Advanced) is limited. Applications are invited from students with a high WAM and an excellent record in a Junior Chemistry unit of study. Places are restricted to students enrolled in the Faculty of Science except by permission of the Head of the School of Chemistry. Students in the Faculty of Science Talented Student Program who are enrolled in the BSc or BSc(Adv) degree are automatically eligible. Students enrolled in other Advanced degree programs within the Faculty are not normally admitted because of timetabling.

Practical: Practical work entails 4 hours per week during the semester. Students must be available 1pm-5pm Friday afternoons for laboratory work.

CHEM 2902 **Chemistry 2B (Advanced)**

8 credit points. **Session**: 2. **Classes**: 5 lec & 4hr prac/wk. **Prerequisite**: 6 credit points of Junior Mathematics. **Qualifier**: WAM greater than 80 and Distinction average in CHEM (1101 or 1901 or 1903) and CHEM (1102 or 1902 or 1904 or 1909). **Prohibition**: May not be counted with CHEM (2202 or 2302). **Assessment**: Theory (56.7%), lab exercises (33.3%), Advanced Assignment (10%).

NB: Department permission required for enrolment. Entry is by invitation.

Lectures and tutorials: Lectures and tutorials in CHEM 2902 (Advanced) comprise two sets: 4 lectures and 1 tutorial per week in common with any other Intermediate Chemistry unit of study; and 1 lecture per week of advanced lectures on topics that are complementary to the other units of study.

Additional information: The number of places in Chemistry 2902 (Advanced) is limited. Normally entry to this unit of study is restricted to those students enrolled in Chemistry 2901. However, a student who has performed particularly well in another February semester Chemistry unit of study may be invited by the Head of School to enrol in Chemistry 2902 (Advanced). See the Intermediate Chemistry unit of study Coordinator for further information.

Practical: Practical work entails 4 hours per week during the semester. Students must be available 1pm-5pm Friday afternoons for laboratory work

CHEM 2311 **Chemistry 2 (Biological Sciences) Theory**

4 credit points. Dr Ron Clarke. **Session**: 1. **Classes**: 4 lec/wk. **Prerequisite**: 12 credit points of Junior Chemistry. **Prohibition**: CHEM (2001 or 2101 or 2301 or 2901 or 2903 or 2502). **Assessment**: 3 hr exam (80%), continuous assessment (20%).

NB: This unit of study is available to students in the Bachelor of Medical Science and the Bachelor of Science (Molecular Biotechnology) only.

This unit of study aims to give students an understanding of the chemistry underlying biological systems. Lectures will cover the mechanisms of organic chemical reactions and their application to biological systems, the molecular basis of spectroscopic techniques used in biological chemistry, analytical chemistry of biological systems, biopolymers and biocolloids and topics from inorganic chemistry of relevance to biological systems (metalloproteins, biomineralisation, etc).

CHEM 2312 **Chemistry 2 (Biological Sciences) Prac**

4 credit points. Dr Ron Clarke. **Session**: 1, 2. **Classes**: 1x4 hour practical/week. **Prerequisite**: 12 credit points of Junior Chemistry. **Corequisite**: CHEM 2311. **Prohibition**: CHEM (2001 or 2101 or 2301 or 2901 or 2903 or 2502). **Assessment**: Practical reports.

NB: This unit of study is available to students in the Bachelor of Medical Science and the Bachelor of Science (Molecular Biotechnology) only.

This unit of study aims to assist students in developing the knowledge and skills required to carry out practical work on the chemistry underlying biological systems. The course will cover experimental investigations of chemical kinetics, organic and inorganic chemical analysis, biopolymer characterisation, and preparation and characterisation of a metal-based anti-inflammatory drug.

CHEM 2903 **Chemistry Life Sciences (Advanced)**

8 credit points. **Session**: 1. **Classes**: 4 lec & 4hr prac/wk. **Prerequisite**: 12 credit points of Junior Mathematics. Candidates for the BSc (Molecular Biology & Genetics) must achieve a credit average in Junior units of study. Candidates for the BSc (Molecular Biotechnology) and the Bachelor of Medical Science must achieve a credit average in Junior units of study and a distinction average in Junior Chemistry units of study. **Qualifier**: CHEM (1902 or 1904 or 1909). **Prohibition**: CHEM (2001 or 2101 or 2301 or 2311 or 2312 or 2502 or 2901). **Assessment**: Theory (67%) and lab exercises (33%).

NB: Department permission required for enrolment. This unit of study is available to students in the Bachelor of Medical Science, the Bachelor of Science (Molecular Biology and Genetics) and the Bachelor of Science (Molecular Biotechnology) only.

This unit of study aims to give students an understanding of the chemistry underlying biological systems. Lectures will cover the mechanisms of organic chemical reactions and their application to biological systems, the molecular basis of spectroscopic techniques used in biological chemistry, analytical chemistry of biological systems, biopolymers and biocolloids and topics from inorganic chemistry of relevance to biological systems (metalloproteins, biomineralisation, etc). There will also be 8 hours of compulsory tutorial workshops. Students must ensure that one complete afternoon from 1.00 pm to 5.00 pm, free from other commitments, is available for the practical work.

Textbooks

As for CHEM 2001

Chemistry Senior units of study

A/Professor A E Masters

The School of Chemistry offers a broad choice of 3 credit point units of study to cater for the differing needs and interests of students. Each unit involves one lecture and the equivalent of 2 hours of lab each week. A number of corequisites and restrictrions apply and students should refer to the information below concerning the degree for which they are enrolled.

Bachelor of Science
Bachelor of Science/Arts
Bachelor of Science/Law

Bachelor of Science/Commerce

Bachelor of Medical Science

For all of the above degrees, the following conditions apply concerning selection of Senior Chemistry units of study:

1) Students must choose a total of either 12 or 24 credit points in Senior Chemistry (ie, 4 or 8 units of study) in a given semester. This restriction is necessary to accommodate the lab classes.

2) There are 4 Groups of units of study, indicated by the second number in the unit code – ie, CHEM X1XX indicates Group 1, CHEM X2XX indicates Group 2, etc. Students enrolling in either 12 or 24 credit points of Senior Chemistry in a semester may only select units from Groups 1, 2 and 3 and must select at least one unit from each of these Groups.

3) The lab classes will consist of two 4 hour sessions for students enrolled in 12 credit points and four 4 hour sessions for students enrolled in 24 credit points of Senior Chemistry. The lab classes are independent of the specific selection of units of study.

Bachelor of Science (Adv)

For students completing a Bachelor of Science (Adv) the following conditions apply concerning selection of Senior Chemistry units of study:

1) Students must choose a total of either 12 or 24 credit points in Senior Chemistry (ie, 4 or 8 units of study) in a given semester.

2) Advanced units of study are identified by a unit code of the form CHEM XX9X. Students who wish to enrol in Advanced Senior Chemistry units of study should make sure that they have indicated the appropriate unit code.

3) There are 4 groups of units of study, indicated by the second number in the unit code – ie, CHEM X1XX indicates Group 1, CHEM X2XX indicates Group 2, etc. Students enrolling in either 12 or 24 credit points of Senior Chemistry in a semester must select units from Groups 1–3 and must select at least one unit from each of these Groups.

4) Students enrolled in either 12 or 24 credit point of Advanced Senior Chemistry units must attend an additional seminar series (1 hour/week) consisting of group-based investigations of contemporary chemistry problems. At the end of the project, students are examined by means of a take-home assignment and these marks are included as a compnent of the lab mark for each of the units of study.

5) The lab classes will consist of two 4 hour sessions for students enrolled in 12 credit points and four 4 hour sessions for students enrolled in 24 credit points of Senior Chemistry. The lab classes are independent of the specific selection of units of study.

Bachelor of Science (Environmental)

Students enrolled in the Bachelor of Science (Environmental) degree who wish to take Senior Chemistry electives in Semester 1 must enrol in CHEM 3100 (or CHEM 3190) and CHEM 3209 (or CHEM 3299). Students in this degree who wish to take the Senior Chemistry elective in Semester 2 must enrol in two of the following units: CHEM 3105 (or CHEM 3195), CHEM 3107 (or CHEM 3197) and CHEM 3305 (or CHEM 3395).

Bachelor of Science (Molecular Biology and Genetics)

Students enrolled in the Bachelor of Science (Molecular Biology and Genteics) degree who wish to take the Senior Chemistry elective in Semester 2 are required to enrol in CHEM 3105 (or CHEM 3195), CHEM 3205 (or CHEM 3295), CHEM 3306 (or CHEM 3396) and any other Semester 2 unit from Groups 1–3.

Bachelor of Science (Molecular Biotechnology)

Students enrolled in Bachelor of Science (Molecular Biotechnology) who wish to take the Senior Chemistry elective in Semester 1 must enrol in CHEM 3209 (or CHEM 3299) and CHEM 3401. Students who wish to enrol in an additional 12 or 24 credit points of Senior Chemistry should refer to the requirements for either the Bachelor of Science or Bachelor of Science (Adv).

Group 1

CHEM 3100 Chemistry of the Main Group

3 credit points. **Session**: 1. **Classes**: One 1hr lecture & 2hr prac. **Prerequisite**: CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902), for students in B.Sc.(ENVI) CHEM(1102 or 1902) and ENVI 2002. **Corequisite**: Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. **Prohibition**: CHEM 3190. **Assessment**: Exam (67%) and lab (33%).

The unit introduces general principles and trends in the physical and chemical properties of the p-block elements. It then discusses the more exotic chemistry of the metals and metalloids of Periodic Table groups 13 and 14, and the non-metallic elements of groups 15–18. Emphasis is placed on the chemical basis of the biological and environmental aspects of these elements as well as examining technologically important materials and new substances with the potential for industrial applications.

Topics will be selected from: boron hydrides, structures, bonding and topology; carboranes and dicarbollide ion complexes; organo-aluminium compounds; semi-conductors; silicates; zeolites; bioorganosilicon chemistry; preparation, properties and use of silicones; condensed polyphosphates, detergents; polyphosphazene systems, pseudo-aromaticity; acid rain; noble gas chemistry; lead compounds, lead oxides; industrial production of chemicals, pollutants from industrial sources; biological implications of p-block elements and other current issues.

CHEM 3103 Organometallic and Catalytic Chemistry

3 credit points. **Session**: 1. **Classes**: One 1hr lecture & 2hr prac. **Prerequisite**: CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **Corequisite**: Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. **Prohibition**: CHEM 3193. **Assessment**: Exam (67%) and lab (33%).

The objective of the unit is to provide an understanding of the fundamental organometallic chemistry, which underpins industrially important catalytic processes. Starting from an overview of catalysis and catalytic processes, which includes coverages of economic and engineering considerations, the features of organometallic chemistry which relate to catalysis are identified. Those features (ligand types, bonding models, fundamental reactions, clusters, spectroscopic characterization) are examined in turn. The combination of these fundamental reactions to form catalytic cycles is discussed. Finally industrially important catalytic processes are analysed in terms of the fundamental organometallic chemistry covered in the unit.

CHEM 3104 Symmetry and Vibrational Spectra

3 credit points. **Session**: 1. **Classes**: One 1hr lecture & 2hr prac. **Prerequisite**: CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **Corequisite**: Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. **Prohibition**: CHEM 3194, CHEM 3304 or CHEM 3394. **Assessment**: exam (67%) and lab (33%).

In order to have a full understanding of vibrational or electronic spectroscopy it is essential to have a firm background in symmetry. Symmetry is an inherently attractive tool for chemists since by applying very simple rules of symmetry it is possible to make inroads into numerous chemical problems such as chemical bonding, molecular vibrations and electronic transitions. Symmetry is used in inorganic chemistry, organic stereochemistry, crystallography and spectroscopy, just to name a few areas. Before we can use symmetry we need to learn some of the rules and define the terms that are frequently used. This involves using group theory theorems without having to be able to prove them mathematically. The course will then examine vibrational spectroscopy of inorganic and biological molecules.

CHEM 3105 Biol/Environ Transition Metal Chem

3 credit points. **Session**: 2. **Classes**: One 1hr lecture & 2hr prac. **Prerequisite**: CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902), for students in B.Sc.(ENVI) CHEM(1102 or 1902) and ENVI 2002. **Corequisite**: Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. **Prohibition**: CHEM 3195. **Assessment**: exam (67%) and lab (33%).

The transition metals have an enormous variety of natural roles in biology; in biological catalysis, oxygen transport, electron transfer and stabilisation of large biomolecules. These roles will be illustrated by descriptions of metalloproteins containing zinc, iron, copper and molybdenum. Examples include recent research on ‘zinc fingers’, nitrogen fixation and photosynthesis. The medical consequences of nutritional trace-element deficiencies are discussed. Transition metals are also important in medicine, both as drugs and as toxins. The use of metal complexes such as platinum anticancer drugs, tumour imaging agents and radiation enhancers will be described. Heavy metal toxicity and the environmental problems associated with heavy metals will also be discussed. All topics are discussed in the context of chemical structure, hard-soft-acid-base theory, stability and reactivity.

CHEM 3106 Inorganic Materials Chemistry

3 credit points. **Session**: 2. **Classes**: One 1hr lecture & 2hr prac. **Prerequisite**: CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **Corequisite**: Either 3 or 7 other Senior Chemistry units of study

selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. **Prohibition**: CHEM 3196. **Assessment**: exam (67%) and lab (33%).

Materials chemistry is concerned with strategies for tailor-making materials with desired and controllable properties, be they catalytic, magnetic, electronic or adsorptive. To do this requires an-understanding of the intricacies of structure and bonding in the solid state. This unit will provide an overview of a number of types of materials and the methods used in their characterisation. Topics to be covered include; the structure-property relationships in metal oxides displaying superconductivity or other unusual electronic properties; the potential of molecular solids for use in electronic and magnetic devices; and the importance of porosity in separations, sensing and catalysis.

CHEM 3107 **Forensic and Analytical Chemistry**

3 credit points. **Session**: 2. **Classes**: One 1hr lecture & 2hr prac. **Prerequisite**: CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902), for students in B.Sc.(ENVI) CHEM(1102 or 1902) and ENVI 2002. **Corequisite**: Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. **Prohibition**: CHEM 3197. **Assessment**: exam (67%) and lab (33%).

This unit examines the gathering and analysis of evidence, using a wide variety of chemical techniques, as well as the development of specialized forensic techniques in the analysis of trace evidence. You will study forensic analyses of inorganic, organic and biological materials, dust, soil, inks, paints, documents, etc. in police, customs and insurance investigations and learn how techniques such as IR, UV, MS, GC, GC-MS, XRD, XRF, SEM, EDAX ICP, HPLC, trace metals analysis, separation science, DNA analysis, etc., singly and in combination are used to examine forensic evidence. Guest speakers will assist with the unit as available.

CHEM 3108 **Supramolecular Materials**

3 credit points. **Session**: 2. **Classes**: One 1hr lecture & 2hr prac. **Prerequisite**: CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **Corequisite**: Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups (1 or 2) and 3. **Prohibition**: CHEM 3198. **Assessment**: exam (67%) and lab (33%).

In contrast to formation of covalent bonds between atoms in molecules, supramolecular chemistry refers to the non-covalent interactions between molecules. These non-covalent interactions (for example, hydrogen bonding, electrostatic interactions, stacking effects, – interactions, and metal binding) are prevalent in biological systems, and are the crucial interactions that result in the binding of specific substrates or enzymes to receptor proteins, in the assembly of protein-protein complexes, in the assembly and stabilisation of DNA, and in the structures and functions of membranes. Chemists are now able to utilise these non-covalent interactions in a similar manner to Nature, and thus allow the construction or self-assembly of large arrays of molecules. Examples of supramolecular systems which will be discussed include the design and synthesis of artificial receptors for drugs, amino acids and nucleotides, the selective encapsulation of metal ions, chemical switches, enzyme mimics, the one-pot assembly of catenanes, rotaxanes and double and triple- helices, and the design and synthesis of molecular frameworks for separations and catalysis.

CHEM 3109 **Transition Metal Chemistry**

3 credit points. **Session**: 1. **Classes**: One 1hr lecture & 2hr prac. **Prerequisite**: CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **Corequisite**: Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. **Prohibition**: CHEM 3199. **Assessment**: exam (67%) and lab (33%).

Transition metal chemistry finds applications in areas such as life processes, advanced materials, colour chemistry, analytical chemistry, environmental chemistry, organic synthesis, marine chemistry, geochemistry and catalysis. This unit involves a systematic study of the 3d, 4d, and 5d transition elements, the lanthanoids and actinoids. Their physical and chemical properties, and the application of their compounds to the above mentioned areas will be discussed. Emphasis is placed on the correlation of physical properties with electronic and geometric structures, which will lead on to a study of inorganic reaction mechanisms. The latter are central to the understanding of a large number of processes, including enzymatic processes, industrial catalysis and many organic oxidations. Topics to be discussed include substitution reactions of octahedral and square-planar complexes, acid- and base- catalysis of substitution reactions, isomerisations and redox chemistry.

CHEM 3190 **Chemistry of the Main Group (Adv)**

3 credit points. **Session**: 1. **Classes**: One 1hr lecture & 2hr prac. **Prerequisite**: Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902), for students in B.Sc.(ENVI) CHEM(1102 or 1902) and ENVI 2002. **Corequisite**: Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. **Prohibition**: CHEM 3100. **Assessment**: exam (67%) and lab+advanced seminars (33%).

The unit introduces general principles and trends in the physical and chemical properties of the p-block elements. It then discusses the more exotic chemistry of the metals and metalloids of Periodic Table groups 13 and 14, and the non-metallic elements of groups 15–18. Emphasis is placed on the chemical basis of the biological and environmental aspects of these elements as well as examining technologically important materials and new substances with the potential for industrial applications.

Topics will be selected from: boron hydrides, structures, bonding and topology; carboranes and dicarbollide ion complexes; organo-aluminium compounds; semi-conductors; silicates; zeolites; bioorganosilicon chemistry; preparation, properties and use of silicones; condensed polyphosphates, detergents; polyphosphazene systems, pseudo-aromaticity; acid rain; noble gas chemistry; lead compounds, lead oxides; industrial production of chemicals, pollutants from industrial sources; biological implications of p-block elements and other current issues.

CHEM 3193 **Organometallic and Catalytic Chem (Adv)**

3 credit points. **Session**: 1. **Classes**: One 1hr lecture & 2hr prac. **Prerequisite**: Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **Corequisite**: Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. **Prohibition**: CHEM 3103. **Assessment**: exam (67%) and lab+advanced seminars (33%).

The objective of the unit is to provide an understanding of the fundamental organometallic chemistry, which underpins industrially important catalytic processes. Starting from an overview of catalysis and catalytic processes, which includes coverages of economic and engineering considerations, the features of organometallic chemistry which relate to catalysis are identified. Those features (ligand types, bonding models, fundamental reactions, clusters, spectroscopic characterization) are examined in turn. The combination of these fundamental reactions to form catalytic cycles is discussed. Finally industrially important catalytic processes are analysed in terms of the fundamental organometallic chemistry covered in the unit.

CHEM 3194 **Symmetry and Vibrational Spectra (Adv)**

3 credit points. **Session**: 1. **Classes**: One 1hr lecture & 2hr prac. **Prerequisite**: Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **Corequisite**: Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. **Prohibition**: CHEM 3104, CHEM 3304 or CHEM 3394. **Assessment**: exam (67%) and lab+advanced seminars (33%).

In order to have a full understanding of vibrational or electronic spectroscopy it is essential to have a firm background in symmetry. Symmetry is an inherently attractive tool for chemists since by applying very simple rules of symmetry it is possible to make inroads into numerous chemical problems such as chemical bonding, molecular vibrations and electronic transitions. Symmetry is used in inorganic chemistry, organic stereochemistry, crystallography and spectroscopy, just to name a few areas. Before we can use symmetry we need to learn some of the rules and define the terms that are frequently used. This involves using group theory theorems without having to be able to prove them mathematically. The course will then examine vibrational spectroscopy of inorganic and biological molecules.

CHEM 3195 **Biol/Environ Transition Metal Chem (Adv)**

3 credit points. **Session**: 2. **Classes**: One 1hr lecture & 2hr prac. **Prerequisite**: Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902), for students in B.Sc.(ENVI) CHEM(1102 or 1902) and ENVI 2002. **Corequisite**: Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. **Prohibition**: CHEM 3105. **Assessment**: exam (67%) and lab+advanced seminars (33%).

The transition metals have an enormous variety of natural roles in biology; in biological catalysis, oxygen transport, electron transfer and stabilisation of large biomolecules. These roles will be illustrated by descriptions of metalloproteins containing zinc,

iron, copper and molybdenum. Examples include recent research on 'zinc fingers', nitrogen fixation and photosynthesis. The medical consequences of nutritional trace-element deficiencies are discussed. Transition metals are also important in medicine, both as drugs and as toxins. The use of metal complexes such as platinum anticancer drugs, tumour imaging agents and radiation enhancers will be described. Heavy metal toxicity and the environmental problems associated with heavy metals will also be discussed. All topics are discussed in the context of chemical structure, hard-soft-acid-base theory, stability and reactivity.

CHEM 3196 **Inorganic Materials Chemistry (Adv)**

3 credit points. **Session**: 2. **Classes**: One 1hr lecture & 2hr prac. **Prerequisite**: Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **Corequisite**: Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. **Prohibition**: CHEM 3106. **Assessment**: exam (67%) and lab+advanced seminars (33%).

Materials chemistry is concerned with strategies for tailor-making materials with desired and controllable properties, be they catalytic, magnetic, electronic or adsorptive. To do this requires an-understanding of the intricacies of structure and bonding in the solid state. This unit will provide an overview of a number of types of materials and the methods used in their characterisation. Topics to be covered include; the structure-property relationships in metal oxides displaying superconductivity or other unusual electronic properties; the potential of molecular solids for use in electronic and magnetic devices; and the importance of porosity in separations, sensing and catalysis.

CHEM 3197 **Forensic and Analytical Chemistry (Adv)**

3 credit points. **Session**: 2. **Classes**: One 1hr lecture & 2hr prac. **Prerequisite**: Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902), for students in B.Sc.(ENVI) CHEM(1102 or 1902) and ENVI 2002. **Corequisite**: Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. **Prohibition**: CHEM 3107. **Assessment**: exam (67%) and lab+advanced seminars (33%).

This unit examines the gathering and analysis of evidence, using a wide variety of chemical techniques, as well as the development of specialized forensic techniques in the analysis of trace evidence. You will study forensic analyses of inorganic, organic and biological materials, dust, soil, inks, paints, documents, etc. in police, customs and insurance investigations and learn how techniques such as IR, UV, MS, GC, GC-MS, XRD, XRF, SEM, EDAX ICP, HPLC, trace metals analysis, separation science, DNA analysis, etc., singly and in combination are used to examine forensic evidence. Guest speakers will assist with the unit as available.

CHEM 3198 **Supramolecular Materials (Adv)**

3 credit points. **Session**: 2. **Classes**: One 1hr lecture & 2hr prac. **Prerequisite**: Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **Corequisite**: Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups (1 or 2) and 3. **Prohibition**: CHEM 3108. **Assessment**: exam (67%) and lab+advanced seminars (33%).

In contrast to formation of covalent bonds between atoms in molecules, supramolecular chemistry refers to the non-covalent interactions between molecules. These non-covalent interactions (for example, hydrogen bonding, electrostatic interactions, stacking effects, – interactions, and metal binding) are prevalent in biological systems, and are the crucial interactions that result in the binding of specific substrates or enzymes to receptor proteins, in the assembly of protein-protein complexes, in the assembly and stabilisation of DNA, and in the structures and functions of membranes. Chemists are now able to utilise these non-covalent interactions in a similar manner to Nature, and thus allow the construction or self-assembly of large arrays of molecules. Examples of supramolecular systems which will be discussed include the design and synthesis of artificial receptors for drugs, amino acids and nucleotides, the selective encapsulation of metal ions, chemical switches, enzyme mimics, the one-pot assembly of catenanes, rotaxanes and double and triple- helices, and the design and synthesis of molecular frameworks for separations and catalysis.

CHEM 3199 **Transition Metal Chemistry (Adv)**

3 credit points. **Session**: 1. **Classes**: One 1hr lecture & 2hr prac. **Prerequisite**: Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **Corequisite**: Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 2 and 3. **Prohibition**: CHEM 3109. **Assessment**: exam (67%) and lab+advanced seminars (33%).

Transition metal chemistry finds applications in areas such as life processes, advanced materials, colour chemistry, analytical chemistry, environmental chemistry, organic synthesis, marine chemistry, geochemistry and catalysis. This unit involves a systematic study of the 3d, 4d, and 5d transition elements, the lanthanoids and actinoids. Their physical and chemical properties, and the application of their compounds to the above mentioned areas will be discussed. Emphasis is placed on the correlation of physical properties with electronic and geometric structures, which will lead on to a study of inorganic reaction mechanisms. The latter are central to the understanding of a large number of processes, including enzymatic processes, industrial catalysis and many organic oxidations. Topics to be discussed include substitution reactions of octahedral and square-planar complexes, acid- and base- catalysis of substitution reactions, isomerisations and redox chemistry.

Group 2

CHEM 3200 **Stereochemistry and Mechanisms**

3 credit points. **Session**: 1. **Classes**: One 1hr lecture & 2hr prac. **Prerequisite**: CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **Corequisite**: Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. **Prohibition**: CHEM 3290. **Assessment**: exam (67%) and lab (33%).

The unit oversees organic chemistry from a mechanistic point of view. You first learn more about the stereochemistry of molecules, the issues of chirality, how to make chiral substances and why all this is important in biology and in the chemical laboratory. Then you see how the stereochemical changes in reactions allow you to prove unambiguously how stepwise substitution, addition and elimination reactions proceed, and finally you learn the wonderfully simple laws which explain (and allow you to predict how) concerted reactions occur.

CHEM 3203 **Bioorganic Chemistry**

3 credit points. **Session**: 1. **Classes**: One 1hr lecture & 2hr prac. **Prerequisite**: CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **Corequisite**: Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. **Prohibition**: CHEM 3293. **Assessment**: exam (67%) and lab (33%).

DNA, proteins and carbohydrates are the three classes of essential biomolecules that are present in all biological systems. This unit will cover the structure and chemical reactivity of the building blocks (nucleotides, amino acids and monosaccharides) from which these molecules are assembled as well as the structure and function of these biomolecules in living systems. Applications of this chemistry will be highlighted for example: sugar (sucrose) and artificial sweetners (Nutrasweet, Splenda); fibre in the diet (what is in Metamucil and All-Bran?); the chemistry of hair, nails and enzymes; medicinally important drugs that interact with DNA (mustard gas, ethidium bromide, current clinically used chemotherapy drugs), and DNA fingerprinting.

CHEM 3204 **Heterocyclic Chemistry**

3 credit points. **Session**: 2. **Classes**: One 1hr lecture & 2hr prac. **Prerequisite**: CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **Corequisite**: Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. **Prohibition**: CHEM 3294. **Assessment**: exam (67%) and lab (33%).

Some 40% of all known organic compounds are heterocyclic and many have outstanding chemical, biological, and industrial importance. The first part of this unit deals with rings with a single heteroatom and can be regarded as a logical continuation of the aromatic chemistry of the second year units. The synthesis and reactions of five- and six-membered heterocyclic compounds, and the influence of the heteroatom will be discussed. The second part of this unit deals with heterocyclic compounds with two or more heteroatoms in the ring system including: important ring systems such as pyrimidines and purines (that are an integral part of the DNA and RNA bases); imidazole and thiazole (that are found in some amino acids and vitamins); and porphyrins (that are natural colouring substances and that are responsible for the oxygen-carrying component of blood).

CHEM 3205 **Medicinal and Biological Chemistry**

3 credit points. **Session**: 2. **Classes**: One 1hr lecture & 2hr prac. **Prerequisite**: CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **Corequisite**: Either 3 or 7 other Senior Chemistry units of study

selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. **Prohibition**: CHEM 3295. **Assessment**: exam (67%) and lab (33%).

This focus of this unit is how pharmaceuticals are designed and synthesised, and how they work. No previous knowledge of biochemistry or cell biology is required or assumed.

The structures and properties of the major targets of drug action – enzymes, receptors, DNA and cell membranes – will be described in detail. The molecular basis for the therapeutic activity of various drugs will be explored, and a description of how pharmaceuticals interact with their specific biomolecular targets to confer their medicinal properties will be presented. The current arsenal of methods used in the discovery of new drugs will be highlighted, including rational drug design, random screening and combinatorial chemistry. Various case studies will be examined throughout the unit, including examples of the action of antibiotics (penicillin, vancomycin), anti-inflammatory drugs (aspirin, naproxen), cholesterol-lowering agents (Lipitor®) and anti-cancer compounds (Taxol®).

CHEM 3206 **Radical and Pericyclic Chemistry**

3 credit points. **Session**: 2. **Classes**: One 1hr lecture & 2hr prac. **Prerequisite**: CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **Corequisite**: Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. **Prohibition**: CHEM 3296. **Assessment**: exam (67%) and lab (33%).

The unit will first deal with free radicals which are ubiquitous species involved in the O2-initiated breakdown of biological material (a radical reaction often mentioned by manufacturers of 'health and beauty' products containing antioxidants), and in the synthesis of natural products, fine chemicals (pharmaceuticals, agrochemicals, etc.) and synthetic polymers. Then we turn to pericyclic reactions, particularly the Diels-Alder reaction which is arguable the most important reaction in organic chemistry. The focus of this unit is on natural products, and on how they have provided such rich chemistry (free radical and pericyclic) which has modern synthetic, biosynthetic, environmental and biological applications.

CHEM 3207 **Synthetic Methods**

3 credit points. **Session**: 2. **Classes**: One 1hr lecture & 2hr prac. **Prerequisite**: CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **Corequisite**: Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. **Prohibition**: CHEM 3297. **Assessment**: exam (67%) and lab (33%).

This unit will focus on the issues that are faced by organic chemists when they pursue the synthesis of novel compounds. It will highlight important general strategies and develop a logical approach to planning a synthesis that is applicable to any target structure. We will study a range of reagents used to effect fundamental synthetic transformations including, hydride reducing agents for functional group reduction, organometallic reagents for carbon-carbon bond formation, phosphorus based reagents for the geometrically controlled synthesis of carbon-carbon double bonds and enolates for the stereoselective synthesis of carbonyl containing compounds. The emphasis will be on how to apply these reagents successfully in complex and challenging situations.Throughout the unit the concepts and techniques introduced will be illustrated by real life examples of synthesis conducted by pharmaceutical companies and academic research labs around the world. Examples will include the synthesis of pharmaceuticals such as local anaesthetics, non-nucleoside anti-HIV-1 treatments and natural products that have recently entered clinical trials for the treatment of multi-drug resistant cancers.

CHEM 3209 **Organic Structures From Spectra**

3 credit points. **Session**: 1. **Classes**: One 1hr lecture & 2hr prac. **Prerequisite**: CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902), for students in B.Sc.(ENVI) CHEM(1102 or 1902) and ENVI 2002, for students enrolled in B.Sci.(MOBT) – MOBT 2001, MOBT 2002, CHEM 2311 and CHEM 2312. **Corequisite**: Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. **Prohibition**: CHEM 3299. **Assessment**: exam (67%) and lab (33%).

This unit is all about how to interpret the spectra produced by the highly sophisticated, modern spectroscopic instruments that are present in all research and analytical laboratories.You learn, inter alia, how to put together the clues from a mass spectrum with the clues from the chemical shift and couplings in an 1H nmr spectrum, and with the clues arising from the interactions between hydrogens and carbons in a 13C nmr spectrum. The unit is part lectures and part problem solving workshops.

CHEM 3290 **Stereochemistry and Mechanisms (Adv)**

3 credit points. **Session**: 1. **Classes**: One 1hr lecture & 2hr prac. **Prerequisite**: Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **Corequisite**: Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. **Prohibition**: CHEM 3200. **Assessment**: exam (67%) and lab+advanced seminars (33%).

The unit oversees organic chemistry from a mechanistic point of view. You first learn more about the stereochemistry of molecules, the issues of chirality, how to make chiral substances and why all this is important in biology and in the chemical laboratory. Then you see how the stereochemical changes in reactions allow you to prove unambiguously how stepwise substitution, addition and elimination reactions proceed, and finally you learn the wonderfully simple laws which explain (and allow you to predict how) concerted reactions occur.

CHEM 3293 **Bioorganic Chemistry (Adv)**

3 credit points. **Session**: 1. **Classes**: One 1hr lecture & 2hr prac. **Prerequisite**: Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **Corequisite**: Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. **Prohibition**: CHEM 3203. **Assessment**: exam (67%) and lab+advanced seminars (33%).

DNA, proteins and carbohydrates are the three classes of essential biomolecules that are present in all biological systems. This unit will cover the structure and chemical reactivity of the building blocks (nucleotides, amino acids and monosaccharides) from which these molecules are assembled as well as the structure and function of these biomolecules in living systems. Applications of this chemistry will be highlighted for example: sugar (sucrose) and artificial sweetners (Nutrasweet, Splenda); fibre in the diet (what is in Metamucil and All-Bran?); the chemistry of hair, nails and enzymes; medicinally important drugs that interact with DNA (mustard gas, ethidium bromide, current clinically used chemotherapy drugs), and DNA fingerprinting.

CHEM 3294 **Heterocyclic Chemistry (Adv)**

3 credit points. **Session**: 2. **Classes**: One 1hr lecture & 2hr prac. **Prerequisite**: Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **Corequisite**: Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. **Prohibition**: CHEM 3204. **Assessment**: exam (67%) and lab+advanced seminars (33%).

Some 40% of all known organic compounds are heterocyclic and many have outstanding chemical, biological, and industrial importance. The first part of this unit deals with rings with a single heteroatom and can be regarded as a logical continuation of the aromatic chemistry of the second year units. The synthesis and reactions of five- and six-membered heterocyclic compounds, and the influence of the heteroatom will be discussed. The second part of this unit deals with heterocyclic compounds with two or more heteroatoms in the ring system including: important ring systems such as pyrimidines and purines (that are an integral part of the DNA and RNA bases); imidazole and thiazole (that are found in some amino acids and vitamins); and porphyrins (that are natural colouring substances and that are responsible for the oxygen-carrying component of blood).

CHEM 3295 **Medicinal and Biological Chemistry (Adv)**

3 credit points. **Session**: 2. **Classes**: One 1hr lecture & 2hr prac. **Prerequisite**: Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **Corequisite**: Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. **Prohibition**: CHEM 3205. **Assessment**: exam (67%) and lab+advanced seminars (33%).

This focus of this unit is how pharmaceuticals are designed and synthesised, and how they work. No previous knowledge of biochemistry or cell biology is required or assumed.

The structures and properties of the major targets of drug action – enzymes, receptors, DNA and cell membranes – will be described in detail. The molecular basis for the therapeutic activity of various drugs will be explored, and a description of how pharmaceuticals interact with their specific biomolecular targets to confer their medicinal properties will be presented. The current arsenal of methods used in the discovery of new drugs will be highlighted, including rational drug design, random screening and combinatorial chemistry. Various case studies will be examined throughout the unit, including examples of the action of antibiotics (penicillin, vancomycin), anti-inflammatory

drugs (aspirin, naproxen), cholesterol-lowering agents (Lipitor®) and anti-cancer compounds (Taxol®).

CHEM 3296 **Radical and Pericyclic Chemistry (Adv)**

3 credit points. **Session**: 2. **Classes**: One 1hr lecture & 2hr prac. **Prerequisite**: Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **Corequisite**: Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. **Prohibition**: CHEM 3206. **Assessment**: exam (67%) and lab+advanced seminars (33%).

The unit will first deal with free radicals which are ubiquitous species involved in the O2-initiated breakdown of biological material (a radical reaction often mentioned by manufacturers of 'health and beauty' products containing antioxidants), and in the synthesis of natural products, fine chemicals (pharmaceuticals, agrochemicals, etc.) and synthetic polymers. Then we turn to pericyclic reactions, particularly the Diels-Alder reaction which is arguable the most important reaction in organic chemistry. The focus of this unit is on natural products, and on how they have provided such rich chemistry (free radical and pericyclic) which has modern synthetic, biosynthetic, environmental and biological applications.

CHEM 3297 **Synthetic Methods (Adv)**

3 credit points. **Session**: 2. **Classes**: One 1hr lecture & 2hr prac. **Prerequisite**: Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **Corequisite**: Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. **Prohibition**: CHEM 3207. **Assessment**: exam (67%) and lab+advanced seminars (33%).

This unit will focus on the issues that are faced by organic chemists when they pursue the synthesis of novel compounds. It will highlight important general strategies and develop a logical approach to planning a synthesis that is applicable to any target structure. We will study a range of reagents used to effect fundamental synthetic transformations including, hydride reducing agents for functional group reduction, organometallic reagents for carbon-carbon bond formation, phosphorus based reagents for the geometrically controlled synthesis of carbon-carbon double bonds and enolates for the stereoselective synthesis of carbonyl containing compounds. The emphasis will be on how to apply these reagents successfully in complex and challenging situations.Throughout the unit the concepts and techniques introduced will be illustrated by real life examples of synthesis conducted by pharmaceutical companies and academic research labs around the world. Examples will include the synthesis of pharmaceuticals such as local anaesthetics, non-nucleoside anti-HIV-1 treatments and natural products that have recently entered clinical trials for the treatment of multi-drug resistant cancers.

CHEM 3299 **Organic Structures From Spectra (Adv)**

3 credit points. **Session**: 1. **Classes**: One 1hr lecture & 2hr prac. **Prerequisite**: Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902), for students in B.Sc.(ENVI) CHEM(1102 or 1902) and ENVI 2002, for students enrolled in B.Sci.(MOBT) – MOBT 2001, MOBT 2002, CHEM 2311 and CHEM 2312. **Corequisite**: Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 3. **Prohibition**: CHEM 3209. **Assessment**: exam (67%) and lab+advanced seminars (33%).

This unit is all about how to interpret the spectra produced by the highly sophisticated, modern spectroscopic instruments that are present in all research and analytical laboratories.You learn, inter alia, how to put together the clues from a mass spectrum with the clues from the chemical shift and couplings in an 1H nmr spectrum, and with the clues arising from the interactions between hydrogens and carbons in a 13C nmr spectrum. The unit is part lectures and part problem solving workshops.

Group 3

CHEM 3301 **Quantum Chemistry**

3 credit points. **Session**: 1. **Classes**: One 1hr lecture & 2hr prac. **Prerequisite**: CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **Corequisite**: Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **Prohibition**: CHEM 3391. **Assessment**: exam (67%) and lab (33%).

Quantum Theory provides the theory and the tools for the study and understanding of chemical processes at the microscopic level of electrons, nuclei and their interactions. This unit focuses on the development of a sound understanding of basic quantum chemical concepts such as the Schr˚dinger wave equation, quantum mechanical operators and wave functions and their interpretation. The techniques are applied to (a) the study of simple model systems, that illustrate fundamental quantum phenomena such as quantization, tunnelling and covalent bonding, (b) the description of atomic and molecular electronic structure, and (c) the role of symmetry and its use in molecular orbital theory.

CHEM 3302 **Chemical Dynamics**

3 credit points. **Session**: 1. **Classes**: One 1hr lecture & 2hr prac. **Prerequisite**: CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **Corequisite**: Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **Prohibition**: CHEM 3392. **Assessment**: exam (67%) and lab (33%).

This unit begins with the fundamentals of dynamics of molecular collisions, reactions on potential energy surfaces, transition states and how we may obtain information about the actual mechanism of reactions at the microscopic level. Important applications of chemical dynamics are then discussed including chain reactions, explosions and flames, oscillating chemical reactions and the approach to chemical chaos.

CHEM 3303 **Surfaces and Colloids**

3 credit points. **Session**: 1. **Classes**: One 1hr lecture & 2hr prac. **Prerequisite**: CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **Corequisite**: Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **Prohibition**: CHEM 3393. **Assessment**: exam (67%) and lab (33%).

Surface chemistry can occur any time two phases – solid, liquid, or gas – are in contact. Many important chemical, physical and biological processes occur at surfaces rather than inside the bulk phases with which we are more familiar. This module introduces the concepts of surface tension, adsorption, and the electrical double-layer and uses them to understand important applications. Examples will be drawn from liquid spreading, adhesion, nucleation of new phases, catalysis, coagulation of dispersions and detergency.

CHEM 3304 **Symmetry and Electronic Spectra**

3 credit points. **Session**: 1. **Classes**: One 1hr lecture & 2hr prac. **Prerequisite**: CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **Corequisite**: Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **Prohibition**: CHEM 3394, CHEM 3104 or CHEM 3194. **Assessment**: exam (67%) and lab (33%).

In order to have a full understanding of vibrational or electronic spectroscopy it is essential to have a firm background in symmetry. Symmetry is an inherently attractive tool for chemists since by applying very simple rules of symmetry it is possible to make inroads into numerous chemical problems such as chemical bonding, molecular vibrations and electronic transitions. Symmetry is used in inorganic chemistry, organic stereochemistry, crystallography and spectroscopy, just to name a few areas. Before we can use symmetry we need to learn some of the rules and define the terms that are frequently used. This involves using group theory theorems without having to be able to prove them mathematically. The course will then examine molecular electronic spectroscopy.

CHEM 3305 **Atmospheric and Photochemistry**

3 credit points. **Session**: 2. **Classes**: One 1hr lecture & 2hr prac. **Prerequisite**: CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902), for students in B.Sc.(ENVI) CHEM(1102 or 1902) and ENVI 2002. **Corequisite**: Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **Prohibition**: CHEM 3395. **Assessment**: exam (67%) and lab (33%).

This unit will examine the chemistry of species emitted into the atmosphere leading to an understanding of i) photochemical smog, ii) stratospheric ozone depletion, and iii) the'Greenhouse effect'. Specific topics to be covered include: the structure of the atmosphere, brief review of spectroscopy and kinetics, chemistry of the 'natural' atmosphere, chemistry of the polluted troposphere, nighttime chemistry, stratospheric chemistry / ozone depletion, global warming and the greenhouse effect.

CHEM 3306 **Biophysical Chemistry**

3 credit points. **Session**: 2. **Classes**: One 1hr lecture & 2hr prac. **Prerequisite**: CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **Corequisite**: Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **Prohibition**: CHEM 3396. **Assessment**: exam (67%) and lab (33%).

Much of biochemistry deals with physical interactions and communication between biological molecules. Examples of this

include protein folding and unfolding, transport across cell membranes, nerve impulse propagation and muscle contraction. In this unit we explore how these complex phenomena arise from familiar electrostatic, hydrogen bonding, hydrophobic and other chemical interactions. We shall also discuss modern physical techniques for their further investigation and the underlying physical principles involved.

CHEM 3307 **Polymer Chemistry**

3 credit points. **Session**: 2. **Classes**: One 1hr lecture & 2hr prac. **Prerequisite**: CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **Corequisite**: Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **Prohibition**: CHEM 3397. **Assessment**: exam (67%) and lab (33%).

Natural and synthetic polymers are inseparable parts of our everyday lives. This module describes the mechanisms of polymer formation and how molecular architecture affects the physical properties of a polymer. Topics include traditional and novel means of polymer synthesis (free radical, ionic, condensation, RAFT), the corresponding kinetics and molecular weights, the molecular-level description of polymer cohesion, hardness and softness (the glass transition), conducting polymers, and the intelligent design of new polymers. The environmental impact of polymers will also be discussed.

CHEM 3308 **Physical Chemistry of Materials**

3 credit points. **Session**: 2. **Classes**: One 1hr lecture & 2hr prac. **Prerequisite**: CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **Corequisite**: Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **Prohibition**: CHEM 3398. **Assessment**: exam (67%) and lab (33%).

One of the most tangible impacts of chemistry in our daily lives is in the macroscopic properties of materials. This unit will provide an introduction to the chemistry of material properties. A number of properties will be selected from among the following: viscosity, diffusion, thermal conductivity, electrical conductivity, elastic moduli, yield stress and toughness. The microscopic origins of the selected properties will then be examined in the context of a selected class of materials. Possible material classes include polymers, ceramics, metals and dielectrics (including semiconductors).

CHEM 3391 **Quantum Chemistry (Adv)**

3 credit points. **Session**: 1. **Classes**: One 1hr lecture & 2hr prac. **Prerequisite**: Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **Corequisite**: Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **Prohibition**: CHEM 3301. **Assessment**: exam (67%) and lab+advanced seminars (33%).

Quantum Theory provides the theory and the tools for the study and understanding of chemical processes at the microscopic level of electrons, nuclei and their interactions. This unit focuses on the development of a sound understanding of basic quantum chemical concepts such as the Schr˚dinger wave equation, quantum mechanical operators and wave functions and their interpretation. The techniques are applied to (a) the study of simple model systems, that illustrate fundamental quantum phenomena such as quantization, tunnelling and covalent bonding, (b) the description of atomic and molecular electronic structure, and (c) the role of symmetry and its use in molecular orbital theory.

CHEM 3392 **Chemical Dynamics (Adv)**

3 credit points. **Session**: 1. **Classes**: One 1hr lecture & 2hr prac. **Prerequisite**: Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **Corequisite**: Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **Prohibition**: CHEM 3302. **Assessment**: exam (67%) and lab+advanced seminars (33%).

This unit begins with the fundamentals of dynamics of molecular collisions, reactions on potential energy surfaces, transition states and how we may obtain information about the actual mechanism of reactions at the microscopic level. Important applications of chemical dynamics are then discussed including chain reactions, explosions and flames, oscillating chemical reactions and the approach to chemical chaos.

CHEM 3393 **Surfaces and Colloids (Adv)**

3 credit points. **Session**: 1. **Classes**: One 1hr lecture & 2hr prac. **Prerequisite**: Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **Corequisite**: Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **Prohibition**: CHEM 3303. **Assessment**: exam (67%) and lab+advanced seminars (33%).

Surface chemistry can occur any time two phases – solid, liquid, or gas – are in contact. Many important chemical, physical and biological processes occur at surfaces rather than inside the bulk phases with which we are more familiar. This module introduces the concepts of surface tension, adsorption, and the electrical double-layer and uses them to understand important applications. Examples will be drawn from liquid spreading, adhesion, nucleation of new phases, catalysis, coagulation of dispersions and detergency.

CHEM 3394 **Symmetry and Electronic Spectra (Adv)**

3 credit points. **Session**: 1. **Classes**: One 1hr lecture & 2hr prac. **Prerequisite**: Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **Corequisite**: Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **Prohibition**: CHEM 3304, CHEM 3104 or CHEM 3194. **Assessment**: exam (67%) and lab+advanced seminars (33%).

In order to have a full understanding of vibrational or electronic spectroscopy it is essential to have a firm background in symmetry. Symmetry is an inherently attractive tool for chemists since by applying very simple rules of symmetry it is possible to make inroads into numerous chemical problems such as chemical bonding, molecular vibrations and electronic transitions. Symmetry is used in inorganic chemistry, organic stereochemistry, crystallography and spectroscopy, just to name a few areas. Before we can use symmetry we need to learn some of the rules and define the terms that are frequently used. This involves using group theory theorems without having to be able to prove them mathematically. The course will then examine molecular electronic spectroscopy.

CHEM 3395 **Atmospheric and Photochemistry (Adv)**

3 credit points. **Session**: 2. **Classes**: One 1hr lecture & 2hr prac. **Prerequisite**: Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902), for students in B.Sc.(ENVI) CHEM(1102 or 1902) and ENVI 2002. **Corequisite**: Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **Prohibition**: CHEM 3305. **Assessment**: exam (67%) and lab+advanced seminars (33%).

This unit will examine the chemistry of species emitted into the atmosphere leading to an understanding of i) photochemical smog, ii) stratospheric ozone depletion, and iii) the'Greenhouse effect'. Specific topics to be covered include: the structure of the atmosphere, brief review of spectroscopy and kinetics, chemistry of the 'natural' atmosphere, chemistry of the polluted troposphere, nighttime chemistry, stratospheric chemistry / ozone depletion, global warming and the greenhouse effect.

CHEM 3396 **Biophysical Chemistry (Adv)**

3 credit points. **Session**: 2. **Classes**: One 1hr lecture & 2hr prac. **Prerequisite**: Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **Corequisite**: Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **Prohibition**: CHEM 3306. **Assessment**: exam (67%) and lab+advanced seminars (33%).

Much of biochemistry deals with physical interactions and communication between biological molecules. Examples of this include protein folding and unfolding, transport across cell membranes, nerve impulse propagation and muscle contraction. In this unit we explore how these complex phenomena arise from familiar electrostatic, hydrogen bonding, hydrophobic and other chemical interactions. We shall also discuss modern physical techniques for their further investigation and the underlying physical principles involved.

CHEM 3397 **Polymer Chemistry (Adv)**

3 credit points. **Session**: 2. **Classes**: One 1hr lecture & 2hr prac. **Prerequisite**: Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **Corequisite**: Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **Prohibition**: CHEM 3307. **Assessment**: exam (67%) and lab+advanced seminars (33%).

Natural and synthetic polymers are inseparable parts of our everyday lives. This module describes the mechanisms of polymer formation and how molecular architecture affects the physical properties of a polymer. Topics include traditional and novel means of polymer synthesis (free radical, ionic, condensation, RAFT), the corresponding kinetics and molecular weights, the molecular-level description of polymer cohesion, hardness and softness (the glass transition), conducting polymers, and the intelligent design of new polymers. The environmental impact of polymers will also be discussed.

CHEM 3398 **Physical Chemistry of Materials (Adv)**
3 credit points. **Session**: 2. **Classes**: One 1hr lecture & 2hr prac. **Prerequisite**: Distinction average in CHEM (2001 or 2101 or 2301 or 2901) and CHEM (2302 or 2902). **Corequisite**: Either 3 or 7 other Senior Chemistry units of study selected from Groups 1–3 including at least one unit from each of Groups 1 and 2. **Prohibition**: CHEM 3308. **Assessment**: exam (67%) and lab+advanced seminars (33%).
One of the most tangible impacts of chemistry in our daily lives is in the macroscopic properties of materials. This unit will provide an introduction to the chemistry of material properties. A number of properties will be selected from among the following: viscosity, diffusion, thermal conductivity, electrical conductivity, elastic moduli, yield stress and toughness. The microscopic origins of the selected properties will then be examined in the context of a selected class of materials. Possible material classes include polymers, ceramics, metals and dielectrics (including semiconductors)

Group 4

CHEM 3401 **Molecular Modelling and Drug Design**
3 credit points. **Session**: 1. **Classes**: One 1hr lecture & 2hr prac. **Prerequisite**: MOBT 2001, MOBT 2002, CHEM 2311 and CHEM 2312. **Corequisite**: Enrollment in B.Sc.(Molecular Biotechnology) and CHEM 3209 or CHEM 3299. **Prohibition**: May not be counted for degree other than B.Sc.(Molecular Biotechnology). **Assessment**: exam (67%) and lab (33%).
The lectures include 4 main topics. Organic and inorganic stereochemistry addresses the importance of stereochemistry in biological activity; geometric isomerism and optical isomerism. Quantitative Structure-Activity Relationships (QSAR) covers chemometric models used to analyse the relationships between the biological activity and the physiochemical properties of a drug. Techniques used to measure the physicochemical parameters used in QSAR techniques, such as reverse-phase high pressure liquid chromatography (RP-HPLC); three-dimensional (3D) QSAR techniques are covered. Also covered are computational methods in drug design and solvation and hydrogen bonding in biological chemistry.

Chemistry Honours

Dr C J Kepert

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, from the Administrative Officer (Academic), or at www.chem.usyd.edu.au/honours.html.

■ Civil Engineering

The Department of Civil Engineering is part of the Faculty of Engineering. 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 CIVL 1051 – Statics (5 credit points), CIVL 2201 – Structural Mechanics (6 credit points), CIVL 2205 – Introduction to Structural Design (4 credit points), and CIVL 2204 – Introduction to Structural Concepts (4 credit points). Details regarding these units of study can be obtained from the Faculty of Engineering Handbook.

The above units of study are intended first to demonstrate the application of scientific principles in an engineering context so that the science student will gain an understanding of the engineering behaviour of materials and engineering structures. The second intention is to introduce the application of this understanding to the analysis and design of engineering structures.

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 prerequisites.

Double Degree

Some BSc graduates, who have passed all four of the above four units of study within the Department 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 Department 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 Faculty Building.

■ Computational Science

Computational Science is an interdisciplinary major offered within the BSc. It focuses on scientific problem solving using computers. It covers the formulation and analysis of problems, the use of software packages and programs to solve these problems computationally, simulations and modelling, mathematical and numerical analysis, high performance super-computing, graphics, visualisation and programming.

Graduates with computational science skills are in strong and increasing demand in scientific research, industry, government and finance, particularly for their analytic and problem solving skills and their specific expertise in computing.

The major in Computational Science can include a wide range of electives to suit individual interests, selected from computationally oriented offerings from various departments and schools from across the Faculty. Table 1 lists the core Senior units and electives, as well as Junior options. COSC units are described below. For descriptions of other units see their separate entries under the contributing school or department.

COSC 1001 **Computational Science in Matlab**
3 credit points. **Session**: 2. **Classes**: one 1hr lecture, one 2hr practical. **Assumed knowledge**: HSC Mathematics. **Prohibition**: May not be counted with COSC 1901. **Assessment**: Two assignments (20%), practical work, including practical exam (40%), theory exam (40%).
This unit of study focuses on scientific problem solving and data visualisation using computers and is complementary to COSC 1002. 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.

Textbooks

Recommended reference:‹
Hahn, B.D Essential MATLAB for Scientists & Engineers, 2nd Ed, Butterworth-Heinemann, Oxford, 2002.

COSC 1901 **Computational Science in Matlab (Adv)**
3 credit points. **Session**: 2. **Classes**: one 1hr lecture, one 2hr practical. **Assumed knowledge**: HSC Mathematics. **Prerequisite**: UAI of at least 90, or COSC 1902, or a distinction or better in COSC 1002, SOFT (1001, 1002, 1901 or 1902). **Prohibition**: May not be counted with COSC 1001. **Assessment**: Two assignments (20%), practical work, including practical exam (40%), theory exam (40%).
This unit of study is the advanced version of COSC 1001 and is complementary to COSC 1902. The subject matter is very similar but more challenging problems will be covered and some additional programming and visualisation techniques will be used. The unit focuses on scientific problem solving and data visualisation using computers. 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.

Textbooks

Recommended reference:‹

Hahn, B.D Essential MATLAB for Scientists & Engineers, 2nd Ed, Butterworth-Heinemann, Oxford, 2002.

COSC 1002 **Computational Science in C**

3 credit points. Dr Mike Wheatland. **Session**: 2. **Classes**: one 1hr lecture, one 2hr practical. **Assumed knowledge**: HSC Mathematics. **Prohibition**: May not be counted with COSC 1902. **Assessment**: Two assignments (20%), practical work, including practical exam (40%), theory exam (40%).

This unit of study focuses on scientific problem-solving using computers and is complementary to COSC 1001. 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.

Recommended references

Gottfried B. Schaum's Outlines Programming with C, McGraw-Hill 1996.‹

Press, Teukolsky, Vetterling and Flannery. Numerical Recipes in C, The Art of Scientific Computing, 2nd edn, Cambridge Press 1992.

COSC 1902 **Computational Science in C (Adv)**

3 credit points. Dr Mike Wheatland. **Session**: 2. **Classes**: one 1hr lecture, one 2hr practical. **Assumed knowledge**: HSC Mathematics. **Prerequisite**: UAI of at least 90, or COSC 1901, or a distinction or better in COSC 1001, SOFT (1001, 1002, 1901 or 1902). **Prohibition**: May not be counted with COSC 1002. **Assessment**: Two assignments (20%), practical work, including practical exam (40%), theory exam (40%).

This unit of study is the advanced version of COSC 1002 and is complementary to COSC 1901. The subject matter is very similar, but more challenging problems will be covered and some additional programming techniques will be used. The unit focuses on scientific problem solving using computers. 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.

Textbooks

Recommended references:‹

Gottfried B. Schaum's Outlines Programming with C, McGraw-Hill 1996.‹

Press, Teukolsky, Vetterling and Flannery. Numerical Recipes in C, The Art of Scientific Computing, 2nd edn, Cambridge Press 1992.

COSC 2001 **Computational Science 2**

6 credit points. Dr M.S. Wheatland. **Session**: 1. **Classes**: 2 lectures & 4 hours prac/week. **Assumed knowledge**: A basic knowledge of C and MATLAB. **Prerequisite**: 12 credit points chosen from junior Mathematics or Junior Computational Science units. **Prohibition**: COSC 2901. **Assessment**: Assignment work, practical exam, written exam.

Scientific computing now ranks with theory and experiment/ observation as a third way to pursue scientific investigations. This unit of study provides an Intermediate-level treatment of the solution of scientific problems using computers. Students will develop their programming abilities and learn numerical methods and modelling techniques to enable them to solve a variety of problems from diverse areas of science, including biology, chemistry, astronomy, and physics. The emphasis will be on practical problem solving skills, and on visualization of data and solutions. Programming will be in C and MATLAB, and a basic knowledge of these languages is assumed.

COSC 2901 **Computational Science 2 (Advanced)**

6 credit points. Dr M.S. Wheatland. **Session**: 1. **Classes**: 2 lectures & 4 hours prac/week. **Assumed knowledge**: A basic knowledge of C and MATLAB. **Prerequisite**: 12 credit points at a credit level chosen from Junior Mathematics units or Junior Mathematics and Junior Computational Science units. **Prohibition**: COSC 2001. **Assessment**: Assignment work, practical exam, written exam.

Scientific computing now ranks with theory and experiment/ observation as a third way to pursue scientific investigations. This unit of study provides an Intermediate-level treatment of the solution of scientific problems using computers. Students will develop their programming abilities and learn numerical methods and modelling techniques to enable them to solve a variety of problems from diverse areas of science, including biology, chemistry, astronomy, and physics. The emphasis will be on practical problem solving skills, and on visualization of data and solutions. Programming will be in C and MATLAB, and a basic knowledge of these languages is assumed.

COSC 3001 **Computational Science 3A**

4 credit points. Dr M.S. Wheatland. **Session**: 1. **Classes**: 2 lectures & 2 hours prac/week. **Assumed knowledge**: Programming experience in C and MATLAB. **Prerequisite**: 12 credit points chosen from junior Mathematics and Statistics, 6 credit points of Junior or Intermediate Computational Science units or equivalent and 16 credit points of Intermediate units in Science subject areas, not including Computational Science. **Prohibition**: COSC 3901, PHYS 3301, PHYS 3901. **Assessment**: Assignment work, practical exam, written exam.

Scientific computing now ranks with theory and experiment/ observation as a third way to pursue scientific investigations. This unit of study provides a senior-level treatment of the solution of scientific problems using computers. Students will learn techniques in programming, numerical methods and modelling enabling them to solve diverse problems in areas including physics, astronomy, chemistry, geology, and biology. Programming will be in C and MATLAB, and programming ability in these languages is assumed.

COSC 3901 **Computational Science 3A (Advanced)**

4 credit points. Dr M.S. Wheatland. **Session**: 1. **Classes**: 2 lecs & 2 hours prac/week. **Assumed knowledge**: Programming experience in C and MATLAB. **Prerequisite**: 12 credit points chosen from junior Mathematics and Statistics, 6 credit points of Junior or Intermediate Computational Science units at credit level or equivalent and 16 credit points of Intermediate units in Science subject areas, not including Computational Science. **Prohibition**: COSC 3001, PHYS 3301, PHYS 3901. **Assessment**: Assignment work, practical exam, written exam.

As for COSC 3001 but with some more challenging material.

COSC 3002 **Computational Science 3B**

4 credit points. Dr M.S. Wheatland. **Session**: 2. **Classes**: 2 lecs & 2 hours prac/week. **Assumed knowledge**: Programming experience in C and MATLAB. **Prerequisite**: 12 credit points from the Science subject areas of Junior Mathematics and Statistics, 6 credit points of Junior or Intermediate Computational Science units or equivalent, and 16 credit points of Intermediate units in Science subject areas, not including Computational Science. **Prohibition**: COSC 3601, COSC 3902, PHYS 3303, PHYS 3933. **Assessment**: Assignment work, practical exam, written exam.

Scientific computing now ranks with theory and experiment/ observation as a third way to pursue scientific investigations. This unit gives a Senior-level treatment of scientific problem solving using computers, covering topics in scientific visualisation and high-performance computing, including visualising 3D datasets, the use of sophisticated algorithms, and parallel programming including Beowulf clusters. Programming will be in C and MATLAB as well as specialised visualisation packages, and experience in C and MATLAB is assumed.

COSC 3902 **Computational Science 3B (Advanced)**

4 credit points. Dr M.S. Wheatland. **Session**: 2. **Classes**: 2 lecs & 2 hours prac/week. **Assumed knowledge**: Programming experience in C and MATLAB. **Prerequisite**: 12 credit points from the Science subject areas of Junior Mathematics and Statistics, 6 credit points of Junior or Intermediate Computational Science units at a credit level or equivalent, and 16 credit points of Intermediate units in Science subject areas, not including Computational Science. **Prohibition**: COSC 3601, COSC 3002, PHYS 3303, PHYS 3933. **Assessment**: Assignment work, practical exam, written exam.

As for COSC 3002 but with some more challenging material.

COSC 3701 **Computational Science Project**

8 credit points. Dr Mike Wheatland. **Session**: N/A in 2004. **Classes**: 1hr meeting with supervisor and 7hr project work/wk; 3–4 introductory lectures given by supervisor. **Assumed knowledge**: Able to program in a standard language. **Prerequisite**: 16 credit points of intermediate level natural sciences plus at least one of COSC (1001 or 1901 or 1002 or 1902) or SOFT (1001 or 1901) or MATH (2003 or 2903) or PHYS (2001 or 2901 or 2002 or 2902). **Assessment**: Quality of proposal (10%), application (50%), and report (40%). The assessment is done at a group level (each group comprises several students) for quality of proposal and application, and at the individual level for the report.

This unit of study is building on a real-case scenario involving an IT company and its clients, employers and employees. The client (ie, a university researcher with an interest in Computational Science outside bioinformatics – see BINF 3001 for bionformatics projects) contacts the company with the aim to obtain a Computational Science application that will assist him/ her in a pursuit of new avenues of research and service provision. Terms of reference are drafted with the project managers (ie, the academics responsible for delivering the unit of study) of the IT company, and are then presented to a small group of employees (ie, the students), who design and implement a plan of how to write and deliver the software.

■ Environmental Science

The majority of the units of study listed below are only available to students in the Bachelor of Science (Environmental). 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. Further information regarding the Bachelor of Science (Environmental) can be found on the Environmental Science Web site at www.usyd.edu.au/envsci.

Bachelor of Science (Environmental) Junior units of study

ENVI 1001 Global Geology

6 credit points. **Session**: 1. **Classes**: 3 lec & prac/tut/wk. **Assessment**: One 2hr exam, class work.

NB: This unit of study is available to students in the Bachelor of Science (Environmental) and the Bachelor of Land & Water Science only.

The unit of study serves as an introduction to environmental geology by examining global geological processes and their controls on the human environment. The unit of study explores the origin of the Earth within the developing Solar System and traces the evolution of the Earth's hydrosphere, atmosphere and biosphere through geological time. Other topics include plate tectonics, and the influence of volcanic activity, earthquakes and other geological hazards on human occupation of the planet. The unit of study includes an examination of minerals and rocks as an introduction to the study of the Earth's mineral and energy resources.

Students considering enrolling in this unit of study should study the pamphlet on the Junior unit of study in Geology, obtainable from the Enquiry Office in the Edgeworth David Building. It gives details of unit of study content, text and reference books, staffing and other relevant matters.

ENVI 1002 Geomorphic Environments and Change

6 credit points. **Session**: 2. **Classes**: 3 lec & prac/tut/wk. **Assessment**: One 2hr exam, class work.

NB: This unit of study is available to students in the Bachelor of Science (Environmental) and the Bachelor of Land & Water Science only.

This unit of study completes the introduction to environmental earth sciences by examining geographical scales of environmental concern, such as catchments, river basins, hydrology and land-use. The unit then progresses on to the basic microbiological aspects of the environment and how we can use these to our benefit. Students will begin to learn how to integrate information from related disciplines to understand relationships between the sciences and the environment and to produce solutions to environmental problems. This will be a continuing theme throughout the Environmental Science program.

Bachelor of Science (Environmental) Intermediate units of study

You must complete both Environmental Science Intermediate units of study (ENVI 2001 and ENVI 2002).

ENVI 2001 Biological Environmental Processes

8 credit points. **Session**: 1. **Classes**: 3 lec, 1 prac & 2 tut/wk, field excursions. **Prerequisite**: ENVI 1001 and ENVI 1002. **Assessment**: One 2hr exam, prac assignments.

NB: This unit of study is available to students in the Bachelor of Science (Environmental) only.

ENVI 2002 Physical Environmental Processes

8 credit points. **Session**: 2. **Classes**: 3 lec, 2 tut & 1 prac/wk, field excursions. **Prerequisite**: ENVI 1001 and ENVI 1002. **Assessment**: One 2hr exam, prac assignments.

NB: This unit of study is available to students in the Bachelor of Science (Environmental) only.

Environmental Science 2 provides the integrated framework for understanding the natural environment in terms of its chemical, physical, biological, ecological and earth-scientific components. This is used to identify and understand the impact of humans on our environments at scales from local rivers to global patterns of climate. ENVI 2001 concentrates on the biological, microbiological and earth science aspects of natural processes within the environment as well as how these are impacted upon by human activities. ENVI 2002 considers the physical and chemical aspects, from climate and hydrology through to geomorphology to pollution. Emphasis is on practical measurement and interpretation to provide professional training in the use of numerous relevant disciplines.

Bachelor of Science (Environmental) Senior units of study

You must complete both Environmental Science Senior units of study (ENVI 3001 and 3002). Environmental Science 3 builds on foundations laid by the Intermediate Environmental Science units of study to provide the integration of scientific and other aspects of environmental problem-solving and professional responsibilities.

ENVI 3001 Environmental Law and Planning

12 credit points. **Session**: 1. **Classes**: 8 lec/wk; 3 field-units. **Prerequisite**: ENVI 2001 and 2002. **Assessment**: Continual assessment throughout the semester by essay, report and prac assignments.

NB: This unit of study is available to students in the Bachelor of Science (Environmental) and the Bachelor of Science (Marine Science) only.

ENVI 3001 covers topics and issues in environmental ethics, law, resource economics, planning, regulation and management for the built and natural environments, and energy production and alternate processes. This is an intensive unit of study that examines issues not normally considered 'environmental' but which impact to a large degree on how we interact with our environment.

ENVI 3002 Environmental Assessment

12 credit points. **Session**: 2. **Classes**: 8 lec & 4 prac/tut/wk. **Prerequisite**: ENVI 2001 and 2002. **Assessment**: Continual assessment throughout the semester by essay, report and prac assignments.

NB: This unit of study is available to students in the Bachelor of Science (Environmental) and the Bachelor of Science (Marine Science) only.

ENVI 3002 covers all issues concerning environmental impact assessment, including topics in conservation, risk assessment and ecotoxicology, as well as providing an examination of the logical structure of environmental sampling. The latter introduces the theory of sampling design for measurements at different scales of biological systems, statistical analysis of data and the interpretation of magnitude and scale of environmental disturbances, with topics including the nature of variables, univariate and multivariate measures, correlation of environmental variables and interpretation of data.

ENVI 3003 Law and the Environment

4 credit points. **Session**: 1. **Classes**: 3 lec/wk. **Prerequisite**: Entry by permission of Course Coordinator only. **Prohibition**: ENVI 3001. **Assessment**: Continual throughout semester.

NB: Department permission required for enrolment. This unit of study is available to Study Abroad students and students enrolled in the Bachelor of Science (Marine Science), Bachelor of Resource Economics and Bachelor of Land & Water Science only.

This unit encompasses the core material of ENVI 3001 and covers topics in environmental ethis, law, planning, regulation and management for the built and natural environments.

ENVI 3004 Environmental Impact Assessment

4 credit points. **Session**: 2. **Classes**: 3 lec/wk. **Prerequisite**: Entry by permission of Course Coordinator only. **Prohibition**: ENVI 3002. **Assessment**: Continual throughout semester.

NB: Department permission required for enrolment. This unit of study is availabe to Study Abroad students and students enrolled in the Bachelor of Science (Marine Science), Bachelor of Resource Economics and Bachelor of Land & Water Science only.

This unit encompasses the core material provided in ENVI 3002 and covers topics in environmental impact and risk assessment.

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'.)

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 Financial Mathematics 1 (MATH 2033/2933) and Financial Mathematics 2 (MATH 3015/3933) 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 three discipline areas of Geography, Geology and Geophysics. Students may take a major in any one of these three disciplines. The School is located within two buildings on the main campus's Eastern Avenue. The Edgeworth David Building houses staff with expertise in Geology and Geophysics as well as the office of the Head of School. Staff with expertise in Geography are located on the second floor of the Madsen Building. Students who wish to obtain additional advice about the units of study described below should approach departmental advisors during the enrolment week or the unit coordinators during semester. Further information is available on the Internet at www.es.usyd.edu.au, as well as in the Geosciences' student handbook which is available from the School's administrative offices.

Geography

Geography is a varied and versatile area of study covering a broad spectrum of knowledge. It was once concerned principally with the description of the earth's surface, but modern geography now embraces society's relationship with the earth within a scientific and highly-structured framework. Students can enrol in units of study that focus on physical, human or environmental geography – the three main sub-disciplines of Geography. Physical geography deals with phenomena such as landforms, plants and soil as elements of physical landscapes and the processes that control the formation and distribution of these phenomena. Human geography investigates the variety of spatial distributions of human populations as well as the social and economic issues they confront. Environmental geography is concerned with impacts of human land-uses and resource exploitation on the natural physical environment and seeks to evaluate the relative contributions of human impacts and natural processes in environmental change.

Geography Junior units of study

Geography offers two Junior units of study: Geography 1001 in the February Semester and Geography 1002 in the July Semester. Entry into both these units of study does not require any prior knowledge. Both units of study consist of three lectures and three hours of laboratory work per week. Morning lectures are repeated in the afternoon.

GEOG 1001 **Biophysical Environments**

6 credit points. Assoc. Prof. Short, Dr Gale. **Session**: 1. **Classes**: 3 lec & 3hr prac/wk. **Assessment**: One 2hr exam, 1500w report, prac assignments.

This unit of study provides an introduction to the earth's biophysical environments. It begins by considering the earth's place in the universe, its origin and its development, and the nature and evolution of the earth's structure. This is followed by an investigation of the evolution of the earth's physical environment and its development to its present stage over time. With this background, the unit of study goes on to examine the earth's hydrosphere and atmosphere and the major landforms produced by the interaction of atmospheric and ocean processes with the earth's surface, including fluvial, arid, coastal and glacial systems.

Practical: Field excursion one half day/sem

GEOG 1002 **Human Environments**

6 credit points. Prof. Connell & Dr W Pritchard. **Session**: 2. **Classes**: 3 lec & 3hr prac/wk. **Assessment**: One 2hr exam, 2000w essay, prac exercises.

Human Environments develops understanding of processes and consequences of interactions among people and between people and their environments. Questions, challenges and issues that stem from the relationships and transformations in the built, natural, social and spatial environments are introduced and scrutinised. Social structures and development are explored and principles of human geography are presented through study of the location and distribution of economic activities with special reference to Australia and the Asia-Pacific region.

Geography Intermediate units of study

Eight Intermediate Geography units of study are offered in the subject's three sub-disciplines. The streams and their units of study are:

Physical Geography and Geomorphology – Geography 2001, 2002, 2302 and 2303

Environmental – Geography 2101 and 2102

Human – Geography 2201 and 2202

Each unit of study consists lectures and assigned work (which may consist of tutorials, practicals, individual course work and/or field work). All students are required to attend compulsory one- to three-day field excursions associated with each unit of study that are held within the semester. Some units of study hold two to three such excursions.

Students who have completed the Junior Geography and Junior Environmental Science prerequisites may elect to do units of study in one or two of these streams:

To complete Intermediate Geography, a student is advised to select at least two Intermediate Geography units of study. A student would normally select two sequential units of study from one of the three streams (Physical Geography and Geomorphology, Environmental, Human). However, students may vary the sequence of units of study between streams and options within units of study, with the permission of the Head of Department. Not all units of study may be offered in any given year.

GEOG 2001 **Processes in Geomorphology**

8 credit points. Associate Professor D Dragovich and others. **Session**: 1. **Classes**: 3 lec & 5 prac or field/wk. **Prerequisite**: 36 credit points of Junior units of study, including GEOG 1001 or ENVI 1001 or 1002. Students enrolled in the Bachelor of Resource Economics should have 36 credit points from Junior units of study in Biology, Chemistry and Mathematics. **Assessment**: One 2hr exam and 1500w essay or prac papers.

This unit of study is concerned with the geomorphology of global environments, as mega-landforms and the processes that shape them. The major focus is on continental-scale landforms and the long term processes which shape the physical platform which is the home, workplace and exploitation surface of humankind.

GEOG 2002 **Fluvial and Coastal Geography**

8 credit points. Dr P Cowell & others. **Session**: 2. **Classes**: 3 lec & 5 prac or field/wk. **Prerequisite**: 36 credit points of Junior units of study, including GEOG 1001 or ENVI 1001 or 1002. Students enrolled in the Bachelor of Resource Economics should have 36 credit points from Junior units of study in Biology, Chemistry and Mathematics. **Prohibition**: May not be counted with GEOG 2302 or 2303 or MARS 2002. **Assessment**: One 2hr exam, 1500w essay or prac reports.

NB: Other Information: As for GEOG 2001

Physical Geography stream: This unit of study focuses not on global, but meso- and micro-scales on two of the major morphostratigraphic systems, namely fluvial and coastal geomorphology. Both provide introductory analyses of rivers and coasts, so fundamental to understanding the physical environments which affect the sustainability of these regions.

GEOG 2101 Environmental Change and Human Response

8 credit points. Associate Professor D Dragovich & Dr Chapman. **Session**: 1. **Classes**: 3 lec & 2 prac & field/wk. **Prerequisite**: 36 credit points of Junior units of study, including GEOG 1001 or 1002 or ENVI 1001 or 1002. **Assessment**: One 2hr exam, 2000w essay or prac reports.

NB: Other Information: As for GEOG 2001

Environmental Geography stream: Environmental change occurs at time scales from seconds to centuries or longer, from the sudden and catastrophic to gradual transformations barely noticeable at human time scales. Some kinds of environmental change are largely caused by humans, but in other cases humans are helpless before the uncontrollable forces of nature. Environmental change is explored in all of these categories. Consideration is given to land degradation problems such as soil erosion and desertification, and how humans are both implicated in these problems and respond to them. We also study environmental hazards like floods and bushfires, and how we may (or in some cases may not) effectively manage them. Included in the unit of study will be a variety of techniques for the analysis of environmental problems.

GEOG 2102 Resource and Environmental Management

8 credit points. Dr Hirsch and Dr McManus. **Session**: 2. **Classes**: 3 lec & 5hr tut or prac or fieldwork/wk. **Prerequisite**: 36 credit points of Junior units of study, including GEOG 1001 or 1002 or ENVI 1001 or 1002. **Assessment**: One 2hr exam, 2000w essay, tut papers, prac and fieldwork report/s.

NB: Other Information: As for GEOG 2001

Environmental Geography stream: This unit of study forms part of the Environmental Geography and Resource Management stream which is designed to evaluate human interaction with the biophysical environment and use of the earth's surface and its resources. Emphasis is upon human impacts on environments through social, economic and political processes and through deliberate decision making and management. Policy responses are considered at a range of scales. The unit of study examines the nature and characteristics of selected resource processes with reference to Australian (and, as appropriate, other national and international) contexts, and, on a more global and regional scale, focuses on the changing relationship between people and environments in tropical Asia and the Pacific.

GEOG 2201 Cultural and Economic Geography

8 credit points. Prof Connell, Dr W Pritchard. **Session**: 1. **Classes**: 3 lec & 5hr tut or prac or fieldwork/wk. **Prerequisite**: 36 credit points of Junior units of study, including GEOG 1001 or 1002 or ENVI 1002 or ECOP 1001 or 1002. **Assessment**: One 2hr exam, two 2000w essays, tut papers, prac and fieldwork reports.

NB: Other Information: As for GEOG 2001

Human Geography stream: This unit of study exams the spatial processes that underpin cultural and economic activity. Two themes dominate: firstly cultural and economic activities are defined by multiple sets of spatial relations; and secondly, that economic and cultural processes and practices are by necessity inter-related. These arguments provide the entry points for debate on the social construction of economic and cultural spaces, with specific attention to topics including urban change and gentrification; ethnicity; the geographies of global financial flows; and the development of industrial clusters. The unit also develops arguments relating to the economic and cultural geographies of food production and consumption.

GEOG 2202 Urban and Political Geography

8 credit points. Lecturers to be advised. **Session**: 2. **Classes**: 3 lec & 5hr tut or prac or fieldwork/wk. **Prerequisite**: 36 credit points of Junior units of study, including GEOG 1001 or 1002 or ENVI 1002 or ECOP 1001 or 1002. **Assessment**: One 2hr exam, two 2000w essays, tut papers, prac and fieldwork reports.

NB: Other Information: As for GEOG 2001.

Human Geography stream: This unit of study starts by examining urban processes and problems in developed and developing countries. For developed countries, the focus is on urban economies, suburbs, urban politics, and the nature of the built environment. For developing countries, urbanisation trends and the ideologies of planning policies are considered. The unit of study considers the political constructions of space, with specific reference to issues of sovereignty and the changing character of political borders and divisions. Topics include diasporas, refugee policies, the role of culture in nationalism, and global geopolitical trends.

GEOG 2302 Fluvial Geomorphology

6 credit points. Lecturers to be advised. **Session**: 2. **Classes**: 3 lec, 3 prac & 1 tut/wk. **Prerequisite**: GEOG 2001 or 36 credit points of Junior units of study including GEOG 1001 or ENVI 1001 or 1002. Students in the Bachelor of Resource Economics should have 36 credit points of Junior units of study in Biology, Chemistry and Mathematics. **Prohibition**: May not be counted with GEOG 2002 or 2303. **Assessment**: One 2hr exam, one essay, one project.

NB: Other Information: as for GEOG 2001.

This unit will provide an introduction to fluvial processes and morphology, with particular reference to the Australian environment. The unit will take a holistic view of the fluvial system, emphasising that stream characteristics are an outcome of interrelated variables operating at different scales within the catchment. It will include a description of catchment characteristics; water and sediment delivery, conveyance and influence on channel morphology; floods and floodplains; natural and anthropogenic channel change; groundwater issues; and estuarine sedimentation.

GEOG 2303 Fluvial and Groundwater Geomorphology

8 credit points. Dr M. Neave, Dr R.W. Vervoort. **Session**: 2. **Classes**: 3 lec, 3 prac & 2 fieldwork/wk. **Prerequisite**: GEOG 2001 or 36 credit points of Junior study including GEOG 1001 or ENVI 1001 or 1002. Students in the Bachelor of Resource Economics should have 36 credit points of study in Biology, Chemistry and Mathematics. **Prohibition**: May not be counted with GEOG 2002 or GEOG 2302. **Assessment**: One 2 hr theory exam, 1 essay, 2 projects.

NB: Other Information: as for GEOG 2001

This course will provide an introduction to fluvial processes, morphology and groundwater hydrology, with particular reference to the Australian environment. The course will take a holistic view of the fluvial system, emphasising that stream characteristics are the result of many factors operating at different scales across the entire catchment. An introduction in groundwater hydrology will introduce aquifer flow and water quality concepts as well as the interaction between aquifers and the over- and underlying strata. A modelling project using MODFLOW will be given to study the effects of a contamination on a groundwater supply.

Geography Senior units of study

Geography offers seven Senior units of study in 3 streams – namely geomorphology, environmental geography and human geography. The streams and their units of study are:

Geomorphology – Geography 3001 and 3002
Environmental – Geography 3101 and 3102
Human – Geography 3201, 3202 and 3302

Each unit of study consists of three lectures and the equivalent of nine hours assigned work (which may consist of tutorials, practicals, individual course work and/or field work) per week. All students are required to attend compulsory one- to three-day field excursions associated with each unit of study which are held within the semester. Some units of study hold two to three such excursions.

Students who have completed the Intermediate Geography prerequisites may elect to do units of study in one or two of these streams.

To complete Senior Geography, a student must select two units of study. Each unit of study is 12 credit points. A student would normally select two sequential units of study from one of the three streams (Geomorphology, Environmental and Human). However, students may vary the sequence of units of study between streams and options within units of study with the permission of the Head of Department. Not all units of study may be offered in any given year.

Geography Senior unit of study Combinations

48 credit points

Students may elect to do four Senior units of study (12 credit points each) in the one year, giving a total of 48 credit points. Such students will be required to enrol in two of the Senior Geography Streams, Geomorphology, Environmental or Human. Those who have passed at least two of the Senior Geography units of study at Honours level may proceed to an appropriate unit of study in Geography Honours. Those choosing physical honours topics must have majored in the Geomorphology stream units of study.

GEOG 3002 Environmental Geomorphology

12 credit points. Assoc. Prof. D Dragovich, Dr S Gale. **Session**: 2. **Classes**: 3 lec & 6 prac or field/wk. **Prerequisite**: GEOG (2001 or 2002 or 2101 or 2302 or 2303). **Assessment**: One 2hr exam, two 1500w essays, prac and 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.

GEOG 3101 **Catchment Management**

12 credit points. Lecturers to be advised. **Session**: 1. **Classes**: 3 lec & 1 tut & 8 prac or field/wk. **Prerequisite**: GEOG 2001 or 2002 or 2101 or 2302 or 2303 and GEOG 2102 or 2201 or 2202. **Assessment**: One 2hr exam, two 1500w essays.

Senior Environmental stream

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 form the Murray-Darling, Mekong, and Hawkesbury-Nepean catchments. Fieldwork in the latter is integral to the unit of study.

GEOG 3201 **Asia-Pacific Field School**

12 credit points. Prof. Connell. **Session**: 1. **Classes**: 28 lectures and 100 hours of tuts, prac and fieldwork. **Prerequisite**: GEOG 2101 or 2102 or 2201 or 2202. **Assessment**: One 2hr exam, two 2000w essays, tut papers, prac and fieldwork reports.

The unit of study builds on key human geographic principles from the sub-disciplines of environmental, social, cultural and economic geography. The unit of study constitutes a field work school run over a five- week period in January-February, prior to the commencement of the semester. The Field School is held in Vanuatu and Fiji. It is run in close association with the University of the South Pacific, whose staff and students participate in some components of the course. It focuses on environmental and development issues in the context of rapid change, especially in the urban context.

GEOG 3202 **Sustainable Cities and Resource Regions**

12 credit points. Dr P McManus, A/Prof Hirsch. **Session**: 1. **Classes**: 3 lec & 9 hrs tut or prac or fieldwork or indiv. research/wk. **Prerequisite**: GEOG (2102 or 2201 or 2202). **Assessment**: One 2hr exam, two 2000w essays, tut papers, prac and fieldwork report/s.

Senior Social and Economic Geography stream. This unit of study on urban and regional sustainability analysis involves an integrated series of lectures, practical work and field visits. It develops urban geography and environmental management themes introduced in second year geography, providing a set of conceptual and analytical tools for examining the social and environmental sustainability of ways in which we manage urban space and natural resources in their regional context. The first part of the unit focuses on themes in urban sustainability, including topics such as utopian visions for cities, urban history, ecological footprint analysis, bioregionalism, transport options, urban form and urban policy with reference to sustainable futures. The second part of the unit examines rural resource regions, examining topics such as indigenous rights, resource peripheries, competing resource values, regional impacts and multipliers, with reference to examples including forestry, dams, mining and fisheries. The unit of study draws on Australian and international examples. Practical skills include the use of GIS and its applications in urban and regional studies.

GEOG 3203 **Globalisation and Regions in Transition**

12 credit points. Dr Pritchard. **Session**: 2. **Classes**: 2 x 2hr lec, 1 tut & 3hr prac/wk & 2 days field work. **Prerequisite**: GEOG (2102 or 2201 or 2202). **Assessment**: One 2hr exam, 2 x 2,500w essay & prac reports.

Senior Human Geography Stream. The aim of this unit of study is to examine theoretical debates and empirical evidence relating to spatial differences in the modern world. Issues to be considered include the role of globalisation as both an agent of change and a point of challenge; contestation over the future of the nation state, and the roles of geographical scale as an organizing vehicle for social and economic processes. The unit will emphasize how these issues are being manifested both in Australia (with particular reference to Sydney) and in the Asia-Pacific. Practical classes will focus on the development of research consultancy skills, and will involve students preparing material for in-class presentations.

Geography Honours

Students contemplating Geography Honours will be invited to complete a preliminary registration form in the July Semester. Following the publication of the July semester Senior Geography unit of study results, those eligible students who have preregistered will be invited to formally enrol. They are required to consult the Head of Geography as soon as possible after the publication of the results concerning choice of topic and the appointment of a staff supervisor. Preliminary work should begin shortly after the publication of these results.

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.

Geology

Geology Junior units of study

Geology and Geophysics offers two Junior units of study: Geology 1001 in the February Semester and Geology 1002 in the July Semester. Entry into both these units of study does not require any prior knowledge. Both units of study consist of three lectures and three hours of laboratory work per week.

GEOL 1001 **Earth and its Environment**

6 credit points. Prof P Davies (Coordinator). **Session**: 1. **Classes**: 3 lec & prac or tut/wk. **Assumed knowledge**: No previous knowledge of Geology assumed. **Prohibition**: GEOL 1501. **Assessment**: One 2hr exam, class and field work.

The aim of this unit of study is to provide students with an understanding of how the Earth system works, its origin, plate tectonics, surface processes, evolution of life and geologic time. The crises in resources and fossil fuel and implications for our economy will be discussed and an assessment made of our own impact on the Earth together with the role of geologists in protecting and monitoring the environment. Students will learn techniques and types of observations used to decipher the history and evolution of the Earth, and dating sediments and rocks. Laboratory classes and a one day field trip in the Sydney region will involve exercises in observing and describing Earth materials and in interpreting Earth history from geological information, including fossils and maps.

GEOL 1002 **Earth Processes and Resources**

6 credit points. Dr Tom Hubble (Coordinator). **Session**: 2. **Classes**: 3 lec & prac or tut/wk. **Assumed knowledge**: No previous knowledge of Geology assumed. **Prohibition**: GEOL 1501. **Assessment**: One 2hr exam, class and field work.

The aim of this unit of study is to examine the chemical and physical processes involved in mineral formation, the interior of the Earth, volcanoes, and metamorphism. Lectures and laboratory sessions on mountain building processes and the formation of ore deposits will lead to an understanding of the driving forces in geology. 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 weekend field excursion to the Hunter Valley. Students will be required to pay hostel accommodation for one night on the Hunter Valley excursion.

Geology and Geophysics Intermediate units of study

Intermediate and Senior Geology units of study build on the preceding junior units of study to present a balanced and wide ranging coverage of resource geology, environmental geology and marine geology. Geology and Geophysics offers four Intermediate units of study: Geology 2001 and Geology 2004 in the February Semester and Geology 2003 and 2203 in the July Semester. Each unit of study consists lectures and assigned work (which may consist of tutorials, practicals, individual course work and/or field work). All students taking Geology 2001 and 2203 are required to attend compulsory field excursions that are held within the semester.

GEOL 2001 Geological Hazards and Solutions

8 credit points. Dr D Wyman. **Session**: 1. **Classes**: 4 lec & 2 prac or tut/wk. **Prerequisite**: GEOL 1002 or ENVI 1001. A candidate who has completed 24 credit points of Junior units of study in Physics and Chemistry and who has not taken Junior Geology or ENVI 1001, may apply under section 1 (4) for permission to enrol in GEOL 2001. **Prohibition**: CIVL 2409. **Assessment**: Two 2hr theory, lab exam, class work, field work.

This unit expands upon the concepts introduced during the Junior units of study in Geology and uses a problem solving approach to investigate geological processes and materials that are important in Asia, Australia, and the South-West Pacific. The two main topics covered in the unit are a) the description, analysis, and remediation of sediments polluted by agricultural, industrial and urban practices; and b) the strategies used to identify, predict and mitigate the hazards associated with volcanism and earthquakes. The unit of study has an emphasis on developing a thorough knowledge of the analytical techniques and methods applied to evaluating the hazards associated with these phenomena as well as providing students with the fundamental geochemical and geological knowledge required to interpret the data collected during these investigations. In addition to lectures and practicals students are required to attend a compulsory field trip and may choose between two alternative field trips, either a) the New Zealand Field Trip which gives students a first-hand experience of volcanism and seismic activity at an active plate margin; or b) the Rivers and Estuaries of Sydney which introduces students to the sampling and mapping techniques used to evaluate geochemical pollution and remediation strategies.

GEOL 2003 Fossils and Time

4 credit points. **Session**: 2. **Classes**: 2 lec & 1 prac or tut/wk. **Prerequisite**: 24 credit points of Science units of study. **Prohibition**: CIVL 2409. **Assessment**: One 2hr theory, class work.

This palaeontology and stratigraphy unit of study is aimed at geoscientists, archaeologists, biologists, marine and environmental scientists who use fossils or stratigraphic data to determine ages, environments or evolutionary lineages. It provides an overview of fossil biodiversity, concentrating on invertebrate animals but also covering vertebrates, plants and microorganisms, with the emphasis on those groups that are most environmentally or stratigraphically useful. It also considers the main methods of stratigraphic correlation and age determination, concentrating on litho- and bio-stratigraphy but also covering the more modern techniques of chemo-, magneto- and sequence-stratigraphy as well as radiometric age dating.

GEOL 2004 Environmental Geology and Climate Change

4 credit points. Dr Hughes and Prof Davies. **Session**: 1. **Classes**: 3 lec/wk & fieldwork. **Prerequisite**: 24 credit points of Science units of study. **Assessment**: One 2hr exam and assignments.

The Earth sciences provide an essential framework for
understanding the environmental changes that arise from short- and
long-term geological processes. This unit of study introduces students
to several geological phenomena that can impact detrimentally on
society. As the welfare of much of the world's population is sensitive
to climate change, a major component of the course will include an
examination of global climate change over a variety of timescales
ranging from millions of years to tens of years. The record of recent
climate change and projections of future climate change will be reviewed
in the context of their natural and human causes.

GEOL 2202 Geological Exploration & Resource Mgmt

8 credit points. Dr Geoff Clarke. **Session**: 2. **Classes**: 4 lec & 2 prac/wk. **Qualifier**: GEOL 2001. **Prohibition**: May not be counted with GEOL (2002 or 2005). **Assessment**: One 2 hr exam, practical exercises, assignment.

This unit of study shall explore the geologic setting of Earth's natural resources, issues of equity in their extraction and use, and the environmental management of mining sites. An understanding of the common geological environments is used as a basis to explore the basic physical, chemical and biological processes that formed sedimentary and metamorphic rocks, petroleum, coal and ore deposits in Australia. This unit of study also introduces students to geophysical techniques used in resource exploration and the economics of resource extraction. It will involve a compulsory six day excursion to the Canberra area to study geological objects in the field, including an appraisal of environmental contamination induced by mining activities and appropriate remedial actions.

Geology and Geophysics Senior units of study

To complete a major in Geology or in Geophysics students are required to complete a minimum of 24 credit points from the relevant subject area. Each unit of study consists of three lectures and the equivalent of nine hours assigned work per week, which may comprise practical classes, seminars, individual course work and/or fieldwork. Some units of study have compulsory field excursions, commonly held in semester breaks.

Students who desire a general background in Geology and/or Geophysics for a career in government, education, resources law, commodity economics and management, or environmental earth science can construct their own stream consisting of any grouping of units of study, within the limits of the timetable. The following suggestions focus seven streams that target vocational training for graduates seeking employment in: Mineral Exploration; Petroleum Exploration; Exploration/Mining, Engineering and Environmental Geophysics; Marine Geology, Marine Geophysics; Environmental Geology and Geocomputing.

Recommended Geology Streams:

Mineral Exploration: GEOS 3003, GEOS 3004, GEOS 3006, GEOS 3007, GEOS 3008

Petroleum Exploration: GEOS 3004, MARS 3005, MARS 3006, MARS 3008, MARS 3106

Marine Geology: MARS 3105, MARS 3005, MARS 3006, MARS 3008, MARS 3106

Environmental Geology: GEOS 3005, GEOS 3007, MARS 3105, MARS 3005, MARS 3008

Geocomputing – Geology: GEOS 3003, GEOS 3006, GEOS 3007, MARS 3105, MARS 3005, MARS 3006

Recommended Geophysics Streams:

Exploration, Mining, Engineering and Environmental Geophysics: GEOS 3003, GEOS 3004, GEOS 3008, MARS 3105, MARS 3005, MARS 3006

Marine Geophysics: MARS 3105, MARS 3106, MARS 3005, MARS 3006, MARS 3008

Geocomputing – geophysics: GEOS 3003, GEOS 3004, GEOS 3007, MARS 3105, MARS 3005, MARS 3006

To complete Senior Geology & Geophysics, a student must complete a minimum of four units of study in either Geology or Geophysics (24 credit points – see Table 1 of the Faculty of Science Handbook for more detail). Students may elect to complete up to eight Senior units of study (6 credit points each) in one year, giving a total of 48 credit points.

Students who have passed at least four of the Senior units of study in Geology or Geophysics with a credit average or above may proceed to the appropriate unit of study in Geology or Geophysics Honours.

GEOS 3003 Structural Geology: The Dynamic Crust

6 credit points. Dr Patrice Rey. **Session**: 1. **Classes**: (weeks 7–13) 12 hrs of lecs & pracs/wk. **Prerequisite**: GEOL 2002 or CIVL 2409. **Prohibition**: May not be counted with GEOL 3101. **Assessment**: 2 hr theory exams, class work and E-report.

The Earth's crust hosts mineral and energy resources that have sustained our civilisation over the past five thousand years. These resources are the by-products of dynamic and thermal processes that have affected the continental lithosphere since its formation in the Archaean. This unit focuses on the understanding the thermal and mechanical aspects of lithospheric deformation. The main headlines of this module include: Heat transfer in the lithosphere; Isostasy and vertical motion of the earth's surface; Plate boundaries, body forces and the dynamic of the Earth's lithosphere; Rheology of the lithosphere; Continental break-up and the formation of continental margins; Thermo-mechanics of sedimentary basins; Thermo-mechanics of orogenesis; Thermal consequences and tectonic feedback of geodynamic processes. Practical classes are designed to enhance computational and communication skills as well as building a profound knowledge in Tectonics. Practicals focus on designing a number of electronic reports on specific topics. These reports will be posted on the Internet to be available to all students. Each report will be the subject of a computer-based oral presentation

GEOS 3004 **Geophysics, Imaging, Oil/Ore Production**

6 credit points. Prof Iain Mason. **Session**: 2. **Classes**: (weeks 1–7) 12 hrs of lecs & pracs/wk. **Prerequisite**: 16 credit points of Intermediate Science units of study or CIVL 2409. **Prohibition**: May not be counted with GEOP 3202. **Assessment**: 2 hr theory exams, computer class work.

This unit examines the use of computerised geophysical techniques to map high value sites. Sites of interest range from oil fields through mine sites to archaeological digs. Data sources include micro-gravity surveying, magnetism and aero-magnetism; radiometry, short-and long-range surveillance and tracking. The course is designed around the reality that while people, as much as data acquisition and reduction technology have influenced modern geophysics, recently, major strides have been made in digital data acquisition and reduction. Lectures deal with the creation, inversion and application of 2D and 3D potential and wave fields. Lab classes extend skills in computer aided image processing.

GEOS 3005 **Regolith-Sediment Geochemistry**

6 credit points. Dr Gavin Birch. **Session**: 1. **Classes**: (weeks 7–13) 12 hrs of lecs & pracs/wk. **Prerequisite**: 16 credit points of Intermediate Science units of study or CIVL 2409. **Assessment**: 2 hr theory exams, class work.

This is a problem-based course where we follow contaminants from their primary sources through aquatic pathways and assess their effects on the adjacent receiving basin. Theoretical and conceptual information gained in lectures will be used to trace contaminants in the field and determine major processes controlling chemical behaviour. The course is underpinned by a GIS data analysis of relevant physical attributes of Port Jackson and its sub-catchments, which determine contaminant distributions. Remediation strategies will be considered. The course also examines the widespread development of deeply weathered Regolith terranes in Australia. Weathering processes and Regolith components will be examined in the context of long-term climate variation. Links between bedrock weathering and groundwater salinity will be evaluated along with resource management strategies.

GEOS 3006 **Mineral Deposits & Spacial Data Analysis**

6 credit points. Dr Derek Wyman. **Session**: 2. **Classes**: (weeks 7–13) 12 hrs of lecs & pracs/wk, field excursion. **Prerequisite**: 16 credit points of Intermediate Science units of study or CIVL 2409. **Prohibition**: May not be counted with GEOL 3103. **Assessment**: 2 hr theory exams, class work and field reports.

Mineral deposits will be examined in terms of their spatial distribution and related exploration strategies, their links to igneous rocks and hydrothermal fluids, and the impact of ore-forming processes on mines and mining techniques. Representative ore deposits from New South Wales, Australia and overseas will be included as case studies for a wide array of mineralisation types and ores including base metals, precious metals, high-tech commodities and gemstones. An integrated approach will relate tectonic processes through to time to the formation of mineral provinces, and the economic and environmental viability of ore extraction and processing. Practical components of the course will introduce specimens of ore deposits and associated rocks and the spatial analysis of geological data at the Global to district scale. In addition to laboratory classes there will be a four-day field excursion. The excursion will include visits to active and historic mining and ore-processing sites in NSW.

GEOS 3007 **Remote Sensing: Imaging the Earth**

6 credit points. Dr Geoff Clarke. **Session**: 1. **Classes**: (weeks 1–7) 12 hrs of lecs & pracs/wk. **Prerequisite**: 16 credit points of Intermediate Science units of study or CIVL 2409. **Prohibition**: May not be counted with GEOL 3101. **Assessment**: Practical work, a 2-hour computer-based examination and an assignment.

This unit of study provides a comprehensive introduction to the computational manipulation and application of imaging techniques commonly used in the Earth Sciences, from the microscopic to macoscopic level. It includes an introduction to image analysis using mineral textures in common igneous and metamorphic rocks, and how this analysis can be used to understand the processes controlling their textural development. The application and interpretation of remote sensing techniques will also be covered in computer-based practical exercises that use a mixture of Landsat thematic mapper, airborne radiometric and magnetic databases. The application of processed images in mineral exploration and tectonic analysis will be covered through integrated lectures and laboratory exercises.

GEOS 3008 **Field Geology and Geophysics**

6 credit points. Dr Geoff Clarke, Dr Patrice Rey, Dr Dietmar Muller. **Session**: 2. **Classes**: (weeks 1–7) 14 days of field work. **Prerequisite**: GEOL 2002. **Prohibition**: May not be counted with GEOL 3103. **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.

Geology Honours

Dr Derek Wyman

Offered: February and July.

Suitably qualified students may take Honours in Geology. They are required to undertake a research project under the direction of a supervisor, submit a thesis embodying the results of the investigation and undertake such coursework as may be prescribed.

Students not eligible to take Honours may be given permission to enrol in the Graduate Diploma in Science.

Further details are available from the Head of School.

Geophysics Honours

Geophysics Honours

Offered: February and July

Suitably qualified students may take Honours in Geophysics. They are required to undertake a research project under the direction of a supervisor, submit a thesis embodying the results of the investigation and undertake such coursework as may be prescribed.

Students not eligible to take Honours may be given permission to enrol in the Graduate Diploma in Science.

Further details are available from the Head of School.

Geology & Geophysics Postgraduate Study

Details concerning fields of postgraduate study in Geology and Geophysics may be obtained from Dr Derek Wyman or the Head of School.

■ History and Philosophy of Science

History and Philosophy of Science allows students to stand back from the specialised concerns of their other subjects and gain some perspective on what science is, how it came to acquire 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. However, 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 Web site www.usyd.edu.au/hps/.

The unit for History and Philosophy of Science does not have first year units of study. Students interested in related topics should consider taking the unit Concepts and Issues in Physical Science (PHYS 1600) 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.

HPSC 2001 **What Is This Thing Called Science?**

4 credit points. Dr Rachel Ankeny. **Session**: 2. **Classes**: 2 lec & 2 tut/wk. **Prerequisite**: 24 credit points of Junior units of study. **Assessment**: Two in-class tests, tutorial assignments.

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.

Textbooks

Chalmers, A. What is this thing called Science? (3rd ed) and Course Reader.

HPSC 2002 The Birth of Modern Science

4 credit points. Dr Ofer Gal. **Session**: 1, Summer. **Classes**: 2 lec & 2 tut/wk. **Prerequisite**: 24 credit points of Junior units of study. **Assessment**: Two in-class tests, tutorial assignments.

An introduction to the 'scientific revolution' of the seventeenth century, 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 and Course Reader.

History and Philosophy of Science Senior units of study

Students wishing to major in History and Philosophy of Science in either the BSc, BA or BLibStud must take 24 credit points from the following Senior units of study. HPSC 3102 is available to Bachelor of Medical Science students only.

HPSC 3002 History of Biological/Medical Sciences

6 credit points. Dr Hans Pols. **Session**: 2. **Classes**: 2 lec, 2 tut/wk. **Prerequisite**: HPSC (2001 and 2002) or (Credit or better in HPSC (2001 or 2002) and at least 24 credit points of Intermediate or Senior units of study). **Assessment**: Short essays, presentation, tutorial work, final essay.

Examines some of the major episodes in the social and scientific history of the biological and biomedical sciences.

Textbooks

Course reader.

HPSC 3005 History/Philosophy of Medicine

4 credit points. Dr Susan Hardy. **Session**: 1. **Classes**: 1 lec & 1 tut/wk. **Assumed knowledge**: Assumed knowledge of HPSC (2001 and 2002). **Prerequisite**: At least 24 credit points of Intermediate or Senior units of study. **Assessment**: Take home tests, tutorial work, essays.

An introduction to some of the major episodes in the social and scientific history of medicine, from ancient Greece to the present day.

Textbooks

Course reader.

HPSC 3007 Science and Ethics

4 credit points. Dr Rachel Ankeny. **Session**: 1. **Classes**: 1 lec, 1 tut/wk. **Prerequisite**: HPSC (2001 and 2002) or (Credit or better in HPSC (2001 or 2002) and at least 24 credit points of Intermediate or Senior units of study). **Assessment**: Short essays, tutorial work, take home tests.

Focuses on the ethical issues arising in science. Students have the chance to compare the theories studied to the experience of working scientists.

Textbooks

Course reader

HPSC 3010 History of the Human Sciences

4 credit points. Dr Hans Pols. **Session**: 1. **Classes**: 1 lec, 1 tut/week. **Prerequisite**: HPSC (2001 and 2002) or (Credit or better in HPSC (2001 or 2002) and at least 24 credit points of Intermediate or Senior units of study). **Assessment**: Take home tests, tutorial work.

Examines the origins and the development of the human sciences, such as anthropology, psychology, sociology, and psychiatry. Topics covered in this course are: the function of the human sciences in their social and political contexts, the development of investigative practices, the development of research methodologies, and the influence of the human sciences on everyday life.

Textbooks

Course reader

HPSC 3015 History and Philosophy of Physics

6 credit points. Jason Grossman. **Session**: 1. **Classes**: 2 lec & 2 tut/wk. Individual student consultation as required. **Assumed knowledge**: HPSC (2001 and 2002). **Prerequisite**: HPSC (2001 and 2002) or (Credit or better in HPSC (2001 or 2002) and at least 24 credit points of Intermediate or Senior units of study. **Prohibition**: HPSC 3105. **Assessment**: Take-home tests, short essays, tutorial participation.

This unit explores the historical and philosophical development of modern physics, from its 19th-century beginnings to the head-boggling philosophical problems of relativity, quantum mechanics and cosmology. Particular attention is paid to times when physicists have had to make philosophical choices in order to decide between competing ways of describing the world.

Textbooks

Course reader

HPSC 3016 History and Philosophy of Mathematics

6 credit points. Ofer Gal. **Session**: 2. **Classes**: 2 lec & 2 tut/wk. Individual student consultation as required. **Assumed knowledge**: HPSC (2001 and 2002). **Prerequisite**: HPSC (2001 and 2002) or (Credit or better in HPSC (2001 or 2002) and at least 24 credit points of Intermediate or Senior units of study. **Prohibition**: HPSC (3001 or 3106). **Assessment**: Take-home tests, short essays, tutorial participation.

This unit explores the historical and philosophical development of mathematics, with particular emphasis on Galileo and the 17th-century mathematical revolution in physics. In addition to seeing how mathematics has developed, we will look at the changing philosophical and social context of that development.

Textbooks

Course reader

HPSC 3021 Philosophy and Sociology of Biology

6 credit points. Jason Grossman. **Session**: 2. **Classes**: 2 lec, 2 tut / week. **Assumed knowledge**: HPSC 2001 and HPSC 2002. **Prerequisite**: HPSC (2001 and 2002) or (Credit or better in HPSC (2001 or 2002) and at least 24 credit points of Intermediate or Senior units of study). **Prohibition**: HPSC 3103. **Assessment**: Essays, take home tests, tutorial assessment.

An examination of scientists' varied concepts of the gene over the last hundred years, the extent to which those concepts were motivated by ideas external to biology, and the consequences of those concepts, both directly within biology and in the broader scheme of things, including the interactions between theories of inheritance and the social uses to which scientific knowledge is put. No previous study of biology is assumed.

Textbooks

Course reader, and Richard Lewontin (1993), 'The Doctrine of DNA', London: Penguin. Also published under the title 'Biology as Ideology'.

HPSC 3022 Science and Society

6 credit points. Hans Pols. **Session**: 1. **Classes**: 2 lec, 2 tut/week. **Assumed knowledge**: HPSC 2001 and HPSC 2002. **Prerequisite**: HPSC 2001 and HPSC 2002 OR a Credit or above in either HPSC 2001 or HPSC 2002 and at least 24 credit points of Intermediate or Senior units of study. **Prohibition**: HPSC 3003. **Assessment**: Tutorial papers (2,000 words total), fieldwork report (1,500 words), 2,500 word essay, presentation.

The sociology of science analyses the place and function of science in society, the relations between science and society, and how scientific communities are formed, maintained, transformed, and disappear. This course provides an overview to the basic approaches within the sociology of science and how these approaches inform and guide current research in history and philosophy of science.

Textbooks

Course reader.

HPSC 3100 Contemporary Issues in HPS

4 credit points. Dr Hans Pols. **Session**: 2. **Classes**: 1 lec, 1 tut/wk. **Prerequisite**: HPSC (2001 and 2002) or (Credit or better in HPSC (2001 or 2002) and at least 24 credit points of Intermediate or Senior units of study). **Assessment**: Short essays, presentation, tutorial work, final essay.

An examination of one area of the recent literature in the history and philosophy of science.

Textbooks

Course reader

HPSC 3102 History of the Biomedical Sciences

12 credit points. Dr Hans Pols & HPS staff. **Session**: 1, 2. **Classes**: 4 lec, 4 tut & 4 prac/wk. **Prerequisite**: HPSC (2001 and 2002). **Assessment**: Tutorial assignments, project reports, essays and take-home tests.

NB: Available to Bachelor of Medical Science students only.

An introduction to some of the major episodes in the social and scientific history of biological and medical science.

HPSC 3104 Medicine, Sex and Gender

4 credit points. Dr Alison Bashford (History). **Session**: 2. **Classes**: Seminars 3hr/wk. Individual student consultation as required. **Prerequisite**: HPSC (2001 and 2002) or (Credit or better in HPSC (2001 or 2002) and at least 24 credit points of Intermediate or Senior units of study). **Prohibition**: May not be counted with WMST 2006. **Assessment**: Essays.

Explores the ways biomedicine has shaped our understandings of gender and sexuality and how it is possible to understand biomedicine as a gendered and sexualised enterprise. The unit is organised historically, beginning with the emergence of modern medicine in the eighteenth century.

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 BLibStud with a major in HPS or another relevant area and to students who have satisfied the requirements for the degree of BMedSci including the HPS options in the second and third years of study.

The Honours course consists of 48 points of Honours level units of study, which must include HPSC 4106 Research Project A and HPSC 4107 Research Project B. In their final semester all students must also enrol in the zero credit point non assessable unit HPSC 4999.

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).

HPSC 4101 **Philosophy of Science**

6 credit points. Jason Grossman. **Session**: 1. **Classes**: One 2hr sem/wk. **Prerequisite**: 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**: Five short written assignments, seminar participation.

NB: Department permission required for enrolment.

This unit explores the relationships between scientific theories and evidence, and the relationships between scientific theories and other scientific theories. Philosophical analyses are compared with examples of actual practice in physical and biological sciences.

Textbooks

Blackburn S. The Oxford Dictionary of Philosophy, and course reader.

HPSC 4102 **History of Science**

6 credit points. HPS Staff. **Session**: 1, 2. **Classes**: One 2hr sem/wk. **Prerequisite**: 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**: Two essays, seminar participation.

NB: Department permission required for enrolment.

This unit explores major episodes in the history of science as well as introducing students to historiographic methods.

Textbooks

Course reader

HPSC 4103 **Sociology of Science**

6 credit points. Dr Ofer Gal. **Session**: 2. **Classes**: One 2hr sem/wk. **Prerequisite**: 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.

NB: Department permission required for enrolment.

This course builds upon earlier courses introducing the sociology of science with an exploration of recent approaches in the social studies of scientific knowledge. Specific topics include the 'strong program' sociologists of knowledge and their critique of traditional philosophy of science, the counter-arguments of philosophers, anthropological approaches to science such as ethnomethodology and 'actor-network' theory, and sociology of technology. Students evaluate the approaches by conducting their own research on specific cases.

Textbooks

Course reader

HPSC 4104 **Recent Topics in HPS**

6 credit points. HPS Staff. **Session**: 1, 2. **Classes**: One 2hr sem/wk. **Prerequisite**: 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**: Two essays, seminar participation.

NB: Department permission required for enrolment.

An examination of one area of the contemporary literature in the history and philosophy of science.

Textbooks

Course reader

HPSC 4105 **HPS Research Methods**

6 credit points. Dr Ofer Gal. **Session**: 1. **Classes**: One 2hr sem/wk. **Prerequisite**: 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.

NB: Department permission required for enrolment.

An introduction to the research skills of history, philosophy and sociology of science. Students will learn to be conscious of their own introductions of interpretations, arguments and theories into their research and writing through comparative study of different schools in contemporary HPS.

Textbooks

Course reader

HPSC 4106 **Research Project A**

12 credit points. HPS Staff. **Session**: 1, 2. **Classes**: Weekly individual supervision. **Prerequisite**: Available only to students admitted to HPS Honours and Graduate Diploma in Science (History and Philosophy of Science). **Corequisite**: Must be taken in conjunction with HPSC 4107 Research Project B in the following semester. **Assessment**: Conduct of research tasks as specified by the supervisor.

NB: Department permission required for enrolment.

Research into a topic in history and philosophy of science under the supervision of one or more members of the HPS staff.

HPSC 4107 **Research Project B**

12 credit points. HPS Staff. **Session**: 1, 2. **Classes**: Weekly individual supervision. **Prerequisite**: Available only to students admitted to HPS Honours and Graduate Diploma in Science (History and Philosophy of Science). **Corequisite**: HPSC 4999 (for Honours students only). **Assessment**: 15000 word thesis.

NB: Department permission required for enrolment.

Production of an original thesis of not more than 15,000wds under the supervision of one or more members of the HPS staff.

HPSC 4999 **History & Philosophy of Science Honours**

No credit points. **Session**: 1, 2. **Prerequisite**: Available only to students admitted to HPS Honours.

NB: 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

Dr Helen Briscoe

The Immunology unit of the Department of Medicine administers the Immunobiology Major. The Immunology unit is located in the Centenary Institute, Building 93, Royal Prince Alfred Hospital and Room 424 Blackburn Building DO6. Further information from Dr Helen Briscoe, (phone (02) 9351 7308; email hbriscoe@med.usyd.edu.au) and www.med.usyd.edu.au/medicine/immunology/

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, molecular biology and genetics, microbiology, pathology or physiology. Participants in the Immunobiology major will select an accompanying senior unit according to their particular interest. Concurrent study in these 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 coordinators 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

The Immunology unit of the Department of Medicine offers Introductory Immunology (IMMU 2001) at Intermediate level, Immunology (IMMU 3002) at Senior level and Immunology Honours. The Immunology unit is located in the Centenary Institute, Building 93, Royal Prince Alfred Hospital and Room 424 Blackburn Building DO6. Further information from Dr Helen Briscoe, (phone (02) 9351 7308; email hbriscoe@med.usyd.edu.au) and www.med.usyd.edu.au/medicine/immunology/

IMMU 2001 **Introductory Immunology**

4 credit points. **Session**: 1. **Classes**: 20hrs lec, 12hrs prac, 20hrs tut/independent study. **Assumed knowledge**: Junior Biology and Junior Chemistry. **Prerequisite**: 24 credit points of Junior units of study from any of the science discipline areas. **Prohibition**: BMED 2506. **Assessment**: One 2hr theory exam (50%), one essay (20%), practical reports and tutorial contributions (30%).

NB: This is a prerequisite unit of study for IMMU 3002. The completion of MBLG (2001 or 2101 or 2901) 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 (10 lectures). This includes the nature of the cells and molecules that recognise antigen and how these cells respond at the cellular and molecular levels. Practical and tutorial sessions will illustrate particular concepts introduced in the lecture program. A further 10 lectures and self-directed learning sessions (directed reading and problem-based learning tutorials) will integrate this fundamental information into studies of mechanisms of host defence against infection, transplantation and pregnancy, and dysfunction of the immune system including allergy, immunodeficiency and autoimmune diseases.

IMMU 3002 **Immunology**

12 credit points. Dr Helen Briscoe. **Session**: 2. **Classes**: 3 lec, 8 prac & 1 tut/wk. **Assumed knowledge**: Intermediate Biochemistry and Molecular Biology and Genetics. **Prerequisite**: IMMU 2001 and 8 credit points of intermediate units of study from Biochemistry or Biology or Microbiology or Molecular Biology and Genetics or Pharmacology or Physiology. **Prohibition**: May not be counted with BMED 3003. **Assessment**: Two 2hr theory exams.: (50%); essay, practical reports and seminar: (50%).

NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.

This unit of study will provide a comprehensive understanding of the components and functions of the immune system at the molecular and cellular levels; the mechanisms of pathological immune processes; immune system dysfunction; and, immunological techniques used in the life sciences in clinical diagnostic and research laboratories. The components of this study unit will be taught by immunologists in the Department of Medicine, with contributions from the Centenary Institute for Cancer Medicine & Cell Biology and other invited experts in the discipline.

Immunology Honours

The Honours program in immunology provides the opportunity for full-time research on a project proposed and supervised by a staff member expert in that field. Experimental research, a literature review in essay format of the research topic, a thesis, and a seminar on the project constitutes the major part of the Honours program. Guidance in research techniques is given in training programs covering experimental design, data analysis, written and oral communication and critical appraisal of the literature. In addition, a supplementary seminar program keeps students informed and abreast of wider issues in immunology.

Students are invited to apply for Honours enrolment during semester two of the year preceding Honours. Students 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 projects of their choice.

Usually Honours candidates will have achieved at least a credit in IMMU 3002 or BMED 3003, will have taken senior study in biochemistry, biology, cell pathology, microbiology or physiology, and, for BSc candidates, gained a Major in Immunobiology, Biochemistry, Biology, Pathology or Physiology. Usually Honours candidates will have an overall SCIWAM of 65+.

■ Information Technologies

The School of Information Technologies administers the disciplines of Information Systems and Computer Science, each of which is available as a major in the Bachelor of Science degree.

Computer Science

Computer Science is the scientific discipline which has grown out of the use of digital computers to manage and transform information. Computer Science 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. Teaching in Computer Science covers a diversity of topics such as Software Development, Networks and Systems, Multimedia Technologies and Principles of Computer Science.

The diversity of the discipline is demonstrated by current research interests in the School which include 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.

Note that units of study beginning with COMP, MULT, NETS, SOFT and INFO (but not ISYS) can be counted as Computer Science. Each INFO unit may only be counted to one subject area (either Computer Science or Information Systems, but not both). Students who intend to major in Computer Science should pay particular attention to the prerequisites of each unit of study.

Students should note that entry to Honours requires an average of Credit or better in the Senior units of study.

Information Systems

Information Systems studies people and organisations to determine and deliver their technological needs. Hence Information Systems encompasses issues such as strategic planning, system development, system implementation, operational management, end-user needs and education. Information Systems study is related to Computer Science but there is an important distinction in that Information Systems is about the architecture of computer systems and making them work for people, hence people are the focus of attention, whereas much of Computer Science is about developing and improving the performance of computers. The School performs IS research in a number of areas including natural language processing, data mining, knowledge management and workflow methods. Students who wish to complete a major in Information Systems need to appreciate that effective communication and critical analysis are important parts of the curriculum and though taught explicitly in one unit ARIN 1000 (or an equivalent unit) are expected to be practised throughout all units of study. Intending Honours students need to complete at least 16 credit points of Information systems units at Senior level. Note that units beginning with both ISYS and INFO codes (but not COMP, MULT, NETS or SOFT) can be counted as Information systems units.

Other information

The units of study offered by the School are described briefly below, and more fully in the School's Handbook which is available from the School Office (Room G71) in the Madsen Building. Students should confirm details of units of study, registration procedures, textbooks, etc., on the School noticeboards and Web site www.it.usyd.edu.au. Those in doubt should seek advice from members of the School's academic staff.

Summer School: January-February.

This School 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.

SOFT 1001 **Software Development 1**

6 credit points. **Session**: 1, 2, Summer. **Classes**: One 1hr lecture, one 2 hr tutorial, one 3hr practical. **Assumed knowledge**: HSC Mathematics Extension 1. **Prohibition**: May not be counted with SOFT 1901 or COMP (1001 or 1901). **Assessment**: Written and practical assignments, quizzes, exam.

Computers are highly versatile: the same machine can be used to manage the payroll for an enterprise, or play multi-user games, or predict changing weather activity. The reason is that people can write software that causes the machine to behave in very different ways. This unit is the first in a long sequence that build students' skills in software development. For many students these skills are the key to their employment as IT professionals. The unit introduces object-oriented software development with design-by-contract, which is the state-of-the-art in industry. Java is the programming language used. Students work in small groups, so they experience many of the issues of team interaction that are important in practice. Also, students take responsibility to plan their own learning to meet required objectives, so they will develop skills to learn from resources including reference materials and examples, just as happens in the profession.

SOFT 1901 **Software Development 1 (Adv)**

6 credit points. **Session**: 1, 2. **Classes**: 1 lec, 2 tut & 3 lab/wk. **Assumed knowledge**: HSC Mathematics Extension 1. **Qualifier**: UAI at least that for acceptance into BSc(Adv) degree program. **Prohibition**: May not be counted with SOFT 1001 or COMP (1001 or 1901). **Assessment**: Written and practical assignments, quizzes, exam.

NB: Department permission required for enrolment. NB. Entry requires departmental permission, except for students in BSc(Adv), BCST(Adv) or BIT degrees

An advanced alternative to SOFT 1001; covers material at an advanced and challenging level. See the description of SOFT 1001 for more information.

SOFT 1002 **Software Development 2**

6 credit points. **Session**: 1, 2, Summer. **Classes**: One 1hr lecture, one 2hr tutorial, one 3 hr practical. **Qualifier**: SOFT (1001 or 1901) or COMP (1001 or 1901). **Prohibition**: May not be counted with SOFT 1902 or COMP (1002 or 1902). **Assessment**: Written and practical assignments, quizzes, exam.

This unit extends the students' software development skills in several important directions. It covers a number of advanced features of Java programming such as inheritance and recursion. It deals with important issues in using library classes to manage collections of similar objects. It also provides students with experience in design; that is, in choosing which classes to write to respond to a user's demands. Design in group work raises special issues of dealing with conflict and misunderstanding between group members.

SOFT 1902 **Software Development 2 (Adv)**

6 credit points. **Session**: 1, 2. **Classes**: 1 lec, 2 tut & 3 lab/wk. **Qualifier**: SOFT (1001 or 1901) or COMP (1001 or 1901) and Distinction in one of these. **Prohibition**: May not be counted with SOFT 1002 or COMP (1002 or 1902). **Assessment**: Written and practical assignments, quizzes, exam.

NB: Department permission required for enrolment in Session 1.

An advanced alternative to SOFT 1002; covers material at an advanced and challenging level. See the description of SOFT 1002 for more information.

ISYS 1003 **Foundations of Information Technology**

6 credit points. **Session**: 1, 2. **Classes**: Two 1hr lectures, one 3hr practical & one 1hr tutorial. **Prohibition**: May not be counted with INFO 1000 or INFS 1000. **Assessment**: Practical assignments, quizzes, tutorial contribution, written exam.

In our society computer systems have become a major platform for communication, commerce, education and entertainment. Students, using a systems thinking approach, will undertake meanngful research and authoring tasks using various kinds of software including word processors, spreadsheets, web browsers and databases, in order to understand how hardware, software and human systems support communication, collaboration, modelling and decision-making. Students will be expected to understand how information is structured, linked and flowed in different situations, and to be able to customise an IT environment to streamline or share tasks. In addition, the course will emphasise the importance of documenting decisions and processes, and understanding the many social, ethical, and intellectual propery issues that arise when creating and handling 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. There will be major changes to the curriculum in 2005. These will result in a large number of changes to the units listed below explained in full on the School of Information Technologies Web site at www.it.usyd.edu.au/. Students should consult this Web site to assist them in selecting their units.

COMP 2003 **Languages and Logic**

4 credit points. **Session**: 2. **Classes**: Two 1hr lecture, one 1hr tutorial. **Qualifier**: [SOFT (1002 or 1902) or COMP (1002 or 1902)] and MATH (1004 or 1904 or 2009 or 2011) or ELEC 1101. **Prohibition**: COMP 2903. **Assessment**: Assessment assignments, written exam.

All communication requires a language. People communicate with each other in a natural language such as English; they communicate with computers in a formal language such as Java. This unit of study looks at two important kinds of formal languages (called regular and context-free), and the algorithms, or automata, that are used to recognise them. On the theoretical side, several ways to represent languages are presented, and their capabilities and limitations discovered; on the practical side, sound and indeed foolproof methods are derived for writing programs to recognise formal languages such as Java. Considerable emphasis is also put on the use of logic (both propositional and first-order), which provides a powerful design tool for hardware implementations of automata.

COMP 2903 **Languages and Logic (Advanced)**

4 credit points. **Session**: 2. **Classes**: Two 1hr tutorial. **Qualifier**: [SOFT (1002 or 1902) or COMP (1002 or 1902)] and MATH (1004 or 1904 or 2009 or 2011) or ELEC 1101 and Distinction in one COMP, SOFT or MATH unit of study. **Prohibition**: COMP 2003. **Assessment**: Assessment assignments, written exam.

This unit of study is the advanced alternative to COMP 2003. Topics in Languages and Logic are covered at an advanced and more challenging level.

COMP 2111 **Algorithms 1**

4 credit points. **Session**: 1. **Classes**: Two 1hr lectures, one 1hr tutorial. **Qualifier**: SOFT (1002 or 1902) or COMP (1002 or 1902). **Corequisite**: MATH (1004 or 1904 or 2009 or 2011). **Prohibition**: May not be counted with COMP (2811 or 2002 or 2902). **Assessment**: Written assignments and exam.

One of the worst things that can happen when implementing a large software system is to find, after months of hard work, that the underlying design is too inefficient, or is fundamentally flawed. Such situations can often be avoided through careful design using well understood structures, and an analysis of the time complexity and correctness of these designs.

This unit includes a formal introduction to the analysis of algorithms. Commonly used data structures such as lists, stacks, queues, priority queues, search trees, hash tables and graphs are all analysed according to a notion of asymptotic complexity. Design principles such as the greedy strategy, divide and conquer, and dynamic programming are covered, as well as efficient techniques for searching within graphs. There will be a programming project in which students will design an algorithmic solution to a problem, analyse its time complexity, and implement it.

COMP 2811 **Algorithms 1 (Advanced)**

4 credit points. **Session**: 1. **Classes**: Two 1hr lectures, one 1hr tutorial. **Qualifier**: [SOFT (1002 or 1902) or COMP (1002 or 1902)] and Distinction in one COMP, SOFT or MATH unit. **Corequisite**: MATH (1004 or 1904 or 2009 or 2011). **Prohibition**: May not be counted with COMP (2111 or 2002 or 2902). **Assessment**: Written assignments and exam.

An advanced alternative to COMP 2111; covers material at an advanced and challenging level. See the description of COMP 2111 for more information.

INFO 2000 **Systems Analysis and Design**

4 credit points. **Session**: 1, Summer. **Classes**: Two 1hr lectures, one 1 hr tutorial, or one 1hr practical; 1 unscheduled lab work with a CASE tool. **Qualifier**: ISYS 1003 or INFO 1000 or INFS 1000 or [COSC (1001 or 1901) and COSC (1002 or 1902)] or SOFT (1001 or 1901) or COMP (1001 or 1901). **Prohibition**: May not be counted with INFO 2900. **Assessment**: Written and practical assignments + written exam.

The syllabus covers data-centred, process-oriented and object-centred methodologies for requirements analysis and system description to address organisational needs, including the gathering of facts, diagnosis of problems, recommendation of appropriate and feasible solutions. A CASE tool will be used to develop practical skills.

INFO 2900 **System Analysis and Design Advanced**

4 credit points. **Session**: 1. **Classes**: Two 1hr lectures, one 1 hr tutorial, or one 1hr practical; 1 unscheduled lab work with a CASE tool. **Qualifier**: ISYS 1003 or INFO 1000 or INFS 1000 or [COSC (1001 or 1901) and COSC (1002 or 1902)] or SOFT (1001 or 1901) or COMP (1001 or 1901) and Distinction in one INFO, ISYS or SOFT unit. **Prohibition**: May not be counted with INFO 2000. **Assessment**: Written and practical assignments + written exam.

An advanced alternative to INFO 2000; covers material at an advanced and challenging level.

INFO 2005 **Database Management, Introductory**

4 credit points. **Session**: 2. **Classes**: 2 lec, 1 tut/wk; 1 unscheduled lab work. **Qualifier**: ISYS 1003 or INFO 1000 or INFS 1000 or [COSC (1001 or 1901) and COSC (1002 or 1902)] or SOFT (1001 or 1901) or COMP (1001 or 1901). **Prohibition**: May not be counted with INFO 2905. **Assessment**: Written and practical assignments plus written exam.

The syllabus covers use of databases through forms and through SQL language; data representation and basic interfaces; good design of tables through normalisation. Use of a variety of data modelling techniques. A commercial strength PC based database system will be used to develop practical skills.

INFO 2905 Database Management, Introductory (Adv)

4 credit points. **Session**: 2. **Classes**: 2 lec, 1 tut/wk; 1 unscheduled lab work. **Qualifier**: ISYS 1003 or INFO 1000 or INFS 1000 or [COSC (1001 or 1901) and COSC (1002 or 1902)] or SOFT (1001 or 1901) or COMP (1001 or 1901) and Distinction in one INFO, ISYS or SOFT unit. **Prohibition**: May not be counted with INFO 2005. **Assessment**: Written and practical assignments plus written exam.

An advanced alternative to INFO 2005; covers material at an advanced and challenging level.

ISYS 2006 Information Systems in Organisations

4 credit points. **Session**: 1. **Classes**: Two 1hr lectures, one 2hr tutorial. **Assumed knowledge**: Use of basic PC tools such as spreadsheets, Internet, email and word processing software. **Prerequisite**: Credit in one of ISYS 1003 or INFS 1000 or INFO 1000. **Assessment**: One 2hr examination, written assignments.

NB: Enrolment Restriction: Entry is restricted to students who have a credit or better in one of the qualifying units.

This course will provide a comprehensive introduction to some of the critical dimensions of information systems in the context of contemporary organisations. It will introduce the organisational foundations of information systems (IS) and explore the critical roles of IS in shaping the organisation, in competing more effectively in the market place, and as an enabler for information and knowledge sharing. The evolving technological foundations of IS will be reviewed.

Some of the important behavioural aspects of implementing new IS applications and the challenges in managing the resulting organisational transformation will be discussed.

The content will be presented in three modules:

i) Introduction to Information Systems and basic concepts of information, decisions and decision making, and organisations.

ii) Technology of Information Systems

iii) Behavioural, organizational, managerial, and ethical issues in implementing a wide range of Information Systems applications.

ISYS 2007 Distributed Information Systems

4 credit points. **Session**: 2. **Classes**: Two 1hr lectures, one 1hr tutorial. **Qualifier**: ISYS 2006 and INFO (2000 or 2900). **Prohibition**: May not be counted with INFO 2007. **Assessment**: One 2hr examination, written assignments.

Distributed Information Systems are systems where processing and or data storage are distributed across two or more autonomous networked computers. The course approaches DIS from a top down or architectural perspective. It assumes a DIS belongs within an organisation, has multiple users, and is inherently complex being made up from many hundreds of components all subject to frequent change. The course covers the design of DIS, the impact of DIS on organisations, network fundamentals and architectures, the client server models, the integration of application components within the system, the integration of disparate systems within an organisation and between organisations, international issues resulting from systems crossing country boundaries, and the impact of reliability, performance and data protection.

NETS 2008 Computer System Organisation

4 credit points. **Session**: 1. **Classes**: Two 1hr lecture, one 2hr practical. **Qualifier**: SOFT (1001 or 1901) or COMP (1001 or 1901) or [COSC (1001 or 1901) and COSC (1002 or 1902)]. **Prohibition**: May not be counted with NETS 2908 or COMP (2001 or 2901). **Assessment**: Written assignments and exam.

For most people, a computer-based system provides powerful services. This unit aims to show how the underlying hardware and software components can make this possible. It covers an overview of the main hardware components, such as CPU, memory, storage, peripherals. it also explains the functionality (not the internal details) of the main software necessary to turn a box into a working system, including the operating system, file system, window manager, command processing shell.

The unit provides hands-on experience of some aspects in the administration of a system, including writing scripts to automate repetitive tasks such as installing upgrades, monitoring logs, altering configuration information, and estimating the performance implications of possible changes.

NETS 2908 Computer System Organisation (Adv)

4 credit points. **Session**: 1. **Classes**: Two 1hr lectures, one 2hr practical. **Qualifier**: SOFT (1001 or 1901) or COMP (1001 or 1901) or [COSC (1001 or 1901) and COSC (1002 or 1902)] and Distinction in one NETS or SOFT unit of study. **Prohibition**: May not be counted with NETS 2008 or COMP (2001 or 2901). **Assessment**: Written assignments and exam.

An advanced alternative to NETS 2008; covers material at an advanced and challenging level. See the description of NETS 2008 for more information.

NETS 2009 Network Organisation

4 credit points. **Session**: 2. **Classes**: Two 1hr lectures, one 2hr practical. **Qualifier**: SOFT (1001 or 1901) or COMP (1001 or 1901) or [COSC (1001 or 1901) and COSC (1002 or 1902)]. **Prohibition**: May not be counted with NETS 2909. **Assessment**: Written assignments and exam.

Computer users often take for granted the ability to access information and services from remote computers. This unit aims to show how the underlying hardware and software components can make this possible. It covers the overall structure of a network, including the hardware (LANs, WANs, bridges, switches) and the software (an overview of the OSI layered reference model; description of the functionality of protocols such as TCP/IP, PPP, SLIP, DNS, SNMP, SMTP, HTTP; and the functionality of networked file systems). It introduces the main issues for security in a network, including firewalls and viruses. The unit provides hands-on experience of some aspects in the administration of a network, including writing scripts to detect problems and adjust configurations. There is practice in trouble-shooting from the wire-level up to the application level.

NETS 2909 Network Organisation (Adv)

4 credit points. **Session**: 2. **Classes**: Two 1hr lectures, one 2hr practical. **Qualifier**: SOFT (1001 or 1901) or COMP (1001 or 1901) or [COSC (1001 or 1901) and COSC (1002 or 1902)] and Distinction in one NETS or SOFT unit of study. **Prohibition**: May not be counted with NETS 2009. **Assessment**: Written assignments and exam.

An advanced alternative to NETS 2009; covers material at an advanced and challenging level. See the description of NETS 2009 for more information.

SOFT 2001 Concurrent Programming

4 credit points. **Session**: 2. **Classes**: Two 1hr lectures, one 2hr practical. **Qualifier**: SOFT (1002 or 1902) or COMP (1002 or 1902). **Prohibition**: May not be counted with SOFT 2901. **Assessment**: Written assignments, exam.

There are many sorts of computing infrastructure such as an operating system kernel or network protocol stack or web server, where one activity may start before other activities have finished. This requires the software to interleave the processing from different activities. This software is called 'concurrent' or 'multithreaded', and it requires special programming techniques which are taught in this unit. In particular, there is a need to synchronise the activities when they deal with shared data, using primitives such as semaphores or mutual exclusion locks. Emphasis is also given to a similar 'event-handling' style for writing graphical user interfaces.

SOFT 2901 Concurrent Programming (Adv)

4 credit points. **Session**: 2. **Classes**: Two 1hr lectures, one 2hr practical. **Qualifier**: SOFT (1002 or 1902) or COMP (1002 or 1902) and Distinction in one of these, or in any SOFT unit at 2000-level or above. **Prohibition**: May not be counted with SOFT 2001. **Assessment**: Written assignments, exam.

An advanced alternative to SOFT 2001; covers material at an advanced and challenging level. See the description of SOFT 2001 for more information.

SOFT 2004 Software Development Methods 1

4 credit points. **Session**: 1, Summer. **Classes**: Two 1hr lectures, one 2hr practical. **Qualifier**: SOFT (1002 or 1902) or COMP (1002 or 1902). **Prohibition**: May not be counted with SOFT 2904 or COMP (2004 or 2904). **Assessment**: Written assignments, exam.

In this unit of study we cover elementary methods for developing robust, efficient, and re-usable software. Specific topics include memory management and the pragmatic aspects of implementing data structures such as lists and hash tables. Debugging tools and techniques are discussed and common programming errors are considered along with defensive programming techniques to avoid such errors. Testing regimes, such as regression testing, are introduced. The subject is taught from a practical engineering viewpoint and it includes a considerable amount of programming practice, using existing tools as building blocks to complete a large-scale task.

SOFT 2904 Software Development Methods 1 (Adv)

4 credit points. **Session**: 1. **Classes**: Two 1hr lectures, one 2hr practical. **Qualifier**: SOFT (1002 or 1902) or COMP (1002 or 1902) and Distinction in one of these, or any SOFT unit at 2000-level or above. **Prohibition**: May not be counted with SOFT 2004 or COMP (2004 or 2904). **Assessment**: Written assignments, exam.

In this unit of study we learn elementary methods for developing robust, efficient, and re-usable software. An advanced alternative

to SOFT 2004; covers material at an advanced and challenging level. See the description of SOFT 2004 for more information.

Computer Science and Information Systems Senior units of study

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. There will be major changes to the curriculum in 2005. These will result in a large number of changes to the units listed below explained in full on the School of Information Technologies Web site at www.it.usyd.edu.au/. Students should consult this Web site to assist them in selecting their units.

COMP 3002 Artificial Intelligence

4 credit points. **Session**: 1. **Classes**: Two 1hr lectures, one 1hr tutorial. **Prerequisite**: [SOFT (2004 or 2904) or COMP (2004 or 2904)] and COMP (2003 or 2903) and 8 credit points 2000-level MATH and/or STAT and/or ECMT. **Prohibition**: May not be counted with COMP 3902. **Assessment**: Assessment assignments, written exam.

Artificial Intelligence 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. Most of these activities depend on general or 'weak' methods, primarily search. AI also addresses issues related to the representation and use of the knowledge of human experts. This unit of study will explore topics from selected areas of AI. Students who complete it will have an understanding of some of the fundamental methods and algorithms of AI, and an appreciation of how they can be applied to interesting problems. The unit of study will involve a practical component in which some simple problems are solved using standard AI techniques.

COMP 3902 Artificial Intelligence (Advanced)

4 credit points. **Session**: 1. **Classes**: Two 1hr lectures, one 1hr tutorial. **Prerequisite**: [SOFT (2004 or 2904) or COMP (2004 or 2904)] and COMP (2003 or 2903) and 8 credit points 2000-level MATH and/or STAT and/or ECMT and Distinction in a COMP, SOFT or MATH unit at 2000-level or above. **Prohibition**: May not be counted with COMP 3002. **Assessment**: Written and programming assignments; written exam.

An advanced alternative to COMP 3002; covers material at an advanced and challenging level.

COMP 3111 Algorithms 2

4 credit points. **Session**: 1. **Classes**: Two 1hr lectures, one 1 hr tutorial. **Assumed knowledge**: MATH 2009. **Prerequisite**: COMP (2111 or 2811 or 2002 or 2902) and MATH (1004 or 1904 or 2009 or 2011) and MATH (1005 or 1905). **Prohibition**: May not be counted with COMP (3811 or 3001 or 3901). **Assessment**: Written and practical assignments plus written exam.

This unit continues the investigation of algorithmics begun in COMP 2111 Algorithms 1. Further strategies for solving search and optimisation problems in graphs will be presented, including network flow methods.

The unit will also provide a survey of algorithmic approaches for which traditional analyses are not appropriate. These will include randomisation, online algorithms and competitive analysis, and parallel and distributed algorithms. Problems drawn from such areas as networks, systems and databases will be used to illustrate these algorithmic approaches; for these, the student will design and analyse their corrective and efficiency. An introduction to intractable problems, NP-hardness, and heuristics will also be given.

COMP 3811 Algorithms 2 (Advanced)

4 credit points. **Session**: 1. **Classes**: Two 1hr lectures, one 1 hr tutorial/lab. **Prerequisite**: COMP (2002 or 2902 or 2111 or 2811) and MATH (1004 or 1904 or 2009 or 2011) and MATH (1005 or 1905). Also Distinction in a COMP, SOFT or MATH intermediate unit. **Prohibition**: COMP (3111 or 3001 or 3901). **Assessment**: Written assignments, written exam.

An advanced alternative to COMP 3111; covers material at an advanced and challenging level.

INFO 3005 Organisational Database Systems

4 credit points. **Session**: 1. **Classes**: Two 1hr lectures, one 1hr tutorial. **Prerequisite**: INFO (2000 or 2900) and INFO (2005 or 2905). **Prohibition**: May not be counted with INFO 3905 or COMP (3005 or 3905). **Assessment**: Assessment assignments, written exam.

Large organisations store lots of essential data in central repositories from which many users can access it. This unit covers the development of client-server systems which access shared data in a DBMS. It also deals with the responsibilities of the Database Administrator who must organise the physical structures to make access efficient, and who must also guard the integrity of the data.

INFO 3600 Major Development Project

12 credit points. **Session**: 1, 2. **Prerequisite**: 36 crpts from Table III(iv) and/or III(v) of the BIT regulations.

NB: only available to students in BIT

Each student will carry out substantial aspects of a significant software development project. The project should be directed to assisting a client group (preferably one 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.

INFO 3905 Organisational Database Systems (Adv)

4 credit points. **Session**: 1. **Classes**: 2 lec & 1 tut/wk. **Prerequisite**: INFO (2000 or 2900) and INFO (2005 or 2905) and Distinction in an INFO, ISYS or SOFT unit at 2000-level or above. **Prohibition**: May not be counted with COMP (3005 or 3905) or INFO 3005. **Assessment**: Written and programming assignments; written exam.

An advanced alternative to INFO 3005; covers material at an advanced and challenging level.

ISYS 3000 Information Systems Management

4 credit points. **Session**: 2. **Classes**: Two 1hr lectures, one 1hr tutorial; 1 unscheduled lab work. **Prerequisite**: ISYS 2007 or INFO 2007. **Assessment**: Written and practical assignments and written exam.

The syllabus covers applications in business and management, managing information technology, planning and implementation of information systems, end user computing, system approach, strategic planning, operations management, control and audit and quality management, strategic information systems.

ISYS 3012 Project Management and Practice

4 credit points. **Session**: 1. **Classes**: One 2hr lecture, one 1hr practical, 1hr independent study. **Prerequisite**: INFO (2000 or 2900). **Assessment**: One 2hr examination, written assignments.

This unit of study covers the factors necessary for successful management of system development or enhancement projects. Both technical and behavioural aspects of project management are discussed with a focus on management of development for enterprise-level systems. Major topics include managing the system life cycle, system and database integration issues, network and client-server management, system performance evaluation, managing expectations of team members, cost-effectiveness analysis, and change management.

ISYS 3015 Analytical Methods for IS Professionals

4 credit points. **Session**: 1. **Classes**: Two 1hr lectures, one 1hr tutorial. **Prerequisite**: [ARIN 1000 or ENGL (1050 or 1005) or LNGS (1001 or 1002 or 1005) or ECOF (1001 or 1002)] and 16 credit points of intermediate or senior units of study, including ISYS 2006 and (ISYS 2007 or INFO 2007) and INFO (2000 or 2900). **Assessment**: Written assignments and exam.

NB: Enrolment Restriction: Entry is restricted to students who have a credit or better in at least one of the Prerequisite units.

A colection of different methods for collecting and analysing information will be studied in the context of a systems thinking approach to investigative research. These approaches include participative methods, surveys, focus groups, controlled experiments and case studies.

ISYS 3113 Arts Informatics Systems

4 credit points. **Session**: 1. **Classes**: Two 1hr lectures, one 1hr tutorial. **Prerequisite**: INFO (2000 or 2900) and INFO (2005 or 2905) and [(ARIN 1000 or ENGL (1050 or 1005) or LNGS (1001 or 1002 or 1005) or ECOF (1001 or 1002)]. **Assessment**: Examination and written assignments.

A variety of topics relevant to the text and image processing needs of the Arts and Social Sciences such as scripting languages, text retrieval, natural language processing, applied artificial intelligence, and multi media techniques in the context of data distributed in databases across networks.

ISYS 3207 Information Systems Project

8 credit points. **Session**: 2. **Classes**: One 1hr lecture. **Prerequisite**: ISYS 3012 and (ISYS 3015 or ARIN 2000). **Assessment**: Written project report and presentation.

The objective is to enable students to design and implement a solution to a complex data processing problem or to investigate

an issue in the management or development of a real-world information system. The project consists of students working together in teams to complete a task of adequate complexity that draws on their education in Information Systems to date. The project will either investigate an issue that is important to the successful practice of the management of Information systems including topics in such areas as end-user computing, IS methodologies, business process re-engineering. Alternatively, it will follow through the life-cycle of systems creation and development and delivery using the traditional tools and methods of the systems analyst.

MULT 3004 **Computer Graphics**

4 credit points. **Session**: 2. **Classes**: Two 1hr lectures, one 1–2 hour tutorial/practical. **Prerequisite**: COMP (2111 or 2811 or 2002 or 2902) and [SOFT (2004 or 2904) or COMP (2004 or 2904)] and MATH (1002 or 1902). **Prohibition**: May not be counted with MULT 3904 or COMP (3004 or 3904). **Assessment**: Written and practical assignments plus 2hr written exam.

A picture has a million pixels (in round terms). Like any other interface, it must be well engineered for accuracy, high-speed performance and compatibility with user needs. This unit of study examines established algorithms for picture generation, covering such topics as hidden-line elimination, shading and texturing and ray-tracing. The effects on performance of algorithmic design choices are considered. This unit assumes an understanding of vector and matrix operations.

MULT 3904 **Computer Graphics (Advanced)**

4 credit points. **Session**: 2. **Classes**: Two 1hr lecture, one 1–2 hour tutorial.practical. **Prerequisite**: COMP (2111 or 2811 or 2002 or 2902) and [SOFT (2004 or 2904) or COMP (2004 or 2904)] and MATH (1002 or 1902) and Distinction in a MULT or SOFT unit at 2000-level or above. **Prohibition**: May not be counted with MULT 3004 or COMP (3004 or 3904). **Assessment**: Written and practical assignments plus 2hr written exam.

An advanced alternative to MULT 3004; covers material at an advanced and challenging level.

MULT 3018 **Multimedia Interaction**

4 credit points. **Session**: 1. **Classes**: Two 1hr lectures, one 1–2 hour tutorial/practical. **Prerequisite**: SOFT (2004 or 2904) or COMP (2004 or 2904). **Prohibition**: May not be counted with MULT 3918. **Assessment**: Assignments and written exam.

More than 70% of the information people receive comes from visual perception. Multimedia allows a more comprehensive interaction between humans and computers by exploiting the natural ability that humans have making sense of visual information. This unit provides an overview of visual communication and multimedia interaction with computer interfaces. It introduces the visual perception fundamentals, discusses multimedia I/O devices and multimedia interaction, illustrates visualisation of relational information, describes interactive visual communication and presents some visualisation applications, such as medical imaging and flight simulation.

MULT 3918 **Multimedia Interaction (Advanced)**

4 credit points. **Session**: 1. **Classes**: Two 1 hr lectures, one 1–2 hour tutorial/practical. **Prerequisite**: SOFT (2004 or 2904) or COMP (2004 or 2904) and Distinction in a MULT or SOFT unit at 2000-level or above. **Prohibition**: May not be counted with MULT 3018. **Assessment**: Written assignments and exam.

An advanced alternative to MULT 3018; covers material at an advanced and challenging level.

MULT 3019 **Digital Media**

4 credit points. **Session**: 1. **Classes**: Two 1hr lectures, one 1–2 hour tutorial/practical. **Prerequisite**: COMP (2111 or 2811 or 2002 or 2902) and MATH (1001 or 1901) and MATH (1002 or 1902) and MATH (1003 or 1903). **Prohibition**: May not be counted with MULT 3919. **Assessment**: Written and practical assignments plus written exam.

Multimedia has become more and more important in modern computing. This unit provides an overview of processing digital media, which includes text, audio, pictorial data and video. It introduces the main processing techniques such as text parsing and summarisation, audio masking and manipulation, video segmentation and tracking; standards in each of these areas, such as UML, MP3, JPEG and MPEG; and presents applications such as multimedia Web design, multimedia presentation, video cataloguing and retrievals.

MULT 3919 **Digital Media (Advanced)**

4 credit points. **Session**: 1. **Classes**: Two 1hr lecture, one 1–2 hour tutorial/practical. **Prerequisite**: COMP (2111 or 2811 or 2002 or 2902) and MATH (1001 or 1901) and MATH (1002 or 1902) and MATH (1003 or 1903) and Distinction in a MULT or SOFT unit at 2000-level or above. **Prohibition**: May not be counted with MULT 3019. **Assessment**: Written and practical assignments plus written exam.

An advanced alternative to MULT 3019; covers material at an advanced and challenging level.

NETS 3007 **Network Protocols**

4 credit points. **Session**: 1. **Classes**: Two 1hr lectures, one 1–2 hr tutorial/practical. **Prerequisite**: [[NETS (2008 or 2908) and NETS (2009 or 2909)] or ELEC 2601] and [SOFT (2004 or 2904) or COMP (2004 or 2904)] and SOFT (2001 or 2901). **Prohibition**: May not be counted with NETS 3907 or COMP (3007 or 3907). **Assessment**: Written assignments and exam.

This unit covers the internal details of network protocols. Building on NETS 2009 which introduces the concepts from a user-viewpoint, discussing the functionality of each protocol, NETS 3007 shows how software can provide that functionality.

Topics include the general issues in communications protocols (naming, error detection, buffering, end-to-end argument), and the main design choices taken in TCP/IP. By the end of the unit, student should be able to design implement and debug simple network protocols.

NETS 3907 **Network Protocols (Advanced)**

4 credit points. **Session**: 1. **Classes**: Two 1hr lectures, one 1–2 hr tutorial/practical. **Prerequisite**: [[NETS (2008 or 2908) and NETS (2009 or 2909)] or ELEC 2601] and [SOFT (2004 or 2904) or COMP (2004 or 2904)] and SOFT (2001 or 2901) and Distinction in a NETS or SOFT unit at 2000-level or above. **Prohibition**: May not be counted with NETS 3007 or COMP (3007 or 3907). **Assessment**: Written assignments and exam.

An advanced alternative to NETS 3007; covers material at an advanced and challenging level.

NETS 3009 **Operating Systems**

4 credit points. **Session**: 2. **Classes**: Two 1hr lecture, one 1–2 hr tutorial/practical. **Prerequisite**: [NETS (2008 or 2908) or ELEC 2601] and [SOFT (2004 or 2904) or COMP (2004 or 2904)] and SOFT(2001 or 2901). **Prohibition**: May not be counted with NETS 3909 or COMP (3009 or 3909). **Assessment**: Written assignments and exam.

This unit covers the internal details of operating systems. Building on NETS 2008 which introduces the concepts from a user-viewpoint, discussing the functionality of each aspect of an OS, NETS 3009 shows how software can provide that functionality. The topics include the internal structure of OS; several ways each major aspect (process scheduling, interprocess communication, memory management, device management, file systems) can be implemented; the performance impact of design choices.

NETS 3909 **Operating Systems (Advanced)**

4 credit points. **Session**: 2. **Classes**: Two 1hr lecture, one 1–2 hr tutorial/practical. **Prerequisite**: [NETS (2008 or 2908) or ELEC 2601] and [SOFT (2004 or 2904) or COMP (2004 or 2904)] and SOFT(2001 or 2901) and Distinction in a NETS or SOFT unit at 2000-level or above. **Prohibition**: May not be counted with NETS 3009 or COMP (3009 or 3909). **Assessment**: Written assignments and exam.

An advanced alternative to NETS 3009; covers material at an advanced and challenging level.

NETS 3016 **Computer and Network Security**

4 credit points. **Session**: 1. **Classes**: Two 1hr lectures, one 1–2 hr tutorial/practical. **Assumed knowledge**: MATH (1004 and 1005). **Prerequisite**: [[NETS (2008 or 2908) and NETS (2009 or 2909)] or ELEC 2601] and [SOFT (2004 or 2904) or COMP (2004 or 2904)]. **Prohibition**: May not be counted with NETS 3916 or ELEC 5610. **Assessment**: Written assignments and exam.

This unit examines the main issues of security for enterprise systems and networks. It covers confidentiality, integrity, data-origin authentication, nonrepudiation, user authentication, access control.

At the end of this unit students will know and understand properties of and evaluate a variety of common techniques to address security threats (public-key crypto, private-key crypto, firewalls, role-based access-control, etc).

We pay special attention to the variety of attacks to which systems are subjected, and we address ways of managing the risks associated with different attacks. In this unit, cryptography is treated as a tool with given properties; to learn more about cryptography see MATH 3024.

NETS 3916 **Computer and Network Security (Advanced)**

4 credit points. **Session**: 1. **Classes**: Two 1hr lectures, one 1–2 hr tutorial/practical. **Assumed knowledge**: MATH (1004 and 1005). **Prerequisite**: [[NETS (2008 or 2908) and NETS (2009 or 2909)] or ELEC 2601] and [SOFT (2004 or 2904) or COMP (2004 or 2904)] and

Distinction in a NETS or SOFT unit at 2000-level or above. **Prohibition**: May not be counted with NETS 3016 or ELEC 5610. **Assessment**: Written assignments and exam.
An advanced alternative to NETS 3016; covers material at an advanced and challenging level.

NETS 3017 Network Programming and Distributed Apps

4 credit points. **Session**: 2. **Classes**: Two 1hr lectures, one 1–2 hr tutorial/practical. **Prerequisite**: [[NETS (2008 or 2908) and NETS (2009 or 2909)] or ELEC 2601] and [SOFT (2004 or 2904) or COMP (2004 or 2904)] and SOFT (2001 or 2901). **Prohibition**: May not be counted with NETS 3917 or ELEC 3604. **Assessment**: Written assignments and exam.
This is a practically-oriented subject in which students learn to write code that uses communication primitives such as sockets, RPC and Java RMI. In contrast, SOFT 3105 assumes the existence of middleware that hides most of the details of creating sockets, sending and receiving data etc.

NETS 3917 Network Prog & Distributed Apps (Adv)

4 credit points. **Session**: 2. **Classes**: Two 1hr lectures, one 1–2 hr tutorial/practical. **Prerequisite**: [NETS (2008 or 2908) and NETS (2009 or 2909) or ELEC 2601] and [SOFT (2004 or 2904) or COMP (2004 or 2904)] and SOFT (2001 or 2901) and Distinction in a NETS or SOFT unit at 2000-level or above. **Prohibition**: May not be counted with NETS 3017 or ELEC 3604. **Assessment**: Written assignments and exam.
An advanced alternative to NETS 3017; covers material at an advanced and challenging level.

SOFT 3101 Object-Oriented Software Design

4 credit points. **Session**: 1. **Classes**: Two 1hr lectures, one 1–2 hr tutorial/practical. **Prerequisite**: SOFT (2001 or 2901) and INFO (2000 or 2900) and INFO (2005 or 2905) and [SOFT (2004 or 2904) or COMP (2004 or 2904)]. **Prohibition**: May not be counted with SOFT 3801 or COMP (3008 or 3908). **Assessment**: Written assignments and exam.
An important benefit of the object-oriented approach to software development is that the modelling style (classes with attributes and methods, related by inheritance) is useful throughout the lifecycle. One can represent the problem space as classes, and then adapt these to give a design which is suitable for coding. In this unit, we study a methodical approach to developing a design for a substantial software project. In particular, many 'patterns' will be introduced. These describe common ways to solve recurring issues, especially ways that use inheritance to reduce the coupling between parts of the system. We will also cover the precise principles behind design-by-contract, espeically the relationship between assertions and inheritance. We will use UML as a notation for expressing designs, and study some ways to structure large designs for improved understanding.

SOFT 3801 Object-Oriented Software Design (Adv)

4 credit points. **Session**: 1. **Classes**: Two 1hr lectures, one 1–2 hr tutorial/practical. **Prerequisite**: SOFT (2001 or 2901) and INFO (2000 or 2900) and INFO (2005 or 2905) and [SOFT (2004 or 2904) or COMP (2004 or 2904)] and Distinction in a SOFT or INFO unit at 2000-level or above. **Prohibition**: May not be counted with SOFT 3101 or COMP (3008 or 3908). **Assessment**: Written assignments and exam.
An advanced alternative to SOFT 3101; covers material at an advanced and challenging level.

SOFT 3102 User Interface Design and Programming

4 credit points. **Session**: 1. **Classes**: Two 1hr lectures, one 1–2 hr tutorial/practical. **Prerequisite**: [SOFT (2004 or 2904) or COMP (2004 or 2904)]. **Prohibition**: SOFT 3802 or COMP (3102 or 3802). **Assessment**: Written assignments and exam.
This unit of study introduces several of the critical elements programmers need to create effective user interfaces. These include the essential technical skills used in creating several of the major types of interface as well as human and design issues. Critical to designing an effective interface is familiarity with the substantial body of knowledge about cognitive and perceptual constraints. The technical tools of User Interface programming include learning current tools for building interfaces. The unit of study will introduce students to 'web-technology' (programming of interfaces in the World-Wide-Web environment), a visual programming environment, and GUI building tools based on scripting.

SOFT 3802 User Interface Design Programming (Adv)

4 credit points. **Session**: 1. **Classes**: Two 1hr lectures, one 1–2 hr tutorial/practical. **Prerequisite**: [SOFT (2004 or 2904) or COMP (2004 or 2904)] and Distinction in a SOFT or INFO unit at 2000-level or above. **Prohibition**: SOFT 3102 or COMP (3102 or 3802). **Assessment**: Written assignments and exam.
An advanced alternative to SOFT 3102; covers material at an advanced and challenging level.

SOFT 3103 Software Validation and Verification

4 credit points. **Session**: 2. **Classes**: Two 1hr lectures, one 1–2 hr tutorial/practical. **Prerequisite**: [SOFT (2004 or 2904) or COMP (2004 or 2904)] and SOFT (2001 or 2901) and MATH (1005 or 1905). **Prohibition**: May not be counted with SOFT 3803. **Assessment**: Written assignments and exam.
This unit will introduce a thorough approach to ensure the quality of software. It will focus on how to design and carry out effective testing. Testing needs to address both functionality and also non-functional issues such as performance, usability, conformance to policy. We will learn to evaluate test strategies in terms of coverage and contribution to system reliability. Attention is also paid to the automation and management of the testing process.

SOFT 3803 Software Validation & Verification (Adv)

4 credit points. **Session**: 2. **Classes**: Two 1hr lectures, one 1–2 hour tutorial/practical. **Prerequisite**: [SOFT (2004 or 2904 or COMP (2004 or 2904)] and SOFT (2001 or 2901) and MATH (1005 or 1905) and Distinction in a SOFT or INFO unit at 2000-level or above. **Prohibition**: May not be counted with SOFT 3103. **Assessment**: Written assignments and exam.
An advanced alternative to SOFT 3103; covers material at an advanced and challenging level.

SOFT 3104 Software Development Methods 2

4 credit points. **Session**: 1. **Classes**: Two 1hr lectures, one 1–2 hr tutorial/practical. **Prerequisite**: [SOFT (2004 or 2904) or COMP (2004 or 2904)] and SOFT (2001 or 2901). **Prohibition**: May not be counted with SOFT 3804 or COMP (3100 or 3800). **Assessment**: Written assignments and exam.
At the end of this course you should have an easy familiarity with C++ and know when (and when not) to use it to solve a problem. In particular, we deal with those issues which differ from Java and C, including multiple inheritance, name spaces, destructors, the difference between virtual and non-virtual overriding, and templates. You should be comfortable reading the STL source. In addition, you will have had experience with refactoring, use of software configuration management systems (such as CVS, RCS, SCCS, Perforce), and use of metrics in Personal Software Process.

SOFT 3804 Software Development Methods 2 (Adv)

4 credit points. **Session**: 1. **Classes**: Two 1hr lectures, one 1–2 hr tutorial/practical. **Prerequisite**: [SOFT (2004 or 2904) or COMP (2004 or 2904)] and SOFT (2001 or 2901) and Distinction in a SOFT or INFO unit at 2000-level or above. **Prohibition**: May not be counted with SOFT 3104 or COMP (3100 or 3800). **Assessment**: Written assignments and exam.
An advanced version of SOFT 3104; covers material at an advanced and challenging level.

SOFT 3200 Software Development Project

8 credit points. **Session**: 1, 2. **Prerequisite**: [SOFT (2004 or 2904) or COMP (2004 or 2904)] and SOFT (2001 or 2901) and 8 credit points from BIT table III(ii) and 8 credit points from BIT table III(iv). **Prohibition**: May not be counted with SOFT 3700. **Assessment**: Written report and presentation.
This unit is a capstone for the undergraduate curriculum. It provides students with the chance to demonstrate their skills in developing a substantial software system, working in a group which needs to carry out the full range of activities including requirements capture, analysis and design, coding, testing and documentation.

SOFT 3700 Software Development Project (Advanced)

8 credit points. **Session**: 1, 2. **Prerequisite**: [SOFT (2004 or 2904) or COMP (2004 or 2904)] and SOFT (2001 or 2901) and 8 credit points from BIT table III(ii) and 8 credit points from BIT table III(iv) and Distinction in a 2000- or 3000- level unit from COMP, INFO, MULT, NETS, or SOFT. **Prohibition**: May not be counted with SOFT 3200. **Assessment**: Written report and presentation.
This unit is an Advanced alternative to SOFT 3200. Students develop software to assist an organisation or research group which is involved in innovation. Involvement in the activities of the client community is an important aspect of the unit.

Computer Science Honours

To be awarded Honours in Computer Science, a student must complete units of study to a total of 48 credit points, as approved by the School and the Faculty, as follows: 6 credit points of research preparation through the unit INFO 4990, covering a literature review and research plan, 18 credit points of research project through the unit INFO 4991 and 4992, and 24 credit points of coursework units of study, which, except with permission of the School and Faculty, must all be from 4000-level units of study which are in the subject area of Computer

Science (that is, units of study which have codes starting with COMP, INFO, MULT, NETS and/or SOFT).

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.

Information Systems Honours

Information Systems Honours consists of coursework and a project. The project involves a substantial development or investigation task generally in support of the department's research effort. It provides training in investigating the history of the body of knowledge that encompasses a conceptual problem space, defining a complex task to tackle the problem, and then taking the task to completion. Students receive an education in moving through a problem from its inception to its completion so that they gain the confidence and experience to tackle independently significant research and industrial projects. Research areas in the School include natural language processing, data mining, systems methodologies and Workflow methods. Students are required to participate in School seminars as part of their coursework and in all other activities of the School. They are provided with office accommodation and laboratory facilities and may be employed for a few hours per week in undergraduate teaching.

For further details consult the School Handbook and the Honours Guide Book.

■ 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 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.

LAWS 1006 **Foundations of Law**

6 credit points. Ms Jenni Millbank (Convenor). **Session**: 1. **Classes**: One 1 hr lecture & Two 2 hr seminars per week.

NB: Unit is part of the Combined Law program.

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:

- the development of judge made and statute law
- the relationship between courts and parliament
- the role and function of courts, tribunals and other forms of dispute resolution
- understanding and interrogating principles of judicial reasoning and statutory interpretation
- the relationship between law, government and politics
- what are rights in Australian law, where do they come from and where are they going

We will have a particular focus on indigenous Australia in exploring many of these issues, for example through the landmark Mabo decision.

LAWS 1010 **Torts**

6 credit points. Mr Ross Anderson (Convenor). **Session**: 2. **Classes**: Two 2 hr seminars per week. **Prerequisite**: Legal Institutions. **Prohibition**: LAWS 3001 Torts.

NB: Unit is part of the Combined Law program for students commencing in 2004.

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;
(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, breach of duty, causation and remoteness of damage and assessment of damages;
(j) Injuries to relational interests, including compensation to relatives of victims of fatal accidents;
(k) Concurrent and vicarious liability;
(l) Defences to negligence;
(m) Breach of statutory duty;
(n) Nuisance; and
(o) Liability for animals.

LAWS 1002 **Contracts**

8 credit points. Dr Elisabeth Peden (Convenor). **Session**: 1, 2, Summer. **Classes**: Two 2 hr seminars per week. **Prerequisite**: Legal Institutions.

February Semester classes are for students in Combined Law and July Semester classes are for students in Graduate Law.

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 option Advanced Contracts.

LAWS 1003 **Criminal Law**

8 credit points. Professor Mark Findlay (Convenor). **Session**: 1, 2. **Classes**: Two 2 hr seminars per week.

February Semester classes are for students in Graduate Law and July Semester classes are for students in Combined Law.

The Graduate Law class will commence in Week 2, to accomodate the Legal Institutions intensive. 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 wide range of socio-legal literature, and will focus on particular substantive 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.
(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 knolwedge of how the criminal law operates in its broader societal context.

The understandings referred to in the foregoing paragraphs will have a critical focus and will draw on procedural, substantive, theoretical and empirical sources. Race, gender, class and the interaction of these factors will be key themes.

LAWS 1008 **Legal Research**

No credit points. Mr Graeme Coss (Convenor). **Session**: 1, 2. **Classes**: 1hr per week over eleven weeks for Combined Law; 2hrs per week over seven weeks for Graduate Law.

This unit is a compulsory component of the Bachelor of Laws degree.

- Combined Law students undertake tuition at the Law School in their first year, with classes offered in either first or second semester depending on timetabling. The semester 1 'host' law

unit will be Legal Institutions, and in semester 2 the 'host' law unit will be Torts.

- Graduate Law students undertake tuition in first semester of the first year. The 'host' substantive law subject will be Criminal Law.

The subject Legal Research aims:

- to promote the proficient use by all students of a law library;
- to introduce students to major Australian legal research aids, both in hard-copy and electronic format, and to discourage dependency;
- to provide students with practice in finding and analysing relevant primary and secondary materials;
- to promote efficient and effective research methods.

Legal Research is graded on a Pass/Fail basis. Attendance at all classes is mandatory. Classes will be of one hour duration, one per week, for eleven weeks for Combined Law students; of two hours duration, one per week, for seven weeks for Graduate Law students. Numbers will be limited to a maximum of 16 in each class. There will be continuous assessment throughout the semester. These will be one compulsory assignment and one compulsory exam.

LAWS 3000 **Federal Constitutional Law**

10 credit points. Dr Isabel Karpin (Convenor). **Session**: 1. **Classes**: Two 2 hr seminars per week. **Prerequisite**: Legal Institutions.

NB: Unit is part of the Combined Law program.

This unit of study aims to achieve an understanding of the principles of Australian constitutional law. The unit commences with a development of an understanding of Australia's constitutional independence, parliamentary sovereignty, indigenous rights and the concepts of representative and responsible government. Further topics covered include federalism (including the external affairs power and the relationship between Commonwealth and state laws); economic and financial power and relations (including the corporations power, the trade and commerce power, freedom of interstate trade, and excise); the doctrine of separation of powers and judicial power of the Commonwealth; express and implied constitutional rights; and principles of constitutional interpretation. The unit aims to develop a capacity to evaluate the principles critically, with regard to political theory and the social context within which cases have been decided.

LAWS 3002 **Law, Lawyers and Justice**

10 credit points. Mr Bernard Dunne (convenor). **Session**: 2. **Classes**: Two 2 hr seminars per week.

NB: Unit is part of the Combined Law program for re-enrolling students in 2004

As for graduate law, LAWS 1001

■ Liberal Studies units of study

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.

ENGL 1005 **Language and Image**

6 credit points. Dr Harbus. **Session**: 1, 2. **Classes**: One 1hr lecture and one 2hr workshop. **Prohibition**: ENGL 1050. **Assessment**: Two 500wd assignments, one 1500wd essay, one 1.5hr examination, and workshop participation.

This unit of study will introduce students to the construction of meaning in written and visual texts, using Graham Greene's novel The Quiet American and the film of the novel as focal points. A range of other fiction, academic and media texts will be used to explore social processes of textual construction and interpretation. In the workshops, students will learn detailed analytic techniques, including close grammatical analysis, as tools for the interpretation of text and image. The lectures will introduce more descriptive topics, such as historical shifts in relations between language and image, narrative organisation, categories of text, and social agency and power in the production of text.

Textbooks

Greene, G. The Quiet American.

Butt, D., et al., Using Functional Grammar: An Explorer's Guide

A Resource book will be available from the University Copy Centre.

LNGS 1005 **Structure of English**

6 credit points. Dr J Simpson. **Session**: 1. **Classes**: (three 1 hr lectures & one 1 hr tutorial)/wk. **Prohibition**: may not be taken as well as LNGS 1001 or LNGS 1004. **Assessment**: one 1hr exam, various written assignments and 1 essay.

This unit looks at the structure of English from the point of view of modern linguistics and focusses on written and spoken academic English. It will be especially valuable to non-native speakers of English in giving them an overview of how and why English works the way it does. Topics covered include: English vocabulary, phonetics; intonation; word types; count and mass nouns; verb types and sentence structures; auxiliary verbs and tense and mood; voice, topicality and information structure. Knowledge about the structure of English will be used to improve students' writing skills in collaboration with the Learning Centre

■ Marine Science

The University of Sydney Institute of Marine Science (USIMS) provides for undergraduate students 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 Web site (www.usyd.edu.au/marine).

MARS 2001 **Introductory Marine Science A**

4 credit points. Dr Hughes. **Session**: 1. **Classes**: 3 lec & 1 tut/wk. **Prerequisite**: 24 credit points of Junior units of study from Science Discipline Areas. This is a qualifying unit of study for Senior Marine Science units. Some Senior electives may have additional prerequisites. **Assessment**: One 2hr exam, classwork.

This unit of study is split into two sections: physical and geological oceanography. Major physical oceanography topics include the physical and chemical properties of ocean water, ocean circulation, waves and tides. Major geological oceanography topics include the origins and geological history of ocean basins, ocean volcanism, sediments and continental margins. Both the regional oceanography and continental shelf of Australia are emphasised. Although this is principally a lecture based unit, you will receive regular feedback on your understanding of the unit content through informal quizzes and assignments. The learning outcome you should expect at the end of the unit is a broad knowledge of the fundamental concepts in physical and geological oceanography, and their particular relevance to the Australasian region. This provides the necessary background for senior-level Marine Science units of study in which you will learn more advanced concepts, and also become involved in the practical and field-based aspects of marine science.

MARS 2002 **Introductory Marine Science B**

4 credit points. Dr Adele Pile. **Session**: 2. **Classes**: 3 lec, 1 day excursion, 1/2 day excursion. **Prerequisite**: 24 credit points of Junior units of study from Science Discipline Areas. This is a qualifying unit for Senior Marine Science units. Some Senior electives may have additional prerequisites. **Prohibition**: GEOG 2002. **Assessment**: One 2hr exam, written assignment, computer based assignment.

This unit of study is split into two sections: marine biology and coastal geomorphology. The marine biology section describes some of the ways that 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 coastal geomorphology section provides an introduction to coastal geomorphology by examining the geographic variability of coasts as the sum effect of variations in terrestrial, climatic and oceanographic factors. These factors are introduced in terms of the main physical processes (geology, sea-level, waves, tides, winds) governing coastal geomorphology on a range of space-time scales. Geographic variation in the physical processes is illustrated by reference to the local coast – ie, Sydney. The illustration is amplified by drawing comparisons with other parts of SE Australia, and with overseas examples (especially from coastal environments very different to that of Sydney).

MARS 2003 **Marine Science Field School**

4 credit points. Prof Andy Short. **Session**: 1a. **Classes**: Field school and prac/Sem 3hr/wk. **Prerequisite**: 48 credit points of Junior units of study from Science Subject Areas. **Corequisite**: MARS 2001. **Assessment**: Participation in field school, participation in practicals, assignments.

NB: This unit of study is available to students in the Bachelor of Science (Marine Science) and the Bachelor of Resource Economics only.

Marine Scientists are generally involved in a wide variety of field work throughout their careers. A detailed knowledge of field methods and techniques is therefore a necessary component in the education of marine scientists. This unit of study introduces students to a range of field issues within the coastal and marine environment during a 5 day field school held prior to commencement of lectures in Semester 1. Many of the field methods focussed on are generic across the marine disciplines. In addition, techniques specific to the disciplines of Biological Sciences and Geosciences are taught. Students will be expected to participate in a hands-on way, undertaking data analysis-based data collected during the field school. These data will provide resources for the practical/seminar part of the course undertaken during the semester. Practical: The 4 practical classes are intended to familiarise the student with data processing techniques and report writing and are

intended to draw the connection between fieldwork and theoretical issues discussed in the Introductory Marine Science units.

Practical: The practical classes are intended to familiarise the student with data processing techniques and the seminars are intended to draw the connection between fieldwork and theoretical issues discussed in the Introductory Marine Science units.

MARS 2004 **Marine Techniques**

4 credit points. Dr Cowell, Dr Pile. **Session**: 2. **Classes**: practicals 4hr/ week. **Prerequisite**: 48 credit points of units of study from Junior Science Subject Areas and MARS 2003. **Corequisite**: MARS 2002. **Assessment**: practical work, assignments.

NB: This unit of study is available to students in the Bachelor of Science (Marine Science) and the Bachelor of Resource Economics only.

Marine scientists are involved in the study of the largest and most diverse and dynamic environment on the planet. A

multidisciplinary approach is required to investigate the complex physical, biological and chemical interactions that compose this environment. This unit will build on MARS 2003, and systematically introduce students to a range of field and

laboratory techniques used in the acquisition and analysis of marine biological and geoscience data. During the unit students will collect data in the field, undertake laboratory analysis, and enter the results into spreadsheet/databases, and finally prepare and present written and oral reports on their findings.

Marine Science Senior units of study

Students in the Bachelor of Science intending to major in Marine Science should enrol in Senior MARS units of study to a total worth of 24 credit points. Students in the Bachelor of Science (Marine Science) must enrol in a minimum of 36 credit points of Senior Marine Science units of study.

There are 7 electives available in Semester 1 and 6 electives in Semester 2. The majority of the electives are of half-semester duration only and are grouped into each half (see list below). Alternatively, students enrolled in the Bachelor of Science (Marine Science) may apply to replace one or more of these electives with Tropical Marine Science (NTMP) units. Students are encouraged to select those electives in which they have a particular interest, subject to certain conditions. All prerequisites must be met and selection of electives must be managed to avoid too much study in any one half semester. That is, no student may do more than 12 credit points in any one half semester. All enrolments are to be registered with and approved by the Undergraduate Advisor of USIMS on the first day of Semester 1. You may be required to change your selection on the basis of these rules.

Semester 1 (weeks 1–7 inclusive)
MARS 3003, MARS 3005, BIOL 3011*
Semester 1 (weeks 7–13 inclusive)
MARS 3004, MARS 3006, MARS 3008, BIOL 3013*
Semester 2 (weeks 1–7 inclusive)
MARS 3103, MARS 3105
Semester 2 (weeks 7–13 inclusive)
MARS 3104, MARS 3106
Semester 2 (full semester)
MARS 3102*

(*) 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 marine 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. Each student should also complete a preliminary enrolment form in the School of Biological Sciences before first semester commences.

Registration

In addition to complying with enrolment procedures required by the University, all students in Senior Marine Sciences must register with the Marine Science Administration Office (Room 469 Madsen) during the first week of lectures. Enquiries should also be directed there.

Descriptions of options

Students should also consult electives (BIOL 3011/3911, BIOL 3013/3913) as listed in this chapter under Biological Sciences in this handbook.

MARS 3003 **Coastal Depositional Environments**

6 credit points. Prof Andy Short. **Session**: 1a. **Classes**: (weeks 1–7) 3 hrs lecs & 3 hrs prac/wk, one half day excursion, one weekend excursion. **Prerequisite**: MARS (2001 and 2002) or 16 credit points of Intermediate Science including at least 8 credit points from Geology or Geography units of study. **Assessment**: Excursion report, 2 x 1500 word essays, 1 hr exam.

Coastal depositional environments dominate the coast of Australia and most shorelines. They are dynamic systems

responding to input sediments and processes as well as boundary conditions. This course focuses on high energy wave and wind dominated depositional systems manifest as beaches, dunes and barrier systems. It examines their formative processes and their global variation, before systematically looking at the beach-surf zone, backshore, dunes and barriers, including their Holocene evolution. The impact of lower waves and tides, embayments, structures and other environmental parameters are also considered. The surface morphology and stratigraphy of representative systems is examined on the excursions and in the practicals. The practicals also introduce students to field and laboratory techniques used in core logging and analysis of sediments. One assignment is based on the excursion and practical work, the second is based on library research of a section of the Australian coast.

Textbooks

Short, A.D. Beach and Shoreface Morphodynamics, John Wiley & Sons, 1999, Chichester, 379 pp.

Course Notes and other material also available at University Copy Centre

MARS 3004 **Coastal Morphodynamics**

6 credit points. Dr Peter Cowell. **Session**: 1b. **Classes**: (weeks 7–13) 3 hrs lecs & 6 hrs pracs/wk. & 3 hrs WebCT assignments/ wk. **Prerequisite**: MARS (2001 and 2002) or 16 credit points of Intermediate Science including at least 8 credit points from Geology or Geography units of study. **Prohibition**: May not be counted with GEOG 3001. **Assessment**: Assignments, 1 hr exam.

Coastal Morphodynamics studies the modeling of complex environmental systems and management of uncertainty in predicting environmental change. Complexity here refers to time-dependent evolution of systems driven by variable inputs (stochastic non-linear dynamics). Specifically the course concerns formal methods to predict (and thus understand) changes in the geomorphology of coastal barrier and mainland beaches (and the associated sand dunes), estuaries (including their deltaic counterparts), coastal lowlands and continental shelves. The subject is of practical relevance to coastal management and planning, as well as to petroleum and mineral exploration. The option aims to provide (1) skills in managing complex problems in general, (2) an analytical understanding of coastal processes in particular, and (3) experience in application of computer simulation programs and vocationally relevant, commercial software packages. Practical work involves extensive use of computers.

MARS 3005 **Marine Geophysical Data Analysis**

6 credit points. Dr Dietmar Mƒller, Dr Michael Hughes. **Session**: 1a. **Classes**: (weeks 1–7) 12 hrs lecs & pracs/week, one weekend excursion. **Prerequisite**: MARS (2001 and 2002) or 16 credit points of Intermediate Science including at least 8 credit points from Geology or Geography units of study or CIVL 2409. **Assessment**: Assignments, 2 hr exam.

Exploring the sediments/rocks that make up the deep ocean floor and the continental shelves requires the use of remote sensing techniques, and the analysis of geophysical data. This unit teaches analytical and interpretive skills in both these areas, with

a focus on: basic signal properties, convolution and correlation, numerical transforms, time series (harmonic and spectral) analysis, filtering, and image analysis. It covers a variety of data types including wave and current data, multibeam seafloor data, gravity, magnetic and heatflow data, seismic reflection data, video imagery, and satellite altimetry. All practical exercises are carried out in an integrated LINUX/Matlab computer environment. The unit is relevant to students interested in marine geophysics and geology, offshore engineering, as well as geological or physical oceanography.

Textbooks

M*f*ller, R. D., and Hughes, M., Marine geophysical data analysis, (available at University Copy Center).

MARS 3006 **Dynamics of Ocean Basins and Margins**

6 credit points. Dr Dietmar M*f*ller. **Session**: 1b. **Classes**: (weeks 7–13) 12 hrs lecs & pracs/wk, one weekend excursion. **Assumed knowledge**: Prior completion of MARS 3005 is highly recommended. **Prerequisite**: MARS (2001 and 2002) or 16 credit points of Intermediate Science including at least 8 credit points from Geology or Geography units of study or CIVL 2409. **Assessment**: Assignments, 2 hr exam.

This module explores the processes that have shaped the abyssal plains, deep sea trenches, continental shelves and slopes of the ocean basins. Plate tectonic processes in the ocean basins and margins control the production of magma and the destruction of crust, which collectively lead to changes in sea level, geochemistry and sedimentation, and drive the formation of basins and mountain belts with associated natural resources. The class introduces the basics of geodynamics as well as research at the cutting edge of modelling our dynamic Earth with an emphasis of data collected by remote sensing and at sea. The physical mechanisms forming different types of basins are examined and their relevance for petroleum resources is explored, based on thermal and mechanical models for the evolution of sedimentary basins and continental shelves. All practical exercises are carried out in a LINUX/Matlab computer environment, and require previous knowledge of Matlab and data analysis techniques based on Fourier transforms as covered in MARS 3005. The class is relevant to all students interested in using computational methods to learn how the Earth works.

Textbooks

M*f*ller, R. D., Dynamics of ocean basins and margins, (available at University Copy Center).

MARS 3008 **Energy: Science, Engineering & Economics**

6 credit points. Prof Peter Davies, Dr Gavin Birch. **Session**: 1. **Classes**: (weeks 7–13) 12 hrs lecs & pracs/wk, one weekend excursion. **Prerequisite**: MARS (2001 and 2002) or 16 credit points of Intermediate Science including at least 8 credit points from Geology or Geography units of study or CIVL 2409. **Prohibition**: May not be counted with GEOL 3102. **Assessment**: Assignments, field work, 2 hr exam.

This unit is aimed at geoscientists, biologists, environmental and marine scientists who are interested in the energy resources, particularly in the context of the evolution of coral reefs and how they have been affected by changing short and long-term environmental conditions. This interdisciplinary unit provides an introduction to offshore energy and coral reefs and explores this complex system in relation to geology, biology and ecology as well as the oceanographic setting. The unit acquaints students with tools currently being used in the industry and is underpinned by modern concepts of basin architecture and sequence stratigraphy. Exploration techniques include the principals and practice of electrical logging, source rock evaluation and reservoir quality assessment. The controlling influence of basin architecture is examined in terms of critical factors such as hydrocarbon source, migration and entrapment, whereas the modern concepts of sequence stratigraphy and seismic stratigraphy are used to demonstrate climatic and tectonic control. Students will also become familiar with the factors and processors that control the structure, morphology, sediments and distribution of coral reefs and how they function as part of larger ecosystem. The unit is based on problem solving by groups and is underpinned by closely integrating geology, geophysics, marine science and economics. The theoretical base developed in course work will be used to solve a real-world exploration case study, using petroleum industry techniques and by simulating an economic competitive environment. The unit will include a 5 day field trip to the Great Barrier Reef. Students will be required to meet associated travel and accommodation costs.

MARS 3102 **Marine Ecology**

12 credit points. Dr Chapman, Dr Norcum, Prof. Underwood, Dr C Styan and others. **Session**: 2. **Classes**: 4 lec & 8hr prac/wk, one 8-day field trip in vacation before Sem 2. **Prerequisite**: MARS (2001 and 2002) and 16 credit points of Intermediate Biology including BIOL (2001 or 2901 or 2002 or 2902 or 2004 or 2904). **Prohibition**: BIOL 3023, 3923, 3024, 3924, 3040 or 3940. **Assessment**: field report, laboratory, exam.

MARS 3102 comprises two parts, Ecological Methods and Marine Ecology. Ecological Methods is conducted during weeks 1–6 and will consider ecology as a theoretical, quantitative, experimental science concerned with the analysis of patterns of distribution, abundance, dynamics, demography and life-histories of natural populations with an appraisal of the nature of scientific investigations, from a philosophical viewpoint and the practicalities of testing hypotheses in the real world. Application of ecological theory and methods to practical problems will be integrated throughout the unit of study. Lectures will be on sound philosophical and experimental principles and useful for the more informed management, conservation and utilization of natural populations and habitats. Practical classes will deal with practical methods of determining patterns of distribution and abundance, problems of sampling, estimation of ecological variables and methods of statistical analysis of field data. Computer simulations and analyses will be used where appropriate.

Marine Ecology will explore the designs of experimental analysis of marine populations, drawing upon extensive examples from intertidal assemblages of animals and plants and from the biology of sub-tidal organisms in coastal habitats. No particular mathematical or statistical skills are required for this module. Much emphasis will be placed on evaluation of recent studies in the literature. Laboratory classes will deal with techniques of analysis and experimental manipulation of natural assemblages. The relationships between experimental marine ecology and general ecological theory will be emphasised. The role of ecological science in management, conservation and exploitation of populations will be emphasised.

Notes

(1) Marine Ecology has a compulsory pre-semester field trip in July (held July 8–15 in 2003). Students wishing to do Marine Ecology must pre-enrol with the School of Biological Sciences and the Marine Science Administration Office early in Semester 1. (2) Students should be aware that the Marine Ecology and NTMP field units may clash. Contact the Marine Science Administration Office for further information. (3) Marine Ecology is a prerequisite for Marine Science Honours in Marine Ecology.

MARS 3103 **GIS Simulation Modelling**

6 credit points. Dr Peter Cowell. **Session**: 2a. **Classes**: (weeks 1–7) 3 hrs lecs & 6 hrs pracs/wk & 3 hrs WebCT assignments/ wk. **Prerequisite**: MARS (2001 and 2002) or 16 credit points of Intermediate Science including at least 8 credit points from Geology or Geography units of study. **Prohibition**: May not be counted with GEOG 3102. **Assessment**: Assignments, 1 hr exam.

Specific aims of the unit are to provide (a) an introduction to technical issues in Geographic Information Systems (GIS), (b) experience in using GIS techniques ('hands on'), and (c) insights into use of GIS to combine theory and environmental data for practical prediction in environmental management (ie, through simulation modeling). The lectures illustrate how Geographic Information Systems can be applied by people working in marine sciences, and provide an introduction to the nuts and bolts of GIS. The technical lectures are based on a leading GIS textbook. The practical work focuses on application of GIS techniques to coastal management project. Practical work involves extensive use of computers.

MARS 3104 **Coastal Zone Management**

6 credit points. Dr Eleanor Bruce. **Session**: 2b. **Classes**: (weeks 7–13) 3 hrs lecs & 4 hrs pracs/wk, fieldtrip. **Prerequisite**: MARS (2001 and 2002) or 16 credit points of Intermediate Science including at least 8 credit points from Geology or Geography units of study. **Prohibition**: GEOG 3102. **Assessment**: Assignments, exam.

Aims of the unit: To assist you to identify significant problems in resource management in the coastal zone, to enhance your understanding of the origins of these problems at the interface between the natural and human environments, and the nature of human responses to them. To equip you with some conceptual models for the management of problems in resource management in the coastal zone, and to teach you some of the fundamental skills in analysis of environmental problems,

including the use of remotely sensed information in resource management.

MARS 3105 Coastal Oceanography & Sediment Dynamics

6 credit points. Dr Michael Hughes. **Session**: 2a. **Classes**: (weeks 1–7) 12 hrs lecs & pracs/wk, one weekend excursion. **Prerequisite**: MARS (2001 and 2002) or 16 credit points of Intermediate Science including at least 8 credit points from Geology or Geography units of study or CIVL 2409. **Prohibition**: May not be counted with GEOL 3104. **Assessment**: Assignments, 2 hr exam.

The scope of this unit of study is intended to have wide appeal: encompassing students with interests ranging from Earth systems modelling through to managing marine environments. You will learn about the fundamental principles that govern fluid and sediment movement in coastal waters, develop computational analysis and modelling skills that enable you to solve practical problems, and explore the wider application of this knowledge and skills base to environmental issues in the Australasian region.

The lecture program addresses a range of physical processes relating to waves, tides, nearshore currents, and their combined influence on coastal sediment transport. The practical program provides hands-on experience with coastal oceanographic data collection, and the use of a wide range of computational analysis and modelling techniques. The practical exercises use real data sets collected during recent research programs, and address issues specific to Australia's coastal seas.

MARS 3106 Physical Marine Habitat

6 credit points. **Session**: 2b. **Classes**: (weeks 7–13) 12 hrs lecs & pracs/wk, one weekend excursion. **Prerequisite**: MARS (2001 and 2002) or 16 credit points of Intermediate Science including at least 8 credit points from Geology or Geography units of study. **Assessment**: Assignments, presentations, 2 hr exam.

The aim of this unit of study is to provide the student with skills to analyse sea floor environments and their respective physical, chemical and biological processes. A variety of geological, geochemical, oceanographic and biological data will be used to interpret the sea floor, particularly in the Australian Exclusive Economic Zone. The Regional Marine Plans being set up under Australia's Oceans Policy will receive particular attention. Marine survey data sets and computer simulation, including 3-D VisLab facilities, will be used to interpret the sea floor. Students will develop skills to analyse remote sensing images (sonar, swath-mapping) of the sea floor and seismic reflection profiles of the sub-sea floor. The practical content of the course will develop student's skills in field experimentation and sampling, and the interpretation of physical processes from the study of sedimentary textures and structures. Samples from the shelf, slope and deep-sea will enable examination of the role of plants and animals in modifying sediment texture and composition. Ocean Drilling Program data will be used to show how and why sedimentary environments have changed through time, particularly the past 100 million years. In seminars students will develop communication and presentation skills by critical analysis of current controversies in marine science and proposals to resolve them. There will be a one-day weekend field trip on Sydney Harbour.

Marine Sciences Honours

Semester: 1, 2.

The structure of Honours in Marine Science (including in Tropical Marine Science for interested students in the Bachelor of Science (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.

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. A minimal WAM score is usually set for entry into Honours in Marine Sciences, preferably during the July semester of the Senior program and otherwise as soon as possible after publication of the Senior units of study examination results. Arrangements for the supervision and Department of primary location of students will be made in the light of their proposed thesis topic. Joint supervision involving staff of more than one Department 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 be eligible to enrol in units of study offered as part of the Tropical Marine Network Program. The TMNP is a joint program of the University of Sydney, the University of Queensland and James Cook University, and will offer six units of study in tropical marine science, all to be taught at marine island research stations off the Queensland coast. 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)

The program contains six units of study, each worth 6 credit points and all of which are 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 will be offered each year, together with two to three of the other units. The prerequisites for all units will be the successful completion of the first year of the B.Sc.(Marine Science) course or equivalent, and the qualifying course MARS 2003.

Students may enrol in these units in academic year 2 and year 3 as part of the BSc(Marine Science). In order to major in Tropical Marine Science, students must successfully complete at least 3 and no more than 5 of the NTMP units of study.

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. Owing to the size of facilities and accommodation at the island research stations all units will have a quota with entry based on merit. For further information on the availability and timing of these units please refer to the Web site: www.usyd.edu.au/marine.

NTMP 3001 Coral Reef Ecosystems

6 credit points. **Session**: 2. **Classes**: Fieldwork, 80 hours block mode. **Assumed knowledge**: General concepts in Biology. **Prerequisite**: MARS (2003 and 2001) plus 16 credit points from Intermediate Science units of study. **Assessment**: Report.

NB: 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.

NTMP 3002 Marine Biotechnology

6 credit points. **Session**: 1. **Classes**: Fieldwork, 80 hours block mode. **Assumed knowledge**: General concepts in Biology. **Prerequisite**: MARS (2003 and 2001) plus 16 credit points from Intermediate Science units of study. **Assessment**: Assignment and report.

NB: Department permission required for enrolment.

Marine Biotechnology is an intensive unit that will be held at the Heron Island Tropical Research Station on the Great Barrier Reef. The unit focuses on novel attributes of coral reef environments that are the basis of an expanding industry of biotechnology. Marine Biotechnology is the application of knowledge of reef-based life to improve our quality of life. Emphasis is given to the abilities of corals and other reef associated organisms (eg, Sponges) to protect themselves against the sun, repel and/or destroy non-self cells, and to immunise themselves against some diseases. Aspects covered include: collection of organisms; field experiments; and, molecular and genetic techniques to separate and identify 'useful proteins'.

NTMP 3003 **Fisheries Biology and Management**

6 credit points. **Session**: 2. **Classes**: Fieldwork, 80 hours block mode. **Assumed knowledge**: General concepts in Biology. **Prerequisite**: MARS (2003 and 2001) plus 16 credit points from Intermediate Science units of study. **Assessment**: Report.

NB: 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.

NTMP 3004 **Aquaculture**

6 credit points. **Session**: 2. **Classes**: Fieldwork, 80 hours block mode. **Assumed knowledge**: General concepts in Biology. **Prerequisite**: MARS (2003 and 2001) plus 16 credit points from Intermediate Science units of study. **Assessment**: Assignments and report.

NB: 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.

NTMP 3005 **Coastal Management**

6 credit points. **Session**: 2. **Classes**: Fieldwork, 80 hours block mode. **Assumed knowledge**: General concepts in Biology. **Prerequisite**: MARS (2003 and 2001) plus 16 credit points from Intermediate Science units of study. **Assessment**: Assignment and report.

NB: 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.

NTMP 3006 **Coastal Oceanography**

6 credit points. **Session**: 1. **Classes**: Fieldwork, 80 hours block mode. **Assumed knowledge**: General concepts in Biology. **Prerequisite**: MARS (2003 and 2001) plus 16 credit points from Intermediate Science units of study. **Assessment**: Report.

NB: Department permission required for enrolment.

Coastal Oceanography is an intensive unit that will be held at the tropical research station on North Stradbroke Island in the Great Barrier Reef. The unit focuses on approaches to studying the physical and biological attributes of coastal and pelagic environments. Emphasis is given to measuring horizontal and vertical attributes of the water column (eg, Salinity and temperature) as well as the composition of planktonic assemblages from low salinity waters to the shelf break. Aspects covered include: the use of physical oceanographic equipment (static sampling and logger); analyses of nutrients; and, the use of plankton nets.

■ 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 three levels, viz. 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 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 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 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.

Web Site: 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 Web site 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.

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. Each unit of study uses both computers and graphics calculators as aids to the development of mathematical ideas.

There are comprehensive 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.

Relation 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 MATH 1011 are encouraged to enrol in normal units of study in subsequent semesters. Students obtaining a Distinction or better in MATH 1011, 1012 or 1013 may proceed to Intermediate units of study in the Mathematics Discipline Area. Students with a Credit or better in MATH 1011 and a Pass or better in MATH 1015 may proceed to Intermediate units of study in the Statistics discipline area. Students with a Pass in only MATH 1015 are limited to the Intermediate Statistics units of study STAT 2002 and STAT 2004.

MATH 1011 **Life Sciences Calculus**

3 credit points. **Session**: 1. **Classes**: 2 lec & 1 tut/wk. **Assumed knowledge**: HSC Mathematics. **Prohibition**: MATH (1001 or 1901 or 1906). **Assessment**: One 1.5 hour examination, assignments and quizzes.

MATH 1011 is designed to provide calculus for students of the life sciences who do not intend to undertake higher year mathematics and statistics.

This unit of study looks at the fitting of data to various functions, introduces finite difference methods, 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.

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

MATH 1012 Life Sciences Algebra

3 credit points. **Session**: 2. **Classes**: 2 lec & 1 tut/wk. **Assumed knowledge**: HSC Mathematics. **Prohibition**: MATH (1002 or 1902). **Assessment**: One 1.5 hour examination, assignments and quizzes.

MATH 1012 is designed to provide algebra for students of the life sciences who do not intend to undertake higher year mathematics and statistics.

This unit of study introduces matrices, systems of linear equations and linear programming and counting techniques.

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

MATH 1013 Differential and Difference Equations

3 credit points. **Session**: 2. **Classes**: 2 lec & 1 tut/wk. **Assumed knowledge**: HSC Mathematics. **Prohibition**: MATH (1003 or 1903 or 1907). **Assessment**: One 1.5 hour examination, assignments and quizzes.

MATH 1013 is designed to provide the theory of difference and differential equations 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.

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

MATH 1015 Life Science Statistics

3 credit points. **Session**: 1, Summer. **Classes**: 2 lec & 1 tut/wk. **Assumed knowledge**: HSC Mathematics. **Prohibition**: MATH (1005 or 1905) or STAT (1021 or 1022) or ECMT Junior units of study. **Assessment**: One 1.5 hour examination, assignments and quizzes.

MATH 1015 is designed to provide a thorough preparation in statistics for students of the Life Sciences.It offers a comprehensive first 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 & 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 comprehensive 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 MATH 1001, MATH 1002 and MATH 1004, knowledge equivalent to the HSC Mathematics Extension 1 course is assumed. The assumed knowledge for MATH 1005 is HSC 2-unit Mathematics. For MATH 1003 the assumed knowledge is MATH 1001 or HSC Mathematics Extension 2. Students who have a very good result in the equivalent of the HSC 2-unit course are encouraged to enrol in the Normal units of study but should discuss their plans with a Mathematics adviser.

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 MATH 1001, MATH 1002, MATH 1003 and (at least) one of MATH 1004 and MATH 1005. 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 are encouraged to enrol in other Advanced units of study.

MATH 1001 Differential Calculus

3 credit points. **Session**: 1, Summer. **Classes**: 2 lec & 1 tut/wk. **Assumed knowledge**: HSC Mathematics Extension 1. **Prohibition**: MATH 1011 or 1901 or 1906. **Assessment**: One 1.5 hour examination, assignments and quizzes.

MATH 1001 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.

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.

MATH 1002 Linear Algebra

3 credit points. **Session**: 1, Summer. **Classes**: 2 lec & 1 tut/wk. **Assumed knowledge**: HSC Mathematics Extension 1. **Prohibition**: MATH 1902 or 1012. **Assessment**: One 1.5 hour examination, assignments and quizzes.

MATH 1002 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.

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

MATH 1003 Integral Calculus and Modelling

3 credit points. **Session**: 2, Summer. **Classes**: 2 lec & 1 tut/wk. **Assumed knowledge**: HSC Mathematics Extension 2 or MATH 1001. **Prohibition**: MATH 1013 or 1903 or 1907. **Assessment**: One 1.5 hour examination, assignments and quizzes.

MATH 1003 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 forms 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.

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

MATH 1004 Discrete Mathematics

3 credit points. **Session**: 2, Summer. **Classes**: 2 lec & 1 tut/wk. **Assumed knowledge**: HSC Mathematics Extension 1. **Prohibition**: MATH 1904 or MATH 2011. **Assessment**: One 1.5 hour examination, assignments and quizzes.

MATH 1004 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 requirements 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.

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

MATH 1005 **Statistics**

3 credit points. **Session**: 2, Summer. **Classes**: 2 lec & 1 tut/wk. **Assumed knowledge**: HSC Mathematics. **Prohibition**: MATH (1905 or 1015) or ECMT Junior units of study or STAT (1021 or 1022). **Assessment**: One 1.5 hour examination, assignments and quizzes.

MATH 1005 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.

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 & 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 comprehensive 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 are encouraged to enrol in these units of study but should discuss their plans with a Mathematics adviser.

Relation to other units of study and recommendation

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 MATH 1901, MATH 1902, MATH 1903 and (at least) one of the units MATH 1904 and MATH 1905. Passes in Junior units of study at this level qualify students to proceed to Intermediate units of study in Mathematics and Statistics at the Normal 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.

MATH 1901 **Differential Calculus (Advanced)**

3 credit points. **Session**: 1. **Classes**: 2 lec & 1 tut/wk. **Assumed knowledge**: HSC Mathematics Extension 2 or result in Band E4 of HSC Mathematics Extension 1. **Prohibition**: MATH (1011 or 1001 or 1906). **Assessment**: One 1.5 hour examination, assignments and quizzes.

MATH 1901 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 MATH 1001 but goes more deeply into the subject matter and requires more mathematical sophistication.

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

MATH 1902 **Linear Algebra (Advanced)**

3 credit points. **Session**: 1. **Classes**: 2 lec & 1 tut/wk. **Assumed knowledge**: HSC Mathematics Extension 2 or result in Band E4 of HSC Mathematics Extension 1. **Prohibition**: MATH (1002 or 1012). **Assessment**: One 1.5 hour examination, assignments and quizzes.

MATH 1902 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 MATH 1002 but goes more deeply into the subject matter and requires more mathematical sophistication.

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

MATH 1903 **Integral Calculus and Modelling Advanced**

3 credit points. **Session**: 2. **Classes**: 2 lec & 1 tut/wk. **Assumed knowledge**: HSC Mathematics Extension 2 or Credit or better in MATH 1001/1901. **Prohibition**: MATH (1003 or 1013 or 1907). **Assessment**: One 1.5 hour examination, assignments and quizzes.

MATH 1903 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 MATH 1003 but goes more deeply into the subject matter and requires more mathematical sophisticaton.

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

MATH 1904 **Discrete Mathematics (Advanced)**

3 credit points. **Session**: 2. **Classes**: 2 lec & 1 tut/wk. **Assumed knowledge**: HSC Mathematics Extension 2 or result in Band E4 of HSC Mathematics Extension 1. **Prohibition**: MATH 1004 or MATH 2011. **Assessment**: One 1.5 hour examination, assignments and quizzes.

MATH 1904 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 of study parallels the normal unit MATH 1004 but goes more deeply into the subject matter and requires more mathematical sophistication.

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

MATH 1905 **Statistics (Advanced)**

3 credit points. **Session**: 2. **Classes**: 2 lec & 1 tut/wk. **Assumed knowledge**: HSC Mathematics Extension 2 or result in Band E3 or better of HSC Mathematics Extension 1. **Prohibition**: MATH (1005 or 1015) or ECMT Junior units of study or STAT (1021 or 1022). **Assessment**: One 1.5 hour examination, assignments and quizzes.

MATH 1905 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 MATH 1005 but goes more deeply into the subject matter and requires more mathematical sophistication.

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

MATH 1906 **Mathematics (Special Studies Program) A**

3 credit points. **Session**: 1. **Classes**: 2 lec, 1 sem, 1 tut/wk. **Prerequisite**: UAI of at least 98.5 and result in Band E4 HSC Mathematics Extension 2; by invitation. **Prohibition**: MATH (1001 or 1011 or 1901). **Assessment**: One 1.5hr exam, assignments, classwork.

NB: 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 MATH 1901 Differential Calculus (Advanced). In addition there will be a selection of special topics, which are not available elsewhere in the Mathematics and Statistics program.

There are comprehensive details of this unit of study in the Junior mathematics Handbook distributed at the time of enrolment.

MATH 1907 **Mathematics (Special Studies Program) B**

3 credit points. **Session**: 2. **Classes**: 2 lec, 1 sem & 1 tut/wk. **Prerequisite**: Distinction in MATH 1906; by invitation. **Prohibition**: MATH (1003 or 1013 or 1903). **Assessment**: One 1.5hr exam, assignments, classwork.

NB: 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 MATH 1906. Students will cover the material in MATH 1903 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.

There are comprehensive details of this unit of study in the Jumior mathematics Handbook distributed at the time of enrolment.

Mathematics Intermediate units of study

The School of Mathematics provides a range of Intermediate units of study, each worth 4 credit points covering a variety of topics in Pure and Applied Mathematics. A normal Intermediate load in a discipline is 16 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 4 credit points)

- Analysis MATH 2007
- Analysis (Advanced) MATH 2907
- Fourier Series and Differential Equations MATH 2005
- Graph Theory MATH 2009
- Introduction to Modern Algebra MATH 2008
- Introduction to Modern Algebra (Advanced) MATH 2918
- Introduction to Nonlinear Systems and Chaos MATH 2006
- Introduction to Nonlinear Systems and Chaos (Advanced) MATH 2906
- Linear Algebra (Advanced) MATH 2902
- Matrix Applications MATH 2002
- Vector Calculus and Complex Variables MATH 2001
- Vector Calculus and Complex Variables (Advanced) MATH 2901

Applied units of study (each 4 credit points)

- Financial Mathematics MATH 2033
- Financial Mathematics (Advanced) MATH 2933
- Fourier Series and Differential Equations MATH 2005
- Introduction to Mathematical Computing MATH 2003
- Introduction to Mathematical Computing (Advanced) MATH 2903
- Introduction to Nonlinear Systems and Chaos MATH 2006
- Introduction to Nonlinear Systems and Chaos (Advanced) MATH 2906
- Lagrangian Dynamics MATH 2004
- Lagrangian Dynamics (Advanced) MATH 2904
- Mathematical Methods (Advanced) MATH 2905
- Matrix Applications MATH 2002
- Optimisation MATH 2010
- Vector Calculus and Complex Variables MATH 2001
- Vector Calculus and Complex Variables (Advanced) MATH 2901

Relation to other units of study and recommendations

In general, 2 units of study (8 credit points) of Intermediate mathematics are needed to progress to a Normal Senior mathematics unit of study, and 3 units of study (12 credit points) of Intermediate mathematics to progress to an Advanced Senior unit of study.

If your major interest is in mathematics, then you are strongly encouraged to enrol in 8 units of study (32 credit points) 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 should choose at least 4 units of study including MATH 2001 or 2901, and MATH 2002 or 2902. Other recommended choices would be 2007 or 2907 and 2008 or 2918. The standard combination of units of study for students wishing to take a full load of Intermediate Applied Mathematics is as follows:

At Normal level: 2001+ 2002 + 2007 + (2008 or 2009).

At Advanced level: 2901 + (2903 or 2906) + 2905 + 2904.

Students intending to specialise in Pure Mathematics should choose at least 4 units of study from the Pure list above and should include MATH 2002 or 2902 and 2008 or 2918. Other recommended choices would be 2007 or 2907. The standard combination of units of study for students wishing to take a full load of Intermediate Pure Mathematics is as follows:

At Normal level: (2001 or 2009) + 2002 + (2005 or 2007) + 2008.

At Advanced level: 2901 + 2902 + 2907 + 2918.

Computer Science students may like to include MATH 2009 among their choices.

Physics students would be well-advised to choose MATH 2001 or 2901, and 2005 or 2905.

Prospective teachers of mathematics should consider MATH 2001, 2009, and 2007 or 2907.

MATH 2001 **Vector Calculus and Complex Variables**

4 credit points. **Session**: 1, Summer. **Classes**: 3 lec & 1 tut/wk. **Prerequisite**: MATH (1001 or 1901or 1906) and (1002 or 1902) and (1003 or 1903 or 1907). **Prohibition**: MATH 2901. **Assessment**: One 2hr exam, assignments, tutorial quizzes.

This unit of study has two major components: firstly, a study of functions of several real variables from a vector point of view, and secondly an introduction to functions of a complex variable. Vector calculus topics include line integrals and multiple integrals, surface integrals, change of variables, theorems of Green, Gauss and Stokes with their physical significance. Complex variables topics include definitions and properties of complex functions, differentiability, Cauchy Riemann conditions and analyticity, contour integration and residues.

MATH 2002 **Matrix Applications**

4 credit points. **Session**: 1, Summer. **Classes**: 2 lec, 1 tut & 1 computer lab/wk. **Prerequisite**: MATH (1002 or 1902) or Distinction in MATH 1012. **Prohibition**: MATH 2902. **Assessment**: One 2hr exam, assignments, tutorial quizzes.

This unit is a continuation of the first year unit MATH 1002. It starts with an examination of the computational efficiency of various methods of solving linear systems, then discusses LU factorisation of a matrix and partial pivoting. The first year work on vectors and matrices is put in a more general setting by developing vector space theory (axioms of a vector space, subspace, linear independence and basis, rank and nullity, linear transformations, eigenvalues and eigenvectors, diagonalisation, orthogonal diagonalisation). These theoretical topics are illustrated by applications, which include fitting polynomials to data sets, applying rotations, reflections, shears and scalings to the plane, solving linear recurrence relations and systems of linked differential equations by diagonalisation, optimising constrained quadratic forms using orthogonal diagonalisation and developing numerical methods of findingeigenvalues and eigenvectors.

MATH 2003 **Introduction to Mathematical Computing**

4 credit points. **Session**: 1. **Classes**: 2 lec & 2 computer lab/wk. **Prerequisite**: MATH (1001 or 1901 or 1906) and (1002 or 1902) and (1003 or 1903 or 1907). **Prohibition**: MATH 2903. **Assessment**: One 2hr exam, assignments, quizzes, computer lab participation.

This unit of study consists of two segments, one devoted to computer simulation and modelling and the other to applied computer algebra. In the first, mathematical models will be set up for a range of problems, such as the minimisation of factory pollutants, determination of drug regimes for a diabetic, the modelling of stars, biological patterns and chaos. Students will

use computer simulations to explore solutions. The emphasis will be on modelling, rather than programming. The second segment gives hands-on experience with a computer algebra program. Students work through a set of interactive lessons showing them the potential of such programs. Students are required to write programs to solve applied mathematical problems that would be intractable if attempted solely by pen and paper.

MATH 2004 **Lagrangian Dynamics**

4 credit points. **Session**: 2. **Classes**: 2 lec, 1 prac & 1 tut/wk. **Prerequisite**: MATH 2001 or 2901. **Prohibition**: MATH 2904. **Assessment**: 2hr exam, assignments.

This unit of study provides a first course in dynamics from a higher standpoint. It demonstrates that Newton's laws of motion can be derived from a variational principle. The advantage offered by the Lagrangian formulation in solving for the motion is emphasised. The applications, which include planetary dynamics, illustrate the basic concepts of Newtonian dynamics such as conservation laws. Small oscillations about equilibrium states are treated as part of linear stability theory.

MATH 2005 **Fourier Series & Differential Equations**

4 credit points. **Session**: 2, Summer. **Classes**: 3 lec & 1 tut/wk. **Prerequisite**: MATH (1001 or 1901 or 1906) and MATH (1002 or 1902) and MATH (1003 or 1903 or 1907). **Prohibition**: MATH 2905. **Assessment**: One 2hr exam, assignments, quizzes.

In the Fourier Series segment, periodic phenomena such as wave motion are given a systematic treatment. The basic problem is to represent a periodic function of one variable as the sum of an infinite series of sines and cosines. The theory has extensive applications in engineering, acoustics, internal and surface waves in fluids, etc., as well as in pure mathematics. Then a review of first order equations is followed by a systematic treatment of second order equations using the methods of variation of parameters, undetermined coefficients and the theory of Laplace Transforms. Linear systems of differential equations are treated using matrices and vectors. The final part of the unit of study deals with partial differential equations with the emphasis on the application of the method of separation of variables to first and second order linear equations and on Laplace transforms for initial value problems.

MATH 2006 **Nonlinear Systems and Chaos Introduction**

4 credit points. **Session**: 2. **Classes**: 2 lec, 1 tut & 1 computer tut/wk. **Prerequisite**: MATH (1001 or 1901 or 1906) and (1002 or 1902) and (1003 or 1903 or 1907) or (Credit in MATH 1011 and 1012 and 1013). **Prohibition**: MATH 2906. **Assessment**: 2hr exam, assignments, computer lab participation.

This unit of study aims to provide an introduction to the simplest cases of nonlinear dynamics and chaos and their use in modelling systems in a variety of applications taken from chemistry, biology, physiology and economics. Topics covered include first order finite difference equations, bifurcations, chaos, fractals, phase portait analysis of one and two dimensional differential equations, fixed points, analysis of stability. The computer labs use the Mathematica software package.

MATH 2007 **Analysis**

4 credit points. **Session**: 2. **Classes**: 3 lec & 1 tut/wk. **Prerequisite**: MATH (1001 or 1901 or 1906) and (1003 or 1903 or 1907) or Distinction average in MATH 1011 and 1013. **Prohibition**: MATH 2907. **Assessment**: One 2hr exam, assignments.

This unit of study is concerned with sequences and series. Topics include the definition of the limit of a sequence, the principle of monotonic convergence, elementary limit theorems, convergence of an infinite series, the comparison and integral tests; absolute convergence, the ratio test and Taylor Series. The last part is devoted to series of complex terms, dealing with power series and radius of convergence.

MATH 2008 **Introduction to Modern Algebra**

4 credit points. **Session**: 2. **Classes**: 2 lec, 1 tut & 1 computer lab/wk. **Prerequisite**: MATH 2002 or 2902. **Prohibition**: MATH 2908 or 2918. **Assessment**: One 2hr exam, assignments.

The major topics in this unit of study are inner product spaces and groups. First, it treats the geometric and algebraic properties of inner product spaces and then the geometrical and combinatorial background to groups. Topics covered include the definitions and elementary properties of groups, subgroups, direct products, the permutation, symmetric and cyclic groups, isomorphisms and homomorphisms, cosets, Lagrange's theorem, conjugate elements, rotations and reflections in the plane, and symmetries of an n-gon.

MATH 2009 **Graph Theory**

4 credit points. **Session**: 2, Summer. **Classes**: 3 lec & 1 tut/wk. **Prerequisite**: 6 credit points of Junior Mathematics (at the Distinction level in Life Sciences units). **Assessment**: One 2hr exam, assignments, quizzes.

Graph theory is a branch of discrete mathematics with important applications in almost every branch of science, and particularly in computer science and engineering. (In graph theory, a graph is a set of points and a set of edges – not the graph of a function.)

Topics covered include: Eulerian graphs, Hamiltonian graphs, trees, shortest paths, planar graphs, colouring of graphs and maps, transport networks, activity networks, matching theory, digraphs.

Many applications are considered, and some famous graph theory problems discussed.

MATH 2010 **Optimisation**

4 credit points. **Session**: 2, Summer. **Classes**: 3 lec & 1 tut/wk. **Prerequisite**: MATH (1001 or 1901 or 1906) and (1002 or 1902). **Prohibition**: ECMT 3510. **Assessment**: One 2hr exam, assignments.

This unit of study looks at practical optimisation problems. Theory developed in lectures will be complemented by workstation laboratory sessions using Matlab. Minimal computing experience will be required. Topics will be chosen from linear programming and the simplex algorithm, transportation problems, constrained and unconstrained minimisation of functions, search methods, dynamical programming, least-squares and singular-value decomposition.

MATH 2011 **Topics in Discrete Mathematics**

4 credit points. **Session**: 1. **Classes**: 2 lec, 1 tut & 1 prac/wk. **Assumed knowledge**: HSC Mathematics Extension 1. **Prerequisite**: 6 credit points of Junior Mathematics. **Prohibition**: MATH (1004 or 1904). **Assessment**: One 2hr exam, assignments, quizzes.

In this unit we introduce 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 include recursion; summation techniques; recurrences and generating functions; elementary number theory, including an introduction to primality testing and cryptography; combinatorics, including connections with probability theory; asymptotics and analysis of algorithms; set theory and logic.

Textbooks

Printed notes for purchase, made available by lecturer.

MATH 2033 **Financial Mathematics 1**

4 credit points. **Session**: 1. **Classes**: 2 lec, 1 tut & 0.5 comp lab/wk. **Prerequisite**: MATH (1001 or 1901 or 1906) and MATH (1002 or 1902) and MATH (1003 or 1903 or 1907) and MATH (1005 or 1905). **Prohibition**: MATH 2933. **Assessment**: 2hr exam, quizzes, assignment, computer project.

This unit of study is an introduction to financial mathematics with the main emphasis being on mathematical and statistical techniques used to solve problems of relevance to the finance industry. Topics covered include: riskless interest rate models, present and future value factors, arbitrage, solution of general cash-flow problems in both discrete and continuous time, analysis of bonds, simple optimisation problems in finance, modelling of risky assets, expectations hypothesis, utility theory, state space security price modelling, introduction to options. Mathematical techniques include: solving difference and differential equations, advanced integration and summation techniques, linear and dynamic programming, method of Lagrange multipliers, calculation of distributions and expectations of random variables, linear algebra methods, analysis of simple random walks.

MATH 2901 **Vector Calculus and Complex Var (Adv)**

4 credit points. **Session**: 1. **Classes**: 3 lec & 1 tut/wk. **Prerequisite**: MATH (1901 or 1906 or Credit in 1001) and (1902 or Credit in 1002) and (1903 or 1907 or Credit in 1003). **Prohibition**: MATH 2001. **Assessment**: One 2hr exam, assignments.

This unit of study is designed to provide the basic tools needed for studying functions of two or more real variables and also an introduction to functions of one complex variable. These subjects are fundamental to many areas of Pure and Applied Mathematics, and are essential for students in Science and Engineering courses. Topics in functions of several variables include the following: local maxima and minima, Lagrange multipliers, inverse function theorem, Jacobians, double integrals, change of variables, triple integrals, line integrals, Green's theorem, surface integrals, Stokes' theorem, triple integrals, Gauss' Theorem, multiple integrals. Elementary complex variable theory includes

complex line integrals, Cauchy's Theorem and Integral Formula, residues and real improper integrals.

MATH 2902 Linear Algebra (Advanced)

4 credit points. **Session**: 1. **Classes**: 3 lec & 1 tut/wk. **Prerequisite**: 12 credit points of Junior Mathematics, including MATH 1902 or Credit in 1002. **Prohibition**: MATH 2002. **Assessment**: One 2hr exam, assignments, three quizzes.

This unit of study is primarily concerned with linear transformations. Abstract vector spaces are introduced as the correct context in which to discuss linear transformations, and the basic structure theorems for finite dimensional vector spaces are proved. The connections between matrices and linear transformations are investigated. Determinants, introduced in first year, are revised and investigated further. Eigenvalues and eigenvectors are discussed and their usefulness for diagonalizing linear transformations is shown. Diagonalisation techniques are applied to solve simple examples of simultaneous differential quations. A partial treatment of the Jordan normal form may be included if time allows.

MATH 2903 Intro to Mathematical Computing (Adv)

4 credit points. **Session**: 1. **Classes**: 2 lec & 2 computer lab/wk. **Prerequisite**: MATH (1901 or 1906 or Credit in 1001) and (1902 or Credit in 1002) and (1903 or 1907 or Credit in 1003). **Prohibition**: MATH 2003. **Assessment**: One 2hr exam, assignments, quizzes, computer lab participation.

The content of this unit of study parallels that of MATH 2003.

MATH 2904 Lagrangian Dynamics (Advanced)

4 credit points. **Session**: 2. **Classes**: 3 lec & 1 tut/wk. **Prerequisite**: MATH 2901 or Credit in MATH 2001. **Prohibition**: MATH 2004. **Assessment**: One 2hr exam, assignments, project.

The content of this unit of study parallels that of MATH 2004.

MATH 2905 Mathematical Methods (Advanced)

4 credit points. **Session**: 2. **Classes**: 3 lec & 1 tut/wk. **Prerequisite**: MATH 2901 or Credit in MATH 2001. **Prohibition**: MATH 2005. **Assessment**: One 2hr exam, assignments.

This unit of study is essentially an advanced version of MATH 2005, the emphasis being on solutions of differential equations in Applied Mathematics. The theory of ordinary differential equations is developed for second order linear, including series solutions, special functions and Laplace transforms. Some use is made of computer programs such as Mathematica. Methods for partial differential equations and boundary-value problems include separation of variables, Fourier series and transforms.

MATH 2906 Nonlinear Systems and Chaos (Advanced)

4 credit points. **Session**: 2. **Classes**: 2 lec, 1 tut & 1 computer tut/wk. **Prerequisite**: MATH (1901 or 1906 or Credit in 1001) and (1902 or Credit in 1002) and (1903 or 1907 or Credit in 1003). **Prohibition**: MATH 2006. **Assessment**: 2hr exam, assignments, computer lab participation.

The content of this unit of study parallels that of MATH 2006.

MATH 2907 Analysis (Advanced)

4 credit points. **Session**: 2. **Classes**: 3 lec & 1 tut/wk. **Prerequisite**: MATH (1901 or 1906 or Credit in 1001) and (1903 or 1907 or Credit in 1003) (MATH 2901 or 2001 strongly advised). **Prohibition**: MATH 2007. **Assessment**: One 2hr exam, assignments.

The aim of the unit of study is to provide a solid grounding to the general theory of infinite processes. We study in a concrete way the limiting behaviour of sequences, series and functions via interesting and enduring examples from classical analysis. This background is essential to understanding the more abstract theories which are studied in third year and beyond, and their myriad of applications in Science, Engineering, Statistics and Economics. Topics will include convergence of sequences and series, power series of real and complex variables, uniform convergence of sequences and series of functions, and Fourier series with applications.

MATH 2918 Introduction to Modern Algebra (Adv)

4 credit points. **Session**: 2. **Classes**: 3 lec & 1 tut/wk. **Prerequisite**: MATH 2902. **Prohibition**: MATH 2008 or 2908. **Assessment**: One 2hr exam, assignments & quizzes.

This unit provides an introduction to modern abstract algebra, via linear algebra and group theory. It starts with a revision of linear algebra concepts from junior mathematics and MATH 2902, and proceeds with a detailed investigation of inner product spaces over the real and complex fields. Applications here include least squares lines and curves of best fit, and approximation of continuous functions by finite Fourier series.

The major part of the unit is concerned with introductory group theory, motivated by examples of matrix groups and permutation groups. Topics include actions of groups on sets, including linear actions on vector spaces. Subgroups, homomorphisms and quotient groups are investigated, and the First Isomorphism Theorem is proved.

MATH 2933 Financial Mathematics 1 (Advanced)

4 credit points. **Session**: 1. **Classes**: 2 lec, 1 tut & 0.5 comp lab/wk. **Prerequisite**: MATH (1901 or 1906 or credit in 1001) and MATH (1902 or credit in 1002) and MATH (1903 or 1907 or credit in 1003) and MATH (1905 or credit in 1005). **Prohibition**: MATH 2033. **Assessment**: 2hr exam, quizzes, assignment, computer project.

The content of this unit of study parallels that of MATH 2033, but students will be required to undertake all problem solving and assessment tasks at a more advanced level. Some additional topics may also be included.

Statistics Intermediate units of study

The School of Mathematics and Statistics provides Intermediate units of study, each worth 4 credit points, in Statistics. A normal Intermediate load in a discipline is 16 credit points and students intending to specialise in Senior Statistics should take the 4 units of study (16 credit points) of Intermediate Statistics.

Some topics are offered at Normal and Advanced levels and may not be counted together.

The units of study (each 4 credit points) are listed below:

February Semester

- Statistical Distributions STAT 2001
- Introduction to Probability (Advanced) STAT 2901
- Data Analysis STAT 2002

July Semester

- Estimation Theory STAT 2003
- Estimation Theory (Advanced) STAT 2903
- Hypothesis Testing STAT 2004

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.

Relation to other units of study and recommendations

Students should note that all Senior Statistics units of study have statistics prerequisites and some require MATH 1003 or MATH 2001 or MATH 2901. Mathematics 2002 or 2902 is also desirable, in addition.

If your major interest is statistics, then you are encouraged to enrol in 4 units of study (16 credit points) in Intermediate Statistics. If you are considering doing Honours in Statistics, these units of study should include some Advanced units of study, and choices from Intermediate Mathematics should include at least Mathematics 2001 or 2901 and Mathematics 2002 or 2902.

If you do not intend to major in Statistics but want a solid introduction to Applied Statistics, you should take STAT 2002 in your first semester and STAT 2004 in your second semester. This allows you the option of continuing with STAT 3002 and STAT 3004 at Senior level.

STAT 2001 Statistical Distributions

4 credit points. **Session**: 1. **Classes**: 2 lec & 1tut/wk. **Prerequisite**: MATH (1001 or 1901 or 1906 or Credit in 1011) and [MATH (1005 or 1905 or 1015) or MATH (1004 or 1904)]. **Prohibition**: STAT 2901. **Assessment**: 2hr exam, assignments, tutorial participation.

Distribution theory for discrete and continuous random variables, providing the probabilistic basis for the treatment of samples.

STAT 2002 Data Analysis

4 credit points. **Session**: 1. **Classes**: 2 lec & 1tut & 1 computer lab/wk. **Prerequisite**: MATH 1005 or 1905 or 1015 (or STAT 1021 for Arts students). **Assessment**: 2hr exam, quizzes, tutorial participation, one 1hr computer practical exam.

Exploratory data analysis, simulation, bootstrapping and an introduction to the use of a statistical computing package.

STAT 2003 Estimation Theory

4 credit points. **Session**: 2. **Classes**: 2 lec & 1tut/wk. **Prerequisite**: STAT 2001 or 2901. **Prohibition**: STAT 2903. **Assessment**: 2hr exam, assignments.

Bivariate distribution theory, estimation, dependence, maximum likelihood estimation and sampling theory.

STAT 2004 Hypothesis Testing

4 credit points. **Session**: 2. **Classes**: 2 lec & 1 tut & 1 computer lab/wk. **Assumed knowledge**: STAT 2002. **Prerequisite**: MATH (1005 or 1905 or 1015). **Assessment**: 2hr exam, quizzes, computer lab participation, one 1hr computer practical exam.

Tests of hypotheses about Normal models, including Analysis of Variance, non parametric tests, and regression theory.

STAT 2901 Introduction to Probability (Advanced)

4 credit points. **Session**: 1. **Classes**: 2 lec & 2 tut/wk. **Prerequisite**: MATH (1903 or 1907 or Credit in 1003) and MATH (1905 or Credit in 1005). **Prohibition**: STAT 2001. **Assessment**: 2hr exam, assignments.
Topics in STAT 2001 are treated at an Advanced level, with extensions. Introduction to the use of generating functions.

STAT 2903 Estimation Theory (Advanced)

4 credit points. **Session**: 2. **Classes**: 2 lec & 2tut/wk. **Prerequisite**: STAT 2901 or Credit in STAT 2001. **Prohibition**: STAT 2003. **Assessment**: 2hr exam, assignments.
Topics in STAT 2003 are treated at an Advanced level, with extensions.

Mathematics Senior units of study

The School of Mathematics and Statistics provides a range of Senior units of study, each worth 4 credit points, covering a wide variety of topics in Pure and Applied Mathematics. Students may take up to 12 units of study (48 credit points) or more at Senior level. Those intending to proceed to Honours or simply to major in mathematics must take a minimum of 6 units of study (24 credit points) from the Science Discipline Area of Mathematics.

The units of study are taught at either the Normal or the Advanced level. Entry into the advanced units of study is restricted to students who have met various prerequisite conditions. Students should consult the list below for requirements of individual Advanced units of study, and seek advice from the Senior year coordinators.

The School encourages students undertaking an Advanced program to choose 3 or 4 units of study at the Advanced level.

Students wishing to keep open the possibility of undertaking an Honours year are strongly advised to consult a Senior year adviser about their choice of units of study.

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 to either. Details for each unit of study appear below, whilst full details of the 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.

It should be noted that not all units of study are offered each year and any unit may be withdrawn due to resources constraints.

Pure units of study (each 4 credit points)

Semester 1

- Algebra I (Advanced) MATH 3902
- Categories and Computer Science (Advanced) MATH 3905 (odd years only)
- Complex Variable (Advanced) MATH 3904
- Differential Geometry (Advanced) MATH 3903
- Elementary Cryptography & Protocols MATH 3024
- History of Mathematical Ideas MATH 3004
- Logic MATH 3005
- Metric Spaces (Advanced) MATH 3901
- Ordinary Differential Equations MATH 3003
- Rings and Fields MATH 3002
- Topology MATH 3001

Semester 2

- Algebra II (Advanced) MATH 3907 (even years only)
- Coding Theory MATH 3007
- Combinatorics (Adv) MATH 3912
- Financial Mathematics 2 MATH 3015
- Financial Mathematics 2 (Advanced) MATH 3933
- Geometry MATH 3006
- Group Representation Theory (Advanced) MATH 3906 (odd years only)
- Information Theory MATH 3010
- Lebesgue Integration & Fourier Analysis (Adv.) MATH 3909
- Nonlinear Analysis (Advanced) MATH 3908
- Number Theory MATH 3009
- Public Key Cryptography (Advanced) MATH 3925
- Real Variables MATH 3008

Applied units of study (each 4 credit points)

Semester 1

- Differential Geometry (Advanced) MATH 3903
- Fluid Dynamics (Advanced) MATH 3914
- History of Mathematical Ideas MATH 3004
- Mathematical Computing I MATH 3016
- Mathematical Computing I (Advanced) MATH 3916
- Partial Differential Equations and Waves MATH 3018
- Partial Differential Equations and Waves (Advanced) MATH 3921
- Signal Processing MATH 3019
- Signal Processing (Advanced) MATH 3919

Semester 2

- Coding Theory MATH 3007
- Financial Mathematics 2 MATH 3015
- Financial Mathematics 2 (Advanced) MATH 3933
- Hamiltonian Dynamics (Advanced) MATH 3917
- Information Theory MATH 3010
- Mathematical Methods (Advanced) MATH 3915
- Nonlinear Analysis (Advanced) MATH 3908
- Nonlinear Systems and Biomathematics MATH 3020
- Nonlinear Systems and Biomathematics (Advanced) MATH 3920

Relation to other units of study and recommendations

In general, 6 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 coodinator.

Students intending to major in Pure Mathematics should choose at least 6 units of study from the Pure list above; 3 units of study each semester is the normal choice. Intending Honours students are strongly encouraged to include Mathematics 3901 and 3902.

Students intending to major in Applied Mathematics should choose at least 6 units of study from the Applied list above.

A double major would require a choice of 12 units of study from the lists above.

Particular combinations would be suitable for students with special interests.

Computer Science students: Mathematics 3001, 3002 or 3902, 3005, 3905, 3006, 3007, 3009, 3010, 3912, 3015 or 3933, 3016 or 3916, 3019 or 3919, 3024, 3925.

Engineering (BSc/BE) students: Mathematics 3001 or 3901, 3003, 3005, 3019 or 3919, 3903, 3904, 3007, 3008, 3010, 3908, 3909, 3015 or 3933, 3016 or 3916, 3018, 3020 or 3920, 3914, 3915, 3917, 3024, 3025.

Physics or Chemistry students: Mathematics 3001 or 3901, 3002, 3003, 3914, 3917, 3903, 3904, 3006, 3008, 3009, 3010, 3908, 3909, 3015 or 3933, 3016 or 3916, 3018, 3019 or 3919, 3020 or 3920, 3906, 3915.

Prospective teachers of Mathematics: Mathematics 3001 or 3901, 3002 or 3902, 3003, 3004, 3005, 3006, 3007, 3008, 3009, 3010, 3016 or 3916, 3018, 3019 or 3919, 3020 or 3920.

MATH 3001 Topology

4 credit points. **Session**: 1. **Classes**: 2 lec & 1 tut/wk. **Prerequisite**: 8 credit points of Intermediate Mathematics. **Prohibition**: MATH 3901. **Assessment**: One 2hr exam, assignments.
Topology can be considered as a branch of geometry, and it has been called ‘rubber sheet geometry’, because it originated in the study of figures which are invariant under elastic deformations. It now forms a basic framework for fields such as functional analysis and nonlinear differential equations.

This unit of study covers a number of the more elementary aspects of both general and combinatorial topology. Topics discussed include continuous mappings and homeomorphisms, compactness, and the combinatorial classification of surfaces.

MATH 3002 Rings and Fields

4 credit points. **Session**: 1. **Classes**: 2 lec & 1 tut/wk. **Prerequisite**: 8 credit points of Intermediate Mathematics (strongly advise MATH 2002 or 2902, with 2008 or 2908). **Prohibition**: MATH 3902. **Assessment**: One 2hr exam, assignments.
This unit of study is concerned primarily with the algebraic systems such as rings and fields, which are generalizations of familiar examples such as polynomials and real numbers. It generalizes familiar notions of divisibility, greatest common divisors and primality from the integers to other rings, and considers homomorphisms and quotient structures.

MATH 3003 Ordinary Differential Equations

4 credit points. **Session**: 1. **Classes**: 2 lec & 1 tut/wk. **Prerequisite**: 8 credit points of Intermediate Mathematics (strongly advise MATH 2002 or 2902, with 2001 or 2901). **Prohibition**: MATH 3923. **Assessment**: One 2hr exam, assignments.
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 be not 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.

MATH 3005 **Logic**

4 credit points. **Session**: 1. **Classes**: 2 lec & 1 tut/wk. **Prerequisite**: (for all but BCST students) 8 credit points of Intermediate Mathematics; (for BCST students) 8 credit points of Intermediate Mathematics or 12 credit points of Junior Mathematics at Advanced level. **Assessment**: One 2hr exam, assignments.

This unit of study is mainly concerned with a general notion of computability, studied by means of Turing machines (simple abstract computers). In particular, it looks at some problems which cannot be solved by any computer. (Note: no experience with computing is required.) In the second part of the unit of study, the results from the first part are applied to mathematics itself. The conclusion is that there is no systematic way of discovering all mathematical truths.

MATH 3006 **Geometry**

4 credit points. **Session**: 2. **Classes**: 2 lec & 1 tut/wk. **Prerequisite**: 8 credit points of Intermediate Mathematics (strongly advise MATH 1902 or 1002). **Assessment**: One 2hr exam, assignments.

Over the last 100 years or so, transformations have come to play an increasingly important role in geometry. In this unit of study, various groups of transformations are studied in some detail. Isometries, affine transformations, projective transformations, and the famous frieze groups are all discussed. The basic approach is via vectors (and matrices), emphasizing the interplay between geometry and linear algebra. Each provides insight into the other. The underlying theme of the unit is the classification of transformation groups in both Euclidean and projective planes.

MATH 3007 **Coding Theory**

4 credit points. **Session**: 2. **Classes**: 2 lec & 1 tut/wk. **Prerequisite**: 8 credit points of Intermediate Mathematics (strongly advise MATH 2002 or 2902). **Assessment**: One 2hr exam, assignments.

This unit of study provides a general introduction to the theory of error-correcting codes. After studying general error correcting block codes, with the aim of constructing efficient codes which can be practically implemented, it leads to the study of cyclic codes which are a special case of linear codes, with nice algebraic properties. This unit of study concludes with the construction of classes of cyclic codes that are used in the modern digital communication systems, including the code used in the compact disc player to correct errors caused by dust and scratches.

MATH 3008 **Real Variables**

4 credit points. **Session**: 2. **Classes**: 2 lec & 1 tut/wk. **Prerequisite**: 8 credit points of Intermediate Mathematics (strongly advise MATH 2001 or 2007 or 2901 or 2907). **Assessment**: One 2hr exam, assignments.

The aim of this unit of study is to present some of the beautiful and practical results which continue to justify and inspire the study of analysis. The unit of study includes a review of sequence, series, power series and Fourier series. It introduces the notions of asymptotic and uniform convergence. Among topics studied are the Bernoulli numbers, Bernoulli polynomials, the Euler-Maclaurin summation formula, the Riemann zeta function and Stirling's approximation for factorials.

MATH 3009 **Number Theory**

4 credit points. **Session**: 2. **Classes**: 2 lec & 1 tut/wk. **Prerequisite**: 8 credit points of Intermediate Mathematics. **Assessment**: One 2hr exam, assignments.

This unit of study is an introduction to elementary number theory, with an emphasis on the solution of Diophantine equations (that is, finding integer solutions to such equations as $x^2+ y^2=z^2$, $x^2–21y^2=1$). Three main tools are developed: (i) the theory of divisibility and congruence (up to quadratic reciprocity), (ii) geometric methods, and (iii) rational approximation (continued fractions).

MATH 3010 **Information Theory**

4 credit points. **Session**: 2. **Classes**: 2 lec & 1 tut/wk. **Prerequisite**: 8 credit points of Intermediate Mathematics (strongly advise MATH 2001 or 2901 and some probability theory). **Assessment**: One 2hr exam, assignments.

This unit of study is a general introduction to the ideas and applications of information theory. The basic concept here is that of entropy, an idea which goes back more than a century to the work of Boltzmann. Interest in the concept was enormously increased by the work of Shannon in the late 1940's. He showed that entropy was a basic property of any (discrete) probability space, and established a fundamental relation between the entropy of a randomly varying signal and the maximum rate at which the signal could be transmitted through a communication line. Another interpretation of entropy is in terms of the financial value of information to a gambler. The unit of study covers applications in both areas; topics studied include data compression, gambling strategies and investment portfolios.

MATH 3015 **Financial Mathematics 2**

4 credit points. **Session**: 2. **Classes**: 2 lec, 1 tut & 1 lab/wk. **Prerequisite**: 8 credit points of Intermediate Mathematics including MATH 2033 or 2933 (and strongly advise MATH 2010 and STAT (2001 or 2901)). **Prohibition**: MATH 3933. **Assessment**: One 2hr exam, quizzes, assignment, computer project.

This unit is a follow-on from the Intermediate unit MATH 2033 (Financial Mathematics 1). The first part deals with modern portfolio theory, the second part with options and derivative securities. Topics covered include: mean-variance Markowitz portfolio theory, the Capital Asset Pricing Model, Arbitrage Pricing Theory, log-optimal portfolios and the Kelly criterion; calls and puts, profit-loss profiles for option strategies, arbitrage from mispricing, binomial random walk and the CRR-option pricing model, risk-neutrality, limit to the continuous time Black-Scholes model, sensitivity analysis, introduction to exotic options and derivative securities. Mathematical and statistical methods required: theory of quadratic programming, Lagrange parameters and Kuhn-Tucker theory, linear factor models in a statistical setting, advance probability theory including distributions and expectations, introduction to random walks and stochastic processes.

MATH 3016 **Mathematical Computing I**

4 credit points. **Session**: 1. **Classes**: 2 lec & 1 tut/wk. **Prerequisite**: 8 credit points of Intermediate Mathematics and one of MATH 1001 or 1003 or 1901 or 1903 or 1906 or 1907. **Prohibition**: May not be counted with MATH 3916. **Assessment**: One 2hr exam, assignments.

This unit of study provides an introductory unit of study on Fortran 95 programming and numerical methods. Topics covered include computer arithmetic and computational errors, systems of linear equations, interpolation, solution of nonlinear equations, numerical quadrature and initial value problems for ordinary differential equations.

MATH 3018 **Partial Differential Equations and Waves**

4 credit points. **Session**: 1. **Classes**: 2 lec & 1 tut/wk. **Prerequisite**: MATH (2001 or 2901) and MATH (2005 or 2905). **Prohibition**: May not be counted with MATH 3921. **Assessment**: One 2hr exam, assignments.

After a review of ordinary differential equations this unit of study covers Sturm-Liouville eigenvalue problems and demonstrates their role in solving PDE's. The standard equations of mathematical physics, the wave equation, the diffusion (heat) equation and Laplace's equation, are treated, together with various applications.

MATH 3019 **Signal Processing**

4 credit points. **Session**: 1. **Classes**: 2 lec, 1 tut & 1 lab/wk. **Prerequisite**: MATH (2001 or 2901) and MATH (2005 or 2905). **Prohibition**: May not be counted with MATH 3919. **Assessment**: One 2hr exam, assignments, computer project.

This unit of study is an introduction to the mathematical theory of Digital Signal Processing. It consists of both theory and application. A significant component of the unit of study involves computer exercises using MATLAB. Topics treated include analogue and digital signals, transforms, the spectral theory of digit signal and wavelets. Applications include sampling and aliassing, filter design and the basics of image processing.

MATH 3020 **Nonlinear Systems and Biomathematics**

4 credit points. **Session**: 2. **Classes**: 2 lec & 1 tut/wk. **Prerequisite**: 8 credit points of Intermediate Mathematics (strongly advise MATH 2006 or 2906 or 2908 or 3003) and one of MATH (1001 or 1003 or 1901 or 1903). **Prohibition**: MATH 3920. **Assessment**: One 2hr exam, assignments.

This unit of study is concerned with nonlinear ordinary and partial differential equations applied to biological systems. The applications will be drawn from predator-prey systems, transmission of diseases, chemical reactions, beating of the heart, neurons (nerve cells), and pattern formation. The emphasis is on qualitative analysis including phase-plane methods, bifurcation theory and the study of limit cycles. The unit of study will include some computer simulations as illustrations.

MATH 3024 **Elementary Cryptography and Protocols**

4 credit points. **Session**: 1. **Classes**: 2 lec & 1 prac/wk. **Prerequisite**: 12 credit points of Intermediate Mathematics. Strongly advise MATH 2008 or 2908 or 2918. **Assessment**: One 2hr exam plus assignments.

Cryptography is the branch of mathematics that provides the techniques which enable confidential information to be transmitted over public networks. This unit introduces the student to cryptography, with an emphasis on the cryptographic primitives that are in most common use today. Following a review of classical cryptosystems, modern symmetric cryptosystems (chiefly DES) and non-symmetric cryptosystems (chiefly RSA) will be studied. In the second part of the unit, these cryptographic primitives will be used to construct protocols for realising digital signatures, data integrity, identification, authentication and key distribution. An important feature of the course will be weekly exercises in practical cryptography using the Computer Algebra system Magma.

MATH 3901 **Metric Spaces (Advanced)**

4 credit points. **Session**: 1. **Classes**: 2 lec & 1 tut/wk. **Prerequisite**: 12 credit points of Intermediate Mathematics (strongly advise MATH 2907). **Prohibition**: MATH 3001. **Assessment**: One 2hr exam, assignments.

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.

MATH 3902 **Algebra I (Advanced)**

4 credit points. **Session**: 1. **Classes**: 2 lec & 1 tut/wk. **Prerequisite**: 12 credit points of Intermediate Mathematics (strongly advise MATH 2902). **Prohibition**: MATH 3002. **Assessment**: One 2hr exam, assignments.

In this unit the tools of modern algebra are developed as an introduction to Galois Theory, which deals with the solution of polynomial equations in one variable. The same tools provide an analysis of the classical problem of determining whether certain geometrical constructions, such as the trisection of a given angle, can be performed using only ruler and compasses. The unit begins with the definitions and basic properties of rings, homomorphisms and ideals, continues with an investigation of factorization in principal ideal domains such as the Gaussian integers and and the ring of polynomials over a field, and concludes with a study of algebraic field extensions and their automorphisms.

MATH 3903 **Differential Geometry (Advanced)**

4 credit points. **Session**: 1. **Classes**: 2 lec & 1 tut/wk. **Prerequisite**: 12 credit points of Intermediate Mathematics (strongly advise MATH 2001 or 2901, with MATH 3001 or 3901). **Assessment**: One 2hr exam, assignments.

Differential Geometry is an important branch of mathematics in which one uses Calculus to study geometric objects, such as curves, surfaces and higher-dimensional objects. It also has close connections with classical and modern physics. This unit of study covers elementary properties of curves and surfaces in R3, following Do Carmo's book, leading to the celebrated Gauss-Bonnet Theorem. If time allows, either the language of differential forms will be introduced or some global theory of differential geometry will be developed.

MATH 3904 **Complex Variable (Advanced)**

4 credit points. **Session**: 1. **Classes**: 2 lec & 1 tut/wk. **Prerequisite**: 12 credit points of Intermediate Mathematics (strongly advise MATH 2001 or 2901, with MATH 3001 or 3901). **Assessment**: One 2hr exam, assignments.

This unit of study continues the study of functions of complex variables introduced in the Intermediate units of study (Mathematics 2001 or 2901) assuming some knowledge of algebra (for example, that covered in Mathematics 2008). It will be advantageous for students to also take either Mathematics 3901 Metric Spaces (Advanced), or Mathematics 3001 Topology if they intend to do this unit of study. The unit of study begins with a review of elementary properties of analytic functions, Cauchy's integral formula, isolated singularities and the calculus of residues. This will be followed by selected topics from the theory of uniform convergence, entire functions, gamma function, zeta function, elliptic functions, harmonic functions, conformal mappings, Riemann surfaces.

MATH 3906 **Group Representation Theory (Advanced)**

4 credit points. **Session**: N/A in 2004. **Classes**: 2 lec & 1 tut/wk. **Prerequisite**: 12 credit points of Intermediate Mathematics (strongly advise MATH 3902). **Assessment**: One 2hr exam, assignments.

NB: This unit is only offered in odd years only.

This topic is a natural extension of linear algebra combined with group theory. Groups occur naturally wherever there is symmetry of any kind; linear algebra is the fundamental tool of solving equations. Representation theory provides techniques for analysing symmetrical systems of equations. The central problem of the subject is the decomposition of a complicated representation into simple constituents. The remarkable theory of group characters, which provide the algebraic machinery for this decomposition, is the main topic of the unit of study.

MATH 3907 **Algebra II (Advanced)**

4 credit points. **Session**: 2. **Classes**: 2 lec & 1 tut/wk. **Prerequisite**: MATH 3902 or Credit in MATH 3002, and 12 credit points of Intermediate Mathematics. **Assessment**: One 2hr exam, assignments.

NB: This unit of study is only offered in even years.

This unit deals 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, analysis of the structure of finite Abelian groups, and techniques for obtaining canonical forms for matrices. Students will be assumed to be familiar with the basic concepts of ring theory.

MATH 3908 **Nonlinear Analysis (Advanced)**

4 credit points. **Session**: 2. **Classes**: 2 lec & 1 tut/wk. **Prerequisite**: 12 credit points of Intermediate Mathematics (strongly advise MATH 3901). **Assessment**: One 2hr exam, assignments.

The purpose of this unit is to give an introduction to some modern ideas in the study of nonlinear dynamical systems. We concentrate largely on one-dimensional discrete systems. The dynamics of the spparently simple systems we study turn out to be remarkably complicated. We show how seemingly elementary nonlinear maps, such as quadratic maps, give rise to fractal sets. This leads into a discussion of concepts like topological conjugacy, symbolic dynamics, chaos theory, the Sarkovskii Theorem and, in particular, bifurcations of maps. We also study how period doubling bifurcations can lead to chaos; homeomorphisms of the circle and the rotation number. We give a more general discussion of the important topic of bifurcation theory.

MATH 3909 **Lebesgue Int and Fourier Analysis (Adv)**

4 credit points. **Session**: 2. **Classes**: 2 lec & 1 tut/wk. **Prerequisite**: 12 credit points of Intermediate Mathematics (strongly advise MATH 2907 and MATH 3901). **Assessment**: One 2hr exam, assignments.

Integration is a very useful tool in many areas of mathematics. Lebesgue's theory of integration is the one used in most modern analysis, providing very general conditions under which integrals are defined. The theory is based on measure theory, which is a generalisation of the ideas of area and volume. Measure theory is also the foundation of probability theory, and is important for understanding many different subjects from quantum physics to financial mathematics. In this unit, measure theory is applied to the study of Fourier series and integrals. The first part deals with measure, outer measure, construction of measure and Lebesgue measure. The second part covers measurable functions, integration theory, Fatou's lemma, dominated convergence theorem. The third part deals with product measure, convolution, Fourier transform and Fourier inversion. The additional topics expectation, Radon-Nikodym derivative, and conditional probability may be covered, if time permits.

MATH 3912 **Combinatorics (Advanced)**

4 credit points. **Session**: N/A in 2004. **Classes**: 2 lec & 1 tut/wk. **Prerequisite**: 12 credit points of Intermediate Mathematics (strongly advise MATH 2902). **Assessment**: Generally one 2hr exam, assignments.

This course is an introduction to enumerative combinatorics. It begins with a study of some of the important numbers that arise in counting: binomial and multinomial coefficients, Stirling numbers, Fibonacci numbers, etc, in particular in the context of counting functions between finite sets, where functions and sets

have special properties. The main tools useful in enumeration problems, including the principle of inclusion-exclusion, generating functions, calculus of differences, are discussed. A feature of the course is a detailed account of Polya's Theory of counting classes of objects possessing some symmetry, for example isomers in chemistry, or non-isomorphic finite simple graphs.

MATH 3913 **Computational Algebra (Advanced)**

4 credit points. **Session**: N/A in 2004. **Classes**: 2 lec & 1 tut/wk. **Prerequisite**: 12 credit points of Intermediate Mathematics (strongly advise MATH 3002 or 3902). **Assessment**: One 2hr exam, assignments.

NB: Not offered on 2002.

Traditional numerical computation in Science and Engineering is concerned with the solution of those problems which can be reduced to calculations involving limited precision approximations to elements belonging to the real or complex fields. By way of contrast, computational algebra is concerned with techniques for the solution of 'non-numerical' problems. Typical examples of such problems are factoring a polynomial with integer coefficients into irreducible factors, finding the indefinite integral (if it exists) of a function, and determining exact solutions of systems of polynomial equations. This unit of study examines the fundamental algorithms for performing exact computation in the ring of integers, various R-modules and polynomial rings. Applications in areas such as cryptography, indefinite integration and robotics may also be briefly reviewed.

MATH 3914 **Fluid Dynamics (Advanced)**

4 credit points. **Session**: 1. **Classes**: 2 lec & 1 tut/wk. **Prerequisite**: MATH (2901 or credit in 2001) and MATH (2905 or credit in 2005). **Assessment**: One 2hr exam, assignments.

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 and Helmholtz's theorem. Topics covered include viscous flows, boundary layers, potential theory and 2-D airfoils, and complex variable methods. The unit of study concludes with an introduction to hydrodynamic stability and the transition to turbulent flow.

MATH 3915 **Mathematical Methods (Advanced)**

4 credit points. **Session**: 2. **Classes**: 2 lec & 1 tut/wk. **Prerequisite**: MATH (2901 or 2905 or 2907 or 3921) or Credit in MATH (2005 or 3018). **Assessment**: One 2hr exam, assignments.

This unit of study begins with a review of analytic functions, complex integration and power series. These techniques are applied to the evaluation of real variable integrals and summation of series. The second part is a study of some of the special functions of mathematical physics in the real and complex domains. Examples include various hypergeometric functions and their connection with certain ordinary and partial differential equations, and also elliptic functions and their connection with the simple pendulum and the spinning top. The third part introduces transforms methods, generalised functions and Green's functions with applications to boundary value problems.

MATH 3916 **Mathematical Computing I (Advanced)**

4 credit points. **Session**: 1. **Classes**: 2 lec & 1 tut/wk. **Prerequisite**: 8 credit points of Intermediate Mathematics and one of MATH 1903 or 1907 or Credit in MATH 1003. **Prohibition**: May not be counted with MATH 3016. **Assessment**: One 2hr exam, assignments.

See entry for MATH 3016 Mathematical Computing I.

MATH 3917 **Hamiltonian Dynamics (Advanced)**

4 credit points. **Session**: 2. **Classes**: 2 lec & 1hr tut/wk. **Prerequisite**: MATH 2904 or Credit in MATH 2004. **Assessment**: One 2hr exam, assignments.

This unit of study provides a brief recapitulation of the essential features of Lagrange's equations and of the calculus of variations before introducing the Hamiltonian and deriving Hamilton's equations from a variational principle. Canonical transformations, that is, transformations which take a Hamiltonian system into a new Hamiltonian system, then lead in a natural way to the Hamilton-Jacobi equation of mechanics, by means of which any integrable Hamiltonian system is most readily solved. The role of action angle variables in perturbation theory is described, and a brief introduction to the onset of chaos in Hamiltonian systems is given. In the last part the use of Pontriagin's principle in optimisation and control theory is discussed.

MATH 3919 **Signal Processing (Advanced)**

4 credit points. **Session**: 1. **Classes**: 2 lec, 1 tut & 1 lab/wk. **Prerequisite**: MATH 2905 or Credit in MATH 2005. **Prohibition**: May not be counted with MATH 3019. **Assessment**: One 2hr exam, assignments, computer project.

As for MATH 3019 but with more advanced problem solving and assessment tasks. Some additional topics may also be included.

MATH 3920 **Nonlinear Systems & Biomathematics (Adv)**

4 credit points. **Session**: 2. **Classes**: 2 lec & 1 tut/wk. **Prerequisite**: 8 credit points of Intermediate Mathematics (strongly advise MATH 2908 or 3003) and one of MATH 1903 and 1905 or 1903 and 1904 or Credit in (MATH 1003 and 1005) or MATH (1003 and 1004). **Prohibition**: MATH 3020. **Assessment**: One 2hr exam, assignments.

See entry for MATH 3020 Nonlinear Systems and Biomathematics.

MATH 3921 **P D E And Waves (Advanced)**

4 credit points. **Session**: 1. **Classes**: 2 lec & 1 tut/wk. **Prerequisite**: MATH (2901 or credit in 2001) and (2905 or credit in 2005). **Prohibition**: May not be counted with MATH 3018. **Assessment**: One 2hr exam, assignments.

As for MATH 3018 but with more advanced problem solving and assessment tasks. Some additional topics may also be included.

MATH 3923 **Ordinary Differential Equations (Adv)**

4 credit points. **Session**: 1. **Classes**: 2 lectures & 1 tutorial per week. **Prerequisite**: MATH 2901 and MATH 2902. **Prohibition**: MATH 3003. **Assessment**: One 2hr exam, assignments, quizzes.

The theory of ordinary differential equations is a classical topic going back to Newton and Leibnitz. 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. This unit of study is an introduction to the subject covering a broad range of theoretical and applied methods. In particular, it covers some elementary methods to solve certain classes of equations. It then covers more theoretical aspect like existence and uniqueness theorems, stability of equilibria and orbits, linearization, hyperbolic critical points and the principle of linearized stability and instability for systems of first order equations. Special topics include the Bendixson negative criterion, -limit sets and limit cycles, the Poincar/- Bendixson theorem, Lyapunov functions and Lyapunov stability. Finally, power series solutions lead to an introduction to perturbation methods such as the Lindstedt-Poincar/ method. All results and techniques will be illustrated by suitable examples from applications in areas like physics, biomathematics and chemistry.

MATH 3925 **Public Key Cryptography (Advanced)**

4 credit points. **Session**: 2. **Classes**: 2 lec & 2 prac/wk. **Prerequisite**: 12 credit points from Intermediate or senior mathematics. Strongly recommend MATH 3902. **Assessment**: One 2hr exam plus assignments.

Public Key Cryptography (PKC) enables two parties to communicate securely over a public communications network, without them first having to exchange a secret key. PKC provides secure communications over the Internet, over mobile phone networks and in many other situations. This course draws on ideas from algebra, number theory and geometry to provide the student with a thorough grounding in the mathematical basis of the most popular PKC's. Specifically, the unit treats PKC's based on the difficulty of integer factorization (RSA), the discrete logarithm problem in a finite field (Diffie-Hellman, ElGamal) and the discrete logarithm problem in the group of rational points of an elliptic curve over a finite field. Attacks on these cryptosystems will be treated in some depth.

MATH 3933 **Financial Mathematics 2 (Advanced)**

4 credit points. **Session**: 2. **Classes**: 2 lec, 1 lab & 1 tut/wk. **Prerequisite**: 8 credit points of Intermediate Mathematics including MATH 2933 or Credit in MATH 2033 (and strongly advise MATH 2010 and STAT (2001 or 2901)). **Prohibition**: MATH 3015. **Assessment**: One 2hr exam, quizzes, assignment, computer project.

As for Math 3015 but with more advanced problem solving and assessment tasks. Some additional topics may also be included.

Statistics Senior units of study

The School of Mathematics and Statistics provides several Senior units of study, each worth 4 credit points, in Statistics. Students wishing to major in Statistics should take 6 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.

The units of study (each 4 credit points) are listed below:

February Semester

- Distribution Theory and Inference STAT 3001
- Applied Linear Models STAT 3002
- Time Series Analysis STAT 3003
- Statistical Theory (Advanced) STAT 3901
- Linear Models (Advanced) STAT 3902

July Semester

- Design of Experiments STAT 3004
- Applied Stochastic Processes STAT 3005
- Sampling Theory and Categorical Data STAT 3006
- Design of Experiments (Advanced) STAT 3904
- Markov Processes (Advanced) STAT 3905
- Multivariate Analysis (Advanced) STAT 3907

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.

Relation to other units of study and recommendations

In general 6 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 3 units of study of Senior Statistics each semester, making 24 credit points in total.

STAT 3001 Distribution Theory and Inference

4 credit points. **Session**: 1. **Classes**: 2 lec & 1 tut/wk. **Prerequisite**: MATH (1003 or 1903 or 1907) and STAT (2003 or 2903). **Prohibition**: STAT 3901. **Assessment**: One 2hr exam, assignments.

Multivariate distribution theory and linear transformations of variables. Properties of estimators, uniformly most powerful tests and likelihood ratio tests.

STAT 3002 Applied Linear Models

4 credit points. **Session**: 1. **Classes**: 2 lec & 1 tut & 1 computer lab/wk. **Prerequisite**: STAT 2004 (or STAT 1022 for Arts students) and MATH (1002 or 1902). **Prohibition**: May not be counted with STAT 3902. **Assessment**: One 2hr exam, assignments, one 1hr computer practical exam.

Multiple regression, diagnostics, principal components, MANOVA, discriminant analysis.

STAT 3003 Time Series Analysis

4 credit points. **Session**: 1. **Classes**: 2 lec & 1 tut & 1 computer lab/wk. **Prerequisite**: STAT (2003 or 2903). **Prohibition**: May not be counted with STAT 3903. **Assessment**: One 2hr exam, assignments.

Modelling and analysing time-dependent situations containing some dependence structure, ARMA models.

STAT 3903 Time Series Analysis (Advanced)

4 credit points. **Session**: 1. **Classes**: 2 lec, 1 computer class & 1 lec/tut/wk. **Prerequisite**: STAT 2903 or credit or better in STAT 2003. **Prohibition**: May not be counted with STAT 3003. **Assessment**: One 2hr exam, assignments.

The topics in STAT 3003 are treated at an Advanced level along with an introduction to spectral analysis.

STAT 3004 Design of Experiments

4 credit points. **Session**: 2. **Classes**: 2 lec & 1 tut & 1 computer lab/wk. **Prerequisite**: STAT (3002 or 3902). **Prohibition**: May not be counted with STAT 3904. **Assessment**: One 2hr exam, assignments, one 1hr computer practical exam.

Design and analysis of controlled comparative experiments, block designs, Latin squares, split-plot designs, 2^n factorial designs.

STAT 3904 Design of Experiments (Advanced)

4 credit points. **Session**: 2. **Classes**: 2 lec, 1 computer class & 1 lec/tut/wk. **Prerequisite**: STAT 3902 or credit or better in STAT 3002. **Prohibition**: May not be counted with STAT 3004. **Assessment**: One 2hr exam, assignments.

Topics in STAT 3004 are treated at an Advanced level, with extensions including response surfaces and cross-over designs.

STAT 3005 Applied Stochastic Processes

4 credit points. **Session**: 2. **Classes**: 2 lec & 1 tut/wk. **Prerequisite**: MATH (1003 or 1903 or 1907) and STAT (2001 or 2901). **Prohibition**: STAT 3905. **Assessment**: One 2hr exam, assignments.

Discrete and continuous time Markov chains, introduction to Brownian motion.

STAT 3006 Sampling Theory and Categorical Data

4 credit points. **Session**: 2. **Classes**: 2 lec, 1 tut & 1 computer lab/wk. **Prerequisite**: STAT 2003 or 2903. **Assessment**: One 2hr exam, assignments.

Sampling without replacement, stratified sampling, ratio estimation, systematic and cluster sampling, contingency tables, log linear models.

STAT 3901 Statistical Theory (Advanced)

4 credit points. **Session**: 1. **Classes**: 2 lec & 2 tut /wk. **Prerequisite**: (MATH 2001 or 2901) and STAT 2903. **Prohibition**: STAT 3001. **Assessment**: One 2hr exam, assignments.

Topics in STAT 3001 are treated at an Advanced level, with extensions.

STAT 3902 Linear Models (Advanced)

4 credit points. **Session**: 1. **Classes**: 2 lec, 1 tut & 1 computer lab/wk. **Prerequisite**: STAT 2004 and (STAT 2903 or Credit in 2003) and (MATH 2002 or 2902). **Prohibition**: May not be counted with STAT 3002. **Assessment**: One 2hr exam, assignments, one 1hr computer practical exam.

Topics in STAT 3002 are treated at an Advanced level, with extensions.

STAT 3905 Markov Processes (Advanced)

4 credit points. **Session**: 2. **Classes**: 2 lec & 2 tut /wk. **Prerequisite**: STAT 2901 or (Credit in STAT 2001 and MATH (1003 or 1903 or 1907)). **Prohibition**: STAT 3005. **Assessment**: One 2hr exam, assignments.

Topics in STAT 3005 are treated at an Advanced level, with extensions.

STAT 3907 Multivariate Analysis (Advanced)

4 credit points. **Session**: 2. **Classes**: 2 lec, 1 tut/wk. **Prerequisite**: STAT 3902 and either STAT (3001 or 3901). **Assessment**: One 2hr exam, assignments.

This unit of study studies the analysis of data on several variables measured simultaneously and multivariate distribution theory.

Mathematics & Statistics Honours

The School of Mathematics and Statistics offers three Honours programs for students who have completed at least 24 credit points of Senior units of study in appropriate subject areas and who are of sufficient merit. The programs are:

- Applied Mathematics
- Mathematical Statistics
- Pure Mathematics

Honours units of study consist of both formal coursework and an essay or project. There is provision for students to take approved units of study from other research areas within the School and from other Departments. The essay or project is a substantial part of the year's assessment and is closely supervised by a staff member. Students are required to prepare a talk about their essay or project topics.

Interested students should contact the fourth year coordinator at some convenient time before pre-enrolment. Senior level students contemplating an Honours year are strongly advised to consult the Senior unit of study handbooks for further advice and to discuss their choice of Senior units of study with the appropriate Senior level coordinator.

Further details of the Honours year are available from the coordinators for Applied Mathematics 4, Mathematical Statistics 4 and Pure Mathematics 4 and the respective unit of study handbooks.

■ Media and Communications units of study

The following units of study are only available to students in the Bachelor of Science Media and Communications 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.

ENGL 1005 Language and Image

6 credit points. Dr Harbus. **Session**: 1, 2. **Classes**: One 1hr lecture and one 2hr workshop. **Prohibition**: ENGL 1050. **Assessment**: Two 500wd assignments, one 1500wd essay, one 1.5hr examination, and workshop participation.

This unit of study will introduce students to the construction of meaning in written and visual texts, using Graham Greene's novel The Quiet American and the film of the novel as focal points. A range of other fiction, academic and media texts will be used to explore social processes of textual construction and

interpretation. In the workshops, students will learn detailed analytic techniques, including close grammatical analysis, as tools for the interpretation of text and image. The lectures will introduce more descriptive topics, such as historical shifts in relations between language and image, narrative organisation, categories of text, and social agency and power in the production of text.

Textbooks

Greene, G. The Quiet American.

Butt, D., et al., Using Functional Grammar: An Explorer's Guide

A Resource book will be available from the University Copy Centre.

MECO 1001 **Introduction to Media Studies 1**

6 credit points. A/Professor Lumby. **Session**: 2. **Classes**: one 2hr lecture, one 1hr tutorial. **Assessment**: One 1500wd essay(40%);one 600wd seminar paper(20%)one 2hr exam (40%).

NB: Available to BA(Media and Commun) and BSc (Media & Commun) students only.

This unit offers an introduction to the history and theory of media and communications studies. Students will gain a foundation in key concepts, methodologies and theorists in the field. They will also explore the interdisciplinary roots of media and communications studies and acquire basic research skills. By the end of the unit students should be familiar with major shifts in the history and theory of media and communications studies and with basic concepts and methodologies in the field.

Textbooks

Gill Branston and Roy Stafford,The Media Student's Handbook (2nd Edition), Routledge, London, 1999

Stuart Cunningham and Graeme Turner (eds), The Media and Communications in Australia, Allen and Unwin, Sydney, 2001.

Students are also required to purchase a reader from the Copy Centre

MECO 1003 **Principles of Media Writing**

6 credit points. Ms Crawford. **Session**: 1. **Classes**: Three hours per week. **Prohibition**: MECO 2002. **Assessment**: One print media news article of 500wds (20%), one radio or television script for a two minute news item (20%), one print media feature article of 1200wds (30%), one takehome exam (30%).

NB: Available to BA(Media and Commun) and BSc (Media & Commun) students only.

This unit will give students a grounding in writing for the print and broadcast media. Students will learn the elements of journalistic style, how to structure news and feature articles, how to script basic broadcast news items, and be introduced to the principles of interviewing and journalistic research. They will also acquire a basic knowledge of the evolution of print media and its formats.

GOVT 2303 **Media Politics**

8 credit points. **Session**: N/A in 2004. **Prerequisite**: Two GOVT 1000 level units of study or MECO 2003. **Assessment**: Essay; Exam;Participation.

'This unit is primarily about news ‹ its production, contents and impacts. It will examine the special demands of different news organisations and of reporting different news areas; the news media as an arena in political conflicts and the consequent interests and strategies of various groups in affecting news content; and the impacts of news on political processes and relationships. Our primary focus is on Australia, but there is some comparison with other affluent liberal democracies. The substantive areas the course will focus on include election reporting, scandals and the reporting of war and terrorism.

MECO 2001 **Radio Broadcasting**

8 credit points. Ms Dunn. **Session**: 1. **Classes**: One 2 hour lecture and one 2 hour workshop. **Prerequisite**: 12 junior credit points of Media & Communications units; ENGL 1050 or 1005 or LNGS 1005. **Assessment**: One 2000 word essay, one production diary, radio script and final work, one 2 hour examination.

NB: Available to BA(Media and Commun) and BSc (Media & Commun) students only.

This unit of study provides an introduction to the theory and practice of radio production, by combining theoretical analysis with practical experience. The course looks at the history and contemporary status of radio and considers such concepts as news values and the role of the Internet in audio broadcasts. The course has a strong practical component in which students will research, script, record and edit a radio news magazine item. They will also analyse radio and online broadcast texts.

Textbooks

Phillips, G and Lindgren, M (2002) Australian Broadcasting Journalism Manual, Oxford University Press. Students are also required to purchase a reader from the University Copy Centre.

MECO 2002 **Writing for Print Media**

8 credit points. Associate Professor Lumby. **Session**: N/A in 2004. **Classes**: One 2hr lecture, one 1hr tutorial. **Prerequisite**: 12 junior credit points of Media & Communications units; ENGL 1050 or 1005 or LNGS 1005. **Prohibition**: MECO 1003. **Assessment**: Two 500wd news stories, two 1500wd feature articles.

NB: Available to BA(Media and Commun) and BSc (Media & Commun) students only.

This unit of study will equip students with practical writing skills required in the mainstream print and online media. It covers the basics of news writing, feature writing, and writing for online publications. Students will be required to research and write articles and to critically analyse material drawn from the contemporary print and online media. They will also study the history of print media forms and learn to critically evaluate articles drawn from the contemporary print and online media in weekly seminars.

MECO 2003 **Media Relations**

8 credit points. Mr Stanton. **Session**: 2. **Classes**: one 2hr lecture, one 1hr tutorial. **Prerequisite**: 12 junior credit points of Media & Communications units; ENGL 1050 or 1005 or LNGS 1005. **Assessment**: 2500 wds of practical assignments, one 1500wd essay.

NB: Available to BA(Media and Commun) and BSc (Media & Commun) students only.

This unit of study will examine the relationships between stakeholders with an interest in public communication including the media, the corporate sector, government and not for profit industries. It will undertake critical analysis of the historical and contemporary relationships between the media and public relations and attempt to contextualise the practical and theoretical place of both in the public sphere. Students will analyse and evaluate material drawn from the media and public relations, while learning the practical skills necessary to undertake media relations at a professional level.

MECO 3001 **Video Production**

8 credit points. Ms Dunn. **Session**: 1, 2. **Classes**: One 2hr lecture, one 2hr workshop. **Prerequisite**: 12 junior credit points of MECO units; ENG1005 or ENGL 1050 or LNS1005. **Assessment**: Individual news study (15%), Group produced video and tutorial presentation (40%), production log & reflection statement (15%), 2 hr exam (30%).

NB: Available to BA(Media and Commun) and BSc (Media & Commun) students only.

This unit builds on knowledge and skills acquired in media studies, writing and radio units. It introduces students to the history, theory and practice of video production, both field and studio based. The unit will equip students with practical skills in planning, researching and budgeting a video production, as well as with skills in digital camera operation, video recording and digital video editing using desktop software. The unit emphasises information-based programming (news, current affairs, corporate video, documentary and infotainment). Students will be expected to produce short video items.

Textbooks

Mollison, Martha (2003). Producing Videos: A Complete Guide. 2nd edition. AFTRS/ Allen & Unwin: Sydney. Students are also required to purchase a reader from the University Copy Centre.

MECO 3002 **Online Media Production**

8 credit points. Ms Crawford. **Session**: 2. **Classes**: one 2hr lecture, one 2hr tutorial. **Prerequisite**: MECO 3001. **Assessment**: One four-page Web site worth 50 per cent; One production log (10%);One two hour exam (30%); One Web site proposal (5%);Tutorial participation (5%).

NB: Available to BA(Media and Commun) and BSc (Media & Commun) students only.

This unit will examine the emerging role of the Internet and the way the web is changing the media landscape. It explores the development and growth of the Internet, and provides a critical framework in which to understand the current industry. By the end of the unit, students will be familiar with key critical and cultural issues in online media, and will engage in both offline and online analysis of the Internet. Students will also gain practical skills in writing and producing for the web and will design and develop their own Web sites.

Textbooks

Gauntlett, David, Web.Studies, Arnold, London, 2002

Students are also required to purchase a reader from the Copy Centre.

MECO 3003 **Media, Law and Ethics**

8 credit points. Ms Dunn. **Session**: 2. **Classes**: one 2hr lecture, one 1hr tutorial. **Prerequisite**: 12 junior credit points of MECO units; ENGL 1005 or ENGL 1050 or LNGS 1005. **Assessment**: One 800wd court report for original research (30%), 1500 wd tutorial paper (30%), 2 hr exam (30%), participation & attendance (10%).

NB: Available to BA(Media and Commun) and BSc (Media & Commun) students only.
MECO 3003 will introduce students to key legal and ethical issues relevant to journalism. Students will be given an introductory survey of the main ethical theories in Western thought to establish a framework within which to examine specific ethical issues that relate to media. They will also be introduced to the structure of Australia's legal system and to those aspects of the law that impinge on the work of media professionals.
Textbooks
Patterson, P and Wlkins, L (2002) Media Ethics: Issues and Cases, McGaw-Hill
Pearson, Mark (2004) The Journalist's Guide to Media Law, Allen and Unwin

MECO 3005 **Media Globalisation**
8 credit points. Mr Stanton. **Session**: 1. **Classes**: one 2hr lecture, one 1hr tutorial. **Prerequisite**: 12 junior credit points of MECO units; ENG1005 or ENGL 1050 or LNGS 1005.
NB: NB: Available to BA (Media & Communication) and BSc (Media & Comm) students only
This unit develops students' understanding of key issues and debates in Australia relation to the concept of globalisation. It covers the history to the present day of the regulation of the media in Australia, including such issues as foreign and cross-media ownership laws, spectrum allocation, and the regulatory environment. Students will explore the nature of globalisation, as it affects the media, considered both as public cultural forms and as political-industrial organisations.

SCMP 3001 **Internship Practice**
8 credit points. **Session**: 1. **Prerequisite**: MECO 3002 and 3003. **Assessment**: Students must satisfy the requirements of an internship contract with their workplace, including attendance and performance, as evaluated through workplace supervisor reports both mid placement and at the end of the internship. The internship is assessed on a satisfactory/unsatisfactory basis.
NB: Available to BSc(Media & Commun) students only.
The internship provides an opportunity for students to gain practical experience in a professional setting, as part of their academic training. Students undertake a minimum of 20 working days in a media organisation, assisted and supervised by both the workplace and the department. Placements may include print, broadcast and online media, public relations and advertising organisations

SCMP 3002 **Internship Project**
8 credit points. **Session**: 2. **Prerequisite**: MECO 3002 and 3003. **Corequisite**: SCMP 3001. **Assessment**: Students will be required to submit a professional journal regarding their internship, including a critical reflection on their experience (4000 words). 4000 word research essay or equivalent production piece.
NB: Available to BSc(Media & Commun) students only.
The Internship Project offers students the opportunity to reflect on their internship. Students will be required to present a journal recounting their experiences during the internship and, in consultation with a supervisor, will formulate a topic for their 3000 word research paper, with the approval of the Science Media & Communications Program supervisor. This piece must be in addition to any production pieces completed as part of the internship.

■ Medical Science units of study

The following units of study are only available to students in the Bachelor of Medical Science 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.

Bachelor of Medical Science Junior units of study

All qualifying, pre- 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

BMED 2501 **Cells and Cell Communication**
6 credit points. A/Prof Robin Allan (Pharmacology). **Session**: 1. **Classes**: Average 6 hrs/wk of lectures, tutorials and practicals. **Prerequisite**: 12 credit points of Junior Mathematics, 12 credit points of Junior Chemistry, 12 credit points of Junior Physics, and 12 credit points of Junior Biology or 12 credit points of Junior Computer Science or 12 credit points of Junior Psychology. **Assessment**: One 3hr theory exam, practical tests, reports, assignments.
A strong understanding of cellular structures and communication systems is essential for an appreciation of whole body function. This unit of study extends students' preexisting understanding of basic cell structure by focussing on organelle function, cell specialisation and tissue organisation in humans. By way of contrast, there is also discussion of the unique morphology of procaryotic organisms (bacteria and viruses). Students are then introduced to the ways in which biochemical building blocks are arranged to form macromolecular subcellular structures (eg, phospholipids into cell membranes, and amino acids into proteins). 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. The various modes of communication between cells are then covered, with extended treatment of receptor-effector signal transduction, intracellular signaling cascades, cell to cell signaling and pharmacological intervention in these processes.

Practical classes not only complement the lecture material but also introduce students to a wide range of technical skills: including biomedical bench skills, tissue processing, bacterial cultivation, manipulation of 3D protein graphics (including drug-receptor interactions), protein purification, and enzyme assay. In addition, the sessions are also designed to give students generic skills such as record keeping, data collection and presentation, protocol planning, spreadsheet design and written communication.

BMED 2502 **Genes and Genetic Engineering**
6 credit points. A/Prof Arthur Conigrave(Biochemistry). **Session**: 1. **Classes**: Average 6 hrs/wk of lectures, tutorials and practicals. **Prerequisite**: 12 credit points of Junior Mathematics, 12 credit points of Junior Chemistry, 12 credit points of Junior Physics, and 12 credit points of Junior Biology or 12 credit points of Junior Computer Science or 12 credit points of Junior Psychology. **Assessment**: One 3hr theory exam, practical tests, reports, assignments.
This unit of study is designed to teach students how genetic information is stored, transmitted and expressed. Students are also introduced to DNA technologies such as cloning and gene therapy as well as receiving an overview of cellular development and embryology. Specifically, the unit of study covers the structure of DNA at both the molecular and chromosomal level, with extrapolation to the packaging, replication and transfer of genetic material. The way in which the message encoded in DNA is transcribed and translated into proteins is then outlined, with particular emphasis on eucaryotic systems and on the control of the expression process. The principles of cloning, gene synthesis, protein engineering and other aspects of modern DNA technology are then described, enabling an appreciation of the application of transgenics, gene therapy and the use of DNA technology in drug design. Students then study the linkage and mapping of genes including reference to DNA fingerprinting and the human genome project. 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 development of the human embryo and the consequences and treatment of abnormal tissue growth (cancer).

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.

BMED 2503 **Regulation of the Internal Environment**
8 credit points. Mrs Francoise Janod-Groves (Physiology). **Session**: 1. **Classes**: Average 8 hrs/wk of lectures, tutorials and practicals. **Prerequisite**: 12 credit points of Junior Mathematics, 12 credit points of Junior Chemistry, 12 credit points of Junior Physics, and 12 credit points of Junior Biology or 12 credit points of Junior Computer Science or 12 credit points of Junior Psychology. **Assessment**: One 3hr theory exam, practical tests, reports and assignments.
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, renal, endocrine and nervous systems. Special reference is made throughout the unit of study to the effect of

drugs on homeostatic components. For example, as part of the discussion on the structure and function of the heart and blood vessels, students are also taught about the effect of drugs on the cardiac output, blood flow and blood pressure. Examples of how homeostatic mechanisms are perturbed in disease are also emphasised (eg, with reference to cardiovascular pathology). Discussion of the respiratory system likewise embraces the structure of the respiratory organs, description of the mechanism of the transport of gases to and from cells and the pharmacotherapy of respiratory disorders (eg, asthma). Similar treatment of the renal system involves anatomical and histological investigation of kidney structure and a physiological description of kidney function with reverence to the regulation of pH, PO2 and temperature of the extracellular fluid. After this, the action of drugs (including diuretic drugs) on the kidney is discussed. Examples of more long-term regulation is provided by consideration of the hormonal control of pregnancy, and the foetal-new-born transition.

Practical classes are designed to nurture the same generic attributes taught in BMED 2501 and BMED 2502 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 endocrine organs, 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 nerve impulses are transmitted, 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. Similarly, study of the pathology of the homeostatic organs will be complemented using tissue samples and slides.

BMED 2504 **Digestion, Absorption and Metabolism**

6 credit points. Dr Margot Day (Physiology). **Session**: 2. **Classes**: Average 6 hrs/wk of lectures, tutorials and practicals. **Prerequisite**: 12 credit points of Junior Mathematics, 12 credit points of Junior Chemistry, 12 credit points of Junior Physics, and 12 credit points of Junior Biology or 12 credit points of Junior Computer Science or 12 credit points of Junior Psychology. **Assessment**: One 3hr theory exam, practical tests, reports, 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 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. The biochemical pathways involved in the extraction of energy from the macronutrient fuels is then covered, with particular emphasis on the whole body integration and regulation of these metabolic processes. This enables students to appreciate the extent of organ coordination in response to circumstances such as starvation, obesity, exercise and diabetes. It also provides a solid background for the understanding of pharmacological intervention in these conditions. The pharmacokinetic angle is explored further with discussion of the metabolism and absorption of drugs including the detoxification and excretion of xenobiotic compounds. Intestinal microflora, both beneficial and pathogenic are also discussed in this unit of study.

Practical classes give students extensive experience with inspection of the digestive system at both the cellular and gross anatomical level. In addition, students a taught radioisotope handling and biochemical assay design skills in concert with sessions designed to nurture oral presentation skills, hypothesis testing, data analysis, troubleshooting, instruction writing and feedback skills.

BMED 2505 **Interaction with External Environment**

6 credit points. Dr Richard Ward (Anatomy & Histology). **Session**: 2. **Classes**: Average 6 hrs/wk of lectures, tutorials and practicals. **Prerequisite**: 12 credit points of Junior Mathematics, 12 credit points of Junior Chemistry, 12 credit points of Junior Physics, and 12 credit points of Junior Biology or 12 credit points of Junior Computer Science or 12 credit points of Junior Psychology. **Assessment**: One 3hr theory exam, practical tests, reports, assignments.

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. This is complemented by discussion of the effects of drugs on the nervous system, particularly addictive and psychoactive compounds, with special reference to pain and analgesics. The structure and function of skeletal muscle is covered at both a histological and anatomical level and has been designed to integrate with information regarding the skeleton and movement. After discussion of the molecular mechanism of muscle contraction, students extrapolate to consider the regulation of fuel selection during exercise and the cause of fatigue. This leads onto discussion of performance enhancing drugs, and to an appreciation of how toxins and infections can perturb the normal neuromuscular coordination. Thus pharmacological and pathological considerations, such as the use of poisoned arrows and muscle paralysis, prion and tetanus infection, are studied in concert with relevant physiological and biochemical concepts.

In practical classes, students perform experiments (often on themselves) to illustrate the functioning of the senses and motor control and coordination. 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 computer simulations in synaptic transmission, the detection of opiods and the isolation and identification of tetanus bacteria.

BMED 2506 **Microbes and Body Defence Systems**

8 credit points. Mrs Helen Agus (Microbiology). **Session**: 2. **Classes**: Average 8 hrs/wk of lectures, tutorials and practicals. **Prerequisite**: 12 credit points of Junior Mathematics, 12 credit points of Junior Chemistry, 12 credit points of Junior Physics, and 12 credit points of Junior Biology or 12 credit points of Junior Computer Science or 12 credit points of Junior Psychology. **Assessment**: One 3hr theory exam, practical tests, reports, assignments.

For a full understanding of human defence systems, 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 starts with a description of the structure and function of pathogenic microorganisms (including bacteria, fungi, protists, and viruses, etc). The impact of bacteria and viruses on individuals and society is taught with reference to specific infectious diseases (eg, influenza, polio, herpes, etc) and this leads into an introduction to epidemiology. Included in 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. 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. 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.

Practical classes allow students to obtain experience in a range of classical and molecular virological, bacteriological and immunological techniques. In an integrated session, students examine the infection, immunity and pathology of tuberculosis. Also included are tutorial sessions in which hospital microbiologists guide students though clinical case studies. In addition, the practical sessions draw widely on, and nurture, the generic skills taught in preceding units of study.

Textbooks

Prescott L M, Harley J P & Klein D A. Microbiology. 5th edn. McGraw-Hill, 2002

Bachelor of Medical Science Intermediate and Senior Elective units of study

All students in the Bachelor of Medical Science must take at least 8 credit points of elective units in order to complete the requirements of the degree. This is an opportunity for students to study subjects outside the confines of the Medical Science degree. These elective units are normally taken in the Intermediate year. If they choose students can count a further 12

credit points of elective units (taken in the Senior year) towards their degree.

There are almost no restrictions on what units may be taken as electives. Students may take further units in subjects which do not form part of the Intermediate and Senior core of the BMedSc degree, for example, Mathematics, Chemistry or Physics. They may choose subjects from other science discipline areas which they have not previously studied, for example, Computer Science or Geology. Alternatively they may choose to study a subject from another faculty, for example, a language.

Exactly what elective units of study are taken, and when, is constrained principally by timetable considerations.

Typical patterns of elective enrollment are:

Example 1:

- Year 2: Semester 1–4 credit points Intermediate Elective
- Year 2: Semester 2–4 credit points Intermediate Elective
- Year 3: Four 12 credit point Senior Medical Science units

Example 2:

- Year 2: Semester 1–6 credit points Junior Elective
- Year 2: Semester 2–6 credit points Junior Elective
- Year 3: Three 12 credit point Senior Medical Science units + 8 CP Intermediate Elective

Students may not take additional units in medical science discipline area units in order to meet the elective requirements. In particular students may not enroll in any of the following subjects:

Anatomy and Histology

- ANAT 2001 Principles of Histology
- ANAT 2002 Comparative Primate Anatomy
- ANAT 2003 Concepts in Neuroanatomy
- ANAT 2004 Principles of Development

Biochemistry

- BCHM 2011 Biochemistry
- BCHM 2002 Molecules, Metabolism and Cells
- BCHM 2102 Molecules, Metabolism and Cells Theory
- BCHM 2902 Molecules, Metabolism and Cells (Advanced)

Biological Sciences

- BIOL 2006 Cell Biology
- BIOL 2906 Cell Biology (Advanced)
- BIOL 2106 Cell Biology – Theory

Immunology

- IMMU 2001 Introductory Immunology

Microbiology

- MICR 2001 Introductory Microbiology
- MICR 2002 Applied Microbiology
- MICR 2003 Theoretical Microbiology A
- MICR 2004 Theoretical Microbiology B
- MICR 2901 Introductory Microbiology (Advanced)
- MICR 2902 Applied Microbiology (Advanced)

Molecular Biology and Genetics

- MBLG 2001 Molecular Biology & Genetics A
- MBLG 2101 Molecular Biology & Genetics A (Theory)
- MBLG 2901 Molecular Biology & Genetics A (Advanced)
- MBLG 2002 Molecular Biology & Genetics B
- MBLG 2102 Molecular Biology & Genetics B (Theory)
- MBLG 2902 Molecular Biology & Genetics B (Advanced)

Pharmacology

- PCOL 2001 Pharmacology Fundamentals
- PCOL 2002 Intro Pharmacology: Drugs and People
- PCOL 2003 Pharmacology: Drugs and Society

Physiology

- PHSI 2001 Introductory Physiology A
- PHSI 2002 Introductory Physiology B
- PHSI 2101 Physiology A
- PHSI 2102 Physiology B

Beyond this there are no restrictions on the subjects which may be taken as electives. Students should note, however, that there may be restrictions on enrollment in particular units imposed by other faculties.

Students should consult degree information in chapter 2, the Tables earlier in this chapter and the handbooks of other faculties for details of other possible choices.

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 where the unit begins with a BMED code, and under the relevant department headings in this chapter where the units are offered by other Schools/Departments in the faculty.

BMED 3003 **Immunology**

12 credit points. Dr Helen Briscoe. **Session**: 2. **Classes**: 3 lec, 1 tut & 8 prac/wk. **Prerequisite**: 32 credit points of Intermediate BMED units including BMED 2506. **Prohibition**: IMMU 3002. **Assessment**: Exam, essays, prac.

This unit of study will be taught by the Immunology unit of the Department of Medicine, with contributions from the Centenary Institute of Cancer Medicine and Cell Biology and other invited experts in the discipline. The unit will provide a comprehensive understanding of the components of the immune system at the molecular and cellular levels; the mechanisms of pathological immune processes; immune system dysfunction; and, immunological techniques used in clinical diagnostic and research laboratories.

BMED 3004 **Infectious Diseases**

12 credit points. A/Prof C Harbour. **Session**: 2. **Classes**: 4 lec & 8 prac/wk. **Prerequisite**: 32 credit points of Intermediate BMED units including BMED 2506. **Assessment**: Essays, tutorials, seminars, practical assessment and theory exam.

This unit of study is taught by the Department of Infectious Diseases, Faculty of Medicine, which is located on the 6th floor of the Blackburn building (Ph: (02) 9351 2412). A major aim of the unit is to study the interactions between infectious agents and their human hosts in order to understand how infectious disease occurs.

The rationale for this approach is that the elucidation and understanding of the mechanisms by which infectious agents cause disease should lead to the development of more rational control strategies. Knowledge of the causes of the most important infectious diseases is acquired by studying case histories in extended tutorial/demonstration sessions, lectures and self-directed learning. The lecture series also covers other topics including mechanisms of pathogenesis, replication strategies, epidemiology, and infection control procedures. Practical sessions are designed to maintain and improve the technical skills appropriate for the handling of infectious agents that you acquired in the core units. Theme sessions are used to demonstrate and explain the conceptual framework underpinning the most important practical procedures used in ID today.

Bachelor of Medical Science Senior Elective units of study

For information regarding senior electives see details above under the title: 'Bachelor of Medical Science Intermediate and Senior Elective units of study'.

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.

■ 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 – eg, biochemistry, genetics and botany.

Microbioloy Intermediate units of study

MICR 2001 Introductory Microbiology

8 credit points. Dr Peter New. **Session**: 1. **Classes**: 3 lec, 1 tut & 4 prac/wk. **Prerequisite**: 6 credit points of Junior Chemistry. **Qualifier**: 6 credit points of Junior Biology. **Prohibition**: MICR (2003 or 2901). **Assessment**: One 2hr exam, continuous assessment in prac, 2 assignments, prac exam.

NB: It is highly recommended that students complete 12 credit points of Junior Biology and MBLG (2001 or 2101 or 2901).

This unit of study aims to give the student sufficient knowledge and technical skills to provide a foundation for future study of microbiology. It is also suitable for students requiring a working knowledge of microbiology while specialising in related fields – eg, molecular biology.

Topics covered include history and scope of microbiology, methodology, comparative study of the major groups of microorganisms (bacteria, algae, protozoa, fungi and the viruses), a detailed study of bacteria including structure, classification and identification, growth, death and control.

An introduction to microbial ecology (soil, aquatic and agricultural microbiology, as well as examples of microbial interactions) illustrates the significance of microorganisms in the global, natural cycles of synthesis and degradation.

The practical component focuses on basic, safe microbiological techniques and the use of these to study examples of microbial activity which are illustrative of the lecture series.

Textbooks

Prescott L M et al. Microbiology.5th edn, WCB/McGraw-Hill, 2002

MICR 2002 Applied Microbiology

8 credit points. Dr Peter New. **Session**: 2. **Classes**: 3 lec, 1 tut & 4 prac/wk. **Prerequisite**: MICR (2001 or 2901). **Prohibition**: MICR (2004 or 2902). **Assessment**: One 2hr exam, continuous assessment in prac, 2 assignments, prac exam.

NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.

This unit of study is designed to expand the understanding of, and technical competence in, microbiology, building on the knowledge and skills acquired in Microbiology 2001 or 2901.

The lectures cover two broad topics: molecular microbiology of the organism and microbial biotechnology and applications. The molecular microbiology covers aspects of microbial genetics, the structure and functioning of procaryotic cells and aspects of microbial taxonomy and microbial evolution.

The microbial biotechnology section covers food microbiology (production, spoilage and preparation, as well as the safety of foods) and aspects of public health and medical microbiology (host parasite relationships, host defences, epidemiology of selected diseases, prevention of disease). Industrial microbiology deals with large scale production, traditional products, recombinant DNA products, biosensors and biocontrol agents, biodeterioration and bioremediation.

Practical classes enable the study of material which both complements and supplements the lecture topics. Excursions to industrial concerns are included.

Work experience

On completion of MICR 2002 students will be offered the opportunity to undertake work experience for approximately one month in a microbiology laboratory of choice (hospital, food, research, environmental etc).

Textbooks

As for MICR 2001

MICR 2003 Theoretical Microbiology A

4 credit points. Dr Peter New. **Session**: 1. **Classes**: 3 lec/wk. **Qualifier**: 6 credit points of Junior Biology. **Prohibition**: MICR (2001 or 2901). **Assessment**: One 2 hr exam.

NB: It is highly recommended that students complete 12 credit points of Junior Biology and MBLG (2001 or 2101 or 2901).

This unit of study is suitable for students who are majoring in other aspects of biology and wish to acquire a broad background knowledge in microbiology. Students attend the same lectures as those enrolled in MICR 2001. There is no practical or tutorial component.

Textbooks

As for MICR 2001

MICR 2004 Theoretical Microbiology B

4 credit points. Dr Peter New. **Session**: 2. **Classes**: 3 lec/wk. **Prerequisite**: MICR (2001 or 2003 or 2901). **Prohibition**: MICR (2002 or 2902). **Assessment**: One 2hr exam.

NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.

This unit of study is suitable for students who are majoring in other aspects of biology and wish to expand their knowledge of microbiology beyond that acquired in MICR 2001, 2003 or 2901 with further theoretical considerations of the subject. Students attend the same lectures as those enrolled in MICR 2002. There is no practical or tutorial component.

Textbooks

As for MICR 2001

MICR 2901 Introductory Microbiology (Advanced)

8 credit points. Dr Peter New. **Session**: 1. **Classes**: 3 or 4 lec, 1 tut & 3 or 4 prac/wk. **Qualifier**: 6 credit points of Junior Chemistry and Distinction in 6 credit points of Junior Biology. **Prohibition**: MICR (2001 or 2003). **Assessment**: As for MICR 2001, plus 1.5 hr exam.

NB: It is highly recommended that students complete 12 credit points of Junior Biology and MBLG (2001 or 2101 or 2901).

This unit of study will be available to students who have performed well in the Biology and Chemistry Junior units of study. The unit of study is based on MICR 2001 with alternative components. The content and nature of these components may vary from year to year. Selection criteria for entry into the unit of study will be available from the coordinator at the time of enrolment.

Textbooks

As for MICR 2001.

MICR 2902 Applied Microbiology (Advanced)

8 credit points. Dr Peter New. **Session**: 2. **Classes**: 3 or 4 lec, 1 tut & 3 or 4 prac/wk. **Qualifier**: Distinction in MICR (2001 or 2901). **Prohibition**: MICR (2002 or 2004). **Assessment**: As for MICR 2002 plus one 1.5hr exam.

NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.

The unit of study is based on MICR 2002 with alternative components. The content and nature of these components may vary from year to year.

Textbooks

As for MICR 2001

MICR 2011 Introductory Microbiology (Nutrition)

4 credit points. Dr Peter New. **Session**: 1. **Prerequisite**: BIOL (1001 or 1101 or 1901) and BIOL (1002 or 1003 or 1902 or 1903) and 6 credit points of Junior Chemistry. **Assessment**: One 1.5hr theory exam, prac exam, continuous assessment in prac, one assignment.

NB: This unit of study is available to students enrolled in the Bachelor of Science (Nutrition) only.

This unit of study aims to give the students some background knowledge and technical skills to provide a foundation for further study of the applied aspects of microbiology.

Topics covered include methodology, a comparative study of the major groups of bacteria, a detailed study of bacteria including their structure, classification and identification, growth, death and control. The practical component focuses on basic, safe microbiological techniques, the principles of asepsis, and the use of these to study examples of microbial activity which are illustrative of the lecture course.

Textbooks

Prescott L M et al. Microbiology.5th edn, WCB/McGraw-Hill, 2002

MICR 2012 Applied Microbiology (Nutrition)

4 credit points. Dr Peter New. **Session**: 2. **Prerequisite**: MICR 2011. **Prohibition**: MICR (2002 or 2902 or 2004). **Assessment**: One 1.5 hr theory exam, one 3hr prac exam, continuous assessment in prac, one assignment.

NB: This unit of study is available to students enrolled in the Bachelor of Science (Nutrition) only.

This unit of study is designed to expand the understanding of, and technical competence in microbiology, building on the skills and knowledge acquired in MICR 2011. The lectures cover aspects of applied microbiology. Food microbiology covers production, spoilage and preparation as well as the safety of food

and aspects of public health. Medical microbiology deals with host-parasite relationship, host defence mechanisms, epidemiology of selected diseases, transmission of disease and prevention and control of disease.

Practical classes enable the study of materials which complement and supplement the lecture topics.

Textbooks

As for MICR 2011

MICR 2909 Fundamental and Applied Microbiology Adv

8 credit points. Dr Peter New. **Session**: 2. **Classes**: 3 lec, 1 tut & 4hr prac/wk & 9 advanced seminars. **Prerequisite**: 12 credit points of Junior Chemistry and BIOL 1901 and (1904 or 1905). **Prohibition**: MICR (2001, 2002, 2901, 2902, 2003 or 2004). **Assessment**: One 2hr and one 1∏ hr exam, continuous assessment, prac exam, one assignment.

NB: This unit of study is available to students enrolled in the Bachelor of Science (Molecular Biology and Genetics) only.

This unit of study is designed to provide students with the knowledge and technical skills needed to understand and manipulate microorganisms as part of the field of molecular biology and genetics. In the first part of the unit of study, students are introduced to the nature and scope of microbiology, and to practical methods for handling and analysing microorganisms. The latter part of the unit focuses on the role of microorganisms in health and disease, and on industrial processes involving microorganisms, including recombinant DNA products, biocontrol agents and bioremediation. An advanced seminar series accompanies the latter part of the unit, and focuses on recent research topics in molecular microbiology.

Textbooks

As for MICR 2001

Microbioloy Senior units of study

MICR 3001 General and Medical Microbiology

12 credit points. Mrs Helen Agus. **Session**: 1. **Classes**: 3 lec, 8 prac & 1 other/wk. **Prerequisite**: MBLG (2001 or 2101 or 2901) and [12 credit points of Intermediate MICR units or MICR (2011 and 2012) or MICR 2909]. For BMedSc students: 32 credit points of Intermediate BMED units including BMED 2506. **Prohibition**: MICR 3901. **Assessment**: One 2hr exam and one 1hr exam, essay, prac.

General Microbiology includes three themes: 1. Microscopy: factors controlling image quality in the light microscope, optical aberrations, objectives and the visualisation of transparent phase objects; 2. Bacterial growth and metabolism: how bacteria grow under different environmental constraints, growth rate and nutrient uptake, aerobic and anaerobic growth, and growth under stress; 3. Microbial ecology: the expansion of microbial ecology resulting from recent advances in molecular biology, the ecological view of disease. Medical Microbiology is divided into three themes: 1. Infections of body systems: bacterial and viral infections that are problematic at particular sites, host defences, virulence mechanisms; 2. Public health microbiology: epidemiology, international public health, parasitic infections and food microbiology; 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.

The practical component is designed to enhance students' practical skills and to complement the lecture series.

MICR 3002 Molecular/Environmental Microbiology

12 credit points. Dr Tom Ferenci and Dr Dee Carter. **Session**: 2. **Classes**: 3 lec, 8 prac, & 1 other/wk. **Prerequisite**: 12 credit points of Intermediate Microbiology and MBLG (2101 or 2001 or 2901). **Prohibition**: MICR (3902, 3004 or 3904). **Assessment**: One 2hr exam and one 1.5hr exam, prac.

This unit of study extends some of the topics covered in MICR 2001 and 2002. Molecular Microbiology covers aspects of bacterial structure and physiology and principles of molecular pathogenicity. Lectures on bacterial structure and physiology include structural aspects of surface components, membranes, periplasm and peptidoglycan, and a discussion of drug resistance mechanisms. Principles of Molecular Pathogenicity covers clones in pathogenic species, modes of pathogenesis and adhesion, bacterial toxins, antigenic variation, and vaccines. Environmental Microbiology includes plant microbiology, particularly in relation to nitrogen fixation systems, Agrobacterium and crown gall, root colonisation, and endophytes. The unit of study also covers aspects of the distribution and activities of microbes in terrestrial and aquatic ecosystems, including their roles in the biodegradation and bioremediation of organic pollutants. The practical component is designed to enhance students' practical skills and to complement the lecture series. Project work may form part of the practical component subject to the availability of resources.

MICR 3901 General and Medical Microbiology (Adv)

12 credit points. Mrs Helen Agus. **Session**: 1. **Classes**: 4 lec, 8 prac & other/wk. **Prerequisite**: MBLG (2101 or 2001 or 2901) and [12 credit points of Intermediate MICR units including one Distinction, or MICR (2011 and 2012) including one Distinction, or Distinction in MICR 2909. For BMedSc: 32 credit points of Intermediate BMED units including Distinction in BMED 2506. **Prohibition**: MICR 3001. **Assessment**: Two 2hr exams and one 1hr exam, essay, prac.

This unit of study is based on MICR 3001. It is available to students who have performed well in MICR (2001 or 2901, and 2002, 2004 or 2902). The unit of study consists of 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. The selection criteria for entry into the unit of study will be available from the coordinator at the time of enrolment.

MICR 3902 Molecular/Environmental Microbiology Adv

12 credit points. Dr Tom Ferenci and Dr Dee Carter. **Session**: 2. **Classes**: 4 lec, 8 prac/wk. **Prerequisite**: 12 credit points of Intermediate Microbiology including one Distinction, and MBLG (2101 or 2001 or 2901). **Prohibition**: MICR (3002, 3004 or 3904). **Assessment**: Two 2hr exams and one 1.5hr exam, essay, prac.

This unit of study is based on MICR 3002. It will be available to students who have performed well in MICR (2001 or 2901, and 2002, 2004 or 2902). The unit of study consists of 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. The selection criteria for entry into the unit of study will be available from the coordinator at the time of enrolment.

MICR 3003 Molecular Biology of Pathogens

12 credit points. Dr Tom Ferenci and Dr Dee Carter. **Session**: 2. **Classes**: 3 lec, 8 prac & 1 other/wk. **Prerequisite**: 32 credit points of Intermediate BMED units including BMED 2506. **Prohibition**: MICR 3903. **Assessment**: One 2hr exam, one 1hr theory exam, practical.

NB: It is strongly recommended that students also enrol in MICR 3001.

This unit of study is designed to provide an understanding of microbial disease at the molecular level. The following topics will be covered: introductory bacterial genetics; pathogenic processes and the molecular basis of pathogenicity in bacteria; structure and function of micro-organisms and action of antibiotics and chemotherapeutic agents; and pathogenic processes in fungi and viruses.

MICR 3903 Molecular Biology of Pathogens Advanced

12 credit points. Dr Tom Ferenci and Dr Dee Carter. **Session**: 2. **Classes**: 4 lec & 8 prac/wk. **Prerequisite**: 32 credit points of Intermediate BMED units including Distinction or better in BMED 2506. **Prohibition**: MICR 3003. **Assessment**: On 2hr exam, one 1.5hr exam, one 1hr theory exam, practical.

NB: It is strongly recommended that students also enrol in MICR 3001.

Same details as MICR 3003, with advanced components

MICR 3004 Molecular Biology of Pathogens Molecular

12 credit points. Dr Tom Ferenci and Dr Dee Carter. **Session**: 2. **Classes**: 3 lec, 8 prac & 1 other/wk and 4 discussion sessions. **Prerequisite**: MICR 2909. **Prohibition**: MICR (3002, 3902 or 3904). **Assessment**: One 2hr exam and one 1hr theory exam, practical and an essay based on discussion sessions.

This unit of study is the same as that in MICR 3003, except for the addition of 4 special molecular biology and genetics discussion sessions, which consist of topical seminars and discussions in this discipline. An essay based on these discussions is included as part of the assessment of the unit of study.

MICR 3904 Molecular Biology of Pathogens Mol (Adv)

12 credit points. Dr Tom Ferenci and Dr Dee Carter. **Session**: 2. **Classes**: 4 lec & 8hrs prac/wk and 4 discussion sessions. **Prerequisite**: Distinction in MICR 2909. **Prohibition**: MICR (3002, 3902 or 3004). **Assessment**: One 2hr exam, one 1.5hr exam, one 1hr theory exam, practical, and an essay based on discussion sessions.

Same details as MICR 3004, with advanced components.

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 in their first semester which will cover diverse aspects of the subject. The coursework involves an essay as well as analysis of recently published papers in Microbiology.

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.

■ Bachelor of Science (Molecular Biology and Genetics)

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 units of study required for this degree.

■ Molecular Biology and Genetics

Molecular Biology and Genetics units of study in second year will be taught by staff from the School of Molecular and Microbial Biosciences and the School of Biological Sciences. The first semester units, MBLG 2001, MBLG 2101 and MBLG 2901 are coordinated by the School of Molecular and Microbial Biosciences while the second semester units, MBLG 2002, MBLG 2102 and MBLG 2902 are coordinated by the School of Biological Sciences.

MBLG 2001 **Molecular Biology and Genetics A**

8 credit points. A/Prof Whitelaw, Dr Hancock. **Session**: 1, Summer. **Classes**: 3 lec & 5 prac/wk & voluntary tutorials. **Prerequisite**: 12 credit points of Junior Chemistry and BIOL (1001 or 1101 or 1901) except for students co-enrolled in BCHM 2011, or with permission of the unit Coordinator. For Combined BAppSc(Exercise and Sport Science)/BSc(Nutrition) degree the completion of all Junior units listed in Table IF. **Prohibition**: AGCH 2001 or BCHM (2001 or 2101 or 2901) or MBLG (2101 or 2901). **Assessment**: One 2hr exam, one 2hr theory of prac exam, prac tasks.

The lectures in this unit of study introduce the main principles of molecular biology and genetics – ie, the molecular basis of life. In the beginning, the students are introduced to the information macromolecules in living cells: DNA, RNA and protein. This is followed by a review of how DNA is organised into chromosomes and genes and this leads on to discussion of gene expression and replication. The unit of study then moves on to discuss how the amino acid sequence of proteins determines the diverse array of protein functions. The unit covers modern molecular biology techniques: plasmids, transposons, bacteriophage and restriction enzymes and the techniques used to manipulate genetic information; gene libraries, DNA sequencing and the polymerase chain reaction.

Practical: The practical component complements the theory component of MBLG 2001 by exposing students to experiments which investigate the regulation of gene expression, the manipulation of DNA molecules and the purification of proteins. During the unit of study, students will acquire a wide range of generic skills; including computing skills, communication and articulation skills (written and oral), criticism and data analysis/evaluation skills, experimental design and hypothesis testing skills. Students perform practical sessions in small groups and, therefore, problem solving and team work form an integral part of each activity. In addition to the generic skills, students will learn important laboratory/technical abilities with an emphasis on the equipment used in molecular biology and genetics research.

Textbooks

Resource Manual for MBLG 2001 Practical Sessions, Sem 1.

MBLG 2101 **Molecular Biology & Genetics A (Theory)**

4 credit points. A/Prof Whitelaw, Dr Hancock. **Session**: 1, Summer. **Classes**: 3 lec wk. **Prerequisite**: 12 credit points of Junior Chemistry and BIOL (1001 or 1101 or 1901). **Prohibition**: AGCH 2001 or BCHM (2001 or 2101 or 2901) or MBLG (2001 or 2901). **Assessment**: One 3 hr theory exam.

This unit of study is comprised of the lecture component of MBLG 2001.

MBLG 2901 **Molecular Biology and Genetics A (Adv)**

8 credit points. A/Prof Whitelaw, Dr Hancock. **Session**: 1. **Classes**: 3 lec & 5 prac/wk. **Prerequisite**: 12 credit points of Junior Chemistry and BIOL (1001 or 1901) except for students co-enrolled in BCHM 2011. For Combined BAppSc(Exercise and Sport Science)/BSc(Nutrition) degree the completion of all Junior units listed in Table IF. Also required is a Distinction or better in one of the prerequisite units of study. **Prohibition**: AGCH 2001 or BCHM (2001 or 2101 or 2901) or MBLG (2001 or 2101). **Assessment**: One 2hr exam, one 2hr theory of prac exam, continuous lab reports.

Extension of concepts taught in MBLG 2001 which will be taught in the context of practical laboratory experiments.

Textbooks

Resource Manual for MBLG 2001 Practical Sessions, Sem 1.

MBLG 2002 **Molecular Biology and Genetics B**

8 credit points. Dr K Raphael. **Session**: 2. **Classes**: 3 lec, 4prac & 1 tut/wk. **Prerequisite**: MBLG 2001 or MBLG 2901. **Prohibition**: BIOL 2105 or MBLG 2102 or 2902. **Assessment**: One 2 hour theory exam, one 2 hour theory of practical exam, laboratory reports, quizzes, project.

This unit of study will build on the concepts introduced in MBLG 2001 and show 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. The course begins with a discussion of classical Mendelian genetics and its extensions, including linkage, sex-linkage and gene interactions. Lectures in this section also cover statistical analysis of genetic data, crossing over, tetrad analysis, gene mapping. Eukaryotic chromosome structure and variations in chromosome number and structure are examined as well as inheritance of cytoplasmic genes and gene mutation.

Topics in bacterial genetics and evolution include transfer of genetic information between bacteria via fertility factors and plasmids, bacterial genomics, population genetics, recombinant micro-organisms and their use in vaccine production and in agriculture. The application of recombinant DNA to the production of important biologicals will be examined as well as the utility of transgenesis and gene knockouts. The study of eukaryotic genomes will begin with a comparison of classical and molecular gene mapping, and results and lessons from eukaryotic sequencing projects, including the Human Genome Project, will be examined. The way in which modern molecular techniques have increased our knowledge in the field of developmental biology will be examined by lectures on the developmental genetics of plants, animals and insects, control of gene expression, regulation of the cell cycle.

Topics in population genetics and molecular evolution include changes in gene frequency, Hardy-Weinberg equilibrium, inbreeding selection, genetic drift, molecular and gene evolution, conservation and ecological genetics, plant and animal breeding.

Practical: Laboratory exercises will utilize a variety of prokaryotic and eukaryotic organisms to illustrate aspects of the lecture material, while developing familiarity and competence with practical equipment, microscopes, computers, and statistical tests.

MBLG 2102 **Molecular Biology & Genetics B (Theory)**

4 credit points. Dr K Raphael. **Session**: 2. **Classes**: 3 lec & 1 tut/wk. **Prerequisite**: MBLG 2001 or 2101. **Prohibition**: BIOL (2005, 2105 or 2905), or MBLG (2002 or 2902). **Assessment**: One 2 hour theory exam, one essay.

This unit of study has the same lectures and tutorials as MBLG 2002 Molecular Biology and Genetics B, but no practical work. It does not lead on to Senior Biology units of study in genetics. It is suitable for students who wish to gain an understanding of theoretical aspects of genetics in greater depth for application to other areas of their careers.

MBLG 2902 **Molecular Biology and Genetics B (Adv)**

8 credit points. Dr K Raphael. **Session**: 2. **Classes**: 3 lec, 4 prac & 1 tut/wk. **Prerequisite**: Distinction or better in MBLG (2001 or 2901). This requirement may be varied and students with lower marks should consult the unit Executive Officer. **Prohibition**: BIOL (2005 or 2105 or 2905 or MBLG 2002 or 2102). **Assessment**: One 2 hour theory exam, one 2 hour theory of practical exam, laboratory reports, quizzes, project.

Qualified students will participate in alternative components of MBLG 2002 Molecular Biology and Genetics B. The content and nature of these components may vary from year to year. This is a core Intermediate unit of study in the BSc (Molecular Biology and Genetics) award course.

MBLG 2111 **Molecular Biology & Genetics A (Lab)**

4 credit points. Dr Dale Hancock. **Session**: 1. **Classes**: 1 tut & 3 prac/wk. **Prerequisite**: MBLG 2101. **Prohibition**: MBLG (2001 or 2901). **Assessment**: One 2hr exam, one skills test in laboratory class and 4 prac reports.

NB: This unit is available to students who have completed MBLG 2101 in the summer school

This unit of study comprises the laboratory component of MBLG 2001.

Textbooks

Laboratory Resource Manual

■ 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 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.

MOBT 2001 **Molecular Biotechnology 2A**

4 credit points. **Session**: 1. **Classes**: 3 lec & 1 tut/wk. **Prerequisite**: 12 credit points of Junior BIOL and 12 credit points of Junior CHEM. **Assessment**: One 2 hour theory exam, quizzes and associated tasks. Students must pass the theory exam to the pass the unit overall.

NB: This unit is only available to students in the BSc (Molecular Biotechnology).

The major purpose of this unit of study is to introduce students to the concepts of modern molecular biotechnology. It assumes students will be taught Molecular Biology and Genetics through MBLG 2001/2901 and MBLG 2002/2902. It commences with case studies of overseas and local molecular biotechnology companies, then considers the roles of intellectual property and patenting in Australia and overseas, in combination with regulatory issues. This is followed by an appreciation of the societal impact and ethics of biotechnology, implications of patent-driven research and development, issues facing start-ups, interactions with big companies, informative interactions with the public, and needs for feedback and relevance. This information is disseminated through discussion sessions and problem-based learning. It leads on to an introduction to industrial macromolecule production, covering areas of sugar-based macromolecules in surgical treatment, engineered protein pharmaceuticals, medicinal enzymes and enzymes in food. This proceeds to considering the chemical synthesis of pharmaceuticals with specific example, including structure-activity relationships, use and modification of natural products in drug design, drugs from virus structures including anti-influenza drugs, new drug targets from genomics and cell-targeting, and bioinorganic drugs. Finally students are taken through large molecule drug discovery, screening in drug development, phage display of molecular targets, molecular diversity of peptides, synthetic peptide combinatorial libraries, molecular diversity of oligonucleotides and examples from industry.

MOBT 2002 **Molecular Biotechnology 2B**

4 credit points. **Session**: 2. **Classes**: 3 lec & 1 tut/wk. **Prerequisite**: MOBT 2001. **Assessment**: One 2 hour theory exam, quizzes and associated tasks. Students must pass the theory exam to the pass the unit overall.

NB: This unit of study is only available to students in the BSc (Molecular Biotechnology).

The major purpose of this unit of study is to build on MOBT 2001 and provide further concepts of modern molecular biotechnology. It assumes students will be taught molecular biology and genetics through MBLG 2001/2901 and MBLG 2002/2902. 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. This is followed by an appreciation of the uses of multicellular factories, illustrated with case studies. It extends biomaterials and wound repair, covering issue diversities, connective tissue candidates, recruitment of wound repair reactions, biomimetics and composites, and the prospects of bioartificial organs. The impact of proteomics in these and related areas will be explored in terms of its interplay with genomics, organ and organismal variety, disease states, quantitative vs. qualitative profiles, database management, computer tools and proteome databases and its major interplay with bioinformatics. Finally students are taken through biosensors, where they will learn about amperometric and potentiometric sensing, optical and fluorescence detection, immobilisation of enzymes on biosensor surfaces, ion-gating or ion-channel biosensors, illustrated with examples, including glucose biosensor for diabetics. Teaching will be augmented through discussion sessions and problem-based learning.

MOBT 3001 **Molecular Biotechnology 3A**

6 credit points. **Session**: 1. **Classes**: 3 lec, 2 prac & 1 tut/wk. **Prerequisite**: MBLG 2002 and MOBT 2002 and [CHEM (2311 and 2312) or 2903]. **Assessment**: One 2 hour theory exam, quizzes and associated tasks. Students must pass the theory exam to the pass the unit overall.

NB: This unit of study is only available to students in the BSc (Molecular Biotechnology).

This Senior unit of study explores major current issues in the field and extends builds on the concepts of modern molecular biotechnology taught in MOBT 2001 and MOBT 2002. It commences with a detailed exploration of drug discovery by combinatorial chemistry and molecular diversity. This will be followed with the theory and practice of computer-assisted drug design. Genomic studies will interface with predictive concepts and then proceed to an appreciation of therapeutic design in the post-genomic era. Students are then taken through essential aspects of genome annotation and functional analysis, then in-silico directed metabolic models and testing. To gain an appreciation of key stages in developing concepts and inventions, these approaches and earlier topics are combined through examples and viewing classical development paths for molecular biotechnology products.

Main subject areas include drug discovery by combinatorial chemistry and molecular diversity; fundamentals of computer assisted drug discovery and optimisation; therapeutic design in the post-genomic era; therapeutic targets, pharmacogenomics and functional analysis; development of molecular diagnostics; and in silico-directed metabolic models and testing.

MOBT 3002 **Molecular Biotechnology 3B**

12 credit points. **Session**: 2. **Classes**: 1 lec, 1 tut & 10 placement/wk. **Prerequisite**: MOBT 3001. **Assessment**: In-industry placements within the Program will be assessed by an academic staff member of the Molecular Biotechnology Program through communication with both the student and industry appointed liaison officer. Assessment is also by presentation, report and theory exam.

NB: This unit of study is only available to students in the BSc (Molecular Biotechnology).

This Senior unit of study builds on knowledge gained in earlier units of modern molecular biotechnology. It emphasises the needs for experience and preparation for invention, product design research and development, and the importance of recognising industry trends. Students are given practical experience through an industry-placement program. This will typically involve either participation on-site at locations of industry partners in association with University staff or in an industry-associated university laboratory. Lectures will address emerging areas in molecular biotechnology and business management. To maximise future opportunities, students will learn about funding, research and development models, partly through Australian and overseas case studies. Guest lecturers will contribute and help students develop an appreciation of emerging areas in molecular biotechnology.

As well as relevant practical experience gained through the industry placement, subject areas including Agricultural Biotechnology; Environmental Biotechnology including remediation strategies and green manufacturing technologies; Bioprocess Technologies (scaling-up and micro-processing); Commercial Biotechnology; management fundamentals for biotechnology-based product marketing with relevant case studies; biotechnology and society; ethics of modern biotechnology; funding, research and development models; and emerging areas in molecular biotechnology will be covered.

■ School of Molecular and Microbial Biosciences

The School brings together Biochemistry, Microbiology, Molecular Biotechnology and Nutrition, with separate study codes BCHM, MICR, MOBT [see Table 1E for details of the BSc (Molecular Biotechnology)] and NUTR [see Table 1F 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.

Unit descriptions

Unit descriptions are located under separate headings in this chapter:

- Biochemistry
- Microbiology
- Molecular Biotechnology
- Molecular Biology and Genetics
- Nutrition.

Location

The School is located in the Biosciences Building (G08), across 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.

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

Coordinator: Dr Karen Cullen (Anatomy)

'Neuroscience' is an interdisciplinary major within the BSc which cuts across boundaries between traditional subject areas. As reflected in the structure of the program, it ranges from concern with processes within nerve cells at the molecular level to complex phenomena such as perception and emotion; from the regulation of breathing and blood pressure through movement, to our ability to learn, remember and think. Students wishing to major in Neuroscience can take various combinations of units of study, mainly ones offered by the Departments of Anatomy, Pharmacology, Physiology and Psychology.

Refer to Table 1 for an enrolment guide and to entries under the contributing departments for unit of study descriptions. Please note that this major requires certain combinations of units of study in the Junior and Intermediate years, as well as the Senior year.

There is no equivalent Honours program but students who take appropriate additional units of study may be eligible for entry into the Honours programs offered by the Departments of Anatomy, Pharmacology, Physiology and Psychology. These Honours programs require the equivalent of a further year of full time study.

■ Nutrition

The Human Nutrition unit in the School of Molecular and Microbial Biosciences offers units of study to students in the Bachelor of Science (Nutrition) degree. Please consult degree information in chapter 2, and Table IF earlier in this chapter, and the relevant Departments/Schools entries in this chapter for descriptions of other units of study required for this degree.

NUTR 2901 **Introductory Food Science (Advanced)**

8 credit points. Dr Kim Bell-Anderson, Prof. J Brand Miller, A/Prof Samir Samman. **Session**: 1. **Classes**: 3 lec & 5 hr prac/wk. **Prerequisite**: CHEM (1101 or 1901 or 1903 or 1909) and CHEM (1102 or 1902 or 1904 or 1908) and BIOL (1001 or 1901) 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 table 1F. **Assessment**: One 3 hr exam (50%), practical (50%).

Foods as commodities

Food use around the world, including the origin, history, cultural and nutritional importance of each the following major human foods:

Food Behaviour

Physical and chemical composition of various commodities, Behaviour and function of the commodity during culinary processes, spoilage of the commodity.

Geography of foods

Understanding of the global food distribution, food abundance and food scarcity, the problems of nutrition in very poor countries and the potential of food aid to minimise food problems.

Macronutrients

Energy, protein, fat, carbohydrate, fibre, water, alcohol consumption patterns, requirements for health, absorption, metabolism and health/disease significance.

Practical: Organoleptic assessment of food: vision, smell, taste and tactile. Food flavour, texture and consistency. Enzymic and non-enzymic browning in foods: desirable versus undesirable browning reactions. Vegetables and fruits. Carbohydrate foods, dairy products, fats and oils, meat and poultry, fish and shellfish.

Practical: Organoleptic assessment of food: vision, smell, taste and tactile. Food pigments, the five tastes, genetic differences, food volatiles, food flavour, texture and consistency. Enzymic and non-enzymic browning in foods: desirable versus undesirable browning reactions. Vegetables and fruits – various parts of the plant, types of tissue, cell structure, soluble and insoluble constituents (cell wall, vacuoles, choroplasts, chromoplasts, oil droplets, intercellular layers), pectic substances, cooking of fruit and vegetables, spoilage reactions. Carbohydrate foods: types of sugars, crystal structures, mouthfeel, texturising, flavour modifying, fermentation. Wheat – effect of milling, gluten structure, leavening agents, ingredients (shortening, emulsifiers, gluten, starch, salt, sugar. Eggs – functional properties of the albumen and yolk, coagulation of proteins, foaming properties, browning, emulsification, clarification, colour and flavour, deterioration and storage. Dairy products – physical structure and chemical composition of milk and dairy products such as butter, cheese, cream and dried milk, effect of whipping, acidity, fermentation, spoilage. Fats and oils – Physical and chemical structure of different fats and oils, functional properties. Meat and poultry – chemical and physical composition of red vs white meat, types of tissues (muscle, adipose, connective), conversion of live muscle to meat, effect of marination, ageing, pigment changes, cooking (dry vs moist), spoilage. Fish and shellfish -types, oily vs non-oily, differences in chemical and physical structure from meat, effect of cooking, problems, spoilage.

Textbooks

Mann J, Truswell AS (eds). Essentials of Human Nutrition. Oxford: OUP, 2002

Griswald N. The Experimental Study of Foods.

NUTR 2902 **Introductory Nutritional Science (Adv)**

8 credit points. A/Prof S. Samman, Dr Kim Bell-Anderson. **Session**: 2. **Classes**: 3 lec & 5 hr prac/wk. **Prerequisite**: NUTR 2901. **Assessment**: One 3 hr exam (50%), practical (50%).

Vitamins

Consumption patterns, requirements for health, absorption, metabolism, nutritional/disease significance, deficiency state in regard to Vitamins A, Bl, B2, B6, B12, niacin, folate, biotin, pantothenic acid, Vitamin C, Vitamin D, Vitamin E, Vitamin K.

Minerals, trace elements

Consumption patterns, requirements for health, absorption, metabolism, nutritional/disease significance, deficiency state in regard to calcium, iron, sodium, potassium, zinc, selenium, copper, carnitine, choline.

Food Science and Technology

Principles of food preservation, Cereal technology, Milk and dairy technology, Fat and oil technology, Sugar technology, Meat technology, Processing and nutrient changes, Food legislation,

Food additives, Naturally-occurring toxicants, Food pollutants, Food safety

Food Hygiene

Food microbiology, Food hygiene, Critical control points and hazards analysis.

Practical: Students will collect 24 hour food intake on themselves. Students will homogenise all foods eaten in a 24 h period, sample representatively and analyse energy content by bomb calorimetry and determine fat and fatty acid composition, protein, starch, total sugars, dietary fibre and selected vitamins and minerals. They will report the finding to the whole class in the final practical.

Textbooks

Mann J, Truswell AS (2002). Essentials of human nutrition. Oxford University Press, Oxford.

Proudlove R.K. The Science & Technology of Foods. Forbes London, 1985.

Hobbs BC Food poisoning and food hygiene. (5th ed) Ballimore, Mad; E. Arnold 1987.

NUTR 2912 Nutritional Science Fundamentals (Adv)

6 credit points. Dr S Samman. **Session**: 2. **Classes**: 3 lec & 5 hr prac/wk. **Prerequisite**: NUTR 2901. **Assessment**: One 3hr exam (50%), practical (50%).

NB: Only available to students enrolled in the Combined program BAppSc(Exercise Sport Science)/BSc(Nutrition).

Content of this unit is the same as NUTR 2902, but with reduction in requirements and assessment from some areas. See NUTR 2902 entry for outline and textbooks, and contact the Human Nutrition unit for more details.

NUTR 3901 Nutrition in Individuals (Advanced)

12 credit points. Dr D Volker, S Amanatidis. **Session**: 1. **Classes**: 4 lec & 8 hr prac/wk. **Prerequisite**: NUTR 2902. **Assessment**: One 3 hr exam (50%), practical project (50%).

Lectures: Dietary intake assessment: 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; computerised nutrient analysis; Atwater conversion factors; 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 measurements; percent body fat; reference standards; growth standards and percentiles

Nutritional metabolism: biochemical interrelationships between nutrients and the supply of energy to the body; effects of nutritional state on energy metabolism

Nutritional epidemiology: basic concepts, advantages and limitations of epidemiological methods; biological markers of chronic diseases; use of biostatistical tools in epidemiology; critical interpretation of published data.

Research design and statistics.

Practical: Formats will include practical classes, problem-based learning with case histories and small group tutorials.

Practical: Formats will include practical classes, problem-based learning with case histories and small group tutorials.

Textbooks

Cameron ME, Van Staveren WA eds. Manual on Methodology for Food Consumption studies. Oxford: Oxford University Press, 1988.

Willett W. Nutritional Epidemiology. Oxford: Oxford University Press, 1990.

Gibson RS. Nutritional Assessment: A Laboratory Manual. Oxford: Oxford University Press, 1993.

NUTR 3902 Nutrition in Populations (Advanced)

12 credit points. Ms Sue Amanatidis, Dr D Volker. **Session**: 2. **Classes**: 4 lec & 8 hr prac/wk. **Prerequisite**: NUTR 2902. **Assessment**: One 3 hr exam (50%), practical project (50%).

Nutrition through the lifecycle; Food Habits: theories of food habits; Nutritional problems in contemporary communities and selected target groups; Nutritional health and chronic disease; Food and nutrition policies and guidelines: dietary guidelines;

Food and Nutrition Systems; Principles of Public Health nutrition; Public Health Nutrition Strategies and programs; Principles of Nutrition Education. Nutrition controversies: fad diets and alternative practitioners.

Practical: The aim of the practicals is to allow students to put into practice what is covered in the lectures. The practical sessions will include problem based learning with case studies and small group tutorials. Practical project Students will work in groups on a major project over the entire semester. Students will be asked to plan a community intervention for a specific target group. The project will require the students to conduct a needs assessment with the target group and to seek information from various community sources including government and non-government organisations and food industries. The students will write a report and present their project to the class.

Nutrition Honours

A/Prof S Samman; Ms Merryl Ireland; A/Prof M Crossley

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 dietician will need to complete the clinical strand.

Clinical Nutritional Science and Dietetics

Students in this strand enrol in and complete:

NUTR 4001 Clinical Nutritional Science A
NUTR 4002 Clinical Nutritional Science B

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;
- to construct appropriate treatment regimes and prevention strategies for these diseases using their nutritional science knowledge.

Nutrition Research

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. 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 two Intermediate 4 credit point units of study, one Intermediate 8 credit point unit of study and four Senior 12 credit point units of study.

PCOL 2001 Pharmacology Fundamentals

4 credit points. Dr H Lloyd. **Session**: 1. **Classes**: 2 lec/wk & 4 prac/computer sessions. **Prerequisite**: 6 credit points of Junior Chemistry and 6 credit points of Junior Biology. **Assessment**: One 1.5hr exam, classwork.

NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.

This unit of study introduces students to the basic concepts of pharmacology – how drugs act and how they reach their sites of action. The molecular sites of action of drugs are described and the relationships between drug activity and chemical structure explored. The roles of absorption, distribution, metabolism and elimination of drugs in determining the actions of drugs in the body are also considered.

Textbooks

Foster RW. Basic Pharmacology. 4th edn, Butterworth-Heinemann, 1996 OR

Rang HP, Dale MM & Ritter JM, Pharmacology. 4th edn, Churchill Livingstone, 1999

Study aids

Dale MM, Dickenson AH & Haylett DG, Companion to Pharmacology. 2nd edn, Churchill Livingstone, 1995

Neal MJ. Medical Pharmacology at a Glance. 4th edn, Blackwell Science, 2002
Reference books
Hardman JG et al, Goodman and Gilman's The Pharmacological Basis of Therapeutics. 9th edn, McGraw-Hill, 1996
Patrick GL. An Introduction to Medicinal Chemistry. 2nd edn Oxford Uni Press, 2001

PCOL 2002 **Intro Pharmacology: Drugs and People**

4 credit points. Dr H Lloyd. **Session**: 2. **Classes**: 2 lec/wk & 4 prac/tut sessions. **Prerequisite**: 6 credit points of Junior Chemistry and 6 credit points of Junior Biology. **Prohibition**: PCOL 2003. **Assessment**: One 1.5hr exam, classwork.

NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended. Students are strongly advised to complete PCOL 2001 before enrolling in PCOL 2002.

This unit of study explores how drugs produce their effects in the body and what these effects are. The effects of drugs on the autonomic nervous system and the types and actions of drugs used for the treatment of pain and inflammation are discussed. The social use of drugs and the effects of some commonly abused drugs are examined. There is also a brief introduction to the toxicology of natural poisons, in particular snake and spider venoms.

Textbooks
Rang HP, Dale MM & Ritter JM, Pharmacology. 4th edn, Churchill Livingstone, 1999
Study aids
Dale MM et al, Companion to Pharmacology. 2nd edn, Churchill Livingstone, 1995
Neal JM, Medical Pharmacology at a Glance. 4th edn, Blackwell Science, 2002
Reference books
Hardman JG et al (eds), Goodman and Gilman's The Pharmacological Basis of Therapeutics. 9th edn, McGraw-Hill, 1996

PCOL 2003 **Pharmacology: Drugs and Society**

8 credit points. Dr H Lloyd. **Session**: 2. **Classes**: 3 lec, 3 prac & 2 wkshps/wk. **Prerequisite**: 6 credit points of Junior Biology and 6 credit points of Junior Chemistry. **Prohibition**: PCOL 2002. **Assessment**: One 2hr theory exam; three lab reports and reflective statements, six on-line quizzes, one presentation, 5 written assignments from case studies.

NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended. Students are strongly advised to complete PCOL 2001 before enrolling in PCOL 2003.

This unit of study will consist of six modules covering the following topics: drug action in the peripheral and central nervous system; a consideration of drugs used to treat inflammation, allergy and disorders of the gut; drug development from an industry perspective and an introduction to the toxicology of natural poisons such as snake and spider venom; an exploration of endocrine drugs such as oral contraceptives and anabolic steroids; the social and economic impact of drugs in society; and a consideration of drugs used for recreational purposes. Unit delivery will involve lectures, practicals, computer-aided learning and workshops. In the practicals emphasis will be placed on the acquisition of technical and teamwork skills and an understanding of the basics of experimental design, data interpretation and how to write scientific reports. Workshops will be largely problem based, using case reports of drug use in the community or will involve a presentation on a selected pharmacological research paper. Online quizzes will accompany each module to aid students in monitoring their progress.

Textbooks
Rang HP, Dale MM & Ritter JM, Pharmacology. 4th edn, Churchill Livingstone, 1999
Study aids
Dale MM et al, Companion to Pharmacology. 2nd edn, Churchill Livingstone, 1995
Neal JM, Medical Pharmacology at a Glance. 4th edn, Blackwell Science, 2002
Reference books
Hardman JG et al (eds), Goodman and Gilman's The Pharmacological Basis of Therapeutics. 9th edn, McGraw-Hill, 1996

PCOL 3001 **Molecular Pharmacology and Toxicology**

12 credit points. A/Prof Ian Spence. **Session**: 1. **Classes**: 4 lec, 2 tut & 6 prac/wk. **Prerequisite**: PCOL 2001 and PCOL (2002 or 2003); or 32 credit points from Intermediate BMED units of study. **Prohibition**: PCOL 3901. **Assessment**: Two 2hr exams, classwork.

NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.

This unit of study covers two major areas of pharmacology: (1) toxicology, and (2) drug design and development. The toxicology area covers metabolism of toxic substances, toxicity to major organs, epidemiology and carcinogenesis. It aims to provide an overview of toxicology with detailed examination of selected issues. Drug design and development looks at the principles guiding the development of new therapeutic agents, for example new histamine antagonists, and the use of new methods to study drug distribution and action such as positron emission tomography (PET) and single photon emission computerised tomography (SPECT) scanning.

Textbooks
Department of Pharmacology PCOL 3001:Toxicology Readings.
Patrick GL. An Introduction to Medicinal Chemistry. 2nd edn Oxford Uni Press, 2001
Reference books
Hardman JG et al (eds). Goodman and Gilman's The Pharmacological Basis of Therapeutics. 9th edn, McGraw-Hill, 1996
Klaassen CD. Casarett & Doull's Toxicology: The Basic Science of Poisons. New York: McGraw-Hill, Health Professions Division, 5th edn 1996
Krogsgaard-Larsen P et al (eds). A Textbook of Drug Design and Development. 2nd edn. Harwood Academic Publishers, 1996

PCOL 3002 **Neuro- and Cardiovascular Pharmacology**

12 credit points. Prof G Johnston. **Session**: 2. **Classes**: 4 lec, 2 tut & 6 prac/wk. **Prerequisite**: PCOL 2001 and PCOL (2002 or 2003;) or 32 credit points from Intermediate BMED units of study. **Prohibition**: PCOL 3902. **Assessment**: Two 3hr exams, classwork.

NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.

The lecture series provides a comprehensive, systematic study of three major areas of pharmacology: (1) neuropharmacology, (2) cardiovascular pharmacology, and (3) respiratory pharmacology. The neuropharmacology component examines the actions of psychoactive drugs at all levels from single cells through to behaviour. The cardiovascular and respiratory components examine therapeutic intervention in disease states such as hypertension and asthma, and the mechanisms of drug action. As part of the unit of study all students prepare a drug profile – a document similar to that required by regulatory authorities when a new drug is introduced. This provides students with the opportunity to become familiar with, firstly, regulatory procedures and, secondly, with the detailed pharmacology of one particular compound. In addition to the core component students choose an elective selected from a number offered by the Department. These cover specific topics in depth and some are laboratory based. Details of these are available from the Department before the commencement of the July semester.

Textbooks
Rang HP, Dale MM & Ritter JM. Pharmacology. 4th edn, Churchill Livingstone, 1999
Study aids
Neal MJ. Medical Pharmacology at a Glance. 4th edn, Blackwell Science, 2002
Reference books
Cooper JR, Bloom FE & Roth RHl. The Biochemical Basis of Neuropharmacology. 7th edn, Oxford, 1996
Hardman JG, et al (eds). Goodman and Gilman's The Pharmacological Basis of Therapeutics. 9th edn, McGraw-Hill, 1996

PCOL 3901 **Molecular Pharmacology & Toxicology Adv**

12 credit points. A/Prof Ian Spence. **Session**: 1. **Classes**: 4 lec, 2 tut & 6 prac/wk. **Prerequisite**: Distinction average in PCOL 2001 and PCOL (2002 or 2003); or in 32 credit points from Intermediate BMED units of study. **Prohibition**: PCOL 3001. **Assessment**: Two 2hr exams, classwork.

NB: Department permission required for enrolment. The completion of MBLG (2001 or 2101 or 2901) is highly recommended. Entry to this unit requires Departmental permission.

This unit will consist of the lecture and practical components of PCOL 3001. Students selected for PCOL 3901 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
Department of Pharmacology PCOL 3901:Toxicology Readings.
Patrick GL. An Introduction to Medicinal Chemistry. 2nd edn Oxford Uni Press, 2001
Reference books
Hardman JG et al (eds). Goodman and Gilman's The Pharmacological Basis of Therapeutics. 9th edn, McGraw-Hill, 1996
Klaassen CD. Casarett & Doull's Toxicology: The Basic Science of Poisons. New York: McGraw-Hill, Health Professions Division, 5th edn 1996
Krogsgaard-Larsen P et al (eds). A Textbook of Drug Design and Development. 2nd edn. Harwood Academic Publishers, 1996

PCOL 3902 Neuro & Cardiovascular Pharmacology Adv

12 credit points. Prof G Johnston. **Session**: 2. **Classes**: 4 lec, 2 tut & 6 prac/wk. **Prerequisite**: Distinction average in PCOL 2001 and PCOL(2002 or 2003); or in 32 credit points from Intermediate BMED units of study. **Prohibition**: PCOL 3002. **Assessment**: Two 2hr exams, classwork.

NB: Department permission required for enrolment. The completion of MBLG (2001 or 2101 or 2901) is highly recommended. Entry to this unit requires Departmental permission.

Advanced students will complete the same core lecture material as students in PCOL 3002 but carry out advanced level elective projects, practicals and tutorials. They will sit the same written examinations as students in PCOL 3002, while the elective projects, practicals and tutorials will be assessed separately.

Textbooks

Rang HP, Dale MM & Ritter JM. Pharmacology. 4th edn, Churchill Livingstone, 1999

Study aids

Neal MJ. Medical Pharmacology at a Glance. 4th edn, Blackwell Science, 2002

Reference books

Cooper JR, Bloom FE & Roth RH. The Biochemical Basis of Neuropharmacology. 7th edn, Oxford, 1996

Hardman J G et al (eds). Goodman and Gilman's The Pharmacological Basis of Therapeutics. 9th edn, MacGraw-Hill, 1996

Pharmacology Honours

Associate Professor R Allan

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 Department. 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 other 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, Intermediate and Senior levels which can be part of a Physics major. 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 noticeboards in the Physics Building as appropriate for each unit of study and outside the Physics Student Support Office (Room 202, ground floor, Physics Building), and also at the School of Physics Web site: www.physics.usyd.edu.au.

Registration

Junior units of study: In assigned laboratory sessions during the second week of each semester.

Intermediate units of study: At first lecture, 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 WebCT.

Physics Junior units of study

Dr John O'Byrne

There are seven different semester length units of study offered at the Junior level.

First semester

PHYS 1001 (Regular)
PHYS 1002 (Fundamentals)
PHYS 1003 (Technological)
PHYS 1901 (Advanced)

Second semester

PHYS 1003 (Technological)
PHYS 1004 (Environmental and Life Sciences)
PHYS 1902 (Advanced)
PHYS 1500 (Astronomy)

PHYS 1003 (Technological) is offered in both first and second semesters, but is best taken after completing one of the other first semester Physics units.Completion of one unit of study in each semester provides a solid foundation for further studies in Physics in higher years. PHYS 1500 Astronomy cannot be counted towards the 12 credit points of Junior Physics needed as a prerequisite for Intermediate Physics.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.

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 Web site at www.physics.usyd.edu.au

PHYS 1001 Physics 1 (Regular)

6 credit points. **Session**: 1. **Classes**: three 1hr lectures, one 3hr laboratory, one 1hr tutorial. **Assumed knowledge**: HSC Physics MATH (1001/1901, 1002/1902, 1003/1903). MATH 1005/1905 would also be useful. **Prohibition**: PHYS (1002 or 1901). **Assessment**: laboratory (20%), assignments (5%), progressive test (5%), skills test (5%), examination (65%).

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 waves.

Textbooks

Young & Freedman. University Physics. 10th edition, Addison Wesley Longman 2000‹

Experimental Physics Laboratory Manual – School of Physics Publication.

PHYS 1002 Physics 1 (Fundamentals)

6 credit points. **Session**: 1. **Classes**: three 1hr lectures, one 3hr laboratory, one 1hr tutorial. **Assumed knowledge**: No assumed knowledge of Physics MATH (1001/1901, 1002/1902, 1003/1903). MATH 1005/1905 would also be useful. **Prohibition**: PHYS (1001 or 1901). **Assessment**: laboratory (20%), assignments (5%), progressive tests (10%), examination (65%).

This unit of study is designed for students who have not studied Physics previously or scored below 65 HSC Physics. The lecture series contains modules on the language of physics, mechanics and waves

Textbooks

Hecht, E.Physics: Calculus, 2nd edition, Brooks/Cole 2000‹

Experimental Physics Laboratory Manual – School of Physics Publication.

PHYS 1003 Physics 1 (Technological)

6 credit points. **Session**: 1, 2. **Classes**: three 1hr lectures, one 3hr laboratory, one 1 hr tutorial. **Assumed knowledge**: HSC Physics or PHYS (1001 or 1002 or 1901) or equivalent. MATH (1001/1901,1002/1902, 1003/1903). MATH 1005/1905 would also be useful. **Prohibition**: PHYS (1004 or 1902). **Assessment**: laboratory (25%), assignments (5%), examination (70%).

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. It is recommended that PHYS (1001 or 1002 or 1901) be completed before this unit

Textbooks

Young & Freedman. University Physics, 10th edition, Addison Wesley Longman 2000‹

Experimental Physics Laboratory Manual – School of Physics Publication.

PHYS 1004 **Physics 1 (Environmental & Life Science)**

6 credit points. **Session**: 2. **Classes**: three 1hr lectures, one 3hr laboratory, one 1hr tutorial. **Assumed knowledge**: HSC Physics or PHYS (1001 or 1002 or 1901) or equivalent. MATH (1001/1901, 1002/1902, 1003/1903). MATH 1005/1905 would also be useful. **Prohibition**: PHYS (1003 or 1902). **Assessment**: laboratory (25%), assignments (5%), examination (70%).

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

Hecht, E. Physics: Calculus, 2nd edition, Brooks/Cole 2000‹

Experimental Physics Laboratory Manual – School of Physics Publication.

PHYS 1500 **Astronomy**

6 credit points. **Session**: 2. **Classes**: three 1hr lectures, one 2hr laboratory, one 1hr tutorial. **Assumed knowledge**: No assumed knowledge of Physics. **Assessment**: laboratory (25%), essay (15%), tutorials (5%), night viewing project (5%), examination (50%).

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

Seeds MA. Horizons: Exploring the Universe. 8th edition, Brooks/Cole 2002‹

Astronomy Computer Exercises available from the Copy Centre.

PHYS 1901 **Physics 1A (Advanced)**

6 credit points. **Session**: 1. **Classes**: three 1hr lectures, one 3hr laboratory, one 1hr tutorial. **Assumed knowledge**: MATH (1001/1901, 1002/1902, 1003/1903). MATH 1005/1905 would also be useful. **Prerequisite**: UAI of at least 96, or HSC Physics result in Band 6, or PHYS 1902, or Distinction or better in PHYS 1003, 1004 or an equivalent unit. **Prohibition**: PHYS (1001 or 1002). **Assessment**: laboratory (20%), assignments (5%), progressive test (5%), skills test (5%), examination (65%).

Physics 1901 (Advanced) A is intended for students who have a strong background in Physics and an interest in studying more advanced topics. It proceeds faster than Physics 1001 (Regular), covering further and more difficult material. The lecture series contains modules on the topics of mechanics, thermal physics, 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, 10th edition, Addison Wesley Longman 2000‹

Physics Laboratory Manual – School of Physics Publication.

PHYS 1902 **Physics 1B (Advanced)**

6 credit points. **Session**: 2. **Classes**: three 1hr lectures, one 3hr laboratory, one 1hr tutorial. **Assumed knowledge**: MATH (1001/1901, 1002/1902, 1003/1903). MATH 1005/1905 would also be useful. **Prerequisite**: UAI of at least 96, or HSC Physics result in Band 6, or PHYS 1901, or Distinction or better in PHYS 1001, 1002 or an equivalent unit. **Prohibition**: PHYS (1003 or 1004). **Assessment**: laboratory (25%), assignments (5%), examination (70%).

This unit of study is a continuation of Physics 1901 (Advanced) A. Students who have completed Physics 1001 (Regular) or Physics 1002 (Fundamentals) at Distinction level may enrol. It proceeds faster than Physics 1003 (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, 10th edition, Addison Wesley Longman 2000‹

Experimental Physics Laboratory Manual – School of Physics Publication.

Physics Intermediate units of study

Dr Gordon Robertson

The School of Physics offers 2 units of study in semester one and 3 in semester two, at the Intermediate level. The semester one units complete a 'first pass' through physics begun in Junior physics.A full year Intermediate program in Physics consists of PHYS 2001 and 2002. Alternatively, PHYS 2901 and 2902 are the advanced physics units of study for students who have achieved a pass or better in PHYS 1901 and 1902, or who have achieved a Credit or better in PHYS 1003 or 1004. Either of these two combinations form the prerequisite units of study for Senior level physics. One other unit of study, PHYS 2105, is a shorter unit for students with an interest in the medical sciences who do not plan to continue with physics at a Senior level.

Full details of Intermediate Physics unit of study structures, contents and assessment policies are provided in the unit of study handbooks available at the start of semester on the School of Physics Web site at www.physics.usyd.edu.au and also on WebCT.

PHYS 2001 **Physics 2A**

8 credit points. **Session**: 1. **Classes**: Three 1hr lectures, one 3hr laboratory, one 2hr computational lab. **Assumed knowledge**: MATH (1001/1901 and 1002/1902 and 1003/1903). (MATH 1005/1905) would also be useful. **Prerequisite**: 12 credit points of Junior Physics (excluding PHYS 1500 and 1600). **Prohibition**: PHYS (2101 or 2103 or 2901). **Assessment**: One 3hr exam, one 1hr computational test, assignments, practical work, report and oral presentation.

In combination with two semesters of Junior Physics, this unit of study completes a first pass through all 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 holography and fibre optics. The module is accompanied by computer simulation studies in the computational physics laboratory..‹
- Special relativity: Space and time at high velocities.‹
- Nuclear and particle physics: the fundamental structure of matter.‹
- Astrophysics: Structure and evolution of stars.‹

Computational Physics: In a 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, analysis of stellar images, 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, 10th edition, Addison Wesley 2000‹

Tango, Introduction to Stellar Astrophysics, published by the School of Physics‹

Experimental Physics Notes, published by the School of Physics.‹Computational Physics Notes (Semester 1), published by the School of Physics

PHYS 2002 **Physics 2B**

8 credit points. **Session**: 2. **Classes**: Three 1hr lectures, one 3hr practical, one 2hr computational lab. **Assumed knowledge**: MATH (1001/1901 and 1002/1902 and 1003/1903). MATH 1005/1905 would also be useful. **Prerequisite**: PHYS (1003 or 1004 or 1902) and PHYS (1001 or 1002 or 1901 or 2001 or 2901). **Prohibition**: PHYS (2102 or 2104 or 2902). **Assessment**: One 3hr exam, one 1hr computational test, assignments, practical work, report and oral presentation.

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 PHYS 2001, except that the material illustrates topics in the quantum physics module.

Practical: Experimental physics is taught as a laboratory module and includes experiments in the areas of quantum physics, electronic instrumentation, and other topics. Assessment is based on mastery of each attempted experiment. At the end of the semester students work in teams on a project, which forms the subject of their written report and oral presentation.

Textbooks

Experimental Physics Notes, School of Physics Publication‹

Serway, Moses and Moyer, Modern Physics, 2nd edition, Saunders College Publishing‹

Computational Physics Notes (Semester 2), published by the School of Physics

PHYS 2105 **Physics for Medical Sciences**

4 credit points. **Session**: 2. **Classes**: Two 1hr lectures, one 1hr tutorial and one 1hr practical. **Prerequisite**: 12 credit points of Junior Physics, excluding PHYS (1500 & 1600). **Assessment**: One 2 hr exam, assignments, practical work and report.

This unit of study is primarily intended for students in the Bachelor of Medical Science program, but is also available in other degree programs. It covers a number of physics topics relevant to medical science: sound and ultrasound, light and optics, fluid flow, electrical properties of the cells and the nervous system, heat and temperature. The topics are presented in the context of their relevance and applications to medical science. In addition to lectures, on alternate weeks there are two hour workshop tutorials and laboratory sessions involving both practical and simulation.

PHYS 2901 **Physics 2A (Advanced)**

8 credit points. **Session**: 1. **Classes**: Three 1hr lectures, one 3hr practical, one 2hr computational lab. **Assumed knowledge**: MATH (1901/1001 and 1902/1002 and 1903/1003). MATH 1905/1005 would also be useful. **Prerequisite**: PHYS 1901 (or credit or better in PHYS 1001 or 1002) and PHYS 1902 (or credit or better in PHYS 1003 or 1004). **Prohibition**: PHYS (2001, 2101, 2103). **Assessment**: One 3hr exam, one 1hr computational test, assignments, practical work, report and oral presentation.

This unit of study is designed for students having a strong interest in Physics. The lecture topics are as for PHYS 2001. They are treated in greater depth and with more rigorous attention to derivations than in PHYS 2001. The assessment reflects the more challenging nature of the material presented.‹

Computational Physics: As for PHYS 2001, but at a more advanced level.

Practical: As for PHYS 2001, but at a more advanced level.

Textbooks

Young & Freedman, University Physics, 10th edition, Addison Wesley 2000‹

Tango, Introduction to Stellar Astrophysics, published by the School of Physics‹

Experimental Physics Notes, published by the School of Physics. ‹Computational Physics Notes (Semester 1), published by the School of Physics

PHYS 2902 **Physics 2B (Advanced)**

8 credit points. **Session**: 2. **Classes**: Three 1hr lectures, one 3hr practical, one 2hr computational lab. **Assumed knowledge**: MATH (1001/1901 and 1002/1902 and 1003/1903). MATH 1005/1905 would also be useful. **Prerequisite**: PHYS 1902 (or credit or better in PHYS 1003 or 1004) and PHYS [(1901 or 2901) or credit or better in PHYS (1001 or 1002 or 2001)]. **Prohibition**: PHYS (2002, 2102, 2104). **Assessment**: One 3hr exam, one 1hr computational test, assignments, practical work, report and oral presentation.

Refer to PHYS 2901 for an overall description of the advanced Intermediate Physics program. The lecture topics are as for PHYS 2002.‹

Microlab: As for PHYS 2002, but at a more advanced level.

Practical: As for PHYS 2002, but at a more advanced level.

Textbooks

Experimental Physics Notes, School of Physics Publication‹Serway, Moses and Moyer, Modern Physics, 2nd edition, Saunders College Publishing‹

Computational Physics Notes (Semester 2), published by the School of Physics

Serway, Moses and Moyer, Modern Physics, 2nd edition, Saunders College Publishing

Computational Physics Notes (Semester 2), published by the School of Physics

Physics Senior units of study

Assoc Prof Tim Bedding

The School of Physics offers units of study at the Senior Physics level in three categories: lecture-based, laboratory-based (Experimental Physics) and project-based (Special Projects).

Most units are offered at both the Normal and Advanced levels. Entry to the Advanced units of study is restricted to students who have met the entry requirments. The Special Project units are only available at the Advanced level and are undertaken in the research groups of the School of Physics.

It is possible to take up to 48 credit points in Senior Physics units of study. 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:

(i) PHYS 3011 or 3911 (4 credit points), and

(ii)at least 8 credit points of other lecture courses in Senior Physics (where COSC 3001, 3901, 3002 and 3902 may be counted towards this requirement), and

(iii)at least 8 credit points chosen from laboratory-based and project-based units (ie, Experimental Physics and Special Projects).

Other notes:

- PHYS 3600 is only available to students in the Bachelor of Science (Environmental) degree.
- Topics in Physics A, B, C and D are restricted to students not majoring in Physics, giving them the flexibility to take a combination of lecture topics that is not offered in the standard units.
- Senior Physics has been reorganised for 2004 and the units of study now offered supersede all previous units. Students continuing their studies in Senior Physics who already have credit in previously offered units will need to obtain approval before completing their enrolment, in order to ensure there is no duplication.

Further information concerning Senior Physics is available via www.physics.usyd.edu.au and from A/Prof. Tim Bedding.

PHYS 3011 **Electromagnetism/Quantum Mechanics**

4 credit points. A/Prof. T. Bedding. **Session**: 1. **Classes**: 3 lec/wk. **Prerequisite**: 16 points of Intermediate Physics and 8 credit points of intermediate mathematics. **Prohibition**: PHYS 3003, 3014, 3015, 3200, 3903, 3911, 3914, 3915. **Assessment**: 3hr exam, assignments.

This unit (at either normal or advanced level) is compulsory for students undertaking a major in Physics. The first half of this unit covers the classical theory of electromagnetism and introduces Maxwell's equations in their differential form. The second half covers the fundamental concepts and formalism of quantum dynamics, and the application of angular momentum and symmetry in quantum mechanics.

Textbooks

See the Senior Physics Handbook, available from the School of Physics or the Web site www.physics.usyd.edu.au/ugrad/spc.html

PHYS 3012 **Condensed Matter Physics/Optics**

4 credit points. A/Prof. T. Bedding. **Session**: 1. **Classes**: 3 lec/wk. **Assumed knowledge**: 8 credit points of intermediate mathematics. **Prerequisite**: 16 credit points of intermediate Physics. **Prohibition**: PHYS 3004, 3005, 3006, 3107, 3904, 3905, 3906, 3014, 3015, 3912, 3914, 3915. **Assessment**: 3hr exam, assignments.

The first half of this unit covers 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 second half of this unit introduces students to modern optics, using the latter to illustrate the applications in studying the properties of matter and many important optical phenomena.

Textbooks

See the Senior Physics Handbook, available from the School of Physics or the Web site www.physics.usyd.edu.au/ugrad/spc.html

PHYS 3013 **Thermodynamics/Kinetic Theory**

4 credit points. A/Prof. T. Bedding. **Session**: 1. **Classes**: 3 lec/wk. **Assumed knowledge**: 8 credit points of Intermediate Mathematics. **Prerequisite**: 16 credit points of intermediate Physics. **Prohibition**: PHYS 3005, 3014, 3015, 3905, 3913, 3914, 3915. **Assessment**: 3hr exam, assignments.

The first half of this unit covers the laws of thermodynamics, including reversible and irreversible processes and the concept of entropy. The second half studies ensembles and the kinetic properties and transport of gases.

Textbooks

See the Senior Physics Handbook, available from the School of Physics or the Web site www.physics.usyd.edu.au/ugrad/spc.html

PHYS 3014 **Topics in Physics A**

4 credit points. A/Prof. T. Bedding. **Session**: 1. **Classes**: 3 lec/wk. **Assumed knowledge**: 8 credit points of Intermediate Mathematics. **Prerequisite**: 16 credit points of intermediate Physics. **Prohibition**: PHYS 3003, 3004, 3005, 3011, 3012, 3013, 3015, 3200, 3903, 3904, 3905, 3911, 3912, 3913, 3914, 3915. **Assessment**: 3hr exam, assignments.

NB: Department permission required for enrolment. Approval required by the Senior Physics Coordinator prior to enrolment

This unit is restricted to students not majoring in Physics, giving them the flexibility to take a combination of lecture topics that is not offered in the standard units. Students must choose two from the following six Semester 1 half-courses (subject to timetabling): Electromagnetism, Condensed Matter Physics, Thermodynamics, Quantum Mechanics, Optics, and Kinetic Theory. Please obtain permission from the Senior Physics Coordinator. This unit may not be taken with any other Semester 1 lecture-based unit.

Textbooks

See the Senior Physics Handbook, available from the School of Physics or the Web site
www.physics.usyd.edu.au/ugrad/spc.html

PHYS 3015 **Topics in Physics B**

6 credit points. A/Prof. T. Bedding. **Session**: 1. **Classes**: 58 lec/semester. **Assumed knowledge**: 8 credit points of Intermediate Mathematics. **Prerequisite**: 16 credit points of intermediate Physics. **Prohibition**: PHYS 3003, 3004, 3005, 3011, 3012, 3013, 3014, 3200, 3903, 3904, 3905, 3911, 3912, 3913, 3914, 3915. **Assessment**: Exams totaling 4.5hrs, assignments.

This unit is restricted to students not majoring in Physics, giving them the flexibility to take a combination of lecture topics that is not offered in the standard units. Students must chose three from the following six Semester 1 half courses (subject to timetabling): Electromagnetism, Condensed Matter Physics, Thermodynamics, Quantum Mechanics, Optics, and Kinetic theory. Please obtain permission from the Senior Physics Coordinator. This unit may not be taken with any other Semester 1 lecture-based unit.

Textbooks

See the Senior Physics Handbook, available from the School of Physics or the Web site
www.physics.usyd.edu.au/ugrad/spc.html

PHYS 3016 **Experimental Physics A**

4 credit points. A/Prof. T. Bedding. **Session**: 1. **Classes**: 4hrs prac/wk. **Assumed knowledge**: 8 credit points of Intermediate Mathematics. **Prerequisite**: 16 credit points of Intermediate Physics. **Prohibition**: PHYS (3008 or 3009 or or 3017 or 3101 or 3102 or 3105 or 3107 or 3200 or 3801 or 3908 or 3909 or 3916 or 3917). **Assessment**: Practical assessment, report & oral presentation.

Physics is an experimentally based discipline. The aim of this course is to give students an appreciation of the analytical, technical and practical skills required to conduct modern experimental work in physics. Six experiments will be undertaken from a selection covering a range of areas, including waves and optics, astronomy, electronics, nuclear physics and the properties of matter.

Textbooks

See the Senior Physics Handbook, available from the School of Physics or the Web site
www.physics.usyd.edu.au/ugrad/spc.html

PHYS 3017 **Experimental Physics B**

8 credit points. A/Prof T Bedding. **Session**: 1. **Classes**: 4hrs prac/wk. **Assumed knowledge**: 8 credit points of Intermediate Mathematics. **Prerequisite**: 16 credit points of Intermediate Physics. **Prohibition**: PHYS (3008 or 3009 or 3016 or 3101 or 3102 or 3105 or 3107 or 3200 or 3801 or 3908 or 3909 or 3916 or 3917). **Assessment**: Practical assessment, report & oral presentation.

Physics is an experimentally based discipline. The aim of this course is to give students an appreciation of the analytical, technical and practical skills required to conduct modern experimental work in physics. Twelve experiments will be undertaken from a selection covering a range of areas, including waves and optics, astronomy, electronics, nuclear physics and the properties of matter.

Textbooks

See the Senior Physics Handbook, available from the School of Physics or the Web site
www.physics.usyd.edu.au/ugrad/spc.html

PHYS 3021 **Plasma Physics/Nanoscience**

4 credit points. **Session**: 2. **Assumed knowledge**: 8 credit points of Intermediate Mathematics. **Prerequisite**: 16 credit points of intermediate Physics. **Prohibition**: PHYS (3005 or 3006 or 3024 or 3025 or 3905 or 3906 or 3921 or 3924 or 3925).

The first half of this unit introduces students to the plasmas, their properties and behaviour when subject to electric and magnetic fields. The second half of this unit studies some of the applications and technologies developed for the new field of nanoscience.

PHYS 3022 **Astrophysics/High Energy Physics**

4 credit points. **Session**: 2. **Prerequisite**: 16 credit points of intermediate Physics and 8 credit points of intermediate mathematics. **Prohibition**: PHYS (3005 or 3006 or 3024 or 3025 or 3105 or 3905 or 3906 or 3922 or 3924 or 3925).

The first half of this unit aims to give students an understanding of the observational properties and underlying astrophysical principles governing stars, the interstellar and galaxies as a whole. The second half studies elementary particles, particularly quarks and leptons, and how they interact and combine to form other particles.

PHYS 3023 **Biological & Medical Physics**

4 credit points. **Session**: 2. **Assumed knowledge**: 8 credit points of Intermediate Mathematics. **Prerequisite**: 16 credit points of Intermediate Physics or Intermediate Biochemistry, 12 credit points of Junior units from Mathematics and Statistics and 12 credit points of Junior Physics. **Prohibition**: PHYS (3006 or 3024 or 3025 or 3906 or 3923 or 3924 or 3925).

The medical physics part of this unit aims to provide an introduction to the applications of ionising radiation (radiation therapy, nuclear medicine and diagnostic radiology), with particular attention to the examination, diagnosis and treatment of patients within the hospital environment. It also includes discussion of medical imaging, particularly Magnetic Resonance Imaging (MRI). The biological physics component will cover applications of physics to biological systems, including topics such as molecular biology, the transport of biomolecules, the thermodynamics of cells, the excitation of nerve impulses, the structure and properties of polymers and proteins, computer simulations of biological systems, biomechanics, multicellular systems and neural networks.

PHYS 3024 **Topics in Physics C**

4 credit points. A/Prof. T. Bedding. **Session**: 2. **Classes**: 3 lec/wk. **Assumed knowledge**: 8 credit points of Intermediate Mathematics. **Prerequisite**: 16 credit points of intermediate Physics. **Prohibition**: PHYS (3003 or 3004 or 3005 or 3021 or 3022 or 3023 or 3025 or 3200 or 3903 or 3904 or 3905 or 3921 or 3922 or 3923 or 3924 or 3925). **Assessment**: 3hr exam, assignments.

This unit of study is restricted to students not majoring in Physics, giving them the flexibility to take a combination of lecture topics that is not offered in the standard units. Students must choose two from the following six Semester 2 half-courses (subject to timetabling): Plasma Physics, Astrophysics, Biological Physics, Nanoscience, High Energy Physics.

Textbooks

See the Senior Physics Handbook, available from the School of Physics or the Web site
www.physics.usyd.edu.au/ugrad/spc.html

PHYS 3025 **Topics in Physics D**

6 credit points. A/Prof. T. Bedding. **Session**: 2. **Classes**: 58 lec/semester. **Assumed knowledge**: 8 credit points of Intermediate Mathematics. **Prerequisite**: 16 credit points of intermediate Physics. **Prohibition**: PHYS (3003 or 3004 or 3005 or 3021 or 3022 or 3023 or 3024 or 3200 or 3903 or 3904 or 3905 or 3921 or 3922 or 3923 or 3924 or 3925). **Assessment**: Exams totaling 4.5hrs, assignments.

This unit is restricted to students not majoring in Physics, giving the flexibility to take a combination of lecture topics that is not offered in the standard units. Students must choose three from the following six Semester 2 half-courses (subject to timetabling): Plasma Physics, Astrophysics, Biological Physics, Nanoscience, High Energy Physics, and Medical Physics. Please obtain permission from the Senior Physics Coordinator. This unit may not be taken with any other Semester 2 lecture-based unit.

Textbooks

See the Senior Physics Handbook, available from the School of Physics or the Web site
www.physics.usyd.edu.au/ugrad/spc.html

PHYS 3026 **Experimental Physics C**

4 credit points. A/Prof. T. Bedding. **Session**: 2. **Classes**: 4hrs prac/wk. **Assumed knowledge**: 8 credit points of Intermediate Mathematics. **Prerequisite**: 16 credit points of Intermediate Physics. **Prohibition**: PHYS (3008 or 3009 or 3027 or 3101 or 3102 or 3105 or 3107 or 3200 or 3801 or 3908 or 3909 or 3926 or 3927). **Assessment**: Practical assessment, report & oral presentation.

Physics is an experimentally based discipline. The aim of this course is to give students an appreciation of the analytical,

technical and practical skills required to conduct modern experimental work in physics. Six experiments will be undertaken from a selection covering a range of areas, including waves and optics, astronomy, electronics, nuclear physics and the properties of matter.

Textbooks

See the Senior Physics Handbook, available from the School of Physics or the Web site
www.physics.usyd.edu.au/ugrad/spc.html

PHYS 3600 Energy and the Environment

4 credit points. Dr Christopher Dey. **Session**: 1. **Classes**: One 1hr lecture, one 1hr seminar & 2hrs made up of field trips. **Prerequisite**: ENVI 2002 or 12 credit points of Junior Physics. **Assessment**: General attendance/participation (15%), 3000w essay (45%), three assignments (15%), specific seminar presentation (25%).

NB: This unit of study is available to students in the Bachelor of Science (Environmental) only.

This unit of study covers the following aspects of energy and the environmental: energy use, power generation including alternative methods, environmental impact of energy use and power generation including the greenhouse effect and other atmospheric impacts: transportation and pollution, energy management in buildings, solar thermal energy, photovoltaics, nuclear energy, socio-economic and political issues related to energy use and power generation.

The unit of study will consist of one lecture and one seminar per week, with a further two hours on average per week made up of 4 field trips.

PHYS 3911 Electromagnetism/Quantum Mechanics (Adv)

4 credit points. **Session**: 1. **Prerequisite**: 16 points of Intermediate Physics with a credit average and 8 credit points of intermediate mathematics. **Prohibition**: PHYS (3003 or 3011 or 3014 or 3015 or 3200 or 3903 or 3914 or 3915).

This unit of study covers the same topics as PHYS 3011, with some more challenging material.

PHYS 3912 Condensed Matter Physics/Optics (Adv)

4 credit points. **Session**: 1. **Assumed knowledge**: 8 credit points of Intermediate Mathematics. **Prerequisite**: 16 credit points of Intermediate Physics. **Prohibition**: PHYS (3004 or 3005 or 3006 or 3012 or 3014 or 3015 or 3107 or 3904 or 3905 or 3906 or 3914 or 3915).

This unit of study covers the same topics as PHYS 3012, with some more challenging material.

PHYS 3913 Thermodynamics/Kinetic Theory (Adv)

4 credit points. **Session**: 1. **Assumed knowledge**: 8 credit points of Intermediate Mathematics. **Prerequisite**: 16 credit points of Intermediate Physics. **Prohibition**: PHYS (3005 or 3013 or 3014 or 3015 or 3905 or 3914 or 3915).

This unit of study covers the same topics as PHYS 3013, with some more challenging material.

PHYS 3914 Topics in Physics A (Adv)

4 credit points. **Session**: 1. **Assumed knowledge**: 8 credit points of Intermediate Mathematics. **Prerequisite**: 16 credit points of Intermediate Physics. **Prohibition**: PHYS (3003 or 3004 or 3005 or 3011 or 3012 or 3013 or 3014 or 3015 or 3200 or 3903 or 3904 or 3905 or 3911 or 3912 or 3913 or 3915).

This unit of study covers the same topics as PHYS 3014, with some more challenging material.

PHYS 3915 Topics in Physics B (Adv)

6 credit points. **Session**: 1. **Assumed knowledge**: 8 credit points of Intermediate Mathematics. **Prerequisite**: 16 credit points of Intermediate Physics. **Prohibition**: PHYS (3003 or 3004 or 3005 or 3011 or 3012 or 3013 or 3014 or 3015 or 3200 or 3903 or 3904 or 3905 or 3911 or 3912 or 3913 or 3914).

This unit of study covers the same topics as PHYS 3015, with some more challenging material.

PHYS 3916 Experimental Physics A (Adv)

4 credit points. **Session**: 1. **Assumed knowledge**: 8 credit points of Intermediate Mathematics. **Prerequisite**: 16 credit points of Intermediate Physics. **Prohibition**: PHYS (3008 or 3009 or 3016 or 3017 or 3101 or 3102 or 3105 or 3107 or 3200 or 3801 or 3908 or 3909 or 3917).

This unit of study covers the same topics as PHYS 3016, with some more challenging material.

PHYS 3917 Experimental Physics B (Adv)

8 credit points. **Session**: 1. **Assumed knowledge**: 8 credit points of Intermediate Mathematics. **Prerequisite**: 16 credit points of Intermediate Physics. **Prohibition**: PHYS (3008 or 3009 or 3016 or 3017 or 3101 or 3102 or 3105 or 3107 or 3200 or 3801 or 3908 or 3909 or 3916).

This unit of study covers the same topics as PHYS 3017, with some more challenging material.

PHYS 3921 Plasma Physics/Nanoscience (Adv)

4 credit points. **Session**: 2. **Assumed knowledge**: 8 credit points of Intermediate Mathematics. **Prerequisite**: 16 credit points of Intermediate Physics. **Prohibition**: PHYS (3005 or 3006 or 3021 or 3024 or 3025 or 3905 or 3906 or 3924 or 3925).

This unit of study covers the same topics as PHYS 3021, with some more challenging material.

PHYS 3922 Astrophysics/High Energy Physics (Adv)

4 credit points. A/Prof. T. Bedding. **Session**: 2. **Classes**: 3 lec/wk. **Prerequisite**: 16 credit points of intermediate physics with a credit average and 8 credit points of intermediate mathematics. **Prohibition**: PHYS (3005 or 3006 or 3022 or 3024 or 3025 or 3105 or 3905 or 3906 or 3924 or 3925). **Assessment**: 3hr exam, assignments.

The first half of this unit aims to give students an understanding of the observational properties and underlying astrophysical principles governing stars, the interstellar and galaxies as a whole. The second half studies elementary particles, particularly quarks and leptons, and how they interact and combine to form other particles.

Textbooks

See the Senior Physics Handbook, available from the School of Physics or the Web site
www.physics.usyd.edu.au/ugrad/spc.html

PHYS 3923 Biological & Medical Physics (Adv)

4 credit points. A/Prof. T. Bedding. **Session**: 2. **Classes**: 3 lec/wk. **Assumed knowledge**: 8 credit points of Intermediate Mathematics. **Prerequisite**: 16 credit points of Intermediate Physics or Intermediate Biochemistry with a credit average and 12 credit points of Junior units from Mathematics and Statistics and 12 credit points of Junior Physics. **Prohibition**: PHYS (3006 or 3906). **Assessment**: 3hr exam, assignments.

This unit of study covers the same topics as PHYS 3023, with some more challenging material.

Textbooks

See the Senior Physics Handbook, available from the School of Physics or the Web site
www.physics.usyd.edu.au/ugrad/spc.html

PHYS 3924 Topics in Physics C (Adv)

4 credit points. **Session**: 2. **Assumed knowledge**: 8 credit points of Intermediate Mathematics. **Prerequisite**: 16 credit points of Intermediate Physics. **Prohibition**: PHYS (3003 or 3004 or 3005 or 3021 or 3022 or 3023 or 3024 or 3025 or 3200 or 3903 or 3904 or 3905 or 3921 or 3922 or 3923 or 3925).

This unit of study covers the same topics as PHYS 3024, with some more challenging material.

PHYS 3925 Topics in Physics D (Adv)

6 credit points. **Session**: 2. **Prerequisite**: 16 credit points of intermediate Physics with a credit average and 8 credit points of intermediate mathematics. **Prohibition**: PHYS (3003 or 3004 or 3005 or 3021 or 3022 or 3023 or 3024 or 3025 or 3200 or 3903 or 3904 or 3905 or 3921 or 3922 or 3923 or 3924).

This unit of study covers the same topics as PHYS 3025, with some more challenging material.

PHYS 3926 Experimental Physics C (Adv)

4 credit points. **Session**: 2. **Assumed knowledge**: 8 credit points of Intermediate Mathematics. **Prerequisite**: 16 credit points of Intermediate Physics. **Prohibition**: PHYS (3008 or 3009 or 3026 or 3027 or 3101 or 3102 or 3105 or 3107 or 3200 or 3801 or 3908 or 3909 or 3927).

This unit of study covers the same topics as PHYS 3026, with some more challenging material.

PHYS 3927 Experimental Physics D (Adv)

8 credit points. **Session**: 2. **Assumed knowledge**: 8 credit points of Intermediate Mathematics. **Prerequisite**: 16 credit points of Intermediate Physics. **Prohibition**: PHYS (3008 or 3009 or 3026 or 3027 or 3101 or 3102 or 3105 or 3107 or 3200 or 3801 or 3908 or 3909 or 3926).

This unit of study covers the same topics as PHYS 3027, with some more challenging material.

PHYS 3928 Special Projects B (Adv)

4 credit points. **Session**: 2. **Assumed knowledge**: 8 credit points of Intermediate Mathematics. **Prerequisite**: 16 credit points of Intermediate Physics. **Prohibition**: PHYS (3103 or 3104 or 3803 or 3804 or 3918).

Physics Honours

Dr Anne Green

Qualifying: 24 credit points of Senior Physics or equivalent.
Classes: 6 lecture courses & research project.
Assessment: coursework exams, one 40 page report.

Students may be admitted to the Honours Program in Physics if they are of sufficient merit and have completed the qualifying requirements, according to the guidelines set out in the Senior Physics section of this handbook.

Fulltime enrolment is equivalent to 48 credit points for the year. Physics Honours comprises formal coursework (weight 50%) and a research project (weight 50%). 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. A wide range of possible projects is available in many areas of contemporary physics including astrophysics, solar and space sciences, photonics, computational condensed matter, materials, coatings and practical applications of plasmas, brain dynamics, medical physics and several areas of theoretical physics.

The formal courses from which students may choose include studies of quantum mechanics, nanotechnology, optical devices, general relativity, cosmology, space and solar physics, sub-atomic physics, relativistic quantum theory, medical physics, electromagentism and the practice of physics. Not all the courses are offered every year and students may substitute a limited number of courses with appropriate ones from complementary disciplines, subject to the approval of the Honours coordinator.

Honours students are encouraged to participate along with staff and research students in all 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 Web site www.physics.usyd.edu.au/ugrad/hons.html

■ 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.

PHSI 2001 **Basic Physiology A**

4 credit points. Dr M Muir. **Session**: 1. **Classes**: 2 lec & 2 tut or prac/wk. **Prerequisite**: 6 credit points of Junior Chemistry plus 30 credit points from Junior Biology, Chemistry, Mathematics, Physics, Psychology units of study. **Prohibition**: PHSI (2101 or 2901). **Assessment**: One 2hr theory exam, data tests, one essay, oral presentations.

NB: Students taking combined degrees or with passes in units not listed should consult the department if they do meet the prerequisites. The completion of MBLG 2001 or 2101 or 2901 is highly recommended.

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 gastrointestinal physiology and haematology. The practical component involves simple experiments on humans or using computer simulations, with an emphasis on data analysis. Both oral and written communication skills are emphasized.

Textbooks

Sherwood L. Human Physiology: From Cells to Systems, 5th edn, 2003

PHSI 2101 **Integrated Physiology A**

8 credit points. Dr M Frommer. **Session**: 1. **Prerequisite**: 6 credit points of Junior Chemistry plus 30 credit points from Junior Biology, Chemistry, Mathematics, Physics, Psychology units of study. **Prohibition**: PHSI (2001 or 2901). **Assessment**: One 3hr theory exam, data tests, one essay, oral presentations.

NB: Students taking combined degrees or with passes in units not listed should consult the department if they do meet the prerequisites. The completion of MBLG 2001 or 2101 or 2901 is highly recommended.

This unit of study incorporates PHSI 2001 but deals with the physiology topics covered there in more detail. These include nervous system function (nerve and muscle cells, sensory and motor systems, central processing), gastrointestinal physiology and haematology. It entails additional lectures, more complex practicals, and a component of problem-based group learning. Skills in hypothesis generation and testing, data analysis, and oral and written communication will be emphasized.

Textbooks

Sherwood L. Human Physiology: From Cells to Systems, 5th edn, 2003

PHSI 2901 **Integrated Physiology A (Advanced)**

8 credit points. Dr Miriam Frommer. **Session**: 1. **Classes**: 3 lec, 1 prac/tut & 1 PBL/wk. **Prerequisite**: 6 credit points of Junior Chemistry plus 30 credit points from Junior Biology, Chemistry, Mathematics, Physics, Psychology units of study. **Prohibition**: PHSI (2001 or 2101). **Assessment**: One 2hr core exam, PBL essay and take-home exam, data and pre-tests, practical presentations, research assignment.

NB: Department permission required for enrolment. Available to selected students who have achieved at least 65 in half of their Junior units of study, including students in combined degrees or with passes in units not listed. The completion of MBLG 2001 or 2101 or 2901 is highly recommended.

This unit of study parallels Physiology A PHSI 2101 but replaces some problem-based learning content with a research library project.

Textbooks

Sherwood L. Human Physiology: From Cells to Systems, 5th edn, 2003

PHSI 2002 **Basic Physiology B**

4 credit points. Dr M Muir. **Session**: 2. **Classes**: 2 lec & 2 tut or prac/wk. **Prerequisite**: 6 credit points of Junior Chemistry plus 30 credit points from Junior Biology, Chemistry, Mathematics, Physics, Psychology units of study. **Prohibition**: PHSI (2102 or 2902). **Assessment**: One 2hr theory exam, data tests, one essay, oral presentations.

NB: Students taking combined degrees or with passes in units not listed should consult the department if they do meet the prerequisites. The completion of MBLG 2001 or 2101 or 2901 is highly recommended.

This unit of study gives a basic introduction to the functions of the remaining body systems: cardiovascular, respiratory, endocrine, reproductive and renal. The practical component involves simple experiments on humans or using computer simulations, with an emphasis on data analysis. Both oral and written communication skills are emphasized.

Textbooks

Sherwood L. Human Physiology: From Cells to Systems, 5th edn, 2003

PHSI 2102 **Integrated Physiology B**

8 credit points. Dr M Frommer. **Session**: 2. **Prerequisite**: 6 credit points of Junior Chemistry plus 30 credit points from Junior Biology, Chemistry, Mathematics, Physics, Psychology units of study. **Prohibition**: PHSI (2002 or 2902). **Assessment**: One 3hr theory exam, data tests, one essay, oral presentations.

NB: Students taking combined degrees or with passes in units not listed should consult the department if they do meet the prerequisites. The completion of MBLG 2001 or 2101 or 2901 is highly recommended.

This unit of study incorporates PHSI 2002 but deals with the physiology topics covered there in more detail. These include the cardiovascular, respiratory, endocrine, reproductive and renal systems. It entails additional lectures, more complex practicals, and a component of problem-based group learning. Skills in hypothesis generation and testing, data analysis, and oral and written communication will be emphasized.

Textbooks

Sherwood L. Human Physiology: From Cells to Systems, 5th edn, 2003

PHSI 2902 **Integrated Physiology B (Advanced)**

8 credit points. Dr Miriam Frommer. **Session**: 2. **Classes**: 3 lec, 1 prac/tut & 1 PBL/wk. **Prerequisite**: 6 credit points of Junior Chemistry plus 30 credit points from Junior Biology, Chemistry, Mathematics, Physics, Psychology units of study. **Prohibition**: PHSI (2002 or 2102). **Assessment**: One 2hr core exam, PBL essay and take-home exam, data and pre-tests, practical presentations, research assignment.

NB: Department permission required for enrolment. Available to selected students who have achieved at least 65 in half of their Junior units of study, including students in combined degrees or with passes in units not listed. The completion of MBLG 2001 or 2101 or 2901 is highly recommended.

This unit of study parallels PHSI 2102 Physiology B but replaces some problem-based learning content with a research library project.

Textbooks

Sherwood L. Human Physiology: From Cells to Systems, 5th edn, 2003

PHSI 3001 **Neuroscience**

12 credit points. Dr J Mitrofanis, Dr D Protti. **Session**: 1. **Classes**: 4 lec & 8 prac/wk. **Prerequisite**: For BMedSc: at least 32 credit points of Intermediate BMED units including BMED (2501 and 2503 and 2505). For others: PHSI (2101 or 2001 or 2901) or ANAT 2003; and MBLG (2001 or 2101 or 2901) or BCHM (2001 or 2101 or 2901); plus at least 8 credit points of Intermediate Science units of study. **Prohibition**: PHSI 3901. **Assessment**: Two 2hr exams, spot test, essay, prac report, seminar presentation.

NB: A minimum of 8 credit points of Intermediate Physiology and/or Anatomy is recommended.

The aim of this unit of study is to give the student a comprehensive view of the structure and function of the human 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. The lecture series addresses the different topics, each of which offers special insight into the normal function of the nervous system in health and disease.

Practical: The practical component of this unit of study consists of small group tutorials in neuroanatomy, experimental and computer based sessions on physiological methods, and small group sessions in which you will discuss current research papers related to the lecture topics. You will have the opportunity to examine human brain specimens during the tutorials, and in the Wilson Museum in the Department of Anatomy and Histology. Computer based facilities which allow you to learn the brain structures by simulated dissection are also available.

Textbooks

Kandel E, Schwartz J, & Jessell T. Principles of Neural Science (4th ed), McGraw Hill

PHSI 3901 Neuroscience (Advanced)

12 credit points. Dr D Protti, Dr J Mitrofanis. **Session**: 1. **Classes**: 4 lec, 1 tut & 7 prac/wk. **Prerequisite**: For BMedSc: at least 32 credit points of Intermediate BMED units including BMED (2501 and 2503 and 2505). For others: PHSI (2101 or 2001 or 2901) or ANAT 2003; and MBLG (2001 or 2101 or 2901) or BCHM (2001 or 2101 or 2901); plus at least 8 credit points of Intermediate Science units of study. **Prohibition**: PHSI 3001. **Assessment**: Two 2hr exams, spot test, essay, prac report, seminar presentation.

NB: Department permission required for enrolment. A minimum of 8 credit points of Intermediate Physiology and/or Anatomy is recommended. Permission required for enrolment. Available to selected students who have achieved a mark of at least 65 in the prerequisite units of study.

The lecture component and practical component are the same as for PHSI 3001. Selected students will be set special advanced assignments and attend tutorials on those assignemtns during the practical sessions.

PHSI 3002 Neuroscience – Cellular and Integrative

12 credit points. Dr K Keay, Prof M Bennett. **Session**: 2. **Classes**: 3 lec, 2 tut & 6hr research/wk. **Prerequisite**: For BMedSc: 32 credit points of Intermediate BMED units including BMED (2501 and 2503 and 2505). For others:16 credit points of Intermediate Science units of study from Anatomy and Histology, Biochemistry, Biology, Chemistry, Computer Science, Mathematics, Microbiology, Molecular Biology and Genetics, Pharmacology, Physics, Physiology, Psychology or Statistics. **Prohibition**: PHSI 3902. **Assessment**: One 2hr exam, tutorial participation, research report.

NB: The completion of MBLG (2001 or 2101 or 2901) is highly recommended.

This second semester unit is designed to introduce students to 'cutting edge' issues in the neurosciences. In a combination of small lectures, discussion groups and laboratory or library based research projects, new, innovative or controversial issues in neuroscience research are covered. These ususally include discussion of findings published in the most recent editions of scientific journals and often research in progress in the departments of Anatomy and Histology and Physiology (Institute of Biomedical Research). The unit follows two general 'strands', the first deals with cellular and molecular approaches, and the second, integrative approaches to understanding nervous system function and dysfunction. Some of the issues covered in recent years have included mechanisms of neurotoxicity and how to prevent neurodeath, how to prevent shock following trauma, the design of novel anti-schizophrenic and anti-parkinsonian drugs, the ways in which development of the brain is organised and what happens when it goes wrong.

PHSI 3902 Neuroscience- Cellular & Integrative Adv

12 credit points. Dr K Keay, Prof M Bennett. **Session**: 2. **Classes**: 3 lec, 2 tut & 6 prac/wk. **Prerequisite**: For BMedSc: 32 credit points of Intermediate BMED units including BMED (2501 and 2503 and 2505). For others: Credit or better in PHSI 3001; and 16 credit points of Intermediate Science units of study from Anatomy and Histology, Biochemistry, Biology, Chemistry, Computer Science, Mathematics, Microbiology, Molecular Biology and Genetics, Pharmacology, Physics, Physiology, Psychology or Statistics. **Prohibition**: PHSI 3002. **Assessment**: One 2hr exam, tutorial participation, research report.

NB: Department permission required for enrolment. Permission required for enrolment. Available to selected students who have achieved a mark of at least 65 in the prerequisite units of study.

The completion of MBLG (2001 or 2101 or 2901) is highly recommended.

The lecture and practical component are the same as for PHSI 3002. Selected students will be set special advanced assignments and attend tutorials on those assignements during the practical sessions.

PHSI 3003 Heart and Circulation

12 credit points. Dr J Hoh, Mrs I Schneider. **Session**: 2. **Classes**: 4 lec, 2 tut & 6hr prac/wk. **Assumed knowledge**: PHSI (2001 or 2101 or 2901) and BCHM (2002 or 2102 or 2902). **Prerequisite**: For BMedSc: 32 credit points of Intermediate BMED units including BMED (2501 and 2503 and 2505). For others: PHSI (2002 or 2102 or 2902) and MBLG (2001 or 2101 or 2901) plus at least 8 credit points of Intermediate Science units of study. **Prohibition**: PHSI 3903. **Assessment**: One 3hr exam, essays, prac reports, seminar presentations.

NB: A minimum of 8 credit points of Intermediate Physiology and BCHM (2002 or 2102 or 2902) are strongly recommended.

This unit of study offers an up to date and in depth treatment of 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 muscle 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, the unit of study deals with short term (neural) mechanisms controlling the blood pressure, and how the system behaves during exercise and other stresses. Long term (hormonal) mechanisms regulating blood pressure via the renal control of extracellular fluid volume, and the pathophysiology of atherosclerosis and hypertension are also discussed.

Practical: Lectures are combined with practical laboratory experiments on animals and human subjects.

PHSI 3903 Heart and Circulation (Advanced)

12 credit points. Dr J Hoh assisted by Ms I Schneider. **Session**: 2. **Classes**: 4 lec, 2 tut & 6hr prac/wk. **Assumed knowledge**: PHSI (2001 or 2101 or 2901) and BCHM (2002 or 2102 or 2902). **Prerequisite**: For BMedSc: 32 credit points of Intermediate BMED units including BMED (2501 and 2503 and 2505). For others: PHSI (2002 or 2102 or 2902) and MBLG (2001 or 2101 or 2901) plus at least 8 credit points of Intermediate Science units of study. **Prohibition**: PHSI 3003. **Assessment**: One 3hr exam, essays, prac reports, seminar presentations.

NB: Department permission required for enrolment. A minimum of 8 credit points of Intermediate Physiology and BCHM (2002 or 2102 or 2902) are strongly recommended. Permission required for enrolment. Available to selected students who have achieved a mark of at least 65 in the prerequisite units of study.

The lecture and practical component are the same as for PHSI 3003. Selected students will be set special advanced assignments and attend tutorials on those assignments as negotiated with a member of the academic staff.

PHSI 3004 Human Cellular Physiology

12 credit points. Dr Bill Phillips. **Session**: 1. **Classes**: 4 lec, 6 prac & 2 small group PBL/wk. **Prerequisite**: For BMedSc: 32 credit points of Intermediate BMED units including BMED (2501 and 2502 and 2504). For others: PHSI (2001 or 2101 or 2901) and PHSI (2002 or 2102 or 2902) and either MBLG (2001 or 2101 or 2901) or BCHM (2001 or 2101 or 2901). **Prohibition**: PHSI 3904. **Assessment**: Written exams, 1 essay, practical reports, oral presentations.

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 and practical classes 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, cystic fibrosis and osteoporosis.

Practical: A problem-based learning (PBL) stream will introduce students to reading and interpreting scientific papers. It involves reading lists structured to address written biological problems. A Methods series of lectures will provide an overview of techniques widely employed in cellular physiology to aid in students' interpretation of published experimental evidence.

Finally, the practical course will emphasize experimental design and interpretation. Collectively, the PBL, Methods lecture series and practical classes are intended to begin to develop skills and outlook to prepare students for the Honours year of research.

PHSI 3904 **Human Cellular Physiology (Advanced)**

12 credit points. Dr Bill Phillips. **Session**: 1. **Classes**: 4 lec, 6 prac & 2 small group PBL/wk. **Prerequisite**: For BMedSc: 32 credit points of Intermediate BMED units including BMED (2501 and 2502 and 2504). For others: PHSI (2001 or 2101 or 2901) and PHSI (2002 or 2102 or 2902) and either MBLG (2001 or 2101 or 2901) or BCHM (2001 or 2101 or 2901). **Prohibition**: PHSI 3004. **Assessment**: Written exams, 1 essay, practical reports, oral presentations.

NB: Department permission required for enrolment. Permission is required for enrolment. Available to selected students who have achieved an average of at least 65 in the prerequisite units of study.

The lecture and practical component are the same as for PHSI 3004. Selected students will be set special advanced assignments and attend tutorials on those assignments as negotiated with a member of the academic staff.

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.

■ 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 subject.

Extensive information about the subject and the School is available on the School web-site: www.psych.usyd.edu.au.

A normal three year sequence required for a major in Psychology is: PSYC 1001, 1002, 2111, 2112, 2113, 2114, and eight Senior units of study selected from PSYC 3201*, 3202*, 3203, 3204, 3205, 3206, 3208, 3209, 3210, 3211, 3212, 3214, 3215 and 3216 (*Required for entry to Fourth Year). Mid year entry is possible and involves modification of this sequence.

The units of study available are:

PSYC 1001, 6 credit points
PSYC 1002, 6 credit points
PSYC 2111, 4 credit points
PSYC 2112, 4 credit points
PSYC 2113, 4 credit points
PSYC 2114, 4 credit points
PSYC 3201, 4 credit points
PSYC 3202, 4 credit points
PSYC 3203, 4 credit points
PSYC 3204, 4 credit points
PSYC 3205, 4 credit points
PSYC 3206, 4 credit points
PSYC 3208, 4 credit points
PSYC 3209, 4 credit points
PSYC 3210, 4 credit points
PSYC 3211, 4 credit points
PSYC 3212, 4 credit points
PSYC 3214, 4 credit points
PSYC 3215 4 credit points
PSYC 3216 4 credit points

Students who have completed PSYC 3001 and/or 3002 must obtain the permission of the Head of School of Psychology before enrolling in any of PSYC 3201 to 3216.

Registration and noticeboards

Students in all years must register during the orientation period. Psychology 1001 students register by going to the Carslaw Building during orientation and collecting a personalised computer generated timetable, 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.

Information about registration meetings for Intermediate and Senior Psychology students will also be posted at the Enrolment Centre, and on the School noticeboards on the 5th floor of the Griffith-Taylor Building, as well as the School web-site.

Enquiries

The main enquiry office of the School is Room 416, Griffith-Taylor Building (phone (02) 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 4 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. These Psychology units include Psychology 2111, 2112, 2113, 2114, 3201, 3202, and at least six other Senior Psychology units from Psychology 3203, 3204, 3205, 3206, 3208, 3209, 3210, 3211, 3212, 3214, 3215 and 3216. 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 4.

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

PSYC 1001, PSYC 1002 and PSYC 3201 are offered in the Sydney Summer School. Consult the Sydney Summer School Web site for more information. www.summer.usyd.edu.au/

PSYC 1001 **Psychology 1001**

6 credit points. **Session**: 1, Summer. **Classes**: 3 lec, one 2hr demonstration/tut/wk. **Assessment**: One 2hr exam, one 1000w essay,two tut 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: subject matter and methods of psychology; basic statistics and measurement; behavioural neuroscience; sensory processes; social psychology; personality theory.

Summer School: January-February

This department offers PSYC 1001 in the Sydney Summer School. Consult The Sydnet Summer School Web site for more information. www.usyd.edu.au/summerschool/

Textbooks

Psychology 1001 Handbook,
Gray, P. (2002). Psychology (4th Edition). New York: Worth Publishers.
Burton, L.J. (2002). An Interactive Approach to Writing Essays and Research Reports in Psychology. Milton, Queensland: John Wiley & Sons.

PSYC 1002 **Psychology 1002**

6 credit points. **Session**: 2, Summer. **Classes**: 3 lec & 2hr demonstration/tut/wk. **Assessment**: One 2hr exam, one 1000w essay, two tut 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 abnormal psychology; visual perception; cognitive processes. Summer School: January-February This department offers PSYC 1001 in the Sydney Summer School. Consult The Sydnet Summer School Web site for more information. www.usyd.edu.au/summerschool/

Textbooks

Psychology 1002 Handbook
Gray, P. (2002). Psychology (4th Edition). New York: Worth Publishers.
Burton, L.J. (2002). An Interactive Approach to Writing Essays and Research Reports in Psychology. Milton, Queensland: John Wiley & Sons.

PSYC 2111 **Learning, Neuroscience and Perception**

4 credit points. **Session**: 1. **Classes**: 2 lec & 1 prac/wk. **Qualifier**: PSYC 1001 and 1002 (Note: 16 credit points of Intermediate Psychology is required for Honours entry). **Assessment**: Multiple choice exam, lab report, tutorial quiz.

This unit of study examines a range of phenomena and principles in perception and learning and their relations to 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. Perceptual phenomena include recognition of faces and 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 Web site

PSYC 2112 **Psychological Statistics**
4 credit points. **Session**: 1. **Classes**: 2 lec & 1 prac/wk, 1 computer tut/ fortnight. **Qualifier**: PSYC 1001 and 1002 (Note: 16 credit points of Intermediate Psychology is required for Honours entry). **Assessment**: Class tests, Group project, Multiple choice exam.
The aim of this unit of study is to introduce students to some of the fundamental concepts in statistics as used in Psychology. These include summary descriptive statistics and an introduction to the principles and practice of experimental design and inferential statistics. Building upon this ground work, the unit of study aims to develop 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 Web site

PSYC 2113 **Cognitive Processes & Social Psychology**
4 credit points. **Session**: 2. **Classes**: 2 lec & 1 prac/wk. **Qualifier**: PSYC 1001 and 1002 (Note: 16 credit points of Intermediate Psychology is required for Honours entry). **Assessment**: Class quiz, prac assignment, multiple choice/short-answer exam.
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 on cognitive psychology focuses on current theories of memory, attention and problem-solving and discusses the methods and issues involved in investigating these processes in both healthy individuals and people with cognitive dysfunctions. The second section presents and evaluates evidence about the effects of the early environment that a child is exposed to on cognitive and social development. The final section focuses on two main areas of Social Psychology:(1) Group and inter-group relationships and (2) Interpersonal processes, with a particular emphasis on altruism, helping behaviour, affiliation and attraction. The practical program will provide students with hands-on experience of some of the research methods used in cognitive and social psychology, develop an understanding of how to test hypotheses about the factors influencing human behaviour and consider the practical implications of theories and research about cognitive, developmental and social psychology.
Textbooks
See School Web site

PSYC 2114 **Personality and Individual Differences**
4 credit points. **Session**: 2. **Classes**: 2 lec & 1 tut & 1hr self-paced computer/library research/wk. **Qualifier**: PSYC 1001 and 1002 (Note: 16 credit points of Intermediate Psychology is required for Honours entry). **Assessment**: Personality: 1hr exam & essay; Individual Differences: 1hr exam and quiz.
PSYC 2114 is made up of two components: Personality and Individual Differences. The aim of the Personality component is to introduce the student to various psychodynamic theories of personality, Eysenck's biological typology and current trait theory. Students will be exposed to conceptual analysis and encouraged to critically evaluate the various theories covered. The aim of the Individual Differences component is to introduce the major issues in individual differences and group differences in human abilities. It is divided into two parts: 5 lectures on individual differences and 8 lectures on group differences. Students are expected to gain an understanding about the major theories of intelligence and of the facts related to the traditional areas of group differences.
Textbooks
See Departmental handout

PSYC 3201 **Statistics and Psychometrics**
4 credit points. **Session**: 2. **Classes**: 2 lec & 1 prac & 1hr unsupervised computer practice/wk. **Prerequisite**: 8 credit points of Intermediate Psychology including PSYC 2112. **Assessment**: Class test, assignment, examination.
NB: 32 credit points of Senior (third year) Psychology is required for a Psychology Major
PSYC 3201 consists of two components, Statistics and Psychometrics. The aim of the Statistics component is to teach students the structure of experiments for which analysis of variance would be an appropriate means of analysis. The unit of study aims to develop students' ability to ask more focused questions than can be answered by omnibus F tests, specifically by the testing of contrasts. The problems of multiple inferences, and the control of the Type I error rate, are an integral aspect of the unit of study.

The objective of the Psychometrics component is to introduce students to measurement as understood in Psychology, to a range of quantitative theories and to the basic concepts of classical psychometrics, item analysis and test construction.
Textbooks
See School Web site

PSYC 3202 **History and Philosophy of Psychology**
4 credit points. **Session**: 1. **Classes**: 2 lec & 1 tut & 1hr self paced library research/wk. **Prerequisite**: 12 credit points of Intermediate Psychology. **Assessment**: 2hr exam, 1 x 2000 word essay.
NB: 32 credit points of Senior (third year) Psychology is required for a Psychology Major
PSYC 3202 consists of two components: History of Psychology and Philosophy of Psychology. The History of Psychology introduces the historical foundations of Western psychology from Descartes through to the cognitive revolution in the 1960's. In covering important individuals, movements and themes, attention is drawn to debate about interpretation of the historical process, and to analysis of the form and structure of the various arguments presented in favour of certain psychological theories. The Philosophy of Psychology introduces traditional and contemporary themes in the philosophy of science, with focus on the relevance to psychology. Students are expected to become aware that metatheoretical analysis has a central place in psychology alongside empirical methods, that the basic concepts and theories of psychology involve philosophical assumptions which can be articulated and examined.
Textbooks
See School Web site

PSYC 3203 **Abnormal Psychology**
4 credit points. **Session**: 2. **Classes**: 2 lec & 1 tut/wk. **Prerequisite**: PSYC 2111 and PSYC (2113 or 2114). **Assessment**: 2hr exam, report/ presentation.
NB: 32 credit points of Senior (third year) Psychology is required for a Psychology Major
This unit of study examines core issues in Abnormal Psychology. The unit of study will cover aspects of adult abnormality and child abnormality and will include topics such as:
(a) Adult abnormal psychology: Anxiety disorders (specific phobias, panic disorder, agoraphobia, 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: Learning disabilities, Mental retardation, Intellectual and educational assessment of children; Pervasive developmental disorders; Attention deficit disorder; Conduct disorder; Anxiety disorders in children and adolescents; Depression.
Textbooks
See School Web site

PSYC 3204 **Behavioural Neuroscience**
4 credit points. **Session**: 2. **Classes**: 2 lec & 1 prac/wk. **Prerequisite**: 8 credit points of Intermediate Psychology including PSYC 2111. **Assessment**: 2hr exam, class quiz, poster presentation, class participation.
NB: 32 credit points of Senior (third year) Psychology is required for a Psychology Major
This unit of study carries on from the Neuroscience component of PSYC 2111, providing more specialised coverage in the areas of psychopharmacology, addiction, molecular neuroscience, sensorimotor intergration and the neural basis of learning and memory. Topics to be covered include Psychopharmacology (basic actions of drugs on the brain, mechanism of action of antidepressant, antipsychotic and anxiolytic drugs, effects of recreational drugs (cannabis, MDMA, alcohol, opiates) on brain, behaviour and cognition); Addiction (the neural basis of addiction, animal models of intravenous drug use and relapse to drug seeking behaviour); Molecular Neuroscience (effects of drugs on gene expression, the use of knockout mice and transgenic techniques in neuroscience); Neurobiology of learning and memory (the synaptic and neuroanatomical basis of associative learning and memory retrieval); Sensorimotor Integration (functions of the vestibular system, the role of the hippocampus in spatial learning). In the first few weeks of the unit, tutorials consist of demonstrations and practicals covering basic neuroanatomy, histology and neuropharmacology. In the

latter part of the course, tutorials involve groups of students giving poster presentations of recent 'hot' papers in the behavioural neuroscience field.
Textbooks
See School Web site

PSYC 3205 **Cognition, Language and Thought**
4 credit points. **Session**: 1. **Classes**: 2 lec & 2hr prac/fortnight. **Prerequisite**: PSYC (2112 and 2113). **Assessment**: 2hr exam, class quiz, report & class participation.
NB: 32 credit points of Senior (third year) Psychology is required for a Psychology Major
The aim of this unit of study is to extend the theories and methods of investigating memory and attentional processes discussed in PSYC 2113 to consider a number of domains of higher cognitive processing. One segment of the course will deal with language processing and focus on theoretical issues and research evidence about the processes involved in speech perception and production, visual word recognition reading, language comprehension and language acquisition. The remainder of the course will deal with topics such as the development of expertise, creativity and problem solving, decision-making and the relationship between cognition and emotion. The practical program will expose students to a variety of the research methods used to investigate higher cognitive processes, develop students' understanding of how these methods can be used to investigate hypotheses about mental processes, consider applications of cognitive research to real-world problems and provide opportunities to discuss the theoretical, methodological and practical implications of the cognitive psychological issues considered in lectures and tutorials.
Textbooks
See School Web site

PSYC 3206 **Developmental Psychology**
4 credit points. **Session**: 1. **Classes**: 2 lec & 1 tut/wk. **Prerequisite**: 8 credit points of Intermediate Psychology. **Assessment**: 2hr exam, report, tutorial assessment.
NB: 32 credit points of Senior (third year) Psychology is required for a Psychology Major
This unit of study examines various theoretical approaches to 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 current developmental theory and research. In addition 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 required to apply their knowledge in practical exercises involving observations of children.
Textbooks
See School Web site

PSYC 3208 **Intelligence**
4 credit points. **Session**: N/A in 2004. **Classes**: 2 lec & 1 tut/wk. **Prerequisite**: PSYC (2112 and 2114). **Assessment**: 2hr exam, tutorial quizzes.
NB: 32 credit points of Senior (third year) Psychology is required for a Psychology Major
The aim is to provide an overview and critical platform to evaluate recent studies of individual differences in human cognitive abilities. The unit introduces major contemporary issues in individual differences in human abilities and intelligence. The emphasis of the latter part is on recent work on the topics related to (a) Psychometric research on intelligence; (b) Experimental cognitive correlates approach to intelligence; (c) Biological aspects of intelligence; and (d) the role of metacognitive abilities in intelligence. Some of the work carried out at this University is also discussed.
Textbooks
See School Web site

PSYC 3209 **Learning and Motivation**
4 credit points. **Session**: 1. **Classes**: 2 lec & 1 tut/wk. **Prerequisite**: PSYC (2111 and 2112). **Assessment**: Report, exam.
NB: 32 credit points of Senior (third year) Psychology is required for a Psychology Major
PSYC 3209addresses the fundamental concepts and more important research findings of contemporary learning theory and selected approaches to motivation. It examines the application of such fundamental research to issues such as drug tolerance, food choice, stress and health. It is designed to develop skills in reading primary sources in this area; and to provide the opportunity for hands-on experience of planning and carrying out a research project.
Textbooks
See School Web site

PSYC 3210 **Perceptual Systems**
4 credit points. **Session**: 1. **Classes**: 2 hrs lec & 1 hr lab/wk. **Prerequisite**: PSYC (2111 and 2112). **Assessment**: 2hr exam, tutorial assessment.
NB: 32 credit points of Senior (third year) Psychology is required for a Psychology Major
This unit covers at an advanced level selected topics in Perception from both the psychophysical and neuroscientific perspectives. Students are expected to gain an understanding of the main theoretical perspectives in current research, to appreciate the significance and relevance of basic perceptual research for understanding normal perceptual functioning, and to be able to evaluate the conceptual and empirical worth of research contributions.
Textbooks
See School Web site

PSYC 3211 **Psychological Assessmt. & Organisational**
4 credit points. **Session**: 2. **Classes**: 2 lec & 1 tut/wk. **Prerequisite**: PSYC (2112 and 2114). **Prohibition**: PSYC 3207 (except with permission from the Head of Department). **Assessment**: 2hr exam, tutorial evaluation.
NB: 32 credit points of Senior (third year) Psychology is required for a Psychology Major
The Psychological Assessment component covers fundamental issues in the construction, evaluation and administration of psychological tests with particular emphasis on tests of personality. Students will be given 'hands-on' experience with a variety of psychological instruments including those used for personality, aptitude and clinical assessment. A variety of psychometric 'skills' (eg, calculating reliability, rudiments of scale construction) will also be taught. This component of the unit will conclude with an introduction of state of the art issues in psychological assessment including demonstrations of adaptive and computerised testing and discussion of item response theory (IRT) and factor analysis.

The Organisational Psychology component focuses on performance in the work place and the influence of social factors on such performance. Various aspects of the workplace will be examined, including leadership, workplace conflict, job satisfaction, selection and appraisal.
Textbooks
See School Web site

PSYC 3212 **Social Psychology**
4 credit points. **Session**: 1. **Classes**: 2 lec & 1 tut/wk. **Prerequisite**: 8 credit points of Intermediate Psychology including PSYC 2113. **Assessment**: 1.5hr exam, classwork quiz.
NB: 32 credit points of Senior (third year) Psychology is required for a Psychology Major
PSYC 3212 continues the coverage of topics in Social Psychology begun in the unit PSYC 2113. The unit is divided into topic areas where the focus is on evaluating theories and the relevant evidence. In any one year approximately four topics will be covered from the following list: affiliation and attraction, social motivation (especially aggression), social cognition, social competence, the impact of aspects of the physical environment on social behaviour, jury decision making, interpersonal communication, and social development through the lifespan. 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 the topics covered in lectures.
Textbooks
See School Web site

PSYC 3214 **Communication and Counselling**
4 credit points. **Session**: 2. **Classes**: 2 lec & 1 tut/wk. **Prerequisite**: PSYC (2113 and 2114). **Assessment**: 2 hour examination, tutorial assessments.
NB: 32 credit points of Senior (third year) Psychology is required for a Psychology Major
The communication component of the unit is concerned with understanding how interpersonal communication occurs in a face to face context. The emphasis will be on the structure of language and non-language components that compose the message and the

extent to which that message is correctly decoded. The counseling component of the unit aims to provide an introduction to counseling psychology, to critically examine the theoretical foundations of counseling processes and their application, and to consider relevant empirical research and professional issues.
Textbooks
See School Web site

PSYC 3215 **Cognitive Neuroscience & Neuropsychology**

4 credit points. **Session**: 2. **Classes**: 2 lec/wk & 2 hr lab/fortnight. **Prerequisite**: Two of PSYC (2111, 2112, 2113). **Assessment**: 2 hr exam; laboratory class assessment.
NB: 32 credit points of Senior (third year) Psychology is required for a Psychology Major
The unit of study will encompass two components. The Cognitive Neuroscience component will focus on approaches to studying the human brain at different scales of function (microscopic to macroscopic), the link between cognitive and biological models of brain function and dysfunction, and the application of these models to understanding cognitive neuropsychiatric disorders such as post-traumatic stress, schizophrenia and attention-deficit disorder. The Cognitive Neuropsychology component will use evidence about the selective breakdown of specific cognitive domains (eg, memory, language, visual cognition, praxis) in a variety of neurodegenerative disorders to (1) examine the functional neuroanatomy underpinning those cognitive domains and (2) explore the implications of focal cognitive deficits in neurological patients for models of normal cognitive function.
Textbooks
See School Web site

PSYC 3216 **Health and Safety Psychology Principles**

4 credit points. Dr R.F. Soames Job, Dr Julie Hatfield. **Session**: N/A in 2004. **Classes**: 2 lec, 1 tut. **Prerequisite**: PSYC (2111 and 2112). **Assessment**: 2hr exam, 2000w essay.
NB: 32 credit points of Senior (third year) Psychology is required for a Psychology Major
The unit of study aims to develop an awareness of the general nature of Health and Safety Psychology, of the extent of preventable health problems and the likely victim groups, and of the role of psychological factors in the aetiology, prevention, and management of health problems. The unit of study will aims also to develop students' ability to understand and evaluate research methodology in health psychology, and to identify the implications which can be drawn from cross-sectional observational, longitudinal observational, and experimental research designs. Topics covered include: several models of health-related behaviour, optimism bias (the phenomenon and its measurement, causal models and possible consequences), psychological factors in road safety, psychological issues related to health promotion messages (and factors which influence their efficacy), psychological factors in occupational health and safety, interactions with the health-care system, stress and its health consequences (including the role of coping and personality), the role of organisational psychology in occupational stress, and stress management, the influence of lifestyle on health (with particular consideration of diet, exercise and sleep), and the effects of noise exposure (methodological issues, behavioural, cognitive, and physical effects and their interrelationships, as well as the moderating role of psychological factors such as noise sensitivity and attitudes toward the noise source). The tutorial program aims to develop an ability to read and understand Health and Safety Psychology research articles, and an appreciation of ethical issues in Health and Safety Psychology research. It will also provide experience in conducting Health and Safety Psychology research.
Textbooks
See School Web site

Psychology Honours

Prerequisite: Average of Pass with Credit or better in 16 credit points of Intermediate Psychology, and also in at least 32 credit points of Senior Psychology which must include PSYC 3201 and 3202. BPsych students should consult resolutions in chapter 5. School permission required.

Due to restricted resources for research supervision, the intake to Psychology 4 Honours will be limited to approximately 55 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 three Special Fields modules.

Students are required to:
(a) devise, conduct and report upon an empirical research project (research area dependent on interests & 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.

4 Talented Student Program

Overview

The Talented Student Program is a special program of study intended for students 'of exceptional merit' who are enrolled in degrees administered by the Faculty of Science (BSc, BMedSc, BIT, BCST, 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 great 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.

Studies undertaken in the Talented Student Program are included separately on the student's academic transcript 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 98.8 or higher 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. 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 the program in their second and third years, students should normally have WAMs 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 not received an invitation to participate in the TSP that year, should contact the Dean.

Range of TSP structures

The relevant Faculty Resolutions (eg, Section 1(6) of the BSc degree, Section 1(6) of the BLibStud degree) authorise 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 mentor will report results and the Dean will also arrange for special notes to be placed on the student's transcript, recording the TSP activity.

TSP coordinators

Faculty of Science

Coordinator: A/Prof Anthony Masters

Senior Agricultural Chemistry

Coordinator: Professor Les Copeland

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

Biochemistry

See Molecular and Microbial Biosciences

Biology

Coordinator: Dr Glenda Wardle

Students may undertake additional seminars and/or special project work.

Chemistry

Coordinator: Dr Meredith Jordan; Dr Cameron Kepert; and Dr Mal McLeod

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.

TSP students in Intermediate Chemistry take the Intermediate Chemistry (Advanced) units of study. The units of study comprise lectures, tutorials and special project-based laboratory exercises that complement the other Intermediate Chemistry units of study. Admission to Intermediate Chemistry (Advanced) units of study is by invitation only, and is limited to 30 students each year. TSP students are automatically eligible.

The Senior Chemistry TSP program consists of either 12 or 24 credit points of Senior Advanced Chemistry in a given semester. There are four groups of units of study. Students enrolling in either 12 or 24 credit points of Senior Chemistry in a semester must select Advanced units from Groups 1 - 3 and must select at least one unit from each of these Groups. Students must also attend an additional seminar series (one hour per week) consisting of group-based investigations of contemporary chemistry problems. At the end of the project, students are examined by means of a take-home assignment and these marks are included as a component of the lab mark for each of the units of study. Admission is by invitation only and is limited to 15 students each year. TSP students are automatically eligible.

Geosciences

Intermediate Geography

Coordinator: A/Prof 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 Rachel Ankeny

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.

Information Technologies

Coordinator: Dr Irena Kobrinska

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 available to them:

- First Year students in the Faculty 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.
- Students in the Faculty 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: A/Prof Ian Spence

Molecular and Microbial Bioscience

(for Biochemistry, Molecular Biology & Genetics, Molecular Biotechnology and Microbiology)
Coordinator: Dr Peter New

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: A/Prof Ian Spence

The Department will make special arrangements for individual students throughout their studies.

Physics

Coordinators: Prof Dick Hunstead and Prof David McKenzie

Junior students may take extra seminars and special project work in addition to, or in lieu of, parts of Physics (Advanced) units of study. Intermediate students may take extra seminars and special project work in addition to, or in lieu of, parts of Intermediate Physics units of study. Senior students may take extra seminars and special research project work in addition to, or in lieu of, parts of Senior Physics units of study.

An excursion to visit research facilities outside Sydney is offered in the mid-semester break in the July semester.

Physiology

Coordinator: Dr Margot Day

Students may undertake, in addition to normal coursework, a special research project.

Psychology

Coordinator: Dr Colin Clifford

The program is available in Intermediate and Senior Psychology. Students admitted to the program have the following 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 (eg, Biochemistry, Computer Science, Mathematics and Statistics)
- a special research project in lieu of, or in addition to, normal practical or classwork components
- various combinations of the above options.

Senior Soil Science

Coordinator: Dr Balwant Singh

Students may undertake, in addition to normal coursework, a special research project.

5 Undergraduate degree regulations

This chapter contains the regulations governing undergraduate degrees throughout the University and the regulations governing undergraduate degrees offered by the Faculty of Science. These are arranged in the following order:

1. University of Sydney (Coursework) Rule
2. Bachelor of Science – BSc

   The Bachelor of Science includes the specially designated streams:
   - Bachelor of Science (Advanced) – BSc(Advanced)
   - Bachelor of Science (Advanced Mathematics) – BSc(Advanced Mathematics)
   - Bachelor of Science (Bioinformatics) – BSc(Bioinformatics)
   - Bachelor of Science (Environmental) – BSc(Environmental)
   - Bachelor of Science (Marine Science) – BSc(Marine Science)
   - Bachelor of Science (Molecular Biology and Genetics) – BSc(Molecular Biology and Genetics)
   - Bachelor of Science (Molecular Biotechnology) – BSc (Molecular Biotechnology)
   - Bachelor of Science (Nutrition) – BSc(Nutrition)

   The Bachelor of Science is offered in the following designated combined degree courses:
   - Bachelor of Science/Bachelor of Laws – BSc/LLB
   - Bachelor of Science/Bachelor of Arts – BSc/BA
   - Bachelor of Arts/Bachelor of Science – BA/BSc
   - Bachelor of Science/Bachelor of Commerce – BSc/BCom
   - Bachelor of Science/Bachelor of Engineering – BSc/BE
   - Bachelor of Engineering/Bachelor of Science – BE/BSc
   - Bachelor of Education (Secondary: Science)/Bachelor of Science – BEd (Secondary: Science)/BSc
   - Bachelor of Education (Secondary: Mathematics)/ Bachelor of Science – BEd (Secondary: Mathematics)/ BSc
   - Bachelor of Education (Secondary: Science)/Bachelor of Science (Psychology) – BEd (Secondary:Science)/BSc
   - Bachelor of Nursing/Bachelor of Science – BN/BSc
   - Bachelor of Applied Science(Exercise and Sport Science)/ Bachelor of Science (Nutrition) - BApplSc(ESS)/ BSc(Nutrition)
3. Bachelor of Computer Science and Technology – BCST

   The Bachelor of Computer Science and Technology includes the specially designated stream:
   - Bachelor of Computer Science and Technology (Advanced) – BCST(Advanced)
4. Bachelor of Information Technology – BIT
5. Bachelor of Medical Science – BMedSc

   The Bachelor of Medical Science is offered in the following designated combined degree course:
   - Bachelor of Engineering/ Bachelor of Medical Science – BE/ BMedSc
6. Bachelor of Psychology – BPsych
7. Bachelor of Science in Media and Communications – BScMediaCommun

The Faculties of Arts and of Science jointly offer the:

8. Bachelor of Liberal Studies – BLibStud

   The Bachelor of Liberal Studies includes the specially designated stream:
   - Bachelor of Liberal Studies (International) – BLibStud(International)
   - Bachelor of Liberal Studies (Advanced) – BLibStud(Adv)

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

The regulations governing postgraduate award courses can be found in chapter 7.

■ University of Sydney (Coursework) Rule 2000

Preliminary

Rules relating to Coursework Award Courses

Division 1Award course requirements, credit points and assessment
Division 2Enrolment
Division 3Credit, cross-institutional study and their upper limits
Division 4Progression
Division 5Discontinuation of enrolment and suspension of candidature
Division 6Unsatisfactory progress and exclusion
Division 7Exceptional circumstances
Division 8Award of degrees, diplomas and certificates
Division 9Transitional provisions

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

Preliminary

1. Commencement and purpose of Rule

(1) This Rule is made by the Senate pursuant to section 37(1) of The University of Sydney Act 1989 for the purposes of The University of Sydney By-law 1999.

(2) This Rule comes into force on 1 January 2001.

(3) This Rule governs all coursework award courses in the University. It is to be read in conjunction with The University of Sydney (Amendment Act) Rule 1999 and the Resolutions of the Senate and the faculty resolutions relating to each award course in that faculty.

Rules relating to Coursework Award Courses

1. Definitions

In this Rule:

award course means a formally approved program of study which can lead to an academic award granted by the University.

coursework means 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, supervised research, other forms of instruction and learning normally will be dominant. All undergraduate award courses are coursework award courses;

credit means advanced standing based on previous attainment in another award course at the University or at another institution. The advanced standing is expressed as credit points granted towards the award course. Credit may be granted as specific credit or non-specific credit.

Specific credit means the recognition of previously completed studies as directly equivalent to units of study.

Non-specific credit means 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;

credit points mean a measure of value indicating the contribution each unit of study provides towards meeting award course completion requirements stated as a total credit point value;

dean means the dean of a faculty or the director or principal of an academic college or the chairperson of a board of studies;

degree means a degree at the level of bachelor or master for the purpose of this Rule;

embedded courses/programs means award courses in the graduate certificate / graduate diploma / master's degree by coursework sequence which allow unit of study credit points to count in more than one of the awards;

faculty means a faculty, college board, a board of studies or the Australian Graduate School of Management Limited as established in each case by its constitution and in these Rules refers to the faculty or faculties responsible for the award course concerned;

major means a defined program of study, generally comprising specified units of study from later stages of the award course;

minor means a defined program of study, generally comprising units of study from later stages of the award course and requiring a smaller number of credit points than a major;

postgraduate award course means an award course leading to the award of a graduate certificate, graduate diploma, degree of master or a doctorate. Normally, a postgraduate award course requires the prior completion of a relevant undergraduate degree or diploma.

research award course means an award course in which students undertake and report systematic, creative work in order to increase the stock of knowledge. The research award courses offered by the University are: higher doctorate, Doctor of Philosophy, doctorates by research and advanced coursework, and certain degrees of master designated as research degrees. The systematic, creative component of a research award course must comprise at least 66% of the overall award course requirements;

stream means a defined program of study within an award course, which requires the completion of a program of study specified by the award course rules for the particular stream, in addition to the core program specified by award course rules for the award course. *student* means a person enrolled as a candidate for a course;

testamur means a certificate of award provided to a graduate, usually at a graduation ceremony;

transcript or *academic transcript* means a printed statement setting out a student's academic record at the University;

unit of study means the smallest stand-alone component of a student's award course that is recordable on a student's transcript. Units of study have an integer credit point value, normally in the range 3-24;

undergraduate award course means an award course leading to the award of an associate diploma, diploma, advanced diploma or degree of bachelor.

2. Authorities and responsibilities

(1) Authorities and responsibilities for the functions set out in this Rule are also defined in the document Academic Delegations of Authority. The latter document sets out the mechanisms by which a person who has delegated authority may appoint an agent to perform a particular function.

(2) The procedures for consideration of, and deadlines for submission of, proposals for new and amended award courses will be determined by the Academic Board.

Division 1: Award course requirements, credit points and assessment

3. Award course requirements

(1) To qualify for the award of a degree, diploma or certificate, a student must:
- (a) complete the award course requirements specified by the Senate for the award of the degree, diploma or certificate concerned;
- (b) complete any other award course requirements specified by the Academic Board on the recommendation of the faculty and published in the faculty resolutions relating to the award course;
- (c) complete any other award course requirements specified by the faculty in accordance with its delegated authority and published in the faculty resolutions relating to the award course; and
- (d) satisfy the requirements of all other relevant –by-laws, rules and resolutions of the University.

4. Units of study and credit points

(1) (a) A unit of study comprises the forms of teaching and learning approved by a faculty. Where the unit of study is being provided specifically for an award course which is the responsibility of another faculty, that faculty must also provide approval.

(b) Any faculty considering the inclusion of a unit of study in the tables of units available for an award course for which it is responsible may review the forms of teaching and learning of that unit, may consult with the approving faculty about aspects of that unit and may specify additional conditions with respect to inclusion of that unit of study.

(2) A student completes a unit of study if the student:
- (a) participates in the learning experiences provided for the unit of study;
- (b) meets the standards required by the University for academic honesty;
- (c) meets all examination, assessment and attendance requirements for the unit of study; and
- (d) passes the required assessments for the unit of study.

(3) Each unit of study is assigned a specified number of credit points by the faculty responsible for the unit of study.

(4) The total number of credit points required for completion of an award course will be as specified in the Senate resolutions relating to the award course.

(5) The total number of credit points required for completion of award courses in an approved combined award course will be specified in the Senate or faculty resolutions relating to the award course.

(6) A student may, under special circumstances, and in accordance with faculty resolutions, be permitted by the relevant dean to undertake a unit or units of study other than those specified in the faculty resolutions relating to the award course and have that unit or those units of study counted towards fulfilling the requirements of the award course in which the student is enrolled.

5. Unit of study assessment

(1) A student who completes a unit of study will normally be awarded grades of high distinction, distinction, credit or pass, in accordance with policies established by the Academic Board. The grades high distinction, distinction and credit indicate work of a standard higher than that required for a pass.

(2) A student who completes a unit of study for which only a pass/fail result is available will be recorded as having satisfied requirements.

(3) In determining the results of a student in any unit of study, the whole of the student's work in the unit of study may be taken into account.

(4) Examination and assessment in the University are conducted in accordance with the policies and directions of the Academic Board.

6. Attendance

(1) A faculty has authority to specify the attendance requirements for courses or units of study in that faculty. A faculty must take into account any University policies concerning modes of attendance, equity and disabled access.

(2) A faculty has authority to specify the circumstances under which a student who does not satisfy attendance requirements may be deemed not to have completed a unit of study or an award course.

Division 2: Enrolment

7. Enrolment restrictions

(1) A student who has completed a unit of study towards the requirements of an award course may not re-enrol in that unit of study, except as permitted by faculty resolution or with the written permission of the dean. A student permitted to re-enrol may receive a higher or lower grade, but not additional credit points.

(2) Except as provided in sub-section (1), a student may not enrol in any unit of study which overlaps substantially in content with a unit that has already been completed or for which credit or exemption has been granted towards the award course requirements.

(3) A student may not enrol in units of study additional to award course requirements without first obtaining permission from the relevant dean.

(4) Except as prescribed in faculty resolutions or with the permission of the relevant dean:
- (a) a student enrolled in an undergraduate course may not enrol in units of study with a total value of more than 32 credit points in any one semester, or 16 credit points in the summer session; and
- (b) a student enrolled in a postgraduate award course may not enrol in units of study with a total value of more than 24 credit points in any one semester, or 12 credit points in the summer session.

Division 3: Credit, cross-institutional study and their upper limits

8. Credit for previous studies

(1) Students may be granted credit on the basis of previous studies.

(2) Notwithstanding any credit granted on the basis of work completed or prior learning in another award course at The University of Sydney or in another institution, in order to qualify for an award a student must:
- (a) for undergraduate award courses, complete a minimum of the equivalent of two full-time semesters of the award course at the University; and
- (b) for postgraduate award courses, complete at least fifty percent of the requirements prescribed for the award course at the University.

These requirements may be varied where the work was completed as part of an embedded program at the University or as part of an award course approved by the University in an approved conjoint venture with another institution.

(3) The credit granted on the basis of work completed at an institution other than a university normally should not exceed one third of the overall award course requirements.

(4) A faculty has authority to establish embedded academic sequences in closely related graduate certificate, graduate diploma and master's degree award courses. In such embedded sequences, a student may be granted credit for all or some of the units of study completed in one award of the sequence towards any other award in the sequence, irrespective of whether or not the award has been conferred.

(5) In an award course offered as part of an approved conjoint venture the provisions for the granting of credit are prescribed in the Resolutions of the Senate and the faculty resolutions relating to that award course.

9. Cross-institutional study

(1) The relevant dean may permit a student to complete a unit or units of study at another university or institution and have that unit or those units of study credited to the student's award course.

(2) The relevant dean has authority to determine any conditions applying to cross-institutional study.

Division 4: Progression

10. Repeating a unit of study

(1) A student who repeats a unit of study shall, unless granted exemption by the relevant dean:
- (a) participate in the learning experiences provided for the unit of study; and
- (b) meet all examination, assessment and attendance requirements for the unit of study.

(2) A student who presents for re-assessment in any unit of study is not eligible for any prize or scholarship awarded in connection with that unit of study without the permission of the relevant dean.

11. Time limits

A student must complete all the requirements for an award course within ten calendar years or any lesser period if specified by Resolution of the Senate or the faculty.

Division 5: Discontinuation of enrolment and suspension of candidature

12. Discontinuation of enrolment

(1) A student who wishes to discontinue enrolment in an award course or a unit of study must apply to the relevant dean and will be presumed to have discontinued enrolment from the date of that application, unless evidence is produced showing:
- (a) that the discontinuation occurred at an earlier date; and
- (b) that there was good reason why the application could not be made at the earlier time.

(2) A student who discontinues enrolment during the first year of enrolment in an award course may not re-enrol in that award course unless:
- (a) the relevant dean has granted prior permission to re-enrol; or
- (b) the student is reselected for admission to candidature for that course.

(3) No student may discontinue enrolment in an award course or unit of study after the end of classes in that award course or unit of study, unless he or she produces evidence that:
- (a) the discontinuation occurred at an earlier date; and
- (b) there was good reason why the application could not be made at the earlier time.

(4) A discontinuation of enrolment may be recorded as *Withdrawn (W)* or *Discontinued Not To Count As Failure (DNF)* where that discontinuation occurs within the time-frames specified by the University and published by the faculty, or where the student meets other conditions as specified by the relevant faculty.

13. Suspension of candidature

(1) A student must be enrolled in each semester in which he or she is actively completing the requirements for the award course. A student who wishes to suspend candidature must first obtain approval from the relevant dean.

(2) The candidature of a student who has not re-enrolled and who has not obtained approval from the dean for suspension will be deemed to have lapsed.

(3) A student whose candidature has lapsed must apply for re-admission in accordance with procedures determined by the relevant faculty.

(4) A student who enrols after suspending candidature shall complete the requirements for the award course under such conditions as determined by the dean.

Division 6: Unsatisfactory progress and exclusion

14. Satisfactory progress

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.

15. Requirement to show good cause

(1) For the purposes of this Rule, good cause means circumstances beyond the reasonable control of a student, which may include serious ill health or misadventure, but does not include demands of employers, pressure of employment or time devoted to non-University activities, unless these are relevant to serious ill health or misadventure. In all cases the onus is on the student to provide the University with satisfactory evidence to establish good cause. The University may take into account relevant aspects of a student's record in other courses or units of study within the University and relevant aspects of academic studies at other institutions provided that the student presents this information to the University.

(2) The relevant dean may require a student who has not made satisfactory progress to show good cause why he or she should be allowed to re-enrol.

(3) The dean will permit a student who has shown good cause to re-enrol.

16. Exclusion for failure to show good cause

The dean may, where good cause has not been established:

(1) exclude the student from the relevant course; or

(2) permit the student to re-enrol in the relevant award course subject to restrictions on units of study, which may include, but are not restricted to:
- (a) completion of a unit or units of study within a specified time;
- (b) exclusion from a unit or units of study, provided that the dean must first consult the head of the department responsible for the unit or units of study; and
- (c) specification of the earliest date upon which a student may re-enrol in a unit or units of study.

17. Applying for re-admission after exclusion

(1) A student who has been excluded from an award course or from a unit or units of study may apply to the relevant dean for readmission to the award course or re-enrolment in the unit or units of study concerned after at least 4 semesters, and that dean may readmit the student to the award course or permit the student to re-enrol in the unit or units of study concerned.

(2) With the written approval of the relevant dean, a student who has been excluded may be given credit for any work completed elsewhere in the University or in another university during a period of exclusion.

18. Appeals against exclusion

(1) In this Rule a reference to the Appeals Committee is a reference to the Senate Student Appeals Committee (Exclusions and Readmissions).

(2) (a) (i) A student who has been excluded in accordance with this Rule may appeal to the Appeals Committee.

(ii) A student who has applied for readmission to an award course or re-enrolment in a unit of study after a period of exclusion, and who is refused readmission or re-enrolment may also apply to the Appeals Committee.

(b) The Appeals Committee shall comprise:
(i) 3 ex officio members (the Chancellor, the Deputy Chancellor and the Vice-Chancellor and Principal);
(ii) the Chair and Deputy Chairs of the Academic Board;
(iii) 2 student Fellows; and
(iv) up to 4 other Fellows.

(c) The Appeals Committee may meet as one or more sub-committees providing that each sub-committee shall include at least 1 member of each of the categories of:
(i) ex officio member;
(ii) Chair or Deputy Chair of the Academic Board;
(iii) student Fellow; and
(iv) other Fellows.

(d) Three members shall constitute a quorum for a meeting of the Appeals Committee or a sub-committee.

(e) The Appeals Committee and its sub-committees have authority to hear and determine all such appeals and must report its decision to the Senate annually.

(f) The Appeals Committee or a sub-committee may uphold or disallow any appeal and, at its discretion, may determine the earliest date within a maximum of four semesters at which a student who has been excluded shall be permitted to apply to re-enrol.

(g) No appeal shall be determined without granting the student the opportunity to appear in person before the Appeals Committee or sub-committee considering the appeal. A student so appearing may be accompanied by a friend or adviser.

(h) The Appeals Committee or sub-committee may hear the relevant dean but that dean may only be present at those stages at which the student is permitted to be present. Similarly, the dean is entitled to be present when the Committee or sub-committee hears the student.

(i) If, due notice having been given, a student fails to attend a meeting of the Appeals Committee or sub-committee scheduled to consider that student's appeal, the Appeals Committee or sub-committee, at its discretion, may defer consideration of the appeal or may proceed to determine the appeal.

(j) A student who has been excluded in accordance with these resolutions and has lodged a timely appeal against that exclusion may re-enrol pending determination of that appeal if it has not been determined by the commencement of classes in the next appropriate semester.

Division 7: Exceptional circumstances

19. Variation of award course requirements in exceptional circumstances

The relevant dean may vary any requirement for a particular student enrolled in an award course in that faculty where, in the opinion of the dean, exceptional circumstances exist.

Division 8: Award of degrees, diplomas and certificates

20. Classes of award

(1) Undergraduate diplomas may be awarded in five grades – pass, pass with merit, pass with distinction, pass with high distinction or honours.

(2) Degrees of bachelor may be awarded in two grades – pass or honours.

(3) Graduate diplomas and graduate certificates may be awarded in one grade only – pass.

(4) Degrees of master by coursework may be awarded three grades – pass, pass with merit or honours.

21. Award of the degree of bachelor with honours

(1) The award of honours is reserved to indicate special proficiency. The basis on which a student may qualify for the award of honours in a particular award course is specified in the faculty resolutions relating to the course.

(2) Each faculty shall publish the grading systems and criteria for the award of honours in that faculty.

(3) Classes which may be used for the award of honours are:
First Class
Second Class/Division 1
Second Class/Division 2
Third Class.

(4) With respect to award courses which include an additional honours year:
(a) a student may not graduate with the pass degree while enrolled in the honours year;
(b) on the recommendation of the head of the department concerned, a dean may permit a student who has been awarded the pass degree at a recognised tertiary institution to enrol in the honours year in that faculty;
(c) faculties may prescribe the conditions under which a student may enrol part-time in the honours year;
(d) a student who fails or discontinues the honours year may not re-enrol in it, except with the approval of the dean.

22. University Medal

An honours bachelor's degree student with an outstanding academic record throughout the award course may be eligible for the award of a University medal, in accordance with Academic Board policy and the requirements of the faculty resolutions relating to the award course concerned.

23. Award of the degree of master with honours or merit

The award of honours or pass with merit is reserved to indicate special proficiency or particular pathways to completion. The basis on which a student may qualify for the award of honours or the award with merit in a particular degree is specified in the faculty resolutions relating to that degree.

24. Transcripts and testamurs

(1) A student who has completed an award course or a unit of study at the University will receive an academic transcript upon application and payment of any charges required.

(2) Testamurs may indicate streams or majors or both as specified in the relevant faculty resolutions.

Division 9: Transitional provisions

25. Application of this Rule during transition

This Rule applies to all candidates for degrees, diplomas and certificates who commence candidature after 1 January 2001. Candidates who commenced candidature prior to this date may choose to proceed in accordance with the resolutions of the Senate in force at the time they enrolled, except that the faculty may determine specific conditions for any student who has re-enrolled in an award course after a period of suspension.

■ Bachelor of Science

Resolutions of the Senate

Bachelor of Science

1. These Resolutions of the Senate relate to the degree of Bachelor of Science including its streams:
(a) Bachelor of Science;
(b) Bachelor of Science (Advanced);
(c) Bachelor of Science (Advanced Mathematics);
(d) Bachelor of Science (Bioinformatics);
(e) Bachelor of Science (Environmental);
(f) Bachelor of Science (Marine Science);
(g) Bachelor of Science (Molecular Biology and Genetics);
(h) Bachelor of Science (Molecular Biotechnology);
(i) Bachelor of Science (Nutrition);
and the Combined degree courses:
(j) Bachelor of Science [or BSc(Advanced) or BSc(Advanced Mathematics)]/Bachelor of Laws;
(k) Bachelor of Science [or BSc(Advanced) or BSc(Advanced Mathematics)]/Bachelor of Arts;
(l) Bachelor of Arts/Bachelor of Science [or BSc(Advanced) or BSc(Advanced Mathematics)];
(m) Bachelor of Science [or BSc(Advanced) or BSc(Advanced Mathematics)]/Bachelor of Commerce;
(n) Bachelor of Science [or BSc(Advanced) or BSc(Advanced Mathematics)]/Bachelor of Engineering;
(o) Bachelor of Engineering /Bachelor of Science [or BSc(Advanced) or BSc(Advanced Mathematics)];
(p) Bachelor of Education (Secondary: Science) /Bachelor of Science [or BSc(Advanced) or BSc(Advanced Mathematics)];
(q) Bachelor of Education (Secondary: Mathematics) / Bachelor of Science [or BSc(Advanced) or BSc(Advanced Mathematics)];
(r) Bachelor of Education (Secondary: Science) /Bachelor of Science (Psychology); and

(s) Bachelor of Nursing/Bachelor of Science [or BSc(Advanced) or BSc(Advanced Mathematics)]
(t) Bachelor of Applied Science (Exercise and Sport Science) /Bachelor of Science (Nutrition).

These Resolutions must be read in conjunction with The University of Sydney (Coursework) Rule, which sets out the requirements for all undergraduate courses, and the relevant Faculty Resolutions.

Requirements for the Pass degree

2. To qualify for the award of the pass degree students must:
   (1) complete successfully units of study giving credit for a total of 144 credit points; and
   (2) satisfy the requirements of all other relevant By-Laws, Rules and Resolutions of the University.

Requirements for the Honours degree

3. To qualify for the award of the honours degree students must complete the honours requirements published in the faculty resolutions relating to the course.

Requirements for the Combined degrees

4. To qualify for the award of the two degrees in a combined degree course students must complete the requirements published in these and the other relevant faculty resolutions relating to the course.

Resolutions of the Faculty

These resolutions must be read in conjunction with The University of Sydney (Coursework) Rule and the Glossary appended to these Faculty Resolutions.

Section 1

Streams

1. The Bachelor of Science degree comprises the following streams:
   (a) Bachelor of Science;
   (b) Bachelor of Science (Advanced);
   (c) Bachelor of Science (Advanced Mathematics);
   (d) Bachelor of Science (Bioinformatics);
   (e) Bachelor of Science (Environmental);
   (f) Bachelor of Science (Marine Science);
   (g) Bachelor of Science (Molecular Biology and Genetics);
   (h) Bachelor of Science (Molecular Biotechnology); and
   (i) Bachelor of Science (Nutrition).
2. A student for the BSc degree in any stream may apply to the Dean for permission to transfer candidature to any other stream.
3. The testamur for the Bachelor of Science shall specify the stream for which it is awarded.

Units of study

4. The units of study, which may be taken for the degree, are set out under Subject areas in Table I and Table VI together with:
   (1) designation as Junior, Intermediate, Senior or Honours and, where appropriate, as Advanced units of study;
   (2) credit point values;
   (3) assumed knowledge, corequisites/prerequisites;
   (4) the semesters in which they are offered; and
   (5) the units of study with which they are mutually exclusive.
5. 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.
6. 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.

Requirements for the Pass Degree

7. To qualify for the award of the degree a student shall complete units of study having a total value of at least 144 credit points, including:
   (1) at least 96 credit points from Science subject areas;
   (2) at least one major from those included in Table I;
   (3) at least 12 credit points from the Science subject areas of Mathematics and Statistics;
   (4) at least 24 credit points of Junior units of study from at least two Science subject areas other than Mathematics and Statistics;
   (5) no more than 60 credit points from Junior units of study; and
   (6) no more than 18 credit points from units of study in which a grade of Pass (Concessional) has been awarded. Pass (Concessional) is the grade returned for a unit of study when the final mark is in the range 46–49. It may be awarded for Junior units of study only.
8. 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. (A major in Psychology requires 16 credit points of Intermediate and 32 credit points of Senior units of study in Psychology). A student may not count a unit of study toward more than one major.
9. 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.
10. Units of study completed at The University of Sydney Summer School which correspond to units of study specified in Section 7 and Section 9 may be credited towards the course requirements.
11. The testamur for the degree of Bachelor of Science shall specify the major(s) completed in order to qualify for the award.

Honours courses

12. There shall be honours courses in all Science subject areas listed in Table VI (Honours units of study).
13. To qualify to enrol in an honours course, students shall:
   (1) (a) have qualified for the award of a pass degree; or
   (b) be a pass graduate of the Faculty of Science; or
   (c) be a pass graduate holding a Bachelor of Science degree or 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 Science units of study; or
   (b) a SCIWAM of at least 58 (or equivalent at another institution); and
   (4) satisfy any additional criteria set by the Head of Department concerned.
14. Students shall complete the requirements for the honours course full-time over two consecutive semesters.
15. 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.
16. 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.
17. The grade of honours and the honours mark are determined by performance in the honours course.
18. 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.
19. A student may not re-attempt an honours course in a single subject area.
20. A student who is qualified to enrol in two honours courses may either:
   (1) complete the honours courses in the two subject areas separately and in succession; or
   (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.

Designated streams

BSc (Advanced)

21. 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 Section 7 with the exception of 7(5) and in addition, except with the permission of the Dean:
   (1) include no more than 48 credit points from Junior units of study;
   (2) include at least 16 credit points of Intermediate units of study at either the Advanced level or as TSP units;

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

(5) 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. 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.

22. 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:

(1) their mark averaged over all attempted units of study is 75 or greater; and

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

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

BSc (Advanced Mathematics)

24. 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 Section 7 except 7(5) and in addition, except with the permission of the Dean:

(1) include no more than 48 credit points from Junior units of study;

(2) include at least 16 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) 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

(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.

(5) 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.

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

(1) their mark averaged over all attempted units of study is 75 or greater; and

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

Other streams

26 (1). In order to qualify for the award of the pass degree in the following streams, a student shall, except with the permission of the Dean, complete the requirements for the BSc degree in Section 7 with the exception of 7(2) and complete the units of study set out in the respective Tables of Undergraduate units of study:

(a) Bioinformatics Table IA;

(b) Environmental Table IB;

(c) Marine Science Table IC;

(d) Molecular Biology & Genetics Table ID;

(e) Molecular Biotechnology Table IE; or

(2). 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 Sections 7 and 16 and complete the units of study set out in Table 1F.

Combined degrees

Science/Law: Faculty Resolutions

27. 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).

28. To qualify for the award of the pass degree in the BSc degree a student shall complete 96 credit points from Science units of study set out in Table I and 48 credit points from Law units of study set out in Table II, including:

(1) at least 12 credit points from the Science subject areas of Mathematics and Statistics;

(2) 24 credit points of Junior units of study from at least two Science subject areas other than Mathematics or Statistics;

(3) 60 credit points of Intermediate/Senior units of study in Science subject areas; and

(4) a major in a Science area.

29. 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 in Section 28 and in addition, except with the permission of the Dean:

(1) include at least 16 credit points of Intermediate units of study at either the Advanced level or as TSP units;

(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) 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) 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.

30. Except with the permission of the Dean of Law, a student may not enrol in any of the Intermediate or Senior units of study in Table II until the units of study LAWS 1006 Legal Institutions LAWS 1010 Torts are completed.

31. Students who qualify to undertake honours in the BSc degree may elect to do so either:

(1) by suspending candidature from the Bachelor of Laws degree (including the combined Science/Law courses) for one year, with the permission of the Faculty of Law; or

(2) after completion of the combined course.

32. Students may abandon the combined degree course and elect to complete either a BSc or LLB in accordance with the resolutions governing those degrees.

33. 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. After that they will be under the general supervision of the Faculty of Law.

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

Science/Commerce: Joint Resolutions

35. 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).

36. 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:

(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 area of Mathematics and Statistics listed in Table I (BSc) not including MATH 1005, MATH 1015 or MATH 1905;

(b) 12 credit points consisting of ECMT 1010 Business and Economic Statistics A and INFS 1000 Foundations of Business Systems;

(c) 12 credit points in Junior units of study from each of Accounting and Economics;

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

(e) at least 96 credit points from Science subject areas;
(2) no more than 100 credit points from Junior units of study;
(3) at least 64 credit points of Senior units of study in Economics and Business subject areas; and
(4) 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.

37. 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 in Section 36 and in addition, except with the permission of the Dean:
(1) include at least 16 credit points of Intermediate units of study at either the Advanced level or as TSP units;
(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) 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) 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.

38. 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.
39. 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.
40. Students will be under the general supervision of the Faculty of Science.
41. The Deans of the Faculties of Economics and Business and Science shall jointly exercise authority in any matter concerning the combined degree program not otherwise dealt with in these resolutions.

Joint Resolutions for BA/BSc and BSc/BA degrees

42. 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 either a BA/BSc or BSc/BA course.
43. 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 in Section 48 or 49 and in addition, except with the permission of the Dean:
(1) include at least 16 credit points of Intermediate units of study at either the Advanced level or as TSP units;
(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) 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) 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.

44. 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.
45. 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.
46. Supervision of all students in the combined degrees will be the responsibility of the Faculty of Science and the Faculty of Arts which will alternate in an agreed pattern.
47. 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.

BA/BSc combined degrees

48. 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:
(1) at least 96 credit points from Science subject areas;
(2) at least 12 credit points from the Science subject areas of Mathematics and Statistics;
(3) at least 24 credit points of Junior units of study from at least two Science subject areas other than Mathematics or Statistics;
(4) no more than 100 credit points from Junior units of study;
(5) a major in a Science area; and
(6) at least 72 credit points of Senior units of study in Arts subject areas from Part A including a major from Part A of the Table of undergraduate units of study in the Faculty of Arts.

BSc/BA combined degrees

49. To qualify for the award of the pass degrees a student normally shall satisfy the requirements for the BA/BSc combined degrees in Section 48 and complete the requirements for the BSc in the first six semesters of enrolment.

Science/Engineering: Joint Resolutions

BE/BSc combined degrees

50. 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.
51. 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:
(1) 96 credit points of units from Science subject areas,
(2) a major in a Science area, and
(3) 162 credit points from units of study prescribed in the BE Specialisation Requirements for the specialisation that the student is pursuing.

52. 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 51:
(1) include at least 56 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;
(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
(3) maintain in Intermediate and Senior Science units of study an average mark of 65 or greater in each year of enrolment.

53. Students who are so qualified may be awarded honours in the BE degree or undertake an honours course in the BSc degree.
54. 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.
55. Students will be under the general supervision of the Faculty of Engineering.
56. The Deans of the Faculties of Engineering and Science shall jointly exercise authority in any matter concerning the combined degrees not otherwise dealt with in these resolutions.

BSc/BE double degrees

57. 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) except as provided in subsection (2), all units of study attempted in the BE degree have been completed with a grade of Pass or better;
(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);
(3) the student is qualified to enrol in a major in a Science area; and
(4) for admission to the Advanced streams, the student satisfies the requirements in Section 21 or 24.

58. 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:
(1) 40 credit points of Intermediate/Senior units of study in Science subject areas; and
(2) a major in a Science area.

59. 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 Sections 57 and 58:

(1) include at least 80 credit points of Intermediate/Senior Science units of study;
(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
(3) maintain in Intermediate and Senior Science units of study an average mark of 65 or greater in each year of enrolment.

60. The requirements of Sections 58 or 59 must be completed in one year of full-time study or two years of part-time study.
61. Students who complete at least 40 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. Students who complete less than 40 credit points may apply to be readmitted to the degree, subject to sections 92–95.
62. Students who are so qualified may undertake an honours course in the BSc in accordance with Sections 12–20.
63. The Deans of the Faculties of Engineering and Science shall jointly exercise authority in any matter concerning the double degree program not otherwise dealt with in these resolutions.

Science/Education: Joint Resolutions

64. A student may proceed concurrently to the degrees of Bachelor of Education and Bachelor of Science, Bachelor of Science (Advanced) or Bachelor of Science (Advanced Mathematics).
65. 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 in Section 70 or 71 and in addition, except with the permission of the Dean:
(1) include at least 16 credit points of Intermediate units of study at either the Advanced level or as TSP units;
(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) 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) 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.

66. 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.
67. 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.
68. Supervision of all students in the combined degrees will be the responsibility of the Faculty of Education.
69. The Deans of the Faculties of Education and Science shall jointly exercise authority in any matter concerning the combined degrees not otherwise dealt with in these resolutions.

BEd(Secondary:Science)/BSc combined degrees

70. To qualify for the award of the pass degrees a student shall complete, over ten semesters, having a total value of at least 240 credit points including:
(1) at least 96 credit points from Science subject areas and 132 credit points from prescribed Education units of study;
(2) at least 12 credit points from the Science subject areas of Mathematics and Statistics;
(3) at least 24 credit points of Junior units of study from at least two Science subject areas other than Mathematics or Statistics;
(4) a major in a Science area;
(5) a major in Education;
(6) at least 32 credit points of units of study in Methods and Practice of Teaching;
(7) 32 credit points in Teaching and Learning including successful completion of the practicum; and
(8) no more than 100 credit points from Junior units of study.

BEd(Secondary:Mathematics)/BSc combined degrees

71. To qualify for the award of the pass degrees a student shall complete, over ten semesters, units of study having a total value of at least 240 credit points including:
(1) at least 96 credit points from Science subject areas and 132 credit points from prescribed Education units of study;
(2) at least 12 credit points from the Science subject areas of Mathematics and Statistics;
(3) at least 24 credit points of Junior units of study from at least two Science subject areas other than Mathematics or Statistics;
(4) a major in the Science area of Mathematics or Statistics;
(5) a major in Education;
(6) at least 32 credit points of units of study in Methods and Practice of Teaching;
(7) 32 credit points in Teaching and Learning including successful completion of the practicum; and
(8) no more than 100 credit points from Junior units of study.

BEd(Secondary)/BSc(Psychology) combined degrees

72. To qualify for the award of the pass degrees a student shall complete, over ten semesters, units of study having a total value of at least 244 credit points including:
Years I to III:
(1) at least 36 credit points from Junior units of study from Science subject areas of which 12 must be in Mathematics and Statistics, 12 in Psychology and 12 in either Chemistry or Physics;
(2) at least 32 credit points from Intermediate units of study from Science subject areas of which 16 must be in Psychology and 16 in Mathematics and Statistics, Physics or Chemistry;
(3) at least 32 credit points from Senior units of study in Psychology; and
(4) at least 48 credit points from prescribed Education units of study;
Years IV and V:
(1) honours in Psychology (or equivalent);
(2) 16 credit points in School Counselling;
(3) at least 16 credit points from prescribed Education units of study; and
(4) at least 16 credit points from the Science subject areas of Mathematics and Statistics, Physics or Chemistry.

Science/Nursing: Joint Resolutions

73. The term Bachelor of Nursing in these joint resolutions means either the Bachelor of Nursing (Pre-registration) or Bachelor of Nursing (Honours).
74. Candidates enrolled the Bachelor of Nursing by block mode are not eligible to undertake study in the combined degree course.
75. A student may proceed concurrently to the degrees of Bachelor Nursing and Bachelor of Science, Bachelor of Science (Advanced) or Bachelor of Science (Advanced Mathematics).
76. To qualify for the award of the pass degrees a student shall complete, over ten semesters, units of study having a total value of at least 240 credit points including:
(1) at least 96 credit points from Science subject areas of which there is:
(a) at least 12 credit points from the Science subject areas of Mathematics and Statistics;
(b) at least 24 credit points of Junior units of study from at least two Science subject areas other than Mathematics or Statistics;
(c) a major in a Science area; and
(d) no more than 60 credit points from Junior Science units of study;
(2) at least 132 credit points of units of study listed in Table 3, for the Bachelor of Nursing; and
(3) at least 12 credit points of electives taken from either the Faculty of Nursing or the Faculty of Science.

77. 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 BN/BSc in Section 76 above and in addition, except with the permission of the Dean:
(1) include at least 16 credit points of Science Intermediate units of study at either the Advanced level or as TSP units;
(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) maintain in Intermediate and Senior units of study in Science subject areas an average mark of 65 or greater in each year of enrolment.

78. To qualify for the award of the pass degree in an Advanced Mathematics stream of the BSc degree, a student shall complete the requirements for the BN/BSc in Section 74 above and in addition, except with the permission of the Dean:
    (1) include at least 16 credit points of Intermediate units of study in the subject areas of Mathematics and Statistics at either the Advanced level or as TSP units;
    (2) include at least 24 credit points of Senior units of study in the subject areas of Mathematics and Statistics at the Advanced level or as TSP units; and
    (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.
79. 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.
80. Students may abandon the combined degree course and elect to complete either a BSc or a BN in accordance with the resolutions governing those degrees.
81. Students will be under the general supervision of the Faculty of Nursing.
82. The Deans of the Faculties of Nursing and Science shall jointly exercise authority in any matter concerning the combined degree program not otherwise dealt with in these resolutions.

Joint Resolutions for Bachelor of Applied Science (Exercise and Sport Science) /Bachelor of Science (Nutrition)

83. A student may proceed concurrently to the degrees of Bachelor of Applied Science (Exercise and Sport Science) and Bachelor of Science (Nutrition).
84. To qualify for the award of the degrees a student shall complete over ten semesters units of study having a total value of at least 240 credit points as specified in Table IF PartE, including
    (1) at least 141 credit points from Science subject areas;
    (2) at least 13 credit points from the Science subject areas of Mathematics and Statistics;
    (3) an Honours year in Nutrition or Nutrition and Dietetics;
    (4) at least 101 credit points of units of study in Exercise and Sport Science listed in Table 9.2 of Faculty Resolutions for the degree of BAppSc(Exercise and Sport Science), Faculty of Health Sciences.
85. A student who does not qualify to undertake year 5 of the combined degree course or who chooses to exit after completing year 4 may:
    (1) 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; or
    (2) 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.
86. A student who so qualifies after completing year 4 of the program 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.
87. After completing at least two semesters in the program 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.
88. 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.
89. The Deans of the Faculties of Health Sciences and Science shall jointly exercise authority in any matter concerning the combined degree program not otherwise dealt with in these resolutions.

Section 2

Enrolment in more/less than minimum load

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

Repeating a unit of study

91. 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.
92. A student may not enrol in a unit of study which they have completed previously with a grade of Pass or better.
93. A student who has been awarded a Pass (Concessional) in a unit of study may repeat that unit but, if subsequently awarded a grade of Pass or better, no further credit points will be gained unless the unit of study previously had not been credited under Section 7(6).

Cross-institutional enrolment

94. 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
    (1) the unit of study content is material not taught in any corresponding unit of study in the University; or
    (2) the student is unable for good reason to attend a corresponding unit of study at the University.

Restrictions on enrolment

95. 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.

Satisfactory progress

96. 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.

Assessment policy

97. Students may be tested by written and oral examinations, exercises, essays or practical work or any combination of these as the Faculty may determine.
98. 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).
99. Heads of Department may arrange for further testing in cases of special consideration, in accordance with Academic Board policy governing illness and misadventure.
100. The award of a Pass (Concessional) in a unit of study entitles the student to be credited with the full number of credit points for that unit of study, provided that the limit on the total credit value specified in Section 7(6) is not exceeded.

Credit Transfer Policy

101. Credit will not be granted for units of study completed more than ten years prior to application, except with the permission of the Dean.
102. 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.
103. 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.
104. 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.

Specific glossary for the BSc

Completion of a unit of study means that the assessment requirements have been satisfied and a grade of Pass (Concessional) or better in Junior units of study or Pass or better in other units of study has been achieved.

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

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).

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.)
Honours unit of study is a 4000 or fourth-year stage unit offered within an honours course.
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.
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. A student may not count a unit of study toward more than one major. (A major in Psychology requires 16 credit points of Intermediate and 32 credit points from Senior units of study in Psychology).
Major in the Faculty of Arts is normally 32 credit points from Senior units of Study in an Arts subject area.
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.
Major in the Faculty of Education is 32 credit points from Senior units of study in the subject area of Education.
Dean means the Dean of Science.
Faculty means the Faculty of Science.
Science subject area means a defined field of study in science.
Degree means the Bachelor of Science.
Requirements means coursework requirements for the award of the degree of Bachelor of Science.
Student means a person enrolled as a candidate for the degree of Bachelor of Science.
TSP means the Talented Student Program in the Faculty of Science.
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 Computer Science and Technology

Resolutions of the Senate

Bachelor of Computer Science and Technology

1. These Resolutions of the Senate relate to the degree of Bachelor of Computer Science and Technology including its streams:
   (a) Bachelor of Computer Science and Technology;
   (b) Bachelor of Computer Science and Technology (Advanced).
   These Resolutions must be read in conjunction with The University of Sydney (Coursework) Rule, which sets out the requirements for all undergraduate courses, and the relevant Faculty Resolutions.

Requirements for the Pass degree

2. To qualify for the award of the pass degree students must:
   (1) complete successfully units of study giving credit for a total of 144 credit points; and
   (2) satisfy the requirements of all other relevant By-Laws, Rules and Resolutions of the University.

Requirements for the Honours degree

3. To qualify for the award of the honours degree students must complete the honours requirements published in the faculty resolutions relating to the course.

Resolutions of the Faculty

These resolutions must be read in conjunction with The University of Sydney (Coursework) Rule, and the Glossary appended to these Faculty Resolutions.

Section 1

Streams

1. The Bachelor of Computer Science and Technology degree comprises the following streams:
   (a) Bachelor of Computer Science and Technology; and
   (b) Bachelor of Computer Science and Technology (Advanced).
2. A student for the BCST degree in any stream may apply to the Dean for permission to transfer candidature to any other stream.
3. The testamur for the Bachelor of Computer Science and Technology shall specify the stream for which it is awarded.

Units of study

4. The units of study, which may be taken for the degree, are those that may be taken for the degree of Bachelor of Information Technology, the tables for which indicate:
   (1) designation as Junior, Intermediate, Senior or Honours and, where appropriate, as Advanced units of study;
   (2) credit point values;
   (3) assumed knowledge, corequisites/prerequisites;
   (4) the semesters in which they are offered; and
   (5) the units of study with which they are mutually exclusive.
5. 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 III.
6. 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 Information Technology, shall satisfy the prerequisites, corequisites and other requirements prescribed for such units of study.

Requirements for the Pass degree

7. To qualify for the award of the degree a student shall complete units of study having a total value of at least 144 credit points, of which:
   (1) at least 92 credit points are from Table III associated with the degree of Bachelor of Information Technology, including:
      (a) at least 20 credit points from III (i);
      (b) at least 8 credit points from III (ii);
      (c) at least 36 credit points from III (iv) and/or III (v); and
      (d) at least 8 credit points from Table III (v);
   (2) at least 16 credit points are from the Science subject areas of Mathematics and/or Statistics;
   (3) at least 40 credit points are from units which have codes starting other than INFO, COMP, ISYS, MULT, NETS, SOFT;
   (4) no more than 18 credit points are from units of study in which a grade of Pass (Concessional) has been awarded. Pass (Concessional) is the grade returned for a unit of study when the final mark is in the range 46–49. It may be awarded for Junior units of study only; and
   (5) at most 72 credit points are from Junior units
8. A major in an Information Technology subject area requires completion of units of study as specified in Table IIIA associated with the degree of Bachelor of Information Technology. The testamur for the degree of Bachelor of Computer Science and Technology shall specify any majors completed.
9. Units of study completed at The University of Sydney Summer School which correspond to units of study specified in Section 7 may be credited towards the course requirements.

Honours courses

10. There shall be honours courses in Computer Science and Information Systems. With permission of the Dean, candidates may be allowed to complete an Honours course available in the Faculties of Science, Arts or Economics, provided that the candidate's plan of study is appropriate for the degree.
11. To qualify to enrol in an honours course, students shall:
    (1) (a) have qualified for the award of a pass degree; or
        (b) be a pass graduate of the Faculty of Science; or
        (c) be a pass graduate holding a Bachelor of Science degree or equivalent qualification from another institution;
    (2) have completed a minimum of 24 credit points of units of study from Table III(iv) and/or III(v) associated with the degree of Bachelor of Information Technology (or equivalent at another institution);
    (3) have achieved either a credit average in the relevant units of study used to satisfy Section 11 (2) above, or a SCIWAM of at least 58; and
    (4) satisfy any additional criteria set by the Head of Department concerned.
12. Students shall complete the requirements for the honours course full-time over two consecutive semesters.

13. 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.
14. To qualify for the award of an honours degree, students shall complete while enrolled in an honours course, 48 credit points of honours units of study in the Table of undergraduate units of study, as prescribed by the Head of Department concerned.
15. The grade of honours and the honours mark are determined by performance in the honours course.
16. 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.
17. A student may not re-attempt an honours course in a single subject area.
18. A student who is qualified to enrol in two honours courses may either:
    (1) complete the honours courses in the two subject areas separately and in succession; or
    (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.

Designated streams – BCST (Advanced)

19. To qualify for the award of the pass degree in the BCST(Advanced) stream, a student shall complete the requirements for the BCST degree in Section 7 so that except with the permission of the Dean:
    (1) they have completed at least 16 credit points of Intermediate units of study from Table III (i) and/or III (ii) which are at either the Advanced level or as TSP units;
    (2) they have completed at least 24 credit points from Table III (iv) and/or III (v) at either the Advanced level or the Honours level or as TSP units;
    (3) they have completed at least 48 credit points from Senior or Honours units of study; and
    (4) they have maintained in Intermediate and Senior units of study an average mark of 65 or greater in each year of enrolment.
    (5) Candidates who fail to maintain the required credit average will be transferred to candidature for the Bachelor of Computer Science and Technology degree in their next year of enrolment with full credit for the units of study completed as Bachelor of Computer Science and Technology (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 Computer Science and Technology.
20. Students who have completed at least 48 credit points may be permitted to transfer to the BCST (Advanced) stream from the BCST if:
    (1) their mark averaged over all attempted units of study is 75 or greater; and
    (2) they are able to enrol in the required number of Advanced level units or TSP units.

Section 2

Enrolment in more/less than minimum load

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

Repeating a unit of study

22. 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.
23. A student may not enrol in a unit of study which they have completed previously with a grade of Pass or better.
24. A student who has been awarded a Pass (Concessional) in a unit of study may repeat that unit but, if subsequently awarded a grade of Pass or better, no further credit points will be gained unless the unit of study previously had not been credited under Section 7(4).

Cross-institutional enrolment

25. 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:
    (1) the unit of study content is material not taught in any corresponding unit of study in the University; or
    (2) the student is unable for good reason to attend a corresponding unit of study at the University.

Restrictions on enrolment

26. 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.

Satisfactory progress

27. 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.

Assessment policy

28. Students may be tested by written and oral examinations, exercises, essays or practical work or any combination of these as the Faculty may determine.
29. 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).
30. Heads of Department may arrange for further testing in cases of special consideration, in accordance with Academic Board policy governing illness and misadventure.
31. The award of a Pass (Concessional) in a unit of study entitles the student to be credited with the full number of credit points for that unit of study, provided that the limit on the total credit value specified in Section 7 (4) is not exceeded.

Credit transfer policy

32. Credit will not be granted for units of study completed more than ten years prior to application, except with the permission of the Dean.
33. Credit may be granted as specific credit if the unit of study is considered to be directly equivalent to a unit of study in the Table of undergraduate units of study or as non-specific credit.
34. 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.
35. All students, not withstanding any credit transfer, must complete at least 24 credit points from Table III (iv) and/or III (v) at The University of Sydney.

Candidates enrolled before 2001

36. These Resolutions apply to all candidates for the degree enrolling in the BCST after 1 January 2001.
37. A person who has enrolled as a candidate for the degree of BCST before 1 January 2001 shall complete the requirements for the degree in accordance with the Resolutions in force at the time the candidature commenced, provided that the candidate completes the requirements for the degree by 31 December 2003 or such later date as the Faculty may approve in special cases; and that if a unit of study specified in those Resolutions is no longer offered the Faculty may permit the candidate to substitute a unit of study or units of study deemed by the Faculty to be equivalent.

Specific glossary for the BCST

Completion of a unit of study means that the assessment requirements have been satisfied and a grade of Pass (Concessional) or better in Junior units of study or Pass or better in other units of study has been achieved.

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

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).

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.)
Honours unit of study is a 4000 or fourth-year stage unit offered within an honours course.
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.
Major in the Faculty of Science 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. A student may not count a unit of study toward more than one major. (A major in Psychology requires 16 credit points of Intermediate and 32 credit points from Senior units of study in Psychology).
Major in the Faculty of Arts is normally 32 credit points from Senior units of Study in an Arts subject area.
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.
Major in the Faculty of Education is 32 credit points from Senior units of study in the subject area of Education.
Faculty means the Faculty of Science. *Dean* means the Dean of Science
Science subject area means a defined field of study in science.
Degree means the Bachelor of Computer Science and Technology.
Requirements means coursework requirements for the award of the degree of Bachelor of Computer Science and Technology.
Student means a person enrolled as a candidate for the degree of Bachelor of Computer Science and Technology.
TSP means the Talented Student Program in the Faculty of Science.
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 Information Technology

Resolutions of the Senate

Bachelor of Information Technology

1. These Resolutions of the Senate relate to the degree of Bachelor of Information Technology.
   These Resolutions must be read in conjunction with The University of Sydney (Coursework) Rule, which sets out the requirements for all undergraduate courses, and the relevant Faculty Resolutions.

Requirements for the Pass degree

2. To qualify for the award of the pass degree students must:
   (1) complete successfully units of study giving credit for a total of 192 credit points; and
   (2) satisfy the requirements of all other relevant By-Laws, Rules and Resolutions of the University.

Requirements for the Honours degree

3. To qualify for the award of the honours degree students must complete the honours requirements published in the faculty resolutions relating to the course.

Resolutions of the Faculty

These resolutions must be read in conjunction with The University of Sydney (Coursework) Rule and the Glossary appended to these Faculty Resolutions.

Section 1

Units of study

1. The units of study, which may be taken for the degree, are set out in Table III and the Tables of units of study associated with the degrees of BSc, BA, BEc, and BE, all of which tables indicate:
   (1) designation as Junior, Intermediate, Senior or Honours and, where appropriate, as Advanced units of study;
   (2) credit point values;
   (3) assumed knowledge, corequisites/prerequisites;
   (4) the semesters in which they are offered; and
   (5) the units of study with which they are mutually exclusive.
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 III.
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 Information Technology, shall satisfy the prerequisites, corequisites and other requirements prescribed for such units of study.

Requirements for the Bachelor of Information Technology degree

4. 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, of which:
   (1) at least 144 credit points are from Table III, including:
      (a) at least 20 credit points from III (i) with results of Credit or better;
      (b) at least 16 credit points from III (ii) with results of Credit or better;
      (c) at least 72 credit points from III (iv) and/or III (v); and
      (d) either INFO 3600 or INFO 4900;
   (2) at least 16 credit points are from the Science subject areas of Mathematics and/or Statistics;
   (3) at least 40 credit points are from units which have codes starting other than INFO, COMP, ISYS, MULT, NETS, SOFT;
   (4) none are from units of study with grade of PCON;
   (5) at most 72 credit points are from Junior units; and
   (6) at least 84 credit points are from Senior and/or Honours units.
5. A major in the Bachelor of Information Technology normally requires the completion of 24 to 28 credit points of Senior and/or Honours units of study, together with other Junior and Intermediate units, as specified in Table IIIA, except that any unit of study listed may be replaced by another unit which is mutually exclusive with it, for example, an Advanced equivalent:
   (1) a major in Principles of Computer Science – all units listed in Table IIIA(i) as core, and at least 12 credit points from units listed as electives;
   (2) a major in Information Systems – all units listed in Table IIIA(ii) as core, and at least 8 credit points from units listed as electives;
   (3) a major in Multimedia Technology – all units listed in Table IIIA(iii) as core, and at least 16 credit points from units listed as electives;
   (4) a major in Networks and Systems – all units listed in Table IIIA(iv) as core, and at least 8 credit points from units listed as electives;
   (5) a major in Software Development – all units listed in Table IIIA(v) as core, and at least 8 credit points from units listed as electives;
   (6) a major in Digital Design – all units listed in Table IIIA(vi) as core, and at least 8 credit points from units listed as electives; and
   (7) a major in Computational Science – all units listed in Table IIIA(vii) as core and at least 12 credit points from units listed as electives.
   (8) a major in Language Technology* - all units listed in Table IIIA(viii) and 12 credit points from units listed as electives.

   ** Subject to the approval of the Senate of the University of Sydney*
6. It is not necessary to complete the requirements of any major in order to qualify for the award of the degree.
7. Units of study completed at The University of Sydney Summer School which correspond to units of study specified in Section 4 may be credited towards the course requirements.
8. The testamur for the degree of Bachelor of Information Technology shall specify the major(s) completed in the degree.

Requirements for the Bachelor of Information Technology (Honours) degree

9. There shall be an honours degree associated with the Bachelor of Information Technology. Entry into the honours degree is only by transfer from the BIT.
10. To qualify to transfer into the Bachelor of Information Technology (Honours) degree, students shall:
    (1) have completed at least 144 credit points from the Bachelor of Information Technology degree;

(2) have completed a minimum of 24 credit points from Table III (iv) and/or III (v), or the equivalent at another institution;
(3) have achieved either a credit average in the relevant units of study used to satisfy 10(2) above, or a SCIWAM of at least 58; and
(4) satisfy any additional criteria set by the Head of Department concerned.

11. Once enrolled in the BIT (Honours) course, students shall complete the requirements for the honours course full-time, over two consecutive semesters.
12. 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.
13. To qualify for the award of the Bachelor of Information Technology (Honours) degree, students shall complete 192 credit points as outlined in Section 4, including 42 credit points from Honours level units, including INFO 4990, INFO 4991, INFO 4992 and INFO 4999, with a result of at least 65 in INFO 4999.
14. The degree of Bachelor of Information Technology (Honours) shall recognise the same majors as the BIT. The testamur shall specify the major(s) completed in qualifying for the award. These majors will be noted independently from the grade of honours awarded.
15. The grade of honours and the honours mark are determined by performance in all Honours level units attempted.
16. 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.
17. A student may not re-attempt the Bachelor of Information Technology (Honours) course. However, students who fail to meet the requirements for the award of honours and who have not already satisfied the requirements of the BIT may elect to transfer back to the BIT.
18. A student who is qualified to enrol in two honours courses may either:
(1) complete the honours courses in the two subject areas separately and in succession; or
(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.

Transfer between the BIT and other degrees

19. Students who have completed at least 48 credit points may be permitted to transfer to the Bachelor of Information Technology degree from other degree programs, if their mark averaged over all attempted units of study is 70 or greater. A quota may apply to the number of students allowed to transfer into the BIT in a given calendar year.
20. Students enrolled in the Bachelor of Information Technology who have satisfied the requirements of the BSc, BSc (Adv), BCST or BCST (Adv) degrees, or with permission of the Dean, may elect to discontinue their enrolment in the Bachelor of Information Technology degree and graduate with the BSc, BSc (Adv), BCST or BCST (Adv) degree, as appropriate.

Section 2

Enrolment in more/less than minimum load

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

Repeating a unit of study

22. 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.
23. A student may not enrol in a unit of study which they have completed previously with a grade of Pass or better.

Cross-institutional enrolment

24. 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:
(1) the unit of study content is material not taught in any corresponding unit of study in the University; or
(2) the student is unable for good reason to attend a corresponding unit of study at the University.

Restrictions on enrolment

25. 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.

Satisfactory progress

26. 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.

Assessment policy

27. Students may be tested by written and oral examinations, exercises, essays or practical work or any combination of these as the Faculty may determine.
28. 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).
29. Heads of Department may arrange for further testing in cases of special consideration, in accordance with Academic Board policy governing illness and misadventure.

Credit transfer policy

30. Credit will not be granted for units of study completed more than ten years prior to application, except with the permission of the Dean.
31. 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 III, or as non-specific credit.
32. 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.
33. All students, notwithstanding any credit transfer, must complete at least 48 credit points of units from Table III(iv) and/or III (v) at The University of Sydney.

Specific glossary for the BIT

Completion of a unit of study means that the assessment requirements have been satisfied and a grade of Pass or better has been achieved.
Junior unit of study is a 1000 or first-year stage unit.
Intermediate unit of study is a 2000 or second-year stage unit.
Senior unit of study is a 3000 or third-year stage unit.
Honours unit of study is a 4000 or fourth-year stage unit offered within an honours course.
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.
Dean means the Dean of Science.
Faculty means the Faculty of Science.
Science subject area means a defined field of study in science.
Degree means the Bachelor of Information Technology.
Requirements means coursework requirements for the award of the degree of Bachelor of Information Technology.
Student means a person enrolled as a candidate for the degree of Bachelor of Information Technology.
TSP means the Talented Student Program in the Faculty of Science.
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

Resolutions of the Senate

Bachelor of Medical Science

1. These Resolutions of the Senate relate to the Bachelor of Medical Science and the Combined degree course:
(a) Bachelor of Engineering/Bachelor of Medical Science

These Resolutions must be read in conjunction with The University of Sydney (Coursework) Rule, which sets out the requirements for all undergraduate courses, and the relevant Faculty Resolutions.

Requirements for the Pass degree

2. To qualify for the award of the pass degree students must:
   (1) complete successfully units of study giving credit for a total of 144 credit points; and
   (2) satisfy the requirements of all other relevant By-Laws, Rules and Resolutions of the University.

Requirements for the Honours degree

3. To qualify for the award of the honours degree students must complete the honours requirements published in the faculty resolutions relating to the course.

Requirements for the Combined degrees

4. To qualify for the award of the two degrees in the combined degree course students must complete the requirements published in these and the other relevant faculty resolutions relating to the course.

Resolutions of the Faculty

These resolutions must be read in conjunction with The University of Sydney (Coursework) Rule and the Glossary appended to these Faculty Resolutions.

Section 1

Units of study

1. The units of study, which may be taken for the degree, are set out in Table IV together with:
   (1) designation as Junior, Intermediate, Senior and Honours and, where appropriate, as an Advanced unit of study;
   (2) credit point value;
   (3) assumed knowledge, qualifying units, corequisites and prerequisites;
   (4) the semester in which they are offered; and
   (5) the units of study with which they are mutually exclusive.
2. A student may enrol, in accordance with Section 4(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.
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 the Tables of Undergraduate units of study

Requirements for the Pass degree

4. In order to qualify for the award of the degree a student shall complete units of study having a total value of at least 144 credit points, including:
   (1) at least 48 credit points from Junior units of study, comprising 12 credit points each from Biology, Chemistry, Mathematics and Physics; with the permission of the Faculty 12 credit points of Biology may be replaced with Junior units of study in Computer Science or Psychology;
   (2) no more than 60 credit points from Junior units of study
   (3) 40 credit points of Intermediate core units of study listed in Table IV;
   (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 listed in Table IV;
   (5) no more than 20 credit points from units of study other than those specified in Table IV.
5. Units of study taken at The University of Sydney Summer School which correspond to units of study specified in Section 4 may be credited towards the course requirements.

Honours courses

6. There shall be honours courses in Science subject areas listed in Table IV D (Bachelor of Medical Science Honours units of study).
7. In order to qualify to enrol in an honours course, students shall:
   (1) either:
      (a) have qualified for the award of the pass degree; or
      (b) be a pass graduate in Medical Science of the Faculty of Science; or
      (c) be a pass graduate holding a Bachelor of Medical Science degree or 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 Science units of study; or
      (b) a SCIWAM of at least 58 (or equivalent at another institution); and
   (4) satisfy any additional criteria set by the Head of Department concerned.
8. Students shall complete the requirements for the course full-time over two consecutive semesters.
9. 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.
10. 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.
11. The grade of honours and the honours mark are determined by performance in the honours course.
12. 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.
13. A student who is qualified to enrol in two honours courses may either:
   (1) complete the honours courses in the two subject areas separately and in succession; or
   (2) complete a joint honours course, equivalent to an honours course in a single subject area, in the two subject areas.
14. A student may not re-attempt an honours course in a single subject area.

Combined degree – Bachelor of Engineering/Bachelor of Medical Science

15. A student may proceed concurrently to the degrees of Bachelor of Engineering (in any specialisation except Civil Engineering) and Bachelor of Medical Science.
16. To qualify for the award of the pass degree a student shall complete units of study having a total value of at least 240 credit points including:
   (1) at least 160 credit points from prescribed Engineering units of study (this total to include the 12 credit points from the Interdisciplinary Thesis);
   (2) 40 credit points of Intermediate core units of study listed in Table IV for the Bachelor of Medical Science;
   (3) at least 24 credit points of Senior units of study from the subject areas listed in Table IV; and
   (4) 12 credit points from the Interdisciplinary Thesis.
17. Students who are so qualified may be awarded honours in the BE degree or undertake an honours course in the BMedSc degree.
18. 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.
19. Students will be under the general supervision of the Faculty of Engineering.
20. The Deans of the Faculties of Engineering and Science shall jointly exercise authority in any matter concerning the combined degrees not otherwise dealt with in these resolutions.

Section 2

Repeating a unit of study

21. 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.
22. A student may not enrol in a unit of study which they have completed previously with a grade of Pass or better.

Cross-institutional enrolment

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

Restrictions on enrolment

24. Except with the permission of the Dean, candidates may not enrol in an Intermediate core unit of study:
    (1) until they have completed all the Junior units of study prescribed by the Faculty as qualifying units of study as set out in Table IV; and
    (2) unless they are also attempting corequisite units of study as set out in Table IV.
25. Except with the permission of the Dean, candidates may not enrol in a Senior unit of study:
    (1) until they have gained credit for at least 32 credit points from core Intermediate units of study; and
    (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.
26. Enrolment in some Senior units of study may be subject to a quota.
27. In satisfying the requirements of Section 4(3) a student may not enrol in units of study which overlap substantially in content with units of study listed in Table IV.
28. A student may not enrol without first obtaining permission from the Dean in:
    (1) additional units of study once the degree requirements of 144 credit points have been satisfied; or
    (2) units of study which may not be counted towards the course requirements.

Satisfactory progress

29. If a student fails or discontinues enrolment in one unit of study twice, the student may be asked to show good cause why he or she should be allowed to re-enrol in that unit of study.

Assessment policy

30. Students may be tested by written and oral examinations, exercises, essays or practical work or any other form that the Faculty may determine.
31. Where a unit of study is offered at different levels of diffculty, 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 levels.
32. Heads of Department may arrange for further testing in cases of special consideration, in accordance with Academic Board policy governing illness and misadventure.

Credit transfer policy

33. Credit will not be granted for units of study completed more than ten years prior to application, except with the permission of the Dean.
34. Advanced standing may be granted as specific credit if the unit of study is considered by the Faculty to be directly equivalent to a unit of study in Table IV, or as nonspecific credit.
35. The total credit point value of the advanced standing may not be greater than 96 credit points and may not include more than 48 credit points of units from other degrees which have been conferred, or for which credit is maintained in another degree program.
36. All students, notwithstanding any credit transfer, must enrol in at least 36 credit points of Senior units of study from Table IV.

Candidates enrolled before 2000

37. These Resolutions apply to all candidates for the degree enrolling in units of study after 1 January 2000.
38. A person who has enrolled as a candidate for the degree of Bachelor of Medical Science before 1 January 2000 may complete the requirements for the degree in accordance with the Resolutions in force at the time the candidature commenced, provided that the candidate completes the requirements for the degree by 31 December 2002 or such later date as the Faculty may approve in special cases; and that if a unit of study specified in those Resolutions is no longer offered the Faculty may permit the candidate to substitute a unit of study or units of study deemed by the Faculty to be equivalent.
39. Where a candidate proceeding pursuant to Section 38 fails to complete the requirements for the degree by 31 December 2002 the candidate shall complete the requirements for the degree under such conditions as may be determined from time to time by the Dean.

Specific glossary for the BMedSc

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

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.

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.

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

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.

Dean means the Dean of Science.

Faculty means to the Faculty of Science.

Pass (Concessional) is not an available grade in the Bachelor of Medical Science

Degree means the Bachelor of Medical Science.

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

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

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

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

Resolutions of the Senate

Bachelor of Psychology

1. These Resolutions of the Senate relate to the Bachelor of Psychology.
   These Resolutions must be read in conjunction with The University of Sydney (Coursework) Rule, which sets out the requirements for all undergraduate course, and the relevant Faculty Resolutions.

Requirements for the degree

2. To qualify for the award of the degree students must:
   (1) complete successfully units of study giving credit for a total of 144 credit points;
   (2) complete successfully an additional 48 credit points from the fourth year (Honours) units of study in the Science subject area of Psychology; and
   (3) satisfy the requirements of all other relevant By-Laws, Rules and Resolutions of the University.

Resolutions of the Faculty

These resolutions must be read in conjunction with The University of Sydney (Coursework) Rule and the Glossary appended to these Faculty Resolutions.

Section 1

Units of study

1. The units of study, which may be taken for the degree, are set out under Subject areas in Table I together with:
   (1) designation as Junior, Intermediate, Senior or Honours and, where appropriate, as Advanced units of study;
   (2) credit point values;
   (3) assumed knowledge, corequisites/prerequisites;
   (4) the semesters in which they are offered; and
   (5) the units of study with which they are mutually exclusive.

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.
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.

Requirements for the degree

4. To qualify for the award of the degree a student shall:
   (1) complete units of study having a total value of at least 144 credit points where:
      (a) 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;
      (b) at least 16 credit points are from Intermediate units of study in the Science subject area of Psychology, with an average grade of distinction or better;
      (c) at least 36 credit points are from Senior units of study in the Science subject area of Psychology (including PSYC 3201 and PSYC 3202) and, except with the permission of Faculty, with an average grade of Distinction or better;
      (d) 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. 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.
      (e) at least 96 credit points are from Science subject areas;
      (f) at least 12 credit points are from the Science subject areas of Mathematics and Statistics;
      (g) at least 12 credit points are Junior units of study from Science subject areas other than Psychology and Mathematics and Statistics;
      (h) no more than 60 credit points are from Junior units of study; and
      (i) no more than 18 credit points are from units in which a grade of Pass (Concessional) has been awarded. Pass (Concessional) is the grade returned for a unit of study when the final mark is in the range 46–49. It may be awarded for Junior units of study only;
   (2) complete 48 credit points from fourth year (Honours) units of study in the Science subject area of Psychology with a grade of honours.
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.
6. Units of study completed at The University of Sydney Summer School which correspond to units of study specified in Section 4 and Section 5 may be credited towards the course requirements.
7. Students shall complete the requirements for the honours course full-time over two consecutive semesters.
8. 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.
9. The grade of honours and the honours mark are determined by performance in the honours course.
10. 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.
11. A student may not re-attempt the Psychology honours course.

Section 2

Enrolment in more/less than minimum load

12. A student may not enrol without first obtaining permission from the Dean in
   (1) additional units of study once the degree requirements of 144 credit points have been satisfied, or
   (2) units of study which may not be counted towards the course requirements.

Repeating a unit of study

13. 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.
14. A student may not enrol in a unit of study which they have completed previously with a grade of Pass or better.
15. A student who has been awarded a Pass (Concessional) in a unit of study may repeat that unit but, if subsequently awarded a grade of Pass or better, no further credit points will be gained unless the unit of study previously had not been credited under Section 4(1)(i).

Cross-institutional enrolment

16. 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:
   (1) the unit of study content is material not taught in any corresponding unit of study in the University; or
   (2) the student is unable for good reason to attend a corresponding unit of study at the University.

Restrictions on enrolment

17. 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.

Satisfactory progress

18. 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.

Assessment policy

19. Students may be tested by written and oral examinations, exercises, essays or practical work or any combination of these as the Faculty may determine.
20. 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).
21. Heads of department may arrange for further testing in cases of special consideration, in accordance with Academic Board policy governing illness and misadventure.
22 The award of a Pass (Concessional) in a unit of study entitles the student to be credited with the full number of credit points for that unit of study, provided that the limit on the total credit value specified in Section 4(1)(i) is not exceeded.

Credit transfer policy

23. Credit will not be granted for units of study completed more than nine years prior to application, except with the permission of the Dean.
24. 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.
25. 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.
26. All students, notwithstanding any credit transfer, must complete at least 36 credit points of Senior Psychology units (as outlined in 4(1)(c)) at The University of Sydney.

Specific glossary for the BPsych

Completion of a unit of study means that the assessment requirements have been satisfied and a grade of Pass (Concessional) or better in Junior units of study or Pass or better in other units of study has been achieved.

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.

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).

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.)
Honours unit of study is a 4000 or fourth-year stage unit offered within an honours course.
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.
Major in the Faculty of Science 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. A student may not count a unit of study toward more than one major. (A major in Psychology requires 16 credit points of Intermediate and 32 credit points from Senior units of study in Psychology).
Dean means the Dean of Science.
Faculty means the Faculty of Science.
Science subject area means a defined field of study in science.
Degree means the Bachelor of Psychology.
Requirements means coursework requirements for the award of the degree of Bachelor of Psychology.
Student means a person enrolled as a candidate for the degree of Bachelor of Psychology.
TSP means the Talented Student Program in the Faculty of Science.
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 Liberal Studies

Resolutions of the Senate

Bachelor of Liberal Studies

1. These Resolutions of the Senate relate to the Bachelor of Liberal Studies including its streams:
   (a) Bachelor of Liberal Studies; and
   (b) Bachelor of Liberal Studies (International); and
   (c) Bachelor of Liberal Studies (Advanced).
   These Resolutions must be read in conjunction with The University of Sydney (Coursework) Rule, which sets out the requirements for all undergraduate courses, and the relevant Faculty Resolutions.

Requirements for the Pass degree

2. To qualify for the award of the degree students must:
   (1) complete successfully units of study giving credit for a total of 192 credit points; and
   (2) satisfy the requirements of all other relevant By-Laws, Rules and Resolutions of the University.

Requirements for the Honours degree

3. To qualify for the award of the honours degree students must complete the honours requirements published in the faculty resolutions relating to the course.

Resolutions of the Faculties of Arts and Science

These resolutions must be read in conjunction with The University of Sydney (Coursework) Rule and the glossary appended to these Faculty resolutions.

Section 1

Authority of the Deans

1. The Deans of Arts and Science shall jointly exercise authority in any matter concerning the Bachelor of Liberal Studies degree not otherwise dealt with in the Resolutions of the Senate or these resolutions.

Streams

2. The Bachelor of Liberal Studies degree comprises the following streams:
   (a) Bachelor of Liberal Studies; and
   (b) Bachelor of Liberal Studies (International); and
   (c) Bachelor of Liberal Studies (Advanced).
3. A student for the BLibStud degree in any stream may apply to the Deans of Arts and Science for permission to transfer candidature to any other stream.
4. The testamur for the Bachelor of Bachelor of Liberal Studies shall specify the stream for which it is awarded.

Units of study

5. The units of study, which may be taken for the degree, are set out under subject areas in Table I for the Bachelor of Science and the Tables of units of study for the degree of Bachelor of Arts, including:
   (1) designation as Junior, Intermediate, Senior or Honours and, where appropriate, as Advanced units of study;
   (2) credit point values;
   (3) assumed knowledge, corequisites/prerequisites;
   (4) the semesters in which they are offered; and
   (5) the units of study with which they are mutually exclusive.
6. The Deans of Arts and Science may permit a student of exceptional merit who is admitted to the Talented Student Program to undertake a unit or units of study other than those specified in Table I for the Bachelor of Science.
7. 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 Liberal Studies, shall satisfy the prerequisites, corequisites and other requirements prescribed for such units of study.

Requirements for the Pass degree

8. 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:
   (1) at least 120 Intermediate or Senior credit points;
   (2) at least one Arts major and one Science major;
   (3) at least 28 credit points, including 16 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;
   (4) 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;
   (5) a minimum of 6 credit points from units of study in Mathematics and Statistics; and
   (6) no more than 18 credit points from units in which a grade of Pass (Concessional) has been awarded. Pass (Concessional) is the grade returned for a unit of study when the final mark is in the range 46–49. It may be awarded for Junior units of study only.
9. Unless otherwise defined, a major shall consist of units of study taken in a single subject area from Part A of the Table of units of study for the Bachelor of Arts or from Table I for the Bachelor of Science.
10. A major in an Arts subject area requires 32 credit points from Senior units of study in an Arts subject area listed in Part A of the Table of units of study for the Bachelor of Arts, including any units of study specified in the Table of units of study as compulsory for that major, or of at least 16 senior credit points from a Part A subject area combined with no more than 16 senior credit points from units of study approved by the Dean of the Faculty of Arts for cross-listing with the major, except in the case of Asian Studies, Medieval Studies, and European Studies where the entire major may be cross-listed and in such other subject areas as may be approved by the Dean of the Faculty of Arts.
11. A major in a Science area normally requires the completion of 24 credit points of Senior units of study in that area, including any units of study specified in Table I as compulsory for that major. (A major in Psychology requires 16 credit points of Intermediate and 32 credit points of Senior units of study in Psychology). A student may not count a unit of study toward more than one major.
12. Candidates shall nominate their choice of majors no later than the beginning of the fifth semester of candidature, but with the permission of the Deans of Arts and Science as appropriate, may change the majors during the candidature.
13. A maximum of 28 credit points may be counted towards the degree requirements from units of study offered by faculties other than the Faculties of Arts and Science and in addition to those listed in Part B of the Table of units of study for the Bachelor of Arts.
14. Units of study completed at The University of Sydney Summer School which correspond to units of study specified in Section 8 and Section 13 may be credited towards the course requirements.

15. The testamur for the degree of Bachelor of Liberal Studies shall specify the majors completed in order to qualify for the award.

Award of the degree

16. (1) A weighted average mark (WAM) will be calculated for each candidate as an overall measure of the performance in the degree Bachelor of Liberal Studies. The WAM 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 as follows:

$$WAM = \frac{\sum(W_c \times M_c)}{\sum(W_c)}$$

where Wc is the weighted credit point value - ie, the product of the credit point value and level of weighting of 2 for 2000-2999 units of study and 3 for 3000-3999 units of study and 4000-4999 units of study; where Mc is the mark
out of 100 for the unit of study.

(2) The degree shall be awarded with the following grades, as determined by the Deans of Arts and Science on the basis of the WAM:
(a) High Distinction
(b) Distinction
(c) Credit
(d) Pass.

Honours courses

17. There shall be honours courses in all Science subject areas and in the Arts subject areas offering honours (4000-level) units as indicated in the Table of units of study.

18. To qualify to enrol in an honours course, students shall:
(1) (a) have completed the requirements for the award of the Bachelor of Liberal Studies with the grade of Credit; or
(b) be a pass graduate holding an equivalent qualification from another institution;
(2) have completed a major at credit average in the subject area relating to the intended honours course (or equivalent at another institution);
(3) satisfy any additional criteria set by the Head or Chair of Department concerned.

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

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

21. To qualify for the award of an honours degree, students shall complete 48 credit points of honours units of study in the Table of units of study for the Bachelor of Arts or in Table VI for the Bachelor of Science, as prescribed by the Head or Chair of Department concerned.

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

23. A student with an honours mark of 90 or greater in an honours subject area shall, if deemed to be of sufficient merit by the Deans of Arts and Science, receive a bronze medal.

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

25. A student who is qualified to enrol in two honours courses may either:
(1) complete the honours courses in the two subject areas separately and in succession; or
(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 Deans of Arts and Science.

Designated Streams – Bachelor of Liberal Studies (International)

26. To qualify for the award of the pass degree in the Bachelor of Liberal Studies (International) stream, a student must complete the requirements for the Bachelor of Liberal Studies degree in Section 8 and in addition, except with the permission of the Deans of Arts and Science, include at least the equivalent of 24 credit points from units of study taken over a minimum of one semester while enrolled as an exchange student at an overseas university which has an exchange agreement with The University of Sydney.

27. To qualify to participate in an exchange program a student must have:
(1) completed at least the equivalent of two semesters of full-time study (normally a minimum of 48 credit points completed towards the Bachelor of Liberal Studies); and
(2) maintained an average mark of 65 or greater over all units of study completed.

28. During the period of their exchange program a student must be enrolled as a full-time student in the Bachelor of Liberal Studies 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 degree.

29. Except as specified in these resolutions, students will comply with the rules of and be under the administration of The University of Sydney's Exchange Program.

30. Students who have completed at least 48 credit points may be permitted 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 65 or greater; and
(2) they are able to qualify for participation in the exchange program.

31. 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.

Bachelor of Liberal Studies (Advanced)

32. To qualify for the award of the pass degree in the Bachelor of Liberal Studies (Advanced) stream, a student must complete the requirements for the Bachelor of Liberal Studies degree in Section 8 and in addition, except with the permission of the Deans of Arts and Science, either
(1) from units in the Faculty of Science:
(a) include at least 16 credit points of Intermediate units of study at either the Advanced level or as TSP units;
(b) 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
(c) maintain in Intermediate and Senior units of study in Science subject areas an average mark of 65 or greater in each year of enrolment.
(2) from units in the Faculty of Arts:
(a) include a minimum of 32 credit points and a maximum of 64 credit points in total from designated 'Advanced' units of study
(b) include a maximum of 32 credit points from 'Advanced' units of study from any one subject area; and
(c) maintain a credit average across all units of study attempted in each calendar year

33. 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.

34. Students who have completed at least 48 credit points may be permitted to transfer from the Bachelor of Liberal Studies to the Bachelor of Liberal Studies (Advanced) stream if:
(1) their mark averaged over all attempted units of study is 75 or greater; and
(2) they are able to enrol in the required number of Advanced level units or TSP units.

Transfer to candidature for the Bachelor of Arts or the Bachelor of Science

35 Candidates 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.

36 Candidates 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.
37 Candidates 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.
38 If a candidate for the degree 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.
39 The maximum enrolment in a single Arts subject area is 18 junior credit points and 64 senior credit points.

Section 2

Enrolment in more/less than minimum load

40.A student may not enrol without first obtaining permission from the Deans of Arts and Science in additional units of study once the degree requirements of 192 credit points have been satisfied.

Repeating a unit of study

41 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 or Chair of Department concerned may exempt the student from certain requirements of the unit of study if satisfied that the relevant competence has been demonstrated.
42 A student may not enrol in a unit of study which they have completed previously with a grade of Pass or better.
43 A student who has been awarded a Pass (Concessional) in a unit of study may repeat that unit but, if subsequently awarded a grade of Pass or better, no further credit points will be gained unless the unit of study previously had not been credited because of the provisions of Section 8(6).

Cross-institutional enrolment

44.Provided that permission has been obtained in advance, the Deans of Arts and Science 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:
(1) the unit of study content is material not taught in any corresponding unit of study in the University; or
(2) the student is unable for good reason to attend a corresponding unit of study at the University.

Restrictions on enrolment

45.Units of study which overlap substantially in content are noted in the Table of units of study for the Bachelor of Arts and in the Tables of Undergraduate units of study for the Bachelor of Science. 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.

Satisfactory progress

46.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.

Assessment policy

47.Students may be tested by written and oral examinations, exercises, essays or practical work or any combination of these as the Faculties of Arts or Science may determine.
48.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).
49.Heads or Chairs of Department may arrange for further testing in cases of special consideration, in accordance with Academic Board policy governing illness and misadventure.

Credit transfer policy

50.Credit will not be granted for units of study completed more than nine years prior to application, except with the permission of the Deans of Arts and Science.
51.Credit may be granted as specific credit if the unit of study is considered to be directly equivalent to a unit of study in the Table of units of study for the Bachelor of Arts or from Table I for the Bachelor of Science or as non-specific credit.
52.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.
53.All students, notwithstanding any credit transfer, must complete a major from each of the Faculties of Arts and Science taken at The University of Sydney.

Specific glossary for the BLibStud

Completion of a unit of study means that the assessment requirements have been satisfied and a grade of Pass (Concessional) or better in Junior units of study or Pass or better in other units of study has been achieved.
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
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).
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.)
Honours unit of study is a 4000 or fourth-year stage unit offered within an honours course.
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.
Major in the Faculty of Arts is normally 32 credit points from Senior units of Study in an Arts subject area, including any units of study specified in the Table of Units of Study as compulsory for that major.
Major in the Faculty of Science 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. A student may not count a unit of study toward more than one major. (A major in Psychology requires 16 credit points of Intermediate and 32 credit points from Senior units of study in Psychology).
Deans means the Dean of Arts and the Dean of Science.
Faculties means the Faculty of Arts and the Faculty of Science.
Arts subject area means a defined field of study in Arts.
Science subject area means a defined field of study in Science.
Degree means the Bachelor of Liberal Studies.
Requirements means coursework requirements for the award of the degree of Bachelor of Liberal Studies.
Student means a person enrolled as a candidate for the degree of Bachelor of Liberal Studies.
TSP means the Talented Student Program in the Faculty of Science.
WAM means the weighted average mark calculated from the results for all Intermediate and Senior units of study weighted by 2 for 2000 level units and 3 for 3000 and 4000 level units.

■ Bachelor of Science in Media and Communications

Resolutions of the Senate

Bachelor of Science in Media and Communications

1. These Resolutions of the Senate relate to the Bachelor of Science in Media and Communications.

   These Resolutions must be read in conjunction with The University of Sydney (Coursework) Rule, which sets out the requirements for all undergraduate courses, and the relevant Faculty Resolutions.

Requirements for the Pass degree

2. To qualify for the award of the degree students must:
   (1) complete successfully units of study giving credit for a total of 192 credit points; and
   (2) satisfy the requirements of all other relevant By-Laws, Rules and Resolutions of the University.

Requirements for the Honours degree

3. To qualify for the award of the honours degree students must complete the honours requirements published in the faculty resolutions relating to the course.

Resolutions of the Faculty of Science

These resolutions must be read in conjunction with The University of Sydney (Coursework) Rule and the Glossary appended to these Faculty Resolutions.

Section 1

Units of study

1. The units of study, which may be taken for the degree, are set out under subject areas in Table V for the Bachelor of Science in Media and Communications and the Tables of units of study associated with the degrees of BSc, BA, BEc, including:
   (1) designation as Junior, Intermediate, Senior or Honours and, where appropriate, as Advanced units of study;
   (2) credit point values;
   (3) assumed knowledge, corequisites/prerequisites;
   (4) the semesters in which they are offered; and
   (5) the units of study with which they are mutually exclusive.
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 other than those specified in the tables of undergraduate units of study.
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 in Media and Communications, shall satisfy the prerequisites, corequisites and other requirements prescribed for such units of study.

Requirements for the Pass degree

4. 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:
   (1) at least 120 Intermediate or Senior credit points;
   (2) at least one Science major;
   (3) a major in Media and Communications (normally 12 credit points from Junior units and 32 credit points from Senior units in MECO);
   (4) an internship in Science Media and Communications Practice (SCMP) consisting of 16 credit points taken in an approved industry in the fourth year of candidature;
   (5) GOVT 2303, MECO 3003 and MECO 3005;
   (6) 6 credit points from a unit of study in communication and analytical skills (currently ENGL 1005);
   (7) at least 12 credit points from units of study in the areas of Mathematics and Statistics.
5. A major in a Science area normally requires the completion of 24 credit points of Senior units of study in that area, including any units of study specified in Table I as compulsory for that major. (A major in Psychology requires 16 credit points of Intermediate and 32 credit points of Senior units of study in Psychology). A student may not count a unit of study toward more than one major.
6. A maximum of 28 credit points may be counted towards the degree requirements from units of study offered by faculties other than the Faculties of Arts and Science.
7. Units of study completed at The University of Sydney Summer School which correspond to units of study specified in Section 4 and Section 6 may be credited towards the course requirements.
8. The testamur for the degree of Bachelor of Science in Media and Communications shall specify the majors completed in order to qualify for the award.

Requirements for the Honours Degree

9. There shall be an Honours degree stream associated with the degree of Bachelor of Science in Media and Communication; entry into the Honours stream is by transfer from the Pass degree.
10. To qualify to transfer into the Honours stream of the Bachelor of Science in Media and Communications degree, students shall
    (1) have completed at least 144 credit points from the Bachelor of Science in Media and Communications degree in accordance with resolution 4;
    (2) completed a minimum of 40 credit points from Intermediate and Senior MECO units at an average of Credit or better; and
    (3) any additional criteria set by the Program Director or Dean.
11. Students shall complete the requirements for the honours course full-time over two consecutive semesters.
12. If the Faculty is satisfied that a student is unable to attempt the honours course on a full-time basis and if the Program Director so recommends, permission may be granted to undertake honours half-time over four consecutive semesters.
13. To qualify for the award of an honours degree, students shall complete 192 credit points in accordance with resolution 4, including 48 credit points of SCMP honours units of study in Table V with an average result of at least 65.
14. The grade of honours and the honours mark are determined by performance in the honours course.
15. A student with an honours mark of 90 or greater and a minimum WAM of 80 in years 1–3 shall, if deemed to be of sufficient merit by the Dean, receive a bronze medal.
16. A student may not re-attempt the Bachelor of Science in Media and Communications (Honours) course; however, students who fail to meet the requirements for the award of honours and who have not already satisfied the requirements of the Pass degree may elect to transfer back to the Pass degree to complete its requirements.

Transfer of candidature to and from other degrees in the Faculty

17. A student may, with the permission of the Dean, transfer into the BSc Media & Communications from the BSc, BMedSc, BPsych, BCST, BIT or BLibStud after two semesters of enrolment, subject to having achieved a Distinction average.
18. A student in the BSc Media & Communications may, with the permission of the Dean, transfer to other degrees in the Faculty subject to meeting prerequiste and progression requirements.
19. If a candidate for the degree has completed the normal requirements for the pass degree of Bachelor of Science he or she may apply to take this degree provided that candidature for the Bachelor of Science in Media and Communications is abandoned.

Other conditions of candidature

20. Unless otherwise specified, the regulations applying for matters not included here shall be those applying for the degree of Bachelor of Science.

Section 2

Enrolment in more/less than minimum load

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

Repeating a unit of study

23. A student may not enrol in a unit of study which they have completed previously with a grade of Pass or better.22. 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.
24. A student who has been awarded a Pass (Concessional) in a unit of study may repeat that unit but, if subsequently awarded a grade of Pass or better, no further credit points will be gained unless the unit of study previously had not been credited under Section 4(8).

Cross-institutional enrolment

25. 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:
    (1) the unit of study content is material not taught in any corresponding unit of study in the University; or
    (2) the student is unable for good reason to attend a corresponding unit of study at the University.

Restrictions on enrolment

26. 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.

Satisfactory progress

27. 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.

Assessment policy

28. Students may be tested by written and oral examinations, exercises, essays or practical work or any combination of these as the Faculty may determine.
29. 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).
30. Heads or Chairs of Department may arrange for further testing in cases of special consideration, in accordance with Academic Board policy governing illness and misadventure.
31. The award of a Pass (Concessional) in a unit of study entitles the student to be credited with the full number of credit points for that unit of study, provided that the limit on the total credit value specified in Section 4(8) is not exceeded.

Credit Transfer Policy

32. Credit will not be granted for units of study completed more than ten years prior to application, except with the permission of the Dean.
33. 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.
34. 4The 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.
35. All students, notwithstanding any credit transfer, must complete at least 24 credit points of Senior Science units normally comprising a major taken at The University of Sydney.

Specific glossary for the BScMediaCommun

Completion of a unit of study means that the assessment requirements have been satisfied and a grade of Pass (Concessional) or better in Junior units of study or Pass or better in other units of study has been achieved.

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.

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).

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.)

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

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.

Major in the Faculty of Science 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. A student may not count a unit of study toward more than one major. (A major in Psychology requires 16 credit points of Intermediate and 32 credit points from Senior units of study in Psychology).

Major in the Faculty of Arts is normally 32 credit points from Senior units of Study in an Arts subject area.

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.

Major in Media and Communications is usually 12 credit points from Junior units of study and 32 credit points from Senior MECO units of study.

Dean means the Dean of Science.

Faculty means the Faculty of Science.

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

Degree means the Bachelor of Science in Media and Communications.

Requirements means coursework requirements for the award of the degree of Bachelor of Science in Media and Communications.

Student means a person enrolled as a candidate for the degree of Bachelor of Science in Media and Communications.

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

WAM 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.

■ Generic glossary for the BSc, BCST, BIT, BMedSc, BPsych, BLibStud & BScMediaCommun

Unit of study is a standalone component of a course and comprises such lectures, tutorial instruction, essays, exercises and practical work as the Faculty may prescribe.

Qualifying unit of study means a unit which must be completed at the grade of Pass or better before a student may enrol in any unit of study for which that unit of study has been prescribed as a qualifying unit unless waived with the permission of the Dean.

Prerequisite means a unit of study which must be completed at the grade of Pass (Concessional) or better before a student may enrol in any unit of study for which that unit of study has been prescribed as a prerequisite unless waived with the permission of the Head/Chair of Department concerned.

Assumed knowledge is curricular material which is assumed to be known by each student when enrolling in a unit of study.

Corequisite means a unit of study in which, unless previously completed, a student must enrol concurrently with any unit of study for which that unit of study has been prescribed as a corequisite unless waived with the permission of the Head of Department concerned.

Credit is granted in the form of credit points towards the requirements of a course on the basis of previous attainment in another course at a recognized tertiary institution.

Credit may be granted as specific credit in recognition of previously completed studies which are directly equivalent to a unit of study at this University or non-specific credit in the form of block credit for a specified number of credit points at a particular level and, where appropriate, in a particular subject area.

Exemption means that a student may be exempted from completing parts of the pre scribed work (lectures, seminars, tutorials and practical work) for a unit of study on the basis of previous study. Exemption may be granted for the whole of a unit of study but no advanced standing will be granted.

Cross-listing is the availability of units of study in one subject area for counting towards requirements in other subject areas.

University means the University of Sydney.

Department means department, school, or teaching unit.

Course means a structured academic program of study leading to the award of a degree.

Stream means a form of specialization in which there is a defined program of study, in terms either of subject areas or depth of study.

Program of study means a recommended or prescribed sequence that forms a course or part of a course, and may consist of compulsory or optional units of study as well as other forms of study.

Combined degrees means concurrent enrolment in two degree courses which compresses the duration of the two degree programs.

Double degrees means completing a second degree while enrolment is suspended from the first degree.

UAC means Universities Admission Centre.

Supervision by a faculty covers all areas of policy and procedure affecting students such as degree rules, enrolment procedures and the Dean to whom reference is to be made at any given time.

6 Postgraduate degree requirements

This chapter sets out the requirements for both research and coursework 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. 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 chapter 7, 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/

■ Research degrees

Research degrees offered by the Faculty are listed in this chapter in the following order:

- Doctor of Science
- Doctor of Philosophy
- Master of Science
- Master of Science (Environmental Science).

The resolutions of the Senate, Academic Board and Faculty relating to these degrees may be found in chapter 7 and the Calendar. Additional valuable resources for intending and current research students are 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 on the Web at www.usyd.edu.au/study/postgrad.shtml

Doctor of Science (DSc)

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. 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.

For Faculty resolutions see chapter 7. For the Resolutions of the Senate see *University of Sydney Calendar.*

Doctor of Philosophy (PhD)

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 master's degree or a bachelor's degree with first or second class honours from The University of Sydney, or an equivalent qualification from another university or institution.

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 is three years in the case of candidates holding a bachelor's 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.*

Master of Science (MSc)

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. Once admitted, candidates proceed full-time or part-time, by supervised research and thesis, or in some cases by coursework and essay.

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 qualifications have been obtained in another university or institution then an application must also be approved by the Academic Board. 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.

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 chapter 7.

Master of Science (Environmental Science)

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 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 chapter 7.

Presentation of theses

The following information is presented for the guidance of candidates. It should be regarded as a summary only. Candidates should also consult the University's 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 on the Web at www.usyd.edu.au/su/ab/committees/committees.html

Formal requirements

Number of copies to be submitted – MSc, 3; PhD, 4. The four copies of theses submitted for examination for the degree of Doctor of Philosophy 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 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.

Similar formal requirements exist for the presentation of MSc theses.

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 Post-Graduate 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/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 examiner's tasks easier is obviously sensible.

■ Coursework/research degrees

Doctor of Clinical Psychology / Master of Science

Doctor of Clinical Psychology / Doctor of Philosophy

The School of Psychology offers two degrees which train psychology graduates in the professional specialisation of clinical psychology: the Doctor of Clinical Psychology/Master of Science degree and the Doctor of Clinical Psychology /Doctor of Philosophy degree.

Both degrees are recognised, in principle, by the New South Wales Department of Health as qualifying the holder for progression to the grade of Clinical Psychologist. The courses are accredited by the Australian Psychological Society as a 5th and 6th year of training, and as approved qualifications for Associate Membership of the APS College of Clinical Psychologists. The NSW Psychologists Registration Board also accredits the course for the purposes of registration.

Combined Doctor of Clinical Psychology/Master of Science degree (Minimum duration 3 years)

The Doctor of Clinical Psychology (DCP) 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, by the second semester of their third year, a Research Thesis that incorporates 1 or 2 journal publications and a comprehensive literature review.

All students enrol in the DCP degree and in the second semester of 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/MSc degree.

Combined Doctor of Clinical Psychology/Doctor of Philosophy degree (Minimum duration 4 1/2 years)

The coursework and clinical internship requirements are identical to those of the Doctor of Clinical Psychology. All students will enrol in the DCP degree and in the beginning of second semester of their second year will also enrol in a MSc degree. Students who have made excellent progress and whose projects are of sufficient scope may then apply for transfer to a PhD degree. Transfer to a PhD is also subject to the satisfactory production of a thesis proposal which on completion, will make a contribution to knowledge in a specialist area of study.

Admission requirements

Admission to both degrees is available to graduates who meet the following requirements:

- Completion of a four year honours degree in Psychology, gaining at least an upper second class (2.1) Honours, or its equivalent – eg, (BPsych, BA(Hons), BSc(Hons), BEc(SocSci)(Hons) or BLibStudies(Hons), GradDipSc(Psych)(Pass with Merit), in Psychology)
- Completion of an individually conducted research project and thesis within the degree
- Completion of clinically relevant work experience (relevant paid, voluntary or research work)
- Satisfactory referee reports (academic referee, clinical work experience referee)
- Successful selection interview

Clinical relevance for application

Students applying for the DCP are not required to have completed an empirical research project in the area of Abnormal or Clinical Psychology. The selection process aims to identify students with a demonstrated interest in abnormal or clinical psychology, an awareness of clinical issues, and experience related to the area. This can be demonstrated in a number of ways, for example relevant work experience or a relevant empirical project. Note also that clinical relevance can be discussed on the basis of projects in may areas of Psychology, for example cognitive psychology, developmental psychology, individual differences, human learning, neuroscience, social psychology.

Selection

- Evaluation of submitted application forms and supporting documentation (including demonstrated relevant work experience and satisfactory referees reports)
- Evaluation of selection interview (assesses relevant academic, research and work experience and performance, aptitude for clinical psychology and awareness of ethical issues relevant to clinical practice)
- Applicants who meet the minimum admission requirements are then ranked according to academic record (class of Honours degree, or equivalent, obtained) and performance in the selection interview
- Offers of places are dependent upon the ranking of applicants and competition for places

Application submission

Applications are to be sent to Postgraduate Manager, Faculty of Science, Carslaw Building (F07), University of Sydney NSW 2006. International applicants should apply in writing to the International Office (G12), University of Sydney, NSW 2006, Australia.

Conditional Registration

All intending candidates are required to obtain provisional registration with the NSW Psychologists Registration Board immediately after commencing their candidature, or if applicable full registration.

Level 2, 28 Foveaux Street, Surry Hills 2010; Phone 02 9219 0211; Fax 02 9281 2030.

Course structure

Both programs are based on a scientist-practitioner model with a cognitive-behavioural emphasis. They aim 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 chapter 7.

DCP/MSc and DCP/PhD coursework requirements

Unit of study		CP
Year 1, Semester 1		
PSYC 6001	Adult Psychological Disorders	9
PSYC 6002	Psychological Assessment of Adults	6
PSYC 6003	Clinical Internships 1	3
PSYC 6004	Ethics and Professional Practice 1	3
PSYC 6005	Research 1	3
Year 1, Semester 2		
PSYC 6006	Child and Family Psychology	9
PSYC 6007	Psychological Assessment of Children	6
PSYC 6008	Clinical Internships 2	3
PSYC 6009	Ethics and Professional Practice 2	3
PSYC 6010	Research 2	3
Year 2, Semester 1		
PSYC 6011	Adult and Health Psychology	9
PSYC 6012	Cognitive Neuropsychology	6
PSYC 6013	Clinical Internships 3	3
PSYC 6014	Ethics and Professional Practice 3	3
PSYC 6015	Research 3	3
Year 2, Semester 2		
PSYC 6016	Specialist Seminars	3
PSYC 6017	Neuropsychological Disorders	6
PSYC 6018	Clinical Internships 4	3
PSYC 6019	Ethics and Professional Practice 4	3
PSYC 6020	Research 4	9
Year 3, Semester 1		
PSYC 6022	Clinical Internships 5	0
PSYC 6023	Ethics and Professional Practice 5	0
PSYC 6024	Research 5	0
Year 3, Semester 2		
PSYC 6021	Advanced Seminars	0
PSYC 6025	Clinical Internships 6	0
PSYC 6026	Ethics and Professional Practice 6	0
PSYC 6027	Research 6	0

PSYC 6002 **Psychological Assessment of Adults**

6 credit points. **Session**: 1.

This unit of study introduces students to the basic theory and the general practice of psychological testing with adult populations, focusing on neuropsychological and personality assessment. This unit will focus on definitions of the components of cognition including intelligence, perception, memory, attention, executive abilities, language, achievement and personality. 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.

PSYC 6003 **Clinical Internship 1**

3 credit points. **Session**: 1.

This unit of study is designed to introduce students to the work of clinical psychologists. This 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.

PSYC 6004 **Ethics and Professional Practice**

3 credit points. **Session**: 1.

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 be presented by specialists in the field including colleagues on the New South Wales Psychologists Registration Board, Guardianship Tribunal and College of Clinical Psychologists of the Australian Psychological Society.

PSYC 6005 **Research 1**

3 credit points. **Session**: 1.

This unit of study provides an introduction to issues in psychological research. Students will attend the School of Psychology Post-Graduate Research Seminar Series. Students also will attend the Departmental Colloquium in fulfillment of requirements for this unit of study.

PSYC 6007 **Psychological Assessment of Children**

6 credit points. **Session**: 2. **Prerequisite**: PSYC 6002.

This unit of study introduces students to the instruments and clinical decision-making process used when assessing children of different ages, levels of abilities and presentations. Developmental, cognitive and behavioural assessment methods will be discussed and students will be thought how to administer, score, interpret and report results taking into consideration child's living environment.

PSYC 6008 **Clinical Internship 2**

3 credit points. **Session**: 2. **Prerequisite**: PSYC 6003.

This unit of study is designed to introduce students to therapy and psychological assessment skills for working specifically with adults. Students will be allocated in pairs to a supervisor who will oversee their clinical practice closely. This internship will expose students to clients with psychological problems in sub-clinical to mild clinical range. The internship builds student's confidence in working with clients of adult ages. For therapy, 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. For assessment, it will allow students to develop hypothesis, select appropriate tests, conduct and interpret test results, communicate these to clients and report these to referring agents.

PSYC 6009 **Case Seminar 2**

3 credit points. **Session**: 2. **Prerequisite**: PSYC 6029.

This unit of study will continue the seminars introduced in PSYC 6029 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. Assessment of this unit of study is by detailed case reports.

PSYC 6010 **Research 2**

3 credit points. **Session**: 2. **Prerequisite**: PSYC 6005.

Within this unit of study students will consolidate their research plan and develop a written proposal for their research project. The Research Forum will also feature the presentation of special topics including research design, statistics and power considerations. Students will also be guided through the process of submitting an Application for Ethical Approval.

PSYC 6013 **Clinical Internship 3**

3 credit points. **Session**: 1. **Prerequisite**: PSYC 6008.

This unit of study is designed to introduce students to therapy and psychological assessment skills for working specifically with young people and their families. Students will be allocated in

pairs to a supervisor who will oversee their clinical practice closely. This internship will expose students to clients with psychological problems in sub-clinical to mild clinical range. The internship builds student's confidence in working with young clients of school age. For therapy, it will allow students to develop skills in the identification of clinical problems, the communication of a formulation and treatment plan and the conduct of that plan. For assessment, it will allow students to develop hypothesis, select appropriate tests, conduct and interpret test results and communicate these to young people, their families and schools, as appropriate. In addition, this unit will allow students to build on their previous work with adults. Specifically, students will continue to work half a day per week with adult clients in the internal clinic. The work will involve therapy and assessment therapy. Interns will be able to work more independently at this stage of their training.

PSYC 6014 **Case Seminar 3**

3 credit points. **Session**: 1. **Prerequisite**: PSYC 6009.

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.

PSYC 6015 **Research 3**

3 credit points. **Session**: 1. **Prerequisite**: PSYC 6010.

Students will attend the Research Forum and will present the rationale, aims, hypotheses, and plan of their proposed research project to the group, which will include staff of the CPU and School of Psychology. During this semester, students will be expected to commence the collection of data. Students will attend the School Colloquium in fulfilment of requirements for this unit of study.

PSYC 6016 **Specialist Seminars**

3 credit points. **Session**: 2. **Prerequisite**: PSYC 6011.

Year 2 students will be required to attend three specialist seminars. Each seminar will be a workshop over two full days. Seminar topics may be: Forensic Psychology, Older Adult Psychology and Schema focused therapy.

PSYC 6018 **Clinical Internship 4**

3 credit points. **Session**: 2. **Prerequisite**: PSYC 6013.

Students are introduced to a range of therapy and assessment experiences in accordance with their clinical and research interests. At least one of their three internships will involve work with children and at least one will involve work with adults. 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. 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.

PSYC 6019 **Case Seminar 4**

3 credit points. **Session**: 2. **Prerequisite**: PSYC 6014.

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.

PSYC 6020 **Research 4**

9 credit points. **Session**: 2. **Prerequisite**: PSYC 6015.

This unit of study will require students to develop literature search, critical analysis of research methods, and writing skills. Students will continue to collect research data. Students will also attend the Research Forum and the School Colloquium in fulfilment of requirements for this unit of study. Each student and supervisor will need to submit a Progress Report to the Head of School towards the end of the year.

PSYC 6021 **Advanced Seminars**

No credit points. **Session**: 2. **Prerequisite**: PSYC 6016.

Year 3 students will be required to attend three specialist seminars. Each seminar will be a workshop over two full days. Seminar topics may be: Transcultural Psychology, Interpersonal Therapy and Integrated approaches to Psychotherapy.

PSYC 6022 **Clinical Internship 5**

No credit points. **Session**: 1. **Prerequisite**: PSYC 6018.

This unit of study, following on from PSYC 6018 Clinical Internship 4, is designed to build on the clinical skills of students in further areas of practice.

PSYC 6023 **Case Seminar 5**

No credit points. **Session**: 1. **Prerequisite**: PSYC 6019.

This unit of study builds upon both the knowledge and clinical skills acquired in previous semesters. Third year students will present complex clinical cases for discussion which pose either diagnostic dilemmas or difficulties in treatment. Assessment of this unit of study is by detailed case reports.

PSYC 6024 **Research 5**

No credit points. **Session**: 1. **Prerequisite**: PSYC 6020.

Students will continue to undertake original investigation of a topic in clinical psychology. Students will continue to work on a thesis that will include at least the following: an updated literature review (incorporating feedback from markers and recent literature), one or two journal articles, discussion, and relevant appendices. Students will also attend the Clinical Psychology unit's Research Forum and the School's Colloquium.

PSYC 6025 **Clinical Internship 6**

No credit points. **Session**: 2. **Prerequisite**: PSYC 6022.

This unit of study, following on from PSYC 6022 Clinical Internships 5, is designed to consolidate the clinical skills of students who will be working with a greater level of independence.

PSYC 6026 **Case Seminar 6**

No credit points. **Session**: 2. **Prerequisite**: PSYC 6023.

This unit of study builds upon both the knowledge and clinical skills acquired in previous semesters. Third year students will present complex clinical cases for discussion which pose either diagnostic dilemmas or difficulties in treatment. Assessment of this unit of study is by detailed case reports.

PSYC 6027 **Research 6**

No credit points. **Session**: 2. **Prerequisite**: PSYC 6024.

Students will submit a research thesis that will include at least the following: an updated literature review (incorporating feedback from markers and recent literature), one or two journal articles (prepared for publication in peer reviewed journals of international reputation), discussion and relevant appendices. Requirements of the Master of Science are outlined in the Resolutions of the Senate. Students will also present their results and conclusions at the Research Forum.

PSYC 6029 **Case Seminar 1**

3 credit points. **Session**: 1.

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.

PSYC 6030 **Paediatric Neuropsychological Disorders**

6 credit points. **Session**: 2. **Prerequisite**: PSYC 6012.

This unit will familiarise students with core neurobehavioural issues of medical conditions affecting the central nervous system in children. Principles and factors that influence the outcome in a developing organism, such as the state of CNS development, psychological/cognitive maturity at the time of insult, plasticity (vulnerability) and impact of the child's environment will be discussed in a range of disorders. In addition to research findings a number of clinical case presentations will be discussed.

PSYC 6031 **Family Therapy**

3 credit points. **Session**: 2.

This course introduces students to issues that may be a focus of clinical attention during childhood but are not defined as mental disorders such as relationship problems in the family system, parenting capacity, and problems related to abuse and/or neglect. Students will be introduced to family therapy as an approach to treating such problems.

PSYC 6032 **Adult Health Psychology**

6 credit points. **Session**: 1. **Prerequisite**: PSYC 6049, PSYC 6031.

This course aims to understand the relationships between psychological and physical functioning across a wide range of medical disorders, including their effect on cognitive function, and the way in which cognitive and behavioural factors influence psychological and physical functioning of those with health

related problems. A variety of medical problems will be studied in relation to their impact on function, as well as issues such as preventative medicine (eg, HIV), adjusting to and living with chronic illness (eg, chronic pain), issues relating to terminal illness (eg, psychooncology) and issues relating to compliance (eg, diabetes). The course will be concerned with theories and interventions that promote health related behaviours and improve quality of life for people with medical problems.

PSYC 6049 **Child Psychological Disorders**

6 credit points. **Session**: 2. **Prerequisite**: PSYC 6001.

This unit of study introduces the nature, assessment and treatment of psychological disorders in children and adolescents. Students will be introduced to the diagnostic classification, aetiology and developmental course of common psychological problems presenting in children and adolescents. These will include anxiety disorders, depression, conduct and oppositional defiant disorders. The theoretical and empirical foundations of a range of cognitive and behavioural intervention strategies will be discussed along with a number of major conceptual and practical issues in child clinical psychology.

PSYC 6050 **Advanced Adult Psychological Disorders**

3 credit points. **Session**: 1. **Prerequisite**: PSYC 6001.

This course is designed to introduce students to the nature of therapeutic work with more complex psychological disorders. It will cover mental health problems, such as schizophrenia, bipolar disorder, drug and alcohol problems, personality disorders, as well as working behaviourally with more recalcitrant problems.

PSYC 6051 **Adult Psychological Disorders**

6 credit points. **Session**: 1.

This unit of study 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 in micro-counselling and interviewing are combined with theoretical knowledge about different disorders to form strong theory-practice links. Strategies for cognitive behavioural interviewing within a diagnostic framework (DSMIV) are reviewed and practiced. Diagnostic assessment, mental status examination and cognitive behavioural case formulation are taught with a view to developing individual treatment plans. 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.

PSYC 6052 **Adult Neuropsychological Disorders**

6 credit points. **Session**: 1, 2. **Prerequisite**: PSYC 6007.

This unit provides a comprehensive introduction to cognitive, behavioural and emotional correlates of neurological disorders. Students will be introduced to a theoretical approach to the principal cognitive domains – memory, language, visual cognition, attention and executive function, and emotive – and their neuroanatomical substrates. This will provide the conceptual framework for consideration of a number of major neuropsychological conditions including amnesic disorders, visual agnosias, visuospatial disturbances including heminattention, problems with language, and disorders of attention and executive function. Students will be introduced to the neuropsychological diagnosis of neurodegenerative disorders, epilepsy, stroke, toxic and metabolic conditions as well as the differential diagnosis of depression and other psychiatric phenomena. The course will focus on recognizing patterns of neuropsychological profiles and the process of differential diagnosis. Each lecture will take the format of a theoretical component accompanied by illustrative case studies.

Doctor of Clinical Neuropsychology / Master of Science

Doctor of Clinical Neuropsychology / Doctor of Philosophy

The School of Psychology offers two new degrees which train psychology graduates in the professional specialisation of clinical neuropsychology: the Doctor of Clinical Neuropsychology/Master of Science degree and the Doctor of Clinical Neuropsychology /Doctor of Philosophy degree.

Both degrees are likely to be 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 complies with the requirements of the Australian Psychological Society's College of Clinical Neuropsychologists and those of the NSW Psychologists Registration Board. The School of Psychology will be seeking formal accreditation from the Australian Psychological Society and the NSW Psychologists Registration Board in 2004.

Doctorate in Clinical Neuropsychology/Master of Science Degree (Duration 3 years)

The Doctor of Clinical Neuropsychology (DCN) 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 Neuropsychologists from Royal Prince Alfred Hospital, Westmead and Concord Repatriation General Hospitals, and from the new Children's and Sydney Children's Hospitals, will provide supervised clinical practice. The research component requires students to produce, by the second semester of their third year, a Research Thesis that incorporates 1 or 2 journal publications and a comprehensive literature review.

All students enrol in the DCN degree and in the second semester of 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 DCN/MSc degree.

Combined Doctorate of Clinical Neuropsychology/Doctor of Philosophy Degree (Duration 4.5 years)

The coursework and clinical internship requirements are identical to those of the Doctor of Clinical Neuropsychology. All students will enrol in the DCN degree and in the beginning of second semester of their second year will also enrol in a MSc degree. Students who have made excellent progress and whose projects are of sufficient scope may then apply for transfer to a PhD degree. Transfer to a PhD is also subject to the satisfactory production of a thesis proposal which 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 its equivalent – eg, (BPsych, BA(Hons), BSc(Hons), BEc(SocSci)(Hons) or BLibStudies(Hons), GradDipSc(Psych)(Pass with Merit), in Psychology);
- Completion of an individually conducted research project and thesis within the degree
- Completion of relevant work experience (relevant paid, voluntary or research work)
- Satisfactory referee reports (academic referee, clinical work experience referee)

Clinical relevance for application

Students applying for the DCN are not required to have completed an empirical research project in the area of Abnormal or Clinical Neuropsychology. The selection process aims to identify students with a demonstrated interest in abnormal, or clinical neuropsychology, an awareness of clinical issues, and experience related to the area. This can be demonstrated in a number of ways, for example relevant work experience or a relevant empirical project. Note also that clinical relevance can be discussed on the basis of projects in may areas of Psychology, for example cognitive psychology, developmental psychology, individual differences, human learning, neuroscience, social psychology.

Selection

- Evaluation of submitted application forms and supporting documentation (including demonstrated relevant work experience and satisfactory referees reports)
- Evaluation of selection interview (assesses relevant academic, research and work experience and performance, aptitude for clinical neuropsychology and awareness of ethical issues relevant to clinical practice)
- Applicants who meet the minimum admission requirements are then ranked according to academic record (class of Honours degree, or equivalent, obtained) and performance in the selection interview
- Offers of places are dependent upon the ranking of applicants and competition for places

Application submission

Applications are to be sent to the Postgraduate Manager, Faculty of Science, Carslaw Building (F07), University of Sydney NSW 2006. International applicants should apply in writing to the

International Office (G12), University of Sydney NSW 2006 Australia.

Conditional Registration

All intending candidates are required to obtain provisional registration with the NSW Psychologists Registration Board immediately after commencing their candidature, or if applicable full registration.

Level 2, 28 Foveaux Street, Surry Hills 2010; Phone 02 9219 0211; Fax 02 9281 2030.

Course structure

The program is based on a scientist-practitioner model. It aims to provide students with a high level of expertise in practical, academic and research areas that will enable them to work successfully as professional clinical neuropsychologists 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 Neuropsychology on the one hand and for conducting Neuropsychological research on the other.

- Course Resolutions: see chapter 7.

DCN/MSc and DCN/PhD coursework requirements

Unit of study		CP
Year 1, Semester 1		
PSYC 6051	Adult Psychological Disorders	6
PSYC 6002	Psychological Assessment of Adults	6
PSYC 6004	Ethics and Professional practice	3
PSYC 6034	Neuropsychology Clinical Internship 1	3
PSYC 6040	Neuropsychology Case Seminars 1	3
PSYC 6005	Research 1	3
Year 1, Semester 2		
PSYC 6048	Neuroanatomy	6
PSYC 6007	Psychological Assessment of Children	6
PSYC 6031	Family Therapy	3
PSYC 6035	Neuropsychology Clinical Internship 2	3
PSYC 6041	Neuropsychology Case Seminars 2	3
PSYC 6010	Research 2	3
Year 2, Semester 1		
PSYC 6052	Adult Neuropsychological Disorders	6
PSYC 6032	Adult Health Psychology	6
PSYC 6033	Issues in Rehabilitation	3
PSYC 6036	Neuropsychology Clinical Internship 3	3
PSYC 6042	Neuropsychology Case Seminars 3	3
PSYC 6015	Research 3	3
Year 2, Semester 2		
PSYC 6030	Paediatric Neuropsychological Disorders	6
PSYC 6046	Seminars in Clinical Neuropsychology	3
PSYC 6037	Neuropsychology Clinical Internship 4	3
PSYC 6043	Neuropsychology Case Seminars 4	3
PSYC 6020	Research 4	9
Year 3, Semester 1		
PSYC 6047	Seminars in Clinical Neuropsychology Adv	0
PSYC 6038	Neuropsychology Clinical Internship 5	0
PSYC 6044	Neuropsychology Case Seminars 5	0
PSYC 6024	Research 5	0
Year 3, Semester 2		
PSYC 6039	Neuropsychology Clinical Internships 6	0
PSYC 6045	Neuropsychology Case Seminars 6	0
PSYC 6027	Research 6	0

PSYC 6033 **Issues in Rehabilitation**

3 credit points. Dr Diana Caine. **Session**: 1. **Classes**: 2-day workshop. **Assessment**: Written assignment/examination.

This course will cover theories of recovery from brain damage from a variety of causes; models of rehabilitation; management of the behavioural consequences of neuropsychological disorders including behaviour modification and environmental manipulation strategies; working in a multidisciplinary team; rehabilitation in the context of acute and chronic neuropsychological disorders

PSYC 6034 **Neuropsychology Clinical Internship 1**

3 credit points. **Session**: 1.

This unit of study is designed to introduce interns to the work of clinical psychologists. Interns will be rotated through the Psychology Clinic and Clinics at Royal Prince Alfred, Wesley and Westmead Hospitals to observe Clinical Neuropsychologists and Clinical Psychologists in practice. This internship will expose Interns to a range of clients with different needs. The internship will strengthen theory-practice links, by exposing interns to the range of neuropsychological and mental health problems faced in clinical settings. It will allow students to begin to develop skills in communicating with clients with a range of problems.

PSYC 6035 **Neuropsychology Clinical Internship 2**

3 credit points. Dr Diana Caine. **Session**: 2. **Classes**: 2.5 days per week, 13 weeks. **Assessment**: Formative Assessment Students will be assessed throughout the placement through observation of the Supervisor who will be a member of the Clinical Psychology unit or a close associate. The supervisor will assess their level of professional competence in managing the cases that they are allocated. Summative Assessment End of Placement Review: The supervisor will assess the level of competency according to detailed guidelines.

This course is designed to introduce interns to neuropsychological assessment skills and therapy specifically with adults. Interns will be allocated in pairs to a supervisor who will oversee their clinical practice closely. This internship will expose Interns to clients with neuropsychological problems in the mild clinical range including mild head injury, questionable neurodegenerative disease, and adult learning disabilities. The internship is aimed at building Intern's confidence in working with adult clients. Students will learn to develop hypotheses about cognitive disorders, select appropriate tests, and conduct and interpret test results in the form of clinical case reporting. In terms of therapy the internship will introduce students to clients with psychological problems in the sub-clinical to mild clinical range, allowing them to develop skills in the identification of clinical problem, the communication of a formulation and treatment plan, and the conduct of that plan.

PSYC 6036 **Neuropsychology Clinical Internship 3**

3 credit points. **Session**: 1. **Classes**: Two days per week: 1.5 days per week child and 0.5 days per week adult. **Assessment**: Formative assessment Students will be observed and assessed throughout the placement by the Supervisor who will be a member of the Clinical Psychology unit or an associate. The supervisor will assess the student's level of competence in assessing and reporting on the cases allocated. Summative assessment End of placement review: The supervisor will assess the level of competence according to detailed guidelines.

This unit is designed to introduce new Interns to neuropsychological assessment and therapy skills in relation to young people and their families. Interns will be allocated to a supervisor in pairs. The internship will allow students to develop skills in the formulation of hypotheses about the nature of the disorder, select appropriate tests to undertake examination of the child, interpret the test results, formulate a diagnosis and communicate the outcome of the assessment to the client, their families and schools, as appropriate. In addition, this unit will allow Interns to build on their previous work with adults in the form of half a day per week of therapy with adult clients of the Psychology Clinic. This work will involve therapy and assessment for therapy.

PSYC 6037 **Neuropsychology Clinical Internship 4**

3 credit points. Dr Diana Caine. **Session**: 1, 2. **Assessment**: Formative assessment Students will be assessed by observation by the Supervisor who will be a member of the Clinical Psychology unit or a close associate. The supervisor will assess the students' level of competence in assessing and reporting on the cases allocated for neuropsychological assessment. Summative Assessment End of placement review: The supervisor will assess the level of competence according to detailed guidelines.

Students will undertake clinical internships with a view to developing skills and expertise in the conduct of neuropsychological assessments in a variety of clinical settings. For these external internships Interns will have the choice of a variety of internships in the community or hospital setting. Internships will be developed in major teaching hospitals and rehabilitation settings. A training plan will be developed for each intern and allocations will be made on the basis of that training plan. Each of these internships is designed to build on the clinical skills of students. Neuropsychology Clinical Internships 5 and 6 students are designed to consolidate the clinical skills of Interns who will be expected to work with a greater level of independence.

PSYC 6038 **Neuropsychology Clinical Internship 5**

3 credit points. Dr Diana Caine. **Session**: 1, 2. **Assessment**: Formative assessment Students will be assessed by observation by the Supervisor who will be a member of the Clinical Psychology unit or a close associate. The supervisor will assess the students' level of competence in assessing and reporting on the cases allocated for neuropsychological assessment. Summative Assessment End of placement review: The supervisor will assess the level of competence according to detailed guidelines.

Students will undertake clinical internships with a view to developing skills and expertise in the conduct of

neuropsychological assessments in a variety of clinical settings. For these external internships Interns will have the choice of a variety of internships in the community or hospital setting. Internships will be developed in major teaching hospitals and rehabilitation settings. A training plan will be developed for each intern and allocations will be made on the basis of that training plan. Each of these internships is designed to build on the clinical skills of students. Neuropsychology Clinical Internships 5 and 6 students are designed to consolidate the clinical skills of Interns who will be expected to work with a greater level of independence.

PSYC 6039 **Neuropsychology Clinical Internship 6**
3 credit points. Dr Diana Caine. **Session**: 1, 2. **Assessment**: Formative assessment Students will be assessed by observation by the Supervisor who will be a member of the Clinical Psychology unit or a close associate. The supervisor will assess the students' level of competence in assessing and reporting on the cases allocated for neuropsychological assessment. Summative Assessment End of placement review: The supervisor will assess the level of competence according to detailed guidelines.
Students will undertake clinical internships with a view to developing skills and expertise in the conduct of neuropsychological assessments in a variety of clinical settings. For these external internships Interns will have the choice of a variety of internships in the community or hospital setting. Internships will be developed in major teaching hospitals and rehabilitation settings. A training plan will be developed for each intern and allocations will be made on the basis of that training plan. Each of these internships is designed to build on the clinical skills of students. Neuropsychology Clinical Internships 5 and 6 students are designed to consolidate the clinical skills of Interns who will be expected to work with a greater level of independence.

PSYC 6040 **Neuropsychology Case Seminars 1**
3 credit points. **Session**: 1. **Classes**: Case Conference: 13 x 1 hour. **Assessment**: Class participation.
This course introduces students to history taking, data interpretation, and differential diagnosis in a neuropsychology setting. It will comprise a 1-hour weekly seminar at which students will observe senior students, staff and clinicians in the field presenting neuropsychological case material

These clinical case conferences will allow students to recognise a wide range of neuropsychological diagnoses, the interrelationships between neuropsychological, neurological and psychiatric symptomatology.

PSYC 6041 **Neuropsychology Case Seminars 2**
3 credit points. Dr Diana Caine. **Session**: 2. **Classes**: Case conferences, 13 x 1 hour. **Assessment**: Case presentation plus two written long case studies, one adult assessment, one adult therapy. All components must be passed.
This course description is the same as in Clinical Case Seminar 1

PSYC 6042 **Neuropsychology Case Seminars 3**
3 credit points. Dr Diana Caine. **Session**: 1. **Classes**: Case conferences, 13 x 1 hour. **Assessment**: Case presentation plus two written long case studies, one child assessment, one child therapy. All components must be passed.
These units of study build upon the previous semesters

PSYC 6043 **Neuropsychology Case Seminars 4**
3 credit points. Dr Diana Caine. **Session**: 2. **Classes**: Case conferences, 13 x 1 hour. **Assessment**: Case presentation only.
These units of study build upon the previous semesters

PSYC 6044 **Neuropsychology Case Seminars 5**
3 credit points. Dr Diana Caine. **Session**: 1. **Classes**: Case conferences, 13 x 1 hour. **Assessment**: Case presentation only.
These units of study build upon the previous semesters

PSYC 6045 **Neuropsychology Case Seminars 6**
3 credit points. Dr Diana Caine. **Session**: 2. **Classes**: Case conferences, 13 x 1 hour. **Assessment**: Case presentation only.
These units of study build upon the previous semesters

PSYC 6046 **Seminars in Clinical Neuropsychology**
3 credit points. Dr Diana Caine. **Session**: 2. **Classes**: 3 x 2-day workshops.
Year 2 students will be required to attend 3 specialist seminars. There will be no formal assessment of these units but attendance is obligatory
1. Forensic Psychology
2. Neuropsychology of PTSD
3. Differential diagnosis of Neurodegenerative diseases

PSYC 6047 **Seminars in Clinical Neuropsychology Adv**
3 credit points. Dr Diana Caine. **Session**: 1. **Classes**: 3 x 2-day workshops.
Year 3 students will be required to attend 3 specialist seminars. There will be no formal assessment of these units but attendance is obligatory. Topics offered will include:
Transcultural Psychology
Psychogeriatrics
Neuropsychology of Schizophrenia
Neuropsychology of epilepsy

PSYC 6048 **Neuroanatomy**
6 credit points. Dr John Mitrofanis. **Session**: 2. **Classes**: 13 x 2hr, lecture, 13 x 4 hr, tutorial, over 6 weeks. **Assessment**: 1 exam, 1 spot test, 3 quizzes.
The lectures and tutorials will provide a general overview of human neuroanatomy, of the structure and function of the brain systems being considered, and the opportunity to learn to identify those structures.

■ Coursework degrees in Science

Graduate Diploma in Science

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 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.

Intending students should consult the table of honours units of study at the end of chapter 3 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.

■ Environmental Science and Law

Master of Environmental Science and Law

Further information can be found on the Environmental Science Web site: www.usyd.edu.au/envsci.

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 Masters in Environmental Science and Law program.

Admission Requirements

Applicants for the Masters program should hold a Bachelors degree appropriate for the field of study, or graduates with subsequent experience which is considered to demonstrate the knowledge and aptitude required to undertake the course.

Course Requirements

To qualify for award of the Master of Environmental Science and Law candidates must complete 48 credit points of units of study approved for the relevant field of study, 24 credit points from the Faculty of Science and 24 credit points from the Faculty of Law. The unit of study LAWS 6044 is compulsory for all students. The unit LAWS 6252 is compulsory for students without a legal qualification.

Course Resolutions: see chapter 7.

Units of study

The table lists the units of study available with this degree. Other units are possible with the permission of the Director of Environmental Science. For LAWS units descriptions, see below. For other descriptions please see the entries in this chapter under Applied Science (Environmental Science).

Note: Law units of study are taught in intensive mode. Contact the Faculty of Law.

Master of Environmental Science and Law

Unit of study	
Unless otherwise indicated, all units are worth 6 credit points	
Core units	
LAWS 6252	Legal Reasoning & Common Law System
LAWS 6044	Environmental Law & Policy
Science Units (= recommended)*	
CHEM 5001	Information Retieval in the Sciences
ENVI 5501	Environmental Research Project (12cp)
ENVI 5705*	Ecological Principles for Environmental Scientists
ENVI 5707	Energy - Sources, Uses & Alternatives
ENVI 5708*	Introduction to Environmental Chemistry
ENVI 5801	Social Science of the Environment
ENVI 5802	Resources and Regional Development
ENVI 5805	The Urban Environment and Planning
ENVI 5808*	Applied Ecology for Environmental Scientists
ENVI 5809	Computer Modelling & Resource Management
ENVI 5901	Weathering Processes & Applications
ENVI 5903	Sustainable Developement
ENVI 5904	Understanding Environmental Uncertainty
GEOG 5001	Geographic Information Systems (Introduction)
GEOG 5002	Geographic Information Systems (Advanced)
MARS 5001	Coastal Processes and Systems
MARS 5002	Coastal Zone Management
MARS 5003	Beach Management
PHIL 5926	Questioning Sustainability and Technology
QMEC 5110	Structure & Managagement of Research Projects
QMEC 5120	Design & Analysis of Sampling (Introduction)
QMEC 5150	Ecological Science & Environmental Impact Assess.
WILD 5001	Australian Wildlife: Introduction
WILD 5002	Australian Wildlife: Field Studies
WILD 5007	Sustainable Wildlife Use & Stewardship
ENGG 5601	Greenhouse Gas Mitigation
PACS 6903	Peace & the Environment
Law units (# = offered every second year)	
LAWS 6021	Comparative Environmental Law
LAWS 6041	Environmental Dispute Resolution
LAWS 6042	Environmental Economics
LAWS 6043	Environmental Assessment Law
LAWS 6045	Environmental Planning Law
LAWS 6055#	Heritage Law (not available in 2003)
LAWS 6061	International Environmental Law
LAWS 6082#	Pollution Law
LAWS 6154#	Sustainable Development Law in China (12cp)
LAWS 6163	Energy Law
LAWS 6165	Biodiversity Law
LAWS 6173#	Trade & Environment
LAWS 6186	Native Title – Co-existence Perspectives
LAWS 6191#	Water Law
LAWS 6820	International Trade and Environment

LAWS 6252 **Legal Reasoning & the Common Law System**

6 credit points. Professor Patrick Parkinson. **Session**: 2 Intensive, 1 Intensive. **Corequisite**: Candidates must have completed or be concurrently enrolled in this unit before being permitted to enrol in other law units. **Assessment**: Two practical assignments, each worth 30%, one dealing with analysis of a case, the other, analysis of a statute. The remaining 40% will be attached to an assignment, comprised of short-answer questions, covering issues raised by the material on constitutional law, administrative law, contracts and torts.

NB: This unit is not compulsory for MBL candidates who have an accountancy degree or have completed a legal studies unit as part of a degree in business or commerce within a common law jurisdiction

This is a compulsory unit for all postgraduate students without a legal qualification entering the:

- Masters of Administrative Law and Policy
- Masters of Environmental Law
- Masters of Health Law
- Masters of Environmental Science and Law
- Masters of International Business and Law
- Masters of Labour Law and Relations

as well as Graduate Diplomas offered in these programs.

The unit has been designed to equip students 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.

LAWS 6044 **Environmental Law and Policy**

6 credit points. Professor Ben Boer (Convenor), Dr Gerry Bates. **Session**: 2 Intensive, 1 Intensive. **Assessment**: two 4000 wd essays (50% each).

NB: NB: Compulsory unit for MEL, GradDipEnvL, MEnvSciLaw candidates

The aim of the unit is to introduce students to overarching themes in environmental law and policy as a foundation to their more detailed studies for the degree of Master of Environmental Law or Graduate Diploma in Environmental Law.

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.

LAWS 6021 **Comparative Environmental Law**

6 credit points. Professor Ben Boer, Ms Rosemary Lyster. **Session**: 2 Intensive. **Corequisite**: Candidates enrolled in the MEL, GradDipEnvLaw and MenvSciLaw must undertake LAWS 6044 Environmental Law and Policy; and LAWS 6252 Legal Reasoning and the Common Law System (candidates who do not hold a legal qualification). **Assessment**: research paper (80%), class participation (20%).

The unit examines different approaches to environmental law in various constitutional, administrative, political, judicial, social, economic and cultural contexts. It familiarises students with environmental management regimes in a range of developed and developing countries. These countries may include the United States, New Zealand, Australia, South Africa, the People's Republic of China, Indonesia and various Pacific Island jurisdictions. Four topics focus on: Environmental Impact Assessment, Indigenous Peoples, Cultural Heritage Conservation, and the conservation of Biodiversity. The international legal and policy context is referred to throughout the course. The responses of various countries to the obligations undertaken through the United Nations Conference on Environment and Development are a theme of the unit.

LAWS 6041 **Environmental Dispute Resolution**

6 credit points. Ms Rosemary Lyster (Convenor), Mr Brian Preston SC. **Session**: 2 Intensive. **Corequisite**: Candidates enrolled in the MEL, GradDipEnvLaw and MenvSciLaw must undertake LAWS 6044 Environmental Law and Policy; and LAWS 6252 Legal Reasoning and the Common Law System (candidates who do not hold a legal qualification). **Assessment**: 7000wd essay (80%), class participation (20%).

NB: Department permission required for enrolment. The unit is restricted by a class quota of 28

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.

LAWS 6042 **Environmental Economics**

6 credit points. Professor Patricia Apps. **Session**: 2 Intensive. **Corequisite**: Candidates enrolled in the MEL, GradDipEnvLaw and MenvSciLaw must undertake LAWS 6044 Environmental Law and Policy; and LAWS 6252 Legal Reasoning and the Common Law System (candidates who do not hold a legal qualification). **Prohibition**: Not available to candidates who have previously completed LAWS 6257 'Public Policy'. **Assessment**: one research paper or exam (80%), problem-based assignments (10%), class presentation (10%).

This unit will present an introduction to the following topics:

- omarket failure and the objectives of environmental policy
- oenvironmental regulation, taxes and marketable permits
- otheory and measurement of externalities
- ocost-benefit analysis
- oeconomics of renewable and non-renewable resources
- ointer-generational equity
- ouncertainty and risk
- oeconomics of sustainable development

Emphasis will be given to the development of a broad social welfare approach to environmental policy which fully recognises costs and benefits for future generations.

LAWS 6043 **Environmental Impact Assessment Law**

6 credit points. Mr Bernard Dunne. **Session**: 1 Intensive. **Corequisite**: Candidates enrolled in the MEL, GradDipEnvLaw and MenvSciLaw must undertake LAWS 6044 Environmental Law and Policy; and LAWS 6252 Legal Reasoning and the Common Law System (candidates who do not hold a legal qualification). **Assessment**: one 4000wd essay (50%), one take 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.

LAWS 6045 **Environmental Planning Law**

6 credit points. Ms Nicola Franklin. **Session**: 1 Intensive. **Corequisite**: Candidates enrolled in the MEL, GradDipEnvLaw and MenvSciLaw must undertake LAWS 6044 Environmental Law and Policy; and LAWS 6252 Legal Reasoning and the Common Law System (candidates who do not hold a legal qualification). **Assessment**: one 4000w essay (50%), problem-based 4000 wd 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 students 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 students undertaking other units in the degree of Master of Environmental Law or the Graduate Diploma of Environmental Law.

LAWS 6055 **Heritage Law**

6 credit points. Professor Ben Boer. **Session**: 2 Intensive. **Classes**: Classes at Law School Aug 18–19 (9–5). Compulsory attendance on field trip Aug 22–27 (plus evening sessions as required) linked with LAWS 6165 Biodiversity Law. **Corequisite**: Candidates enrolled in the MEL, GradDipEnvLaw and MenvSciLaw must undertake LAWS 6044 Environmental Law and Policy; and LAWS 6252 Legal Reasoning and the Common Law System (candidates who do not hold a legal qualification). **Assessment**: one 4000wd research paper (50%) Due Date: Friday 17 October 2004 one problem assignment (50%) Due Date: Friday 12 November 2004.

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 Laws 6165 Biodiversity Law. Students 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. Typed notes will be available for distribution by 18 July 2004.

LAWS 6061 **International Environmental Law**

6 credit points. Professor Ben Boer. **Session**: 1 Intensive. **Corequisite**: Candidates enrolled in the MEL, GradDipEnvLaw and MenvSciLaw must undertake LAWS 6044 Environmental Law and Policy; and LAWS 6252 Legal Reasoning and the Common Law System (candidates who do not hold a legal qualification). **Assessment**: one problem based 2500 wd assignment (30%), one 5500wd essay (70%).

This unit aims to provide students 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.

LAWS 6082 **Pollution Law**

6 credit points. Ms Nicola Franklin, Dr Gerry Bates. **Session**: 1 Intensive. **Corequisite**: Candidates enrolled in the MEL, GradDipEnvLaw and MenvSciLaw must undertake LAWS 6044 Environmental Law and Policy; and LAWS 6252 Legal Reasoning and the Common Law System (candidates who do not hold a legal qualification). **Assessment**: one problem based 4000wd assignment (50%), one 4000wd 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.

LAWS 6154 **Sustainable Development Law in China**

12 credit points. Ms Nicola Franklin (Convenor), Chinese Professors of Law at Tsinghua University, Beijing. **Session**: 2 Intensive. **Assessment**: 12,000–15,000 word research paper submitted in March Semester (100%).

This 12-credit point unit comprises an intensive series of lectures and field trips in Beijing and Wuhan or Shanghai, China, followed by supervised research. The unit introduces the legal

and institutional framework of environmental law and policy in China, including the environmental responsibilities of foreign investors and is designed to encourage comparative and jurisprudential studies of Chinese and Australian environmental law and policy.

The lectures and field trips are undertaken over a period of two to three weeks in November. The unit is taught by both Australian and Chinese academics and involves the participation of both Australian and Chinese students. Australian students are given an introduction to Chinese law and the Chinese legal system before embarking on a study of Chinese environmental law. The introductory lectures are given by Chinese Professors of Law at Tsinghua University, Beijing.

Practical: Field Trips

LAWS 6163 **Energy Law**

6 credit points. Ms Rosemary Lyster. **Session**: 1 Intensive. **Corequisite**: Candidates enrolled in the MEL, GradDipEnvLaw and MenvSciLaw must undertake LAWS 6044 Environmental Law and Policy; and LAWS 6252 Legal Reasoning and the Common Law System (candidates who do not hold a legal qualification). **Assessment**: class participation (20%), one 7000wd essay (80%).

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 analyse 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.

LAWS 6165 **Biodiversity Law**

6 credit points. Professor Ben Boer (Convenor), Mr Brian Preston. **Session**: 2 Intensive. **Classes**: Classes at Law School Aug 20–21 (9–5). Compulsory attendance on field trip Aug 22–27 (plus evening sessions as required) linked with LAWS 6055 Heritage Law. **Corequisite**: Candidates enrolled in the MEL, GradDipEnvLaw and MenvSciLaw must undertake LAWS 6044 Environmental Law and Policy; and LAWS 6252 Legal Reasoning and the Common Law System (candidates who do not hold a legal qualification). **Assessment**: one 8000 wd research paper (100%) due on Friday 19 November 2004.

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 Laws 6055 Heritage Law. Students 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. Typed notes will be availble for distribution by 18 July 2004.

LAWS 6173 **Trade and Environment**

6 credit points. Visiting Professor Jan McDonald (Coordinated by Ms Nicola Franklin). **Session**: N/A in 2004. **Assessment**: 100% Research Paper (10,000 words).

This unit of study examines the sources of tension between the law and policy aspects of the international trade liberalisation regime, environmental protection and ecologically sustainable development. It examines the obligations imposed by the World Trade Organisation (WTO) framework and the scope and operation of environmental exceptions that have been considered in recent trade-environment disputes. It explores these developments from the perspective of parallel initiatives in international law aimed at promoting Ecologically Sustainable Development domestically and globally. The Agreements on Food Safety Standards and Technical Barriers to Trade are also covered to the extent that they impose limitations on nations' ability to specify the manner in which foods and other traded goods are manufactured or processed. Tensions between the Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS) and the rights and duties created by the Convention on Biodiversity are also discussed.

The unit contrasts the WTO regime with that implemented by regional trade groups such as the European Union, the North American Free Trade Agreement (NAFTA) and the Asia Pacific Economic Cooperation Forum (APEC) and attempts some evaluation of their relative strengths in promoting ESD. It also reflects on the attempts to negotiate an agreement on investment liberalisation and the issues that raises for environmental protection initiatives. By the end of the unit participants should be able to critically assess the prospects for future harmonisation of global free trade regimes and ESD principles in the context of the Australian debate on these issues.

LAWS 6186 **Native Title – Co-Existance Perspectives**

6 credit points. Ms Patricia Lane. **Session**: N/A in 2004. **Assessment**: 10 000 w original research essay (100%).

This course provides an introduction to native title law and practice in a variety of different areas. The unit will first give an overview of the common law of native title, and the concepts of its recognition and extinguishment. International law and experience of indigenous rights to land are covered, as also the extent to which the concept of native title relates to indigenous concepts of law and relationship to land. The remainder of the course deals with legal and other issues arising in the course of defining the extent of native title recognition, including:

1. The process by which native title rights are determined under the Native Title Act, including mediation and litigation in the Federal Court;
2. The effect of recognition of native title on resource development through the operation of the Future Act regmine;
3. The interaction between native title, heritage protection, and planning systems, with attention to the prospects for negotiating framework agreements between communities and government;
4. Aspects of compensation for impairment of native title.

LAWS 6191 **Water Law**

6 credit points. Ms Rosemary Lyster. **Session**: 2 Intensive. **Corequisite**: Candidates enrolled in the MEL, GradDipEnvLaw and MenvSciLaw must undertake LAWS 6044 Environmental Law and Policy; and LAWS 6252 Legal Reasoning and the Common Law System (candidates who do not hold a legal qualification). **Assessment**: one 7000wd essay (80%), 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.

LAWS 6820 **International Trade and Environment**

6 credit points. Professor Ben Boer. **Session**: 2 Intensive. **Corequisite**: Candidates enrolled in the MEL, GradDipEnvLaw and MenvSciLaw must undertake LAWS 6044 Environmental Law and Policy; and LAWS 6252 Legal Reasoning and the Common Law System (candidates who do not hold a legal qualification). **Prohibition**: Not available to candidates who previously completed LAWS 6173 'Trade & Environment'. **Assessment**: one 6000 wd assignment (60%), one problem assignment (40%).

This unit of study examines the sources of tension between the law and policy aspects of the international trade liberalisation regime, environmental protection and ecologically sustainable development. It examines the obligations imposed by the World Trade Organisation (WTO) framework and the scope and operation of environmental exceptions that have been considered in recent trade environmentdisputes. It explores these

developments from the perspective ofparallel initiatives in international law aimed at promoting EcologicallySustainable Development domestically and globally. The Agreements on Food Safety Standards and Technical Barriers to Trade are also covered to the extent that they impose limitations on nations' ability to specify the manner in which the Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS) and the rights and duties created by the Convention on Biodiversity are also discussed.The unit contrasts the WTO regime with that implemented by regional trade groups such as the European Union, the North American Free Trade Agreement (NAFTA) and the Asia Pacific Economic Cooperation Forum (APEC) and attempts some evaluation of their relative strengths in promoting ESD. It also reflects on the attempts to negotiate an agreement on investment liberalisation and the issues that raises for environmental protection initiatives. By the end of the unit participants should be able to critically assess the prospects for futureharmonisation of global free trade regimes and ESD principles in the context of the Australian debate on these issues.

■ History and Philosophy of Science

Graduate Certificate in Science (History and Philosophy of Science)

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.

Admission requirements

Candidates must have a Bachelors Degree or equivalent.

Course requirements

Candidates must complete 24 credit points from the following units of study, including HPSC 4108 (if they have not completed a major in HPS or equivalent program of study at another institution). Each unit of study is worth 6 credit points.

Units of study

- HPSC 4101 Philosophy of Science
- HPSC 4102 History of Science
- HPSC 4103 Sociology of Science
- HPSC 4104 Recent Topics in HPS
- HPSC 4105 HPS Research Methods
- HPSC 4108 Core Topics in HPS

Other information

The unit of study, HPSC 4108 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.

Course resolutions: see chapter 7.

HPSC 4101 **Philosophy of Science**

6 credit points. Jason Grossman. **Session**: 1. **Classes**: One 2hr sem/wk. **Prerequisite**: 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**: Five short written assignments, seminar participation.

NB: Department permission required for enrolment.

This unit explores the relationships between scientific theories and evidence, and the relationships between scientific theories and other scientific theories. Philosophical analyses are compared with examples of actual practice in physical and biological sciences.

Textbooks

Blackburn S. The Oxford Dictionary of Philosophy, and course reader.

HPSC 4102 **History of Science**

6 credit points. HPS Staff. **Session**: 1, 2. **Classes**: One 2hr sem/wk. **Prerequisite**: 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**: Two essays, seminar participation.

NB: Department permission required for enrolment.

This unit explores major episodes in the history of science as well as introducing students to historiographic methods.

Textbooks

Course reader

HPSC 4103 **Sociology of Science**

6 credit points. Dr Ofer Gal. **Session**: 2. **Classes**: One 2hr sem/wk. **Prerequisite**: 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.

NB: Department permission required for enrolment.

This course builds upon earlier courses introducing the sociology of science with an exploration of recent approaches in the social studies of scientific knowledge. Specific topics include the 'strong program' sociologists of knowledge and their critique of traditional philosophy of science, the counter-arguments of philosophers, anthropological approaches to science such as ethnomethodology and 'actor-network' theory, and sociology of technology. Students evaluate the approaches by conducting their own research on specific cases.

Textbooks

Course reader

HPSC 4104 **Recent Topics in HPS**

6 credit points. HPS Staff. **Session**: 1, 2. **Classes**: One 2hr sem/wk. **Prerequisite**: 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**: Two essays, seminar participation.

NB: Department permission required for enrolment.

An examination of one area of the contemporary literature in the history and philosophy of science.

Textbooks

Course reader

HPSC 4105 **HPS Research Methods**

6 credit points. Dr Ofer Gal. **Session**: 1. **Classes**: One 2hr sem/wk. **Prerequisite**: 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.

NB: Department permission required for enrolment.

An introduction to the research skills of history, philosophy and sociology of science. Students will learn to be conscious of their own introductions of interpretations, arguments and theories into their research and writing through comparative study of different schools in contemporary HPS.

Textbooks

Course reader

HPSC 4108 **Core topics: History & Philosophy of Sci**

6 credit points. HPS staff. **Session**: 1, 2. **Classes**: 1 sem/wk. **Prerequisite**: 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). **Prohibition**: 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**: Fortnightly literature reviews, seminar presentations, seminar participation mark.

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.

■ Information Technology

Graduate Certificate in Information Technology

Graduate Diploma in Information Technology

Master of Information Technology

Course Overview

The University of Sydney offers planned, targeted postgraduate programs in IT to meet the demand of the IT industry. This articulated program includes the Graduate Certificate in Information Technology, the Graduate Diploma in Information Technology and the Master of Information Technology degree and is designed to provide a core of knowledge in information technology, supplemented by a broad range of options within areas of Computer Networks and the Internet, E-business, Multimedia, Database Management and Administration, Software Engineering, Business Information Systems, etc. The combination of core units and electives provides an excellent retraining opportunity. Students will not only obtain breadth and depth in their knowledge of the IT industry but will also be able to choose from a selection of options which will allow them to focus on a specialisation in the broad span of the industry.

The Master of Information Technology requires 1 year (2 semesters) of full-time study. The degree is designed to teach you current developments in topics you have already studied as well as extend your knowledge in advanced computing subjects. The program consists of coursework and/or projects in your major area of interest.

During the first semester of attendance you have the opportunity to select from a number of Information Technology units of study. These cover topics in software engineering, database systems, multimedia, computer networks, business information systems, telecommunications engineering, and computer engineering.

Also available is a selection of specialist units of study covering advanced topics within various areas. In addition you have the option to choose information technology projects to replace some specialist units in the second semester if the average mark of your units of study is credit or above. The project involves a substantial piece of programming using the knowledge gained during the course and may be related to your employment.

Course Outcomes

Upon completion of the Graduate Certificate, graduates will possess a practical and theoretical background in some of the basic aspects of Information Technology. This can be supplemented and extended upon completion of the Graduate Diploma, and extended further to include research and practical skills by completion of the Masters program.

Upon completion of the Master of Information Technology graduates will have a sound knowledge base in several contemporary topics within information technology. They may also have opportunity of applying this knowledge to the implementation of a useful system.

Admission Requirements

Applicants for the Graduate Certificate in Information Technology should hold a Bachelor's degree with substantial study of a relevant field of Information Technology or a Bachelor of Engineering, Software Engineering or Telecommunications Engineering, or be able to offer evidence of recognised prior learning which is considered to demonstrate the knowledge and aptitude required to undertake this course.

Applicants for the Graduate Diploma in Information Technology should hold a Bachelor's degree with substantial study of a relevant field of Information Technology or a Bachelor of Engineering with a major sequence of study in Computer Engineering, Software Engineering or Telecommunications Engineering, or have completed the Graduate Certificate in Information Technology at the University of Sydney with credit average results or above.

Applicants for the Master of Information Technology should hold a Bachelor's degree with credit average results in a major sequence in any aspect of Information Technology, or a Bachelor of Engineering with credit average results in a major sequence in Computer Engineering, Software Engineering or Telecommunications Engineering, or have completed the Graduate Diploma in Information Technology at the University of Sydney with credit average results or above.

Course Requirements

Graduate Certificate in Information Technology:

- A total of 24 credit points must be completed;
- Credit points can be selected from Foundational and Specialist units of study, excluding INFO 5590 and IT project units of study.

Graduate Diploma in Information Technology:

- A total of 36 credit points must be completed;
- A maximum of 24 credit points can be selected from Foundational units of study;
- At least 12 credit points should come from Specialist units of study, excluding INFO 5590 and IT project units of study

Master of Information Technology:

- A total of 48 credit points must be completed;
- A maximum of 24 credit points can be selected from Foundational units of study;
- At least 24 credit points should come from Specialist units of study or IT project units of study;
- Every student must complete a defined major in the Master of Information Technology, which requires them to complete at least 18 credit points of Core units in the designated major;
- After completing 24 credit points of course work, students who achieve Credit average results or above in their coursework may select 12 credit points of IT project units of study among their Specialist units;
- After completing 24 credit points of course work, students who have Distinction average results or above may be eligible for the Research path subject to the approval of the Head of the School of Information Technologies and the Dean;
- Students who pursue the Research path must study INFO 4990 and select 18 credit points from IT research project units of study.

Credit for previous study

Credit is available in the Graduate Certificate in Information Technology, Graduate Diploma in Information Technology and Master of Information Technology for postgraduate study which has been undertaken in these award courses within the previous three years and for which no award has been conferred. If an award has been conferred, credit for study in these award courses is limited to 12 credit points. Students enrolled in either the GradCertIT, GradDipIT, or MInfTech are not permitted to transfer to the Master of Applied Information Technology course.

Course Resolutions: see chapter 7.

Units of study available in 2004

The units of study change annually

Unit of study		Sem
Unless otherwise indicated, all units are worth 6 credit points		
Foundational units		
COMP 5114	Digital Media Fundamentals	1,2
COMP 5028	Object Oriented Analysis and Design	1,2
COMP 5116	Internet Protocols	1,2
COMP 5122	Multimedia Human Computer Interaction	1,2
COMP 5126	Distributed Systems Programming	1,2
COMP 5138	Relational Database Management Systems	1,2
COMP 5148	Quality Software Development in Practice	1,2
ELEC 6404	Integrated Circuit Design	1
ELEC 6504	Digital Communication Systems	1
ELEC 6505	Error Control Coding	1
ELEC 6507	Wireless Networks	2
ELEC 6704	Software Project Management	1
INFS 6000	Business Information Systems	1,2
MKTG 5001	Marketing Principles	1,2
Specialist units		
COMP 5318	Knowledge Discovery and Data Mining	1,2
COMP 5338	Advanced Data Models	1,2
COMP 5347	E-Commerce Technology	1,2
COMP 5348	Enterprise Scale Software Development	1,2
COMP 5415	Multimedia Authoring and Production	1,2
COMP 5416	Advanced Network Technologies	1,2
COMP 5425	Multimedia Storage, Retrieval and Delivery	1,2
COMP 5426	Network Based High Performance Computing	1,2
INFO 5990	Professional Practice in IT	1,2
ELEC 6604	Engineering Software Requirements	2
ELEC 6605	Computer Design	1
ELEC 6606	Real Time Computing	1

Unit of study		Sem
ELEC 7501	Advanced Communication Networks	2
ELEC 7502	Satellite Communication Systems	2
ELEC 7503	Optical Communication Systems	1
ELEC 7504	Cellular Radio Engineering	1
ELEC 7506	Optical Networks	2
ELEC 7610	Computer & Network Security	2
ELEC 8521	Radio Frequency Engineering	1
ELEC 8522	Antennas & Propagation	2
INFS 6001	Management Information Systems	2
INFS 6002	Information Technology Strategy & Mgmt	1
INFS 6004	Change Agent Consulting for IT Industry	1
INFS 6012	Integrated Enterprise Systems	1
INFS 6013	IT Risk Management & Assurance	1
INFS 6014	IT Project Management	2
INFS 6015	Business Process Analysis & Design	2
INFS 6017	INFS Knowledge Management	2
INFS 6101	Special Topic in Business Info Systems	1,2
MKTG 6015	Electronic Marketing	2
IT project units		
COMP 5702	Information Technology Project A (12 cp)	1,2
COMP 5703	Information Technology Project B (12 cp)	1,2
COMP 5704	Information Technology Project C	1,2
ELEC 8900	Project full-time (12 cp)	1,2

Units of study available in majors in 2004

Majors are not defined for the Graduate Certificate or for the Graduate Diploma in Information Technology.

Core Units for Computer Networks major

To achieve a major in Computer Networks, a student must complete INFO5990 and 12 credit points of study units from this list. Students in the Research path must complete INFO4990 instead of INFO5990. Unless otherwise indicated, all units are worth 6 credit points.

COMP 5416 Advanced Network Technologies
COMP 5426 Network Based High Performance Computing
COMP 5703 Information Technology Project (12 cp)
ELEC 8900 Project full time (12 cp)

Only available to the Research path:

COMP 5702 IT Research Project A (12 cp)
COMP 5704 IT Research Project B

(COMP 5702 + COMP 5704 = 18 cp)

Core Units for Multimedia Technology major

To achieve a major in Multimedia Technology, a student must complete INFO5990 and 12 credit points of study units from this list. Students in the Research path must complete INFO4990 instead of INFO5990. Unless otherwise indicated, all units are worth 6 credit points.

COMP 5415 Multimedia Authoring and Production
COMP 5425 Multimedia Storage, Retrieval and Delivery
COMP 5703 Information Technology Project (12 cp)
ELEC 8900 Project full time (12 cp)

Only available to the Research path:

COMP 5702 IT Research Project A (12 cp)
COMP 5704 IT Research Project B

(COMP 5702 + COMP 5704 = 18 cp)

Core Units for Database Management Systems major

To achieve a major in Database Management Systems, a student must complete INFO5990 and 12 credit points of study units from this list. Students in the Research path must complete INFO4990 instead of INFO5990. Unless otherwise indicated, all units are worth 6 credit points.

COMP 5338 Advanced Data Models
COMP 5318 Knowledge Discovery and Data Mining
COMP 5703 Information Technology Project (12 cp)
ELEC 8900 Project full time (12 cp)

Only available to the Research path:

COMP 5702 Information Technology Project A (12 cp)
COMP 5704 Information Technology Project B

(COMP 5702 + COMP 5704 = 18 cp)

Core Units for Software Engineering major

To achieve a major in Software Engineering, a student must complete INFO5990 and 12 credit points of study units from this list. Students in the Research path must complete INFO4990 instead of INFO5990. Unless otherwise indicated, all units are worth 6 credit points.

COMP 5347 E-Commerce Technology
COMP 5348 Enterprise Scale Software Development
COMP 5703 Information Technology Project (12 cp)
ELEC 8900 Project full time (12 cp)

Core Units for Software Engineering major

Only available to the Research path:

COMP 5702 Information Technology Project A (12 cp)
COMP 5704 Information Technology Project B

(COMP 5702 + COMP 5704 = 18 cp)

Core Units for Computer Science major

To achieve a major in Computer Science, a student must complete INFO5990 and 12 credit points of study units from this list. Students in the Research path must complete INFO4990 instead of INFO5990. Unless otherwise indicated, all units are worth 6 credit points.

COMP 5425 Multimedia Storage, Retrieval and Delivery
COMP 5426 Network Based High Performance Computing
COMP 5318 Knowledge Discovery and Data Mining
COMP 5348 Enterprise Scale Software Development
COMP 5703 Information Technology Project (12 cp)
ELEC 8900 Project full time (12 cp)

Only available to the Research path:

COMP 5702 IT Research Project A (12 cp)
COMP 5704 IT Research Project B
(COMP 5702 + COMP 5704 = 18 cp)

Telecommunications Engineering major

Unit of study		Core
Unless otherwise indicated, all units are worth 6 credit points		
Foundational units		
ELEC 6504	Digital Communication Networks	
ELEC 6505	Error Control Coding	
ELEC 6507	Wireless Networks	
ELEC 6704	Software Project Management	
Specialist units		
ELEC 7501	Advanced Communication Networks	C
ELEC 7502	Satellite Communication Systems	C
ELEC 7503	Optical Communication Systems	C
ELEC 7504	Cellular Radio Engineering	C
ELEC 7506	Optical Networks	C
ELEC 8521	Radio Frequency Engineering	C
ELEC 8522	Antennas and Propagation	C
IT projects		
ELEC 8900	Project full time (12 cp)	

Computer Engineering major

Unit of study		Core
Unless otherwise indicated, all units are worth 6 credit points		
Foundational units		
COMP 5114	Digital Media Fundamentals	
ELEC 6404	Integrated Circuit Design	
ELEC 6704	Software Project Management	
Specialist units		
COMP 5347	E-Commerce Technology	
ELEC 6604	Engineering Software Requirements	C
ELEC 6605	Computer Design	C
ELEC 6606	Real Time Computing	C
ELEC 7610	Computer and Network Security	C
IT projects		
ELEC 8900	Project full time (12 cp)	

E-Business major

Unit of study		Core
Unless otherwise indicated, all units are worth 6 credit points		
Foundational units		
COMP 5114	Digital Media Fundamentals	
INFS 6000	Business Information Systems	
MKTG 5001	Marketing Principles	
Specialist units		
COMP 5347	E-Commerce Technology	C
ELEC 7610	Computer and Network Security	
INFS 6001	Management Information Systems	
INFS 6002	Information Technology Strategy & Management	C
INFS 6004	Change Agent Consulting for IT Industry	C
INFS 6012	Integrated Enterprise Systems	
INFS 6013	IT Risk Management and Assurance	
INFS 6014	IT Project Management	C
INFS 6015	Business Process Analysis and Design	
INFS 6016	Internet Business Models & Strategies	
INFS 6017	Knowledge Management	
INFS 6101	Special Topic in Business Information Systems	
MKTG 6015	Electronic Marketing	C

Business Information Systems major

Unit of study		Core
Unless otherwise indicated, all units are worth 6 credit points		
Foundational units		
INFS 6000	Business Information Systems	
MKTG 5001	Marketing Principles	
Specialist units		
COMP 5318	Knowledge Discovery and Data Mining	
COMP 5347	E-Commerce Technology	
INFS 6001	Management Information Systems	C
INFS 6002	Information Technology Strategy and Management	
INFS 6004	Change Agent Consulting for IT Industry	
INFS 6012	Integrated Enterprise Systems	C
INFS 6013	IT Risk Management and Assurance	C
INFS 6014	IT Project Management	
INFS 6015	Business Process Analysis and Design	C
INFS 6016	Internet Business Models & Strategies	
INFS 6017	Knowledge Management	
INFS 6101	Special Topic in Business Information Systems	
MKTG 6015	Electronic Marketing	

■ Information Technology units of study

Foundational units of study

COMP 5028 **Object-Oriented Analysis and Design**

6 credit points. **Session**: 1, 2. **Classes**: 2 lec & 1 tut/wk. **Assumed knowledge**: Some programming experience is essential. **Assessment**: Assignments, written exam.

Foundational

This unit introduces Object-Oriented Analysis and Design especially the principles of modeling 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 and exception handling;
- implement and test the objects;
- read and write various UML diagrams (use case, activity, class, object, sequence, collaboration, state chart, component and deployment diagrams).

COMP 5114 **Digital Media Fundamentals**

6 credit points. **Session**: 1, 2. **Classes**: 2 lec, 1 tut/wk. **Assessment**: Assignments, written exam.

Foundational.

This unit provides an overview of processing digital media which include text, audio, pictorial data and video. It introduces various processing techniques and standards, and presents some applications.

Objectives

The unit covers Multimedia Primer; Text Processing which includes text parsing, text summarization, text manipulation, text index and retrieval, and surrogate coding; Audio Data Processing which includes audio attribute, audio masking, MP3 audio, audio manipulation and audio segmentation; pictorial data processing which includes still image processing, multi-modal image processing and artificial image processing; video data processing which includes active image processing, video segmentation, motion analysis, moving object extraction, video representation and codification.

COMP 5116 **Internet Protocols**

6 credit points. **Session**: 1, 2. **Classes**: 3 hrs/week. **Assessment**: Examination, class tests and written assignments.

To provide an overview and in depth knowledge of the structure and algorithms used in the TCP/IP networking protocols that make up the foundation of the Internet. The unit will enable students to use their knowledge to go beyond the fundamental protocol stack and to work actively with more advanced topics outside of the stack. Furthermore, the unit will provide the students with the architectural insight to being able to design and analyse protocols in the perspective of their intended use. Finally, to provide experience in reading standard documents such as Internet RFC's and/or drafts.

COMP 5122 **Multimedia Human Computer Interaction**

6 credit points. **Session**: 1, 2.

COMP 5126 **Distributed Systems Programming**

6 credit points. **Session**: 1, 2. **Classes**: 3 hrs/week. **Assumed knowledge**: COMP 5213, Java and C++, firm understanding of the core protocols in the TCP/IP protocol stack through Internet Protocols. **Assessment**: Examination, class tests and programming assignments.

This unit examines the importance of platform independent networks.

Students will gain extensive knowledge on Internet, the Transport Layer including TCP and UDP, Socket Address Structures, I/O Multiplexing, DNS Name and Address Conversions, Routing Sockets, Broadcasting and Multicasting. The unit will also cover Threads Programming, Client/Server Programming with Shared Access and Advanced Sockets Programming.

Textbooks

W. Stevens – Unix Network Programming.

COMP 5138 **Relational Database Management Systems**

6 credit points. **Session**: 1, 2. **Classes**: 3 hrs/week. **Assessment**: Final examination and project(s).

This unit of study will provide a comprehensive conceptual and practical introduction to managing large relational databases. Relational and normalization theory will be emphasized along with a focus on relational query language (SQL).

COMP 5148 **Quality Software Development in Practice**

6 credit points. **Session**: 1, 2. **Classes**: 3 hrs/week. **Assumed knowledge**: COMP 5214. **Assessment**: Examination and two practical assignments.

This course will focus on the issues in software development other than the syntax of a particular programming language. Students who complete this course will have the ability to write good code rather than just correct code, as well as the ability to analyse a given solution to a problem and determine if the solution is a good one.

Textbooks

The Practice of Programming, Kernighan and Pike. The Pragmatic Programmer, Andrew Hunt and David Thomas.

ELEC 6404 **Integrated Circuit Design**

6 credit points. **Session**: 1. **Classes**: Two 1hr lectures and a 2hr lab/tut per week. **Prerequisite**: Assumed Knowledge: ELEC 3401 Electronic Devices and Circuits. **Assessment**: A design project and a 2hr exam at end of semester.

Recommended elective unit of study for Computer, Electrical, Software and Telecommunications Engineering.

Technology (IC production process, design rules, layout). Design automation and verification (DRC, circuit extraction, simulation and hardware design languages). Basic digital building blocks (inverters, simple logic gates, transmission gates, propagation delays, power dissipation and noise margins). Digital circuits and systems (PLAs, dynamic circuits, RAM, ROM, microprocessors, systolic arrays). Semicustom design (gate arrays and standard cells). Analog VLSI (switches, active resistors, current sources and mirrors, voltage, current references, amplifiers, DAC, ADC, continuous time filters, switch capacitor circuits, analog signal processing circuits).

ELEC 6504 **Digital Communication Systems**

6 credit points. **Session**: 1. **Classes**: Two 1hr lectures and a 2hr lab/tut per week. **Assumed knowledge**: ELEC 3502 Random Signals and Communications, and ELEC 3503 Introduction to Digital Communications. **Assessment**: Assignments, lab work and a 2hr exam at end of semester.

Core unit of study for Telecommunications Engineering. Recommended elective unit of study for Computer, Electrical and Software Engineering and Electronic Commerce.

Digital communications principles and performance criteria. Digitally modulated signals: non-linear modulation methods, continuous phase FSK, continuous phase modulation. Modulated carrier data transmission: QPSK, QAM, MFSK, MSK. Trellis coded modulation and modem technologies. Spread spectrum, including frequency hopping and CDMA principles. Optical communication systems – single and multi-channel systems, performance criteria and systems analysis. Satellite communications systems. Cellular mobile radio systems.

ELEC 6505 **Error Control Coding**

6 credit points. **Session**: 1. **Classes**: Two 1hr lectures and a 2hr lab/tut per week. **Prerequisite**: Assumed Knowledge: ELEC 3502 Random Signals and Communications, and ELEC 3503 Introduction to Digital Communications. **Assessment**: Assignments and a 2hr exam at end of semester.

Recommended elective unit of study for Computer, Electrical, Software and Telecommunications Engineering.

Error control coding principles, linear algebra, linear block codes, cyclic codes, BCH codes, Reed-Solomon codes, burst-error correcting codes, design of codecs for block codes, applications of block codes in communications and digital recording, convolutional codes, Viterbi algorithm, design of codecs for convolutional codes, applications of convolutional codes in communications, soft decision decoding of block and convolutional codes, trellis coded modulation, block coded modulation, design of codecs for trellis codes, applications of trellis codes in data transmission, multidimensional codes, turbo codes.

ELEC 6704 **Software Project Management**

6 credit points. **Session**: 1. **Classes**: Two 1hr lectures and a 2hr lab/tut per week. **Prerequisite**: Assumed Knowledge: (COMP 3100 Software Engineering and COMP 3205 Product Development Project) or (INFO 2000 Systems Analysis and Design and SOFT 2004 Software Development Methods 1). **Assessment**: Lab work, project and a 2h exam at end of semester.

Core unit of study for Software Engineering. Recommended elective unit of study for Computer, Electrical and Telecommunications Engineering and Electronic Commerce.

The objective of this unit of study is for students to understand the issues involved in software project management and the factors that affect software quality; to be familiar with a range of standards, techniques and tools developed to support software project management and the production of high quality software; and to be able to develop software project plans, supporting software quality plans and risk management plans. Topics covered include project management issues such as client management; management of technical teams; project planning and scheduling; risk management; configuration management; quality assurance and accreditation; legal issues. Topics on software quality include: factors affecting software quality; planning for quality; software quality assurance plans; software measurement; Australian and international standards.

INFS 6000 **Business Information Systems**

6 credit points. **Session**: 1, 2.

The aim is to help understand (i) the need for business processes to meet organisational objectives and expected outcomes, (ii) the complex and changing information systems environment of business and government from the perspective of stakeholders, and (iii) the issues associated with managing information technology effectively. Understanding is fostered through presenting conceptual frameworks, system documentation tools and practical problems of implementation and operation of information systems. Three themes are referenced during the course: relational forms of data storage, integrating enterprise-wide systems and core processes supporting e-business initiatives. The challenges of adequate governance and internal control are explored with reference to both business processes and information technology.

MKTG 5001 **Marketing Principles**

6 credit points. **Session**: 1, 2, Summer. **Assessment**: In-class quizzes 20%; Final exam 30%; Team assessment 50%.

This course introduces students to the basic principles and language of marketing theory and practice. Marketing principles are examined in relation to a wide variety of products and services, in both commercial and non-commercial domains. A strong emphasis is placed on strategy planning and the marketing decision process. Students learn via the analysis of case studies drawn from the Asia-Pacific region, as well as the USA.

The course is presented in four sections. These are: (a) introduction to marketing and the marketing management process, (b) strategic issues in marketing – focussing on the preliminary analyses that are required before a marketing decision can be made, (c) the marketing mix – a detailed look at the components that make up a marketing plan, and (d) marketing planning, implementation and control processes. Students will gain practical experience in analysing marketing situations and developing a comprehensive marketing plan.

Specialist units of study

COMP 5318 **Knowledge, Discovery and Data Mining**

6 credit points. **Session**: 1, 2. **Classes**: 2 lec & 1 tut/wk. **Prerequisite**: COMP 5138. **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 unit provides a practical and technical introduction to knowledge discovery and data mining.

COMP 5338 **Advanced Data Models**

6 credit points. **Session**: 1, 2. **Classes**: 3 hrs/week. **Prerequisite**: COMP 5138. **Assessment**: Final examination and project(s).

This course will offer a comprehensive survey of post-relational data models and technologies with significant emphasis on XML and content management on the world wide web. The important challenges in managing the complex and varied data in modern database environments will be specifically addressed.

COMP 5347 **E-commerce Technology**

6 credit points. **Session**: 1, 2. **Classes**: 2 lec & 1 tut/wk. **Prerequisite**: COMP 5028. **Assessment**: Assignments, written exam.

This unit of study is designed to provide in-depth technologies relevant to electronic commerce on the Internet. It covers communications and networking, the Internet and mobile ecommerce, architecture of web systems, data interchange, access and cryptographic security, electronic payments, etc. This includes server-side development of e-business applications, methodologies and practices for the development of web-applications, J2EE/Java-based support for front-end development, XML processing, and database integration, as well as web services development (SOAP, WSDL, UDDI) and handheld wireless integration.

COMP 5348 **Enterprise Scale Software Development**

6 credit points. **Session**: 1, 2.

This unit addresses important technological issues of enterprise-scale solutions such as naming, registration, security, and ACID transactions. These concepts are treated at a level that applies across technologies, and students also get practical experience with several technologies of current importance.

A crucial factor in the successful delivery of enterprise-scale solutions is the treatment of software development as a 'mission critical' business process. This unit focuses on recognised skills and techniques for the definition, measurement, evaluation, management, and improvement of enterprise-scale software development processes.

Textbooks

F. P. Brooks. The Mythical Man-Month, Addison Wesley (1995). P Kruchten. The Rational Unified Process, Addison-Wesley, (1999). W Humphrey. The Personal Software Process

COMP 5415 **Multimedia Authoring and Production**

6 credit points. **Session**: 1, 2. **Classes**: 2 lec, 1 tut/wk. **Prerequisite**: COMP 5114. **Assessment**: Assignments, written exam.

This unit provides fundamentals on multimedia authoring and production. It discusses in great length on multimedia animation and authoring. It also introduces some multimedia authoring packages. The students will get a great exposure to the software authoring package Alice. It will study the applications of multimedia authoring in the areas of tele-medicine, progressive animation, multi-casting, distance learning.

COMP 5416 **Advanced Network Technologies**

6 credit points. **Session**: 1, 2. **Classes**: 3 hrs. **Prerequisite**: COMP (5116 or 5126). **Assessment**: Examination, class tests and written assignments.

This unit will provide an understanding of the fundamental issues in building an integrated multi-service network for global Internet services taking into account service objectives, application characteristics and needs and network mechanisms. The unit will cover the core issues and the proposed solutions so students can actively follow and participate in the development of the Internet beyond the basic bit transport service.

Textbooks

Technical documents including RFCs and Internet drafts

COMP 5425 **Multimedia Storage, Retrieval & Delivery**

6 credit points. **Session**: 1, 2. **Prerequisite**: COMP 5122.

This unit provides a comprehensive coverage on developing multimedia systems and retrieving multimedia information. It introduces multimedia storage and compression, describes multimedia information retrieval, and discusses various issues on

multimedia security, copyright protection, transmission and delivery.

COMP 5426 Network Based High Performance Computing

6 credit points. **Session**: 1, 2. **Classes**: 3 hrs. **Prerequisite**: COMP 5126. **Assessment**: mid-semester test, assignments, and an exam.

This unit introduces the study of high performance computer systems. It presents the foundational concepts pertaining to the different types and classes of high performance computers, and the technological context of current high performance computer systems.

This unit will provide the students with skills in evaluating, experimenting with, and optimizing the performance of high performance computers. The course will also provide the students with the ability to undertake more advanced topics and courses on high performance computing.

Textbooks

B. Wilkinson, M. Allen. Parallel Programming: Techniques and Applications Using Networked Workstations and Parallel Computers (Prentice-Hall, 2004).

INFO 5990 Professional Practice in IT

6 credit points. **Session**: 1, 2. **Classes**: 3 hrs. **Assessment**: Examination, assignments, case studies.

The unit defines and explains the standards of knowledge of Information & Communication Technology (ICT) professionals. It covers the project management and quality principles necessary for the successful management of system development or enhancement projects.

The unit will focus on managing the system life cycle, system performance evaluation, managing expectations of team members, cost effectiveness analysis, scheduling and change and risk management. It will also cover issues related to Ethics and Social implications as part of their involvement in professional practice.

Textbooks

Schwalbe, K. – Information Technology Project Management

ELEC 6604 Engineering Software Requirements

6 credit points. **Session**: 2. **Classes**: Two 1hr lectures and a 2hr lab/tut per week. **Prerequisite**: Assumed Knowledge: (COMP 3100 Software Engineering or COMP 2111 Algorithms 1) and SOFT 2004 Software Development Methods 1. **Assessment**: Lab work, project and a 2h exam at end of semester.

Core unit of study for Software Engineering. Recommended elective unit of study for Computer, Electrical and Telecommunications Engineering and Electronic Commerce.

The objective of this course is for students to become aware of issues, tools and techniques involved in the engineering of software to meet specific performance, safety and security requirements; to understand the factors that affect software reliability and be familiar with design techniques that can enhance reliability. Topics covered include: systems design process; system specifications; functional decomposition; safety requirements aspects; security requirements; reliability concepts, models and design techniques.

ELEC 6605 Computer Design

6 credit points. **Session**: 1. **Classes**: Two 1hr lectures and a 2hr lab/tut per week. **Prerequisite**: Assumed Knowledge: ELEC 3403 Switching Devices and Electronics, and ELEC 3601 Digital Systems Design. **Prohibition**: MECH 4730 Computers in Real time Instrumentation and Control. **Assessment**: Assignments, lab reports and a 2hr exam at end of semester.

Core unit of study for Computer Engineering. Recommended elective unit of study for Electrical, Software and Telecommunications Engineering.

Digital systems design process. Design cycle. Top down design. Specification. Functional design. Structural design. Testing. Hardware description languages. VHDL. Digital systems architectures. Processors, buses and I/O devices. Synchronous, asynchronous and semi-synchronous buses. Bus interconnections. Memory and I/O interface design. Static and dynamic memory design. Memory interfacing. Interrupts. Vectored interrupts. Interrupt controllers. Parallel interface design. Serial interface design. Bus arbitration. Processor interfacing. IBM PC interfacing. Some case studies.

ELEC 6606 Real Time Computing

6 credit points. **Session**: 1. **Classes**: Two 1hr lectures and a 2hr lab/tut per week. **Prerequisite**: Assumed Knowledge: ELEC 3601 Digital Systems Design and COMP 3100 Software Engineering. **Assessment**: Lab marks, reports and a 2hr exam at the end of semester.

Core unit of study for Computer and Software Engineering. Recommended elective unit of study for Electrical and Telecommunications Engineering.

Hard real time and embedded systems, as applied to engineering, manufacturing and automation. Timing and scheduling: periodic vs aperiodic processes, hard vs soft deadlines, predictability and determinacy, granularity, rate monotonic and earliest deadline scheduling. Real-time systems and software, implementation of real-time control. Real-time languages and their features. Real time operating systems. Real time software design.

Embedded Systems: overview, signal flow, interfacing. Reliability and fault tolerance in hardware and software.

SCADA and DCCS. Some case studies.

ELEC 7501 Advanced Communication Networks

6 credit points. **Session**: 2. **Classes**: Two 1hr lectures and a 2hr lab/tut per week. **Prerequisite**: Assumed Knowledge: NETS 3007 Network Protocols or ELEC 3604 Internet Engineering. **Assessment**: Project report and presentation and a 2hr exam at end of semester.

Recommended elective unit of study for Computer, Electrical, Software and Telecommunications Engineering.

This unit of study serves as an introduction to network research. The unit relies on a solid understanding of the TCP/IP protocol suite and properties of data networks' physical layers. The unit introduces some of the currently most debated research topics in networking and presents an overview of different technical solutions. The students are expected to critically evaluate these solutions in their context and produce an objective analysis of advantages/disadvantages of the different research proposals. Areas covered will be IP mobility management, quality of service in IP networks, ad hoc networks, naming and presence systems and peer-to-peer networks.

ELEC 7502 Satellite Communication Systems

6 credit points. **Session**: 2. **Classes**: Two 1hr lectures and a 1hr tut per week. **Prerequisite**: Assumed Knowledge: ELEC 3502 Random Signals and Communications, ELEC 3503 Introduction to Digital Communications and ELEC 4502 Digital Communication Systems. **Assessment**: Assignments and a 2hr exam at end of semester.

Recommended elective unit of study for Computer, Electrical, Software and Telecommunications Engineering.

Introduction to satellite communication, satellite link design, propagation characteristics of fixed and mobile satellite links, channel modelling, access control schemes, system performance analysis, system design, mobile satellite services, global satellite systems, national satellite systems, mobile satellite network design, digital modem design, speech codec design, error control codec design, low earth orbit communication satellite systems.

ELEC 7503 Optical Communication Systems

6 credit points. **Session**: 1. **Classes**: Two 1hr lectures and a 1hr tut per week. **Prerequisite**: Assumed Knowledge: ELEC 3402 Communications Electronics, ELEC 3502 Random Signals and Communications, and ELEC 3503 Introduction to Digital Communications. **Assessment**: Assignments and a 2hr exam at end of semester.

Recommended elective unit of study for Computer, Electrical, Software and Telecommunications Engineering.

Introduction to optical fibre communications, optical fibre transmission characteristics, semiconductor and fibre laser signal sources, optical transmitters, direct and external modulation, optical amplifiers, optical repeaters, fibre devices and multiplexers, fibre nonlinearity, optical detectors, optical receivers and regenerators, sensitivity and error rate performance, photonic switching and processing, lightwave local area networks, multi-channel multiplexing techniques, optical fibre communication systems.

ELEC 7504 Cellular Radio Engineering

6 credit points. **Session**: 1. **Classes**: Two 1hr lectures and a 2hr lab/tut per week. **Prerequisite**: Assumed Knowledge: ELEC 3502 Random Signals and Communications, and ELEC 3503 Introduction to Digital Communications. **Assessment**: Assignments and a 2hr exam at end of semester.

Recommended elective unit of study for Computer, Electrical, Software and Telecommunications Engineering.

Antenna basics: analysis of simple antennas, uniform linear antenna arrays, planar array, base-station antennas, mobile antennas. Mobile radio channel: multipath fading, diversity, log-normal fading, mean propagation loss, propagation models. Cellular technologies: cell types, coverage, frequency allocation, link budget, power budget, traffic capacity. TDMA cellular systems ‹ GSM standard: coding and modulation, special characteristics and features, logical and physical channels, frame

structure, general packet radio services (GPRS), GSM evolution towards UMTS. CDMA cellular systems ‹ IS-95 standard: physical and logical channels, asynchronous data, short message service, packet data services for CDMA cellular/PCS systems, cdma 2000 layering structure.

ELEC 7506 **Optical Networks**

6 credit points. **Session**: 2. **Classes**: Two 1hr lectures and a 1hr lab/tut per week. **Prerequisite**: Assumed Knowledge: ELEC 3502 Random Signals and Communications, and ELEC 3503 Introduction to Digital Communications. **Assessment**: Assignments and a 2hr exam at end of semester.

Recommended elective unit of study for Computer, Electrical, Software and Telecommunications Engineering.

Introduction, photonic network architectures: point to point, star, ring, mesh; system principles: modulation formats, link budgets, optical signal to noise ratio, dispersion, error rates, optical gain and regeneration; wavelength division multiplexed networks; WDM components: optical filters, gratings, multiplexers, demultiplexers, wavelength routers, optical crossconnects, wavelength converters, WDM transmitters and receivers; Wavelength switched/routed networks, ultra high speed TDM, dispersion managed links, soliton systems; broadcast and distribution networks, multiple access, subcarrier multiplexed lightwave video networks, optical local area and metropolitan area networks; protocols for photonic networks: IP, Gbit Ethernet, SDH/SONET, FDDI, ATM, Fibre Channel.

ELEC 7610 **Computer and Network Security**

6 credit points. **Session**: 1. **Classes**: Two 1hr lectures and a 2hr lab/tut per week. **Prerequisite**: Assumed Knowledge: (ELEC 3604 Internet Engineering and ELEC 4501 Data Communication Networks) or ELEC 3504 DataCommunications and the Internet. **Prohibition**: NETS 3016 Computer and Network Security. **Assessment**: Assignments, lab marks and an exam at end of semester.

Recommended elective unit of study for Computer, Electrical, Software and Telecommunications Engineering.

This unit examines the basic cryptographic building blocks of security, working through to their applications in authentication, key exchange, secret and public key encryption, digital signatures, protocols and systems. It then considers these applications in the real world, analysing practical cryptosystems, the assumptions with which they were designed, their limitations, failure modes, and ultimately why most end up broken.

ELEC 8521 **Radio Frequency Engineering**

6 credit points. **Session**: 1. **Classes**: Two 1hr lectures and a 1hr lab/tut per week. **Prerequisite**: Assumed Knowledge: ELEC 2101 Circuit Analysis, and ELEC 3401 Electronic Devices and Circuits. **Assessment**: Assignments and a 2hr exam at end of semester.

Recommended elective unit of study for Computer, Electrical, Software and Telecommunications Engineering.

This unit of study is concerned with the design, specification, implementation and support of radio frequency systems such as in mobile communications. It covers the following areas: transmission lines and circuit descriptions; passive radio frequency components, including couplers, filters and power dividers; typical radio frequency circuits; radio frequency system characteristics, including noise, linearity, sensitivity, selectivity and distortion; basic radio frequency measurements; amplifier and oscillator design; frequency translating circuits; non-linear and large signal characteristics; introduction to device modelling and circuit simulation.

ELEC 8522 **Antennas and Propagation**

6 credit points. **Session**: 2. **Classes**: Two 1hr lectures and a 1hr lab/tut per week. **Prerequisite**: Assumed Knowledge: MATH 2001 Complex Variables, and ELEC 3102 Engineering Electromagnetics. **Assessment**: Assignments and a 2hr exam at end of semester.

Recommended elective unit of study for Computer, Electrical, Software and Telecommunications Engineering.

This unit of study covers the theory and practice of modern antenna design, relevant to applications in telecommunications, radar and imaging systems from metre to millimetre wavelengths.

The first part of the unit describes the theory of radiation from elementary current sources, wires and arrays and introduces antenna terminology and characteristics such as radiation patterns, directivity, polarization and gain. The properties of receiving and transmitting antennas in a communications link are also described.

The second part of the unit describes three significant areas in antenna practice:

1. Numerical analysis of wire antennas ‹ an introduction to the computer aided design of wire antennas and arrays.
2. Aperture antennas ‹ an introduction to horn and reflector antennas and their applications.
3. Microstrip antennas ‹ an introduction to modern printed circuit antennas and arrays and their applications

INFS 6001 **Management Information Systems**

6 credit points. **Session**: 1. **Prerequisite**: INFS 6000. **Assessment**: Group assignments; Mid-semester exam; Final exam.

This unit is concerned with the organisational foundations of information systems and their emerging strategic role. It provides an extensive introduction to real-world systems, focusing on their relationship to organisations, management and business processes. It also provides a solid understanding of the technology underlying information systems and how various information technology work together to create infrastructure for electronic commerce and electronic business. The role of information systems in capturing and distributing organisational knowledge and in enhancing management decision making is also explored. Finally the special management challenges and opportunities created by the pervasiveness and power of information systems are examined.

INFS 6002 **Information Technology Strategy and Mgmt**

6 credit points. **Session**: 2. **Prerequisite**: INFS 6000. **Assessment**: Group assignments; Mid-semester exam; Final exam.

The main purpose of this unit is to provide a strategic and senior management perspective to the management of information technology considering its increasing strategic importance. This unit provides insight to how businesses manage IT in the context of business strategy, the IT function, and IT projects. It examines approaches to re-thinking business operations and models, including associated strategies, risks and implementation. An important focus is on how competitive organisations make decisions about their IT investments and then leverage IT in use. It particularly deals with the role and potential of IT in creating and sustaining business competitive advantage in a dynamic and global business environment.

INFS 6004 **Change Agent Consulting for IT Industry**

6 credit points. Mark Borman. **Session**: 1. **Assumed knowledge**: INFS 6000.

This course aims to equip students with an ability to operate as a change agent in the IT industry with an appropriate sensitivity to the needs of the client and their own role in the change process. Its learning objectives are to understand: i) the context and roles of change; ii) the applicability of various change techniques and the role of information technology in each; iii) practical issues in the management of client selection, relationships and contract management; and iv) how to apply all these concepts to the activity of consulting in the IT industry.

INFS 6012 **Integrated Enterprise Systems**

6 credit points. **Session**: 1. **Assumed knowledge**: INFS 6000; INFS 6010 OR COMP 5015 (Relational Database Systems) OR COMP 5215 (Foundational Database Systems).

This unit provides an overview of integrated enterprise systems with the help of packaged software solutions (via the SAP R/3 enterprise resource planning system). It provides students with practical experience in using the SAP R/3 system and familiarises them with all the modules and their functionality with the aim of exploring the concepts of enterprise resource planning and its ability to integrate functions within business. Students gain a thorough understanding of the information flows in procurement, production planning, production control, inventory control, sales and distribution, financial accounting and cost controlling. Reengineering and configuration of the enterprise systems and the architecture requirements for successful implementation of packaged software solutions is also covered.

INFS 6013 **IT Risk Management and Assurance**

6 credit points. **Session**: 1. **Assumed knowledge**: INFS 6000.

The main purpose of this subject is to provide concepts, tools and techniques for effective management control of the acquisition, implementation and operation of information systems. Within a risk management framework, the unit outlines the requirements and potential risks of each stage of the information system lifecycle and details how the application of appropriate quality standards and internal controls can serve to mitigate those risks. Theoretical and conceptual material covered in lectures is reinforced through extensive case study analysis.

Students will be exposed to the specific requirements of information systems for different organisational functions and introduced to auditing approaches and standards to ensure that processes and controls are effective.

INFS 6014 **IT Project Management**
6 credit points. **Session**: 2. **Assumed knowledge**: INFS 6000.
This course covers the factors necessary for successful management of system development or enhancement projects. Both technical and behavioural aspects of project management are discussed with a focus on management of development. Major topics include project plan development, execution and control along with consideration of the organisational context of the project including cost-benefit analysis, human resource management, communications management and any application specific issues.

INFS 6015 **Business Process Analysis and Design**
6 credit points. **Session**: 2. **Assumed knowledge**: INFS 6000.
This unit provides students with an overview of designing, analysing, modelling and redesigning business processess. It provides detailed understanding of concepts, strategies, tools and technologies for reengineering, integration, and performance measurement of the business processes. The unit also develops practical skills by modelling and redesigning business processes and workflows using commercial software. The notion of developing a fully process-managed enterprise is central to the unit.

INFS 6016 **Internet Business Models and Strategies**
6 credit points. **Session**: 2. **Assumed knowledge**: INFS 6000.
This unit studies electronic commerce from a management perspective and in the context of integrated information systems and inter-enterprise integration models. It describes the concepts, strategies, tools and technologies for carrying out electronic commerce on the Internet. It also provides a solid introduction to the business models and essential business processes that have evolved in conducting business using Internet technology. The topics in this unit include framework for e-commerce, e-business models, B2B commerce, value chains, e-business processes, electronic payment systems, infrastructure for e-commerce, and retailing in e-commerce.

INFS 6017 **INFS Knowledge Management**
6 credit points. **Session**: 2. **Assumed knowledge**: INFS 6000.
Knowledge, and its effective exploitation, is increasingly considered a major competitive differentiator for organisations. This unit introduces the concept of knowledge management and outlines the systems and activities that enable the acquisition, storage, distributions and use of knowledge. The unit begins by defining different types of knowledge and examines how knowledge is creating and captured. Different systems and tools (including data mining and knowledge portals) for processing and disseminating knowledge are also presented and their appropriateness assessed. This unit also takes students through the end-to-end process of developing and implementing a knowledge strategy within an organisation.

INFS 6101 **Special Topic in Business Info Systems**
6 credit points. **Session**: 1, 2. **Prerequisite**: Permission of Head of Department.
NB: Department permission required for enrolment.
This unit provides the opportunity for students to complete intensive study in an area of Business Information Systems. In the absence of formal classes, students are required to research and write a short dissertation under the guidance of a staff member in an area of contemporary business information systems.

MKTG 6015 **Electronic Marketing**
6 credit points. Jeaney Yip. **Session**: 2. **Prerequisite**: MKTG 5001. **Assessment**: Presentation of e-marketing plan 10%; In-class participation 10%; Case analysis 20%; E-marketing plan and Web site 30%; Final exam 30%.
This subject introduces students to emerging interactive technologies. The primary focus will be the Internet and its impact on every aspect of marketing strategy. At present, every function within marketing is fundamentally changed by these interactive technologies. Consequently, there is a clear need for marketing students and practitioners to understand how these new technologies can be combined with traditional marketing techniques. An objective of this course is to equip students with a working knowledge of the principles and techniques of electronic marketing. Additionally it explores the similarities and differences between using the traditional and new technologies in the marketing context.

IT project units

COMP 5702 **IT Research Project A**
12 credit points. **Session**: 1, 2. **Classes**: 8 prac/wk. **Assessment**: Report.
Specialist/Elective/Project

COMP 5703 **Information Technology Project**
12 credit points. **Session**: 1, 2. **Classes**: 8 prac/wk. **Assessment**: Report.
Specialist/Elective/Project

COMP 5704 **IT Research Project B**
6 credit points. **Session**: 1, 2. **Classes**: 4 prac/wk. **Assessment**: Report.
Specialist/Elective/Project

ELEC 8900 **Project, Full-Time**
12 credit points. **Session**: 1, 2.
The carrying out and writing up of an approved significant project equivalent to about four months full-time work in a topic preferably related to their course-work enrolment. It can be part of the candidate's normal employment. As a guide, a project topic is likely to be satisfactory if a successful outcome of the work is such that it would lend itself to publication in a learned journal such as the Journal of the Institution of Engineers, Australia. The project may be carried out full-time over one semester or part-time over two semesters (part A followed by part B).

■ Applied Information Technology

Graduate Certificate in Applied Information Technology

Graduate Diploma in Applied Information Technology

Master of Applied Information Technology

Course Overview
The University of Sydney offers planned, targeted postgraduate programs in IT to meet the demand of the applied IT industry. This articulated program includes the Graduate Certificate in Applied Information Technology, the Graduate Diploma in Applied Information Technology and the degree of Master of Applied Information Technology and is designed to provide a core of knowledge in information technology, supplemented by a broad range of options within the areas of Computer Networks and the Internet, Multimedia, Database Management and Administration, Software Engineering and Computer Science. The combination of core units and options provides an excellent retraining opportunity. Students will not only obtain depth in their knowledge of the IT industry but they will also be able to choose from a selection of options which will allow them to focus on specialisations in the broad span of the industry.

Course Outcomes
The articulated award program in Applied Information Technology is designed for graduates in other fields who wish to enter the IT industry, for graduates with expertise in another field who wish to enhance the effective use of IT within the field of their previous training, or for those already skilled as IT professionals who wish to embrace new technology.

Upon completion of the Graduate Certificate, graduates will possess a practical and theoretical background in some of the basic aspects of Information Technology. This can be supplemented and extended upon completion of the Graduate Diploma, and extended further to include research and practical skills by completion of the Masters program. Students completing the full postgraduate program will have a grounding in all basic areas of Information Technology, enabling them to follow innovations in IT, contribute to the development of IT, and make use of IT in solving various issues.

Admission Requirements
Applicants for the Graduate Certificate in Applied Information Technology should hold a Bachelor's degree in Physical Science, Engineering, or a Bachelor's degree with some background in Information Technology or Mathematics, or be persons who have

worked in Information Technology for more than 8 years can offer evidence of prior learning which is considered to demonstrate the knowledge and aptitude required to undertake this course.

Applicants for the Graduate Diploma in Applied Information Technology should hold a Bachelor's degree in Physical Science or Engineering, or a Bachelor's degree with some background in Information Technology or Mathematics, or have completed the Graduate Certificate in Applied Information Technology at the University of Sydney with credit average results or above.

Applicants for the Master of Applied Information Technology should hold a Bachelor's degree in Physical Science or Engineering, or a Bachelor's degree with some background in Information Technology or Mathematics, or have completed the Graduate Diploma of Applied Information Technology at the University of Sydney with credit average results or above.

Course Requirements

Graduate Certificate in Applied Information Technology:

- A total of 36 credit points must be completed;
- A total of 24 credit points must be selected from Elementary units of study;
- At least 12 credit points should come from Foundational and Specialist units of study, excluding INFO 5990 and IT project units of study;

Graduate Diploma in Applied Information Technology:

- A total of 48 credit points must be completed;
- A total of 24 credit points must be selected from Elementary units of study;
- At least 18 credit points of Elementary units of study must be completed before students can enrol in any Foundational or Specialist unit of study;
- At least 24 credit points should come from Foundational and Specialist units of study, excluding INFO 5990 and IT project units of study;

Master of Applied Information Technology:

- A total of 72 credit points must be completed;
- A total of 24 credit points must be selected from Elementary units of study;
- A maximum of 24 credit points must be selected from Foundational units of study;
- At least 18 credit points of Elementary units of study must be completed before students can enrol in any Foundational or Specialist unit of study;
- At least 24 credit points should come from Specialist units of study or IT project units of study;
- units of study offered by the Faculties of Engineering and Economics & Business are not available for students enrolled in the Grad Cert Applied IT, Grad Dip Applied IT, or Master of Applied IT degree programs;
- Every student must complete a defined major in the Master of Applied Information Technology, which requires them to complete at least 18 credit points of Core units in the designated major;
- After completing 48 credit points of course work, students who achieve Credit average results or above in all Foundational and Specialist units of study attempted may select 12 credit points of IT project units of study among their specialist units;
- After completing 48 credit points of course work, students who have Distinction average results or above in all Foundational and Specialist units of study attempted may be eligible for the Research path subject to the approval of the Head of the School of Information Technologies and the Dean;
- Students who pursue the Research path must study INFO 4990 and select 18 credit points from IT research project units of study.

Credit for previous study

Credit is not available in the Graduate Certificate in Applied Information Technology, Graduate Diploma in Applied Information Technology and Master of Applied Information Technology for postgraduate study unless it was undertaken in these award courses within the previous three years and no award has been conferred. If an award has been conferred, credit for study in these award courses is limited to 12 credit points of the units from the other award course.

Course Resolutions: see chapter 7.

Units of study available in 2004

The units of study offered change annually

Unit of study		Sem
Unless otherwise indicated, all units are worth 6 credit points		
Elementary Units		
COMP 5211	Algorithms	1,2
COMP 5213	Computer and Network Organisation	1,2
COMP 5206	Introduction to Information Systems	1,2
COMP 5214	Software Development in Java	1,2
Foundational units		
COMP 5114	Digital Media Fundamentals	1,2
COMP 5028	Object Oriented Analysis and Design	1,2
COMP 5116	Internet Protocols	1,2
COMP 5122	Multimedia Human Computer Interaction	1,2
COMP 5126	Distributed Systems Programming	1,2
COMP 5138	Relational Database Management Systems	1,2
COMP 5148	Quality Software Development in Practice	1,2
Specialist units		
COMP 5318	Knowledge Discovery and Data Mining	1,2
COMP 5347	E-Commerce Technology	1,2
COMP 5415	Multimedia Authoring and Production	1,2
COMP 5338	Advanced Data Models	1,2
COMP 5348	Enterprise Scale Software Development	1,2
COMP 5416	Advanced Network Technologies	1,2
COMP 5425	Multimedia Storage, Retrieval and Delivery	1,2
COMP 5426	Network Based High Performance Computing	1,2
INFO 5990	Professional Practice in IT	1,2
IT project units		
COMP 5702	Information Technology Project A (12 cp)	1,2
COMP 5703	Information Technology Project B (12 cp)	1,2
COMP 5704	Information Technology Project C	1,2

Units of study available in majors in 2004

Majors are not defined for the Graduate Certificate or the Graduate Diploma in Applied Information Technology.

Core Units for Computer Networks major

ToTo achieve a major in Computer Networks, a student must complete INFO5990 and 12 credit points of study units from this list. Students in the Research path must complete INFO4990 instead of INFO5990. Unless otherwise indicated, all units are worth 6 credit points.

COMP 5416 Advanced Network Technologies
COMP 5426 Network Based High Performance Computing
COMP 5703 Information Technology Project (12 cp)

Only available to the Research path:

COMP 5702 IT Research Project A (12 cp)
COMP 5704 IT Research Project B

(COMP 5702 + COMP 5704 = 18 cp)

Core Units for Multimedia Technology major

To achieve a major in Multimedia Technology, a student must complete INFO5990 and 12 credit points of study units from this list. Students in the Research path must complete INFO4990 instead of INFO5990. Unless otherwise indicated, all units are worth 6 credit points.

COMP 5415 Multimedia Authoring and Production
COMP 5425 Multimedia Storage, Retrieval and Delivery
COMP 5703 Information Technology Project (12 cp)

Only available to the Research path:

COMP 5702 IT Research Project A (12 cp)
COMP 5704 IT Research Project B

(COMP 5702 + COMP 5704 = 18 cp)

Core Units for Database Management Systems major

Core Units for Database Management Systems major
To achieve a major in Database Management Systems, a student must complete INFO5990 and 12 credit points of study units from this list. Students in the Research path must complete INFO4990 instead of INFO5990. Unless otherwise indicated, all units are worth 6 credit points.

COMP 5338 Advanced Data Models
COMP 5318 Knowledge Discovery and Data Mining
COMP 5703 Information Technology Project (12 cp)

Only available to the Research path:

COMP 5702 Information Technology Project A (12 cp)
COMP 5704 Information Technology Project B

(COMP 5702 + COMP 5704 = 18 cp)

Core Units for Software Engineering major

To achieve a major in Software Engineering, a student must complete INFO5990 and 12 credit points of study units from this list. Students in the Research path must complete INFO4990 instead of INFO5990. Unless otherwise indicated, all units are worth 6 credit points.

COMP 5347 E-Commerce Technology
COMP 5348 Enterprise Scale Software Development
COMP 5703 Information Technology Project (12 cp)
ELEC 8900 Project full time (12 cp)

Only available to the Research path:

COMP 5702 Information Technology Project A (12 cp)
COMP 5704 Information Technology Project B

(COMP 5702 + COMP 5704 = 18 cp)

Core Units for Computer Science major

To achieve a major in Computer Science, a student must complete INFO5990 and 12 credit points of study units from this list. Students in the Research path must complete INFO4990 instead of INFO5990. Unless otherwise indicated, all units are worth 6 credit points.

COMP 5425 Multimedia Storage, Retrieval and Delivery
COMP 5426 Network Based High Performance Computing
COMP 5318 Knowledge Discovery and Data Mining
COMP 5348 Enterprise Scale Software Development
COMP 5703 Information Technology Project (12 cp)

Only available to the Research path:

COMP 5702 Information Technology Project A (12 cp)
COMP 5704 Information Technology Project B

(COMP 5702 + COMP 5704 = 18 cp)

■ Applied Information Technology units of study

For descriptions of Foundational and Specialist units and IT projects, refer to the Information Technology units of study in the preceding pages.

Elementary units

COMP 5206 **Introduction to Information Systems**

6 credit points. **Session**: 1, 2. **Classes**: 3 hrs/week. **Assessment**: Examination, laboratory-based assignments, and written reports.

The unit content will provide an introduction to information systems in organisations and the role of database management. It will introduce the fundamentals of database management and the modelling and analysis that need to be carried out for designing and implementing database solutions. The unit will also introduce a database query language.

COMP 5211 **Algorithms**

6 credit points. **Session**: 1, 2. **Classes**: 2 lec & 1 tut/wk. **Assessment**: Assignments, written exam.

Algorithm is a fundamental technique in computing. This unit of study covers data structure, algorithm and 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. It also teaches students how to program in C language.

COMP 5213 **Computer and Network Organisation**

6 credit points. **Session**: 1, 2. **Classes**: 2 lec & 1 tut/wk. **Assessment**: Assignments, written exam.

Elementary

This unit of study is an overview of hardware and system infrastructure software including compilers, operating systems, device drivers, network protocols, etc. It also includes user-level Unix skills and network usability.

Objectives

This unit of study provides an overview of hardware and system infrastructure software including compilers, operating systems, device drivers, network protocols, etc. It also includes user-level Unix skills and network usability.

COMP 5214 **Software Development in Java**

6 credit points. **Session**: 1, 2. **Classes**: 2 lec & 1 tut/wk. **Assessment**: Assignments, written exam.

Elementary

This unit of study introduces software development method with main emphasis on the 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 programming background and will not go into programming but want to know computer software.

Objectives

This unit of study covers system analysis, design methodology, quality assurance, group collaboration, version control, software delivery and system documentation.

■ Marine Ecology

Graduate Certificate in Quantitative Marine Ecology

Graduate Diploma in Quantitative Marine Ecology

Master of Quantitative Marine Ecology

Course outcomes

Upon completion of the Graduate Certificate graduates will possess a practical and theoretical background in some aspects of the field of study; this will be extended upon completion of the Graduate Diploma and further extended to include research and practical skills upon completion of the Masters program.

Admission requirements

Applicants for the Graduate Certificate should hold a Bachelor's degree appropriate for the field of study, or experience which is considered to demonstrate the knowledge and aptitude required to undertake the course.

Applicants for the Graduate Diploma should hold a Bachelor's degree appropriate for the field of study, or an equivalent standard of knowledge; or have completed the Graduate Certificate in Quantitative Marine Ecology in the same field of study.

Applicants for the Master in Quantitative Marine Ecology should hold a Bachelor's degree appropriate for the field of study, or an equivalent standard of knowledge; or have completed the Graduate Diploma in Quantitative Marine Ecology in the same field of study.

Course requirements

The Graduate Certificate in Quantitative Marine Ecology is completed full time over one semester. To qualify for the award candidates must complete 24 credit points of units of study, as described in the table below.

The Graduate Diploma in Quantitative Marine Ecology is completed by one semester of full time study and one semester of part time study. To qualify for the award candidates must complete 24 credit points of core units of study in semester one and 12 credit points of elective units in semester two, as described in the table below.

The Master of Quantitative Marine Ecology is completed by one semester of full time study and two semesters of part time study. To qualify for the award candidates must complete 24 credit points of core units of study in semester one, 12 credit points of elective units in semester two and the associated project in the first semester of the following year, as described in the table below.

Prospective international students should contact the Centre for Research on the Ecological Impacts of Coastal Cities (CREICC) regarding alternative timetabling arrangements.

Credit for previous study

Credit is not available in the Graduate Certificate in Quantitative Marine Ecology, Graduate Diploma in Quantitative Marine Ecology and Master of Quantitative Marine Ecology for postgraduate study which has not been undertaken in these award courses within the previous three years, except at the discretion of the Dean. A candidate who has qualified for the award of the Graduate Certificate in Quantitative Marine Ecology may transfer, within three years, to the Graduate Diploma in Quantitative Marine Ecology and receive credit for up to 24 credit points from the Graduate Certificate in Quantitative Marine Ecology. A candidate who has qualified for the award of the Graduate Diploma in Quantitative Marine Ecology may transfer, within three years, to the Master of Quantitative Marine Ecology and receive credit for up to 36 credit points from the Graduate Diploma in Quantitative Marine Ecology. A candidate who has completed units of study in the Quantitative Marine Ecology program within the previous three years, but has not qualified for an award, may transfer to another award within the

Quantitative Marine Ecology program and receive credit for the units of study completed.

Course Resolutions: see chapter 7.

Master of Quantitative Marine Ecology

Unit of study		Credit points
Year 1, Semester 1 – All students		
QMEC 5110	Structure & Management of Research Projects	6
QMEC 5120	Design & Analysis of Sampling (Introduction)	6
QMEC 5140	Intro to Assessment of Living Marine Resources	6
QMEC 5150	Ecological Science & Environmental Impact Assessment	6
Year 1, Semester 2 – Graduate Diploma and Master's		
QMEC 5270	Environmental Impacts & Ecological Restoration	12
QMEC 5280	Conservation & Biodiversity	12
QMEC 5290	Assessment of Living Marine Resources	12
Year 2, Semester 1 – Master's		
QMEC 5310	Project: Environmental Impacts & Restoration	12
QMEC 5320	Project: Conservation & Biodiversity	12
QMEC 5330	Project: Assessment of Living Marine Resources	12

QMEC 5110 **Structure & Management of Research Proj**

6 credit points. **Session**: 1.

Developing an understanding of the management of ecological/ environmental research projects through phases of recognition, definition, explanation, sampling, analysis, interpretation, conclusions and action requires realization of the nature of scientific aspects of problem-solving. This unit will integrate the logical basis of the problem being investigated with the management of the quantitative data needed to interpret such problems.

QMEC 5120 **Design and Analysis of Sampling (Intro)**

6 credit points. **Session**: 1.

This unit introduces ecological variables in spatial hierarchies and how to estimate means and variances, with simple linear relationships between ecological variables. The unit demonstrates decision-making using statistical estimates.

QMEC 5140 **Intro Assessment:Living Marine Resources**

6 credit points. **Session**: 1.

An overview of the application of modelling methods for marine resource assessment. Candidates will build deterministic and stochastic simulation models of fisheries and modify these to reflect management options and performance criteria. The written report of this modelling exercise will be assessed.

QMEC 5150 **Ecological Sci & Enviro Impact Assess**

6 credit points. **Session**: 1.

This unit includes lectures, tutorials and assessment that will provide the candidate with a critical understanding of the role of ecological science within environmental impact assessment (EIA). Guidelines for EIA shall be studied along with several environmental impact statements (EIS) for proposals within the marine environment. Candidates will learn to identify if the ecological science presented within these EIS meets appropriate scientific standards and is adequate to meet the guidelines for EIA in NSW.

QMEC 5270 **Enviro Impacts & Ecological Restoration**

12 credit points. **Session**: 2. **Prerequisite**: QMEC (5110 and 5120 and 5140 and 5150).

This unit is comprised of several topics that are described below:

Design and Analysis of Sampling

This topic builds from the introduction in QMEC 5120 to develop concepts of linear models and combinations of ecological variables. The topic leads to general skills with design of sampling programs to detect specified patterns in temporally variable and spatially patchy habitats.

Legislative and Policy Frameworks

In this topic, the regulatory and policy frameworks for environmental assessments are identified. A particular focus is guide-lines for professional consultants in quantitative aspects of sampling and monitoring.

Analysis of Multivariate Data

This topic emphasises conceptual understanding and applied usage of advanced analytical methods. Implementation and interpretation of methods in applied research with complex experimental designs and structures are emphasized.

Environmental Impact Assessment

Quantitative analyses to test hypotheses about environmental impacts are generally asymmetrical because disturbances are usually in one area, while many reference or locations are available to provide realistic contrasts. Beyond BACI procedures and other modern approaches solve the problems. In this topic, their use is explained and practical examples explored.

Numerically Intensive Statistical Methods

Candidates will be given the necessary computing skills and theoretical knowledge to tackle various problems using numerically intensive methods such as bootstrapping and permutation tests.

Ecological Restoration

This unit will introduce the participants to the scientific background and quantitative nature of ecological restoration, thereby emphasizing it as a scientific discipline. It will discuss the logical framework for restoration, how this leads to appropriate sampling designs and analyses to measure it and the consequences of ignoring such a quantitative approach. Methods of measuring and analysing restoration will be illustrated with practical examples and field studies

QMEC 5280 **Conservation and Biodiversity**

12 credit points. **Session**: 2. **Prerequisite**: QMEC 5110, QMEC 5120, QMEC 5140 and QMEC 5150.

This unit is comprised of several topics that are described below:

Design and Analysis of Sampling

This topic builds from the introduction in QMEC 5120 to develop concepts of linear models and combinations of ecological variables. The topic leads to general skills with design of sampling programs to detect specified patterns in temporally variable and spatially patchy habitats.

Legislative and Policy Frameworks

In this topic, the regulatory and policy frameworks for environmental assessments are identified. A particular focus is guide-lines for professional consultants in quantitative aspects of sampling and monitoring.

Analysis of Multivariate Data

This topic emphasises conceptual understanding and applied usage of advanced analytical methods. Implementation and interpretation of methods in applied research with complex experimental designs and structures are emphasized.

Analysis of Marine Biodiversity

This topic will introduce the participants to the quantitative nature of marine biodiversity. Appropriate measurements of biodiversity are discussed and analysed.

Numerically Intensive Statistical Methods

Candidates will be given the necessary computing skills and theoretical knowledge to tackle various problems using numerically intensive methods such as bootstrapping and permutation tests.

Ecological Restoration

This unit will introduce the participants to the scientific background and quantitative nature of ecological restoration, thereby emphasizing it as a scientific discipline. It will discuss the logical framework for restoration, how this leads to appropriate sampling designs and analyses to measure it and the consequences of ignoring such a quantitative approach. Methods of measuring and analysing restoration will be illustrated with practical examples and field studies

QMEC 5290 **Assessment of Living Marine Resources**

12 credit points. **Session**: 2. **Prerequisite**: QMEC 5110, QMEC 5120, QMEC 5140 and QMEC 5150.

This unit is comprised of several topics that are described below:

Design and Analysis of Sampling

This topic builds from the introduction in QMEC 5120 to develop concepts of linear models and combinations of ecological variables. The topic leads to general skills with design of sampling programs to detect specified patterns in temporally variable and spatially patchy habitats.

Marine Population Dynamics and Stock Assessment

This topic examines the statistical modelling techniques used to assess fish stocks. Approaches such as age-structured modelling and yield-per-recruit analyses are covered in detail. Strategies for modelling the growth of individual fish and relationships between stock size and recruitment are also studied.

Legislative and Policy Frameworks

In this topic, the regulatory and policy frameworks for environmental assessments are identified. A particular focus is guide-lines for professional consultants in quantitative aspects of sampling and monitoring.

Numerically Intensive Statistical Methods & Monte Carlo Simulation

Candidates will be given the necessary computing skills and theoretical knowledge to tackle various problems using numerically intensive methods such as bootstrapping and Monte Carlo Simulation.

QMEC 5310 **Project: Environment Impacts/ Restoration**

12 credit points. **Session**: 1, 2. **Corequisite**: QMEC 5270.

The unit will provide candidates with the necessary skills and experience for them to either commence a Ph.D. in marine ecology, environmental management or other related fields. Candidates will initiate a research project of their own design, but will be supervised in all aspects of developing it as a M.Sc. level thesis. This will involve identifying and understanding the logical basis of the questions being asked, the sampling design, methods and analyses to answer them, the collection of data and interpretation of the results with respect to the international literature. The research will be written up as a academic thesis and published in a peer-reviewed journal (if of suitable quality).

QMEC 5320 **Project: Conservation and Biodiversity**

12 credit points. **Session**: 1, 2. **Corequisite**: QMEC 5280.

The unit will provide candidates with the necessary skills and experience for them to either commence a Ph.D. in marine ecology, environmental management or other related fields. Candidates will initiate a research project of their own design, but will be supervised in all aspects of developing it as a M.Sc. level thesis. This will involve identifying and understanding the logical basis of the questions being asked, the sampling design, methods and analyses to answer them, the collection of data and interpretation of the results with respect to the international literature. The research will be written up as a academic thesis and published in a peer-reviewed journal (if of suitable quality).

QMEC 5330 **Project: Assess Living Marine Resources**

12 credit points. **Session**: 1, 2. **Corequisite**: QMEC 5290.

The unit will provide candidates with the necessary skills and experience for them to either commence a Ph.D. in marine resource assessment or commence employed work in this field. Candidates will complete a research project that requires them to complete a fishery resource assessment of interest to a state or federal management agency. Tasks will include liaison with the appropriate agency staff, quality assessment of data, parameter estimation, variance estimation and appropriate forecasts of management decisions. The assessment will be written up as a academic thesis and published in a peer-reviewed journal (if of suitable quality).

■ Medical Physics

Graduate Diploma in Medical Physics

Master of Medical Physics

Course overview

The Master of Medical Physics provides the entry qualification for a medical physicist working in a hospital and is accredited by the Australasian College of Physical Scientists and Engineers in Medicine (ACPSEM). The degree consists of eight coursework units of study (which by themselves constitute the Graduate Diploma) plus a substantial project, which would usually be undertaken in a hospital.

Course outcomes

A graduate of the Masters program will be a qualified medical physicist according to the criteria set down by ACPSEM and will be eligible to apply for medical physicist positions in hospitals in Australia and New Zealand. A graduate of the Graduate Diploma would not be a qualified medical physicist, but will have acquired the same knowledge and practical skills base. Upon completion of the Graduate Diploma, this can be extended to include research and further practical skills by completion of the Masters program.

Admission requirements

A graduate with a major in physics (ie, three undergraduate years of Physics) or equivalent (such as an appropriate engineering degree).

Course requirements

Graduate Diploma in Medical Physics

48 credit points, consisting of eight core units of study, each of 6 credit points.

Master of Medical Physics

72 credit points, consisting of the 48 credit points of the Graduate Diploma plus a 24 credit point project.

Credit for previous study

Credit is not available in the Graduate Diploma in Medical Physics and Master of Medical Physics for postgraduate study which has not been undertaken within these award courses within the previous three years, except at the discretion of the Dean. 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.

Course Resolutions: see chapter 7.

*** Please note: these units are subject to approval by the Senate of The University of Sydney. They are included here as an indication only. Please contact the Faculty for further information on these units.**

Units of study available in 2004

Unit of study		Credit points
All units are core. Unless otherwise indicated all units are worth 6 credit points		
PHYS 5001	Radiation Physics	6
PHYS 5002	Anatomy & Physiology	6
PHYS 5003	Instrumentation	6
PHYS 5004	Radiation Dosimetry	6
NTDT 5305	Radiotherapy Physics	6
PHYS 5006	Medical Imaging Physics	6
PHYS 5007	Image Processing	3
PHYS 5008	Radiation Biology & Health Physics	6
PHYS 5009	Research Methodology	3
PHYS 5010	Project	24

Medical Physics units of study

All units are core. Unless otherwise indicated all units are worth 6 credit points

PHYS 5001 **Radiation Physics**

6 credit points. Session: 1. Classes: 2 lec/wk, 1 prac/wk; Assessment: assignments, written exam

Concepts of radioactivity will be introduced. The production of ionising radiation and its fundamental interactions with matter and related factors will be covered.

PHYS 5002 **Anatomy and Physiology**

6 credit points. Session: 1. Classes: 2 lec/wk, 1 prac/wk; Assessment: assignments, written exam

This unit introduces concepts of the structure of the human cell and tissues. The organisation and function of each of the major organ systems that constitute the human body are covered. Example of pathology of diseases commonly encountered in the practice of medical physics will be included.

PHYS 5003 **Instrumentation**

6 credit points. Session: 1. Classes: 2 lec/wk, 1 prac/wk; Assessment: assignments, written exam

The principles underlying the fundamental operation of instrumentation used in medicine will be introduced. Examples will include pressure and volume measurements in respiratory medicine, electric potential measurements in cardiology and dosimetry of ionising radiation in radiotherapy and radiology.

PHYS 5004 **Radiation Dosimetry**

6 credit points. Session: 1. Classes: 2 lec/wk, 1 prac/wk; Assessment: assignments, written exam

This unit introduces the principles of both absolute and relative measurement of ionising radiation in radiotherapy and medical imaging. Issues related to the dosimetry of non-ionising radiation will also be covered.

PHYS 5005 **Radiotherapy Physics**

6 credit points. Session: 2. Classes: 2 lec/wk, 1 prac/wk; Assessment: assignments, written exam

This unit introduces both theoretical and practical aspects of the major topics in radiotherapy physics. These topics will include radiation beam production and modification, calibration and characterisation. Principles of treatment planning and dose calculation and reporting will also be covered. The physics of brachytherepy will also be considered.

PHYS 5006 **Medical Imaging Physics**

6 credit points. Session: 2. Classes: 2 lec/wk, 1 prac/wk; Assessment: assignments, written exam

This unit introduces the physical principles underlying the science of imaging in radiology, ultrasound, magnetic resonance imaging and nuclear medicine. Image appreciation in general will be covered.

PHYS 5007 **Image Processing**

3 credit points. Session: 2. Classes: 2 lec/wk, 1 prac/wk, for half semester; Assessment: assignments, written exam

Medical imaging modalities produce images in digital form. These digital images frequently undergo processing such as enhancement, registration, fusion and 3D reconstruction. Along with the theory of image formation, this unit introduces concepts of computing, numerical methods and image processing.

PHYS 5008 **Radiation Biology and Health Physics**

6 credit points. Session: 2. Classes: 2 lec/wk, 1 prac/wk; Assessment: assignments, written exam

This unit identifies the biological effects due to the interaction of radiation with human tissues from the DNA level through to the major organ systems. Factors affecting dose response will be considered. Models describing characteristic behaviour will be explored.

PHYS 5009 **Research Methodology**

3 credit points. Session: 2. Classes: 2 lec/wk, 1 prac/wk, for half semester; Assessment: assignments, written exam

This unit provides an understanding of the processes involved in conducting various forms of research, basic data analysis and interpretation, research writing and presentation skills. The professional framework is presented by considering issues such as legal, ethical and basic management issues.

PHYS 5010 **Project**

24 credit points. Session: 1,2 Assessment: report

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.

■ Nutrition and Dietetics

Master of Nutrition and Dietetics

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 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. First year starts at the same time as undergraduate teaching but there is some work during vacations. 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.

Admission Requirements

Applicants must have a degree from a recognised institution and have completed two full semesters in Biochemistry and Human Physiology. For example, a student who completed a BSc at Sydney should have studied Biochemistry 2001(or MBLG 2001) and 2002 and Physiology 2001 and 2002. A student who has completed a BMedSc should have completed the second year of the program. These subjects are required by the Dietitians Association of Australia.

Course requirements

First Year: This is an integrated academic year of teaching, practicals and study. As part of the course, students attend the Ryde College of Technical and Further Education for practicals in commercial cookery, followed by dietetic cookery. This costs an additional $550. All students take the courses listed below.

Second year: In the February semester of second year (Jan to June) approximately half of the class do a clinical and community dietetics training placement while the other half do a research project. Then in the July semester of second year (July to Nov) students cross over to the alternate course.

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 Dean of the Faculty of Science.

Course Resolutions: see chapter 7.

Master of Nutrition and Dietetics

Unit of study		Credit points
Year 1, Semester 1		
NTDT 5301	Nutritional Science	8
NTDT 5302	Food Science	4
NTDT 5303	Dietary Intake & Nutrition	4
NTDT 5304	Principles of Dietetic Practice	2
NTDT 5305	Food Service Management	6
Year 1, Semester 2		
NTDT 5307	Clinical Nutrition & Dietetics	12
NTDT 5308	Community & Public Health	10
NTDT 5309	Communication	2
Year 2, Semester by arrangement		
NTDT 5310	Nutrition Research Project	24
NTDT 5311	Nutrition Practice	12
NTDT 5312	Nutrition & Dietetics Training Placement	12

NTDT 5301 **Nutritional Science**

8 credit points. Dr Samir Samman. **Session**: 1.

The study of biochemical interrelationships between nutrients, energy supply and modification of metabolism by disease; the study of the macronutrients – ie, protein, fat, carbohydrate, energy and the micronutrients – ie, vitamins and minerals.

NTDT 5302 **Food Science**

4 credit points. Prof. J Brand-Miller. **Session**: 1.

The study of nutritional content, production and consumption of major foods, and the study of principles of food preservation, processing, safety and microbiology.

NTDT 5303 **Dietary Intake & Nutritional Assessment**

4 credit points. Dr Karen Webb. **Session**: 1.

The study of methodology for assessing dietary intake and nutritional status.

NTDT 5304 **Principles of Dietetic Practice**

2 credit points. Dr D Volker. **Session**: 1.

The study of knowledge and skills of professional dietetic conduct.

NTDT 5305 **Food Service Management**

6 credit points. Ms Maria Kokkinakos. **Session**: 1.

The study of food service systems for use in institutions.

NTDT 5307 **Clinical Nutrition and Dietetics**

12 credit points. Dr D Volker. **Session**: 2.

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.

NTDT 5308 **Community and Public Health Nutrition**

10 credit points. Ms Sue Amanatidis. **Session**: 2.

The study of nutrition assessment, planning, intervention and outcomes in the community, and the study of nutrition in the prevention of disease and the methods involved in promotion of nutritious food for all.

NTDT 5309 **Communication**

2 credit points. Ms Veronica Taffs. **Session**: 2.

The study of counselling and education methods to communicate nutrition to individuals, groups and nations.

NTDT 5310 **Nutrition Research Project**
24 credit points. Dr Samir Samman. **Session**: 1, 2.
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.

NTDT 5311 **Nutrition Practice**
12 credit points. Ms Nicola Riley. **Session**: 1, 2.
NB: This unit of study will commence prior to the start of semester.
This 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 Masters course.

NTDT 5312 **Nutrition & Dietetics Training Placement**
12 credit points. Ms Nicola Riley. **Session**: 1, 2.
NB: This unit of study will commence prior to the start of semester.
Students are attached to two or more teaching hospitals and their associated community dietetic centres. The majority of time is spent in the wards or outpatient departments. There are up to 20 weeks' of training in dietetic practice in major primary health institutions so this unit starts early.

Nutrition Research Project units

The following units of study are for students have completed the DipNutrDiet and are upgrading to the MNutrDiet.

NTDT 5321 **Nutrition Research Project (Full-Time)**
24 credit points. **Session**: 1, 2.
This unit of study is for full-time students upgrading from the DipNutrDiet to the MNutrDiet, and it involves completing a research project.

NTDT 5322 **Nutrition Research Project A**
12 credit points. **Session**: 1, 2.
This unit of study is for part-time students upgrading from the DipNutrDiet to the MNutrDiet, and it involves completing a research project.

NTDT 5323 **Nutrition Research Project B**
12 credit points. **Session**: 1, 2.
This unit of study is for part-time students upgrading from the DipNutrDiet to the MNutrDiet, and it involves completing a research project.

Master of Nutritional Science

Course overview
The MNutrSc provides the same survey of all aspects of human nutrition in the first year as the MNutrDiet, but is designed for those persons who wish to pursue a career in nutrition research. The second year is devoted to a research project, with regular seminars. Students have a range of areas to choose from for their research year, for example sports nutrition, lipid biochemistry, infant nutrition or ecological research.

Course outcomes
Upon completion of the course the graduate will have a sound knowledge base in nutritional science and possess the skills to conduct nutrition research projects.

Course requirements
First year: The first year coursework and practicals coincide with those for MNutrDiet except that NTDT 5305 is replaced with the units of study NTDT 5306 and NTDT 5315.

Second Year: The second year is devoted to a full-time research project, supervised by a member of the academic staff of the Human Nutrition unit, which is written up for assessment in a short thesis. Students enrol in NTDT 5313 and NTDT 5314.

Admission
Applicants must have a degree from a recognised institution and have completed two full semesters in Biochemistry and Human Physiology. However, the requirement for 2nd year university physiology can be replaced by such alternatives as a third year course in Biochemistry or in Food Science. Application forms are available from the Faculty of Science. Applications close in early November and should be lodged with the Faculty of Science together with your academic record.

Course Resolutions: see chapter 7.

Unit of study descriptions
See also units listed under first year for Master of Nutrition and Dietetics (above).

Master of Nutritional Science

Unit of study		Credit points
Year 1, Semester 1		
NTDT 5301	Nutritional Science	8
NTDT 5302	Food Science	4
NTDT 5303	Dietary Intake & Nutrition	4
NTDT 5304	Principles of Dietetic Practice	2
NTDT 5306	Introduction to Food Service	3
NTDT 5315	Scientific Methodology in Nutrition	3
Year 1, Semester 2		
NTDT 5307	Clinical Nutrition & Dietetics	12
NTDT 5308	Community & Public Health	10
NTDT 5309	Communication	2
Year 2		
NTDT 5313	Nutritional Science Research A	24
NTDT 5314	Nutritional Science Research B	24

NTDT 5306 **Introduction to Food Service**
3 credit points. Ms Maria Kokkinakos. **Session**: 1.
An introduction to food service systems in institutions.

NTDT 5315 **Scientific Methodology in Nutrition**
3 credit points. Dr Samir Samman. **Session**: 1.
A small report on the desired area of research in year 2.

NTDT 5313 **Nutritional Science Research A**
24 credit points. **Session**: 1.
Students have a range of areas to choose from for their research year – eg, sports nutrition, lipid biochemistry, infant nutrition or ecological research.

NTDT 5314 **Nutritional Science Research B**
24 credit points. **Session**: 2.

■ Psychology

Graduate Diploma in Psychology

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) or Bachelor of Liberal Studies. 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, either in Psychology 4 (Honours) or the Graduate Diploma in Science (Psychology), and from there to a higher degree in Psychology.

Eligibility for admission
1. The Faculty of Science may admit to candidature applicants who hold the award course of Bachelor of Science, Bachelor of Arts, Bachelor of Economics (Social Science), or Bachelor of Liberal Studies from the University of Sydney, or equivalent degree as deemed by the Faculty, who have not previously completed a major in Psychology. When assessing an applicant, both undergraduate record and UAI (or equivalent) may be taken into account.
2. Applicants must have already successfully completed 12 credit points of Junior Psychology (currently PSYC 1001 and 1002) or equivalent.

Method of progression
Students are required to study a minimum of 48 credit points of Intermediate and Senior level Psychology. This shall consist of 16 credit points of Intermediate Psychology (currently PSYC 2111, 2112, 2113 and 2114) and a minimum of 32 credit points of Senior Psychology. 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.

To be eligible for study in Psychology beyond the Graduate Diploma at the University of Sydney, students must, except with School approval, include PSYC 3201 Statistics and Psychometrics for entry to the Graduate Diploma in Science (Psychology) and both PSYC 3201 Statistics and Psychometrics and PSYC 3202 History of Philosophy of Psychology for entry to Psychology 4 (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 ten years.

The amount of exemptions allowed will not exceed Faculty of Science regulations or will not exceed 24 credit points, whichever is the lower.

Units of study for Graduate Diploma in Psychology

- PSYC 2111 Learning, Neuroscience and Perception
- PSYC 2112 Psychological Statistics
- PSYC 2113 Cognitive Processes and Social Psychology
- PSYC 2114 Personality and Individual Differences
- PSYC 3201 Statistics and Psychometrics
- PSYC 3202 History and Philosophy of Psychology
- PSYC 3203 Abnormal Psychology
- PSYC 3204 Behavioural Neuroscience
- PSYC 3205 Cognition, language and thought
- PSYC 3206 Developmental Psychology
- PSYC 3208 Intelligence (not offered in 2004)
- PSYC 3209 Learning and Motivation
- PSYC 3210 Perceptual Systems
- PSYC 3211 Psychological Assessment and Organisational
- PSYC 3212 Social Psychology
- PSYC 3214 Communication and Counselling
- PSYC 3215 Cognitive neuroscience & neuropsychology
- PSYC 3216 Health and Safety Psychology Principles

See chapter 3 for unit of study descriptions.

Course Resolutions: see chapter 7.

Graduate Diploma in Science (Psychology)

Award Course overview

The Graduate Diploma in Science (Psychology) is an Honours equivalent (in the terms used by the Australian Psychological Society) fourth year of study in Psychology. It is designed to meet the needs of students wishing to continue with Psychology but who have not completed a four year Honours program. The diploma requires one year of full-time or two years of part-time study.

Course outcomes

Upon completion of this course the graduate will have a sound background in significant issues in general and applied psychology, an understanding of research methodology in both experimental and field studies contexts, be capable of finding and assessing relevant research literature, be eligible to apply for further programs of study in psychology and be prepared to undertake supervised training in certain professional areas of psychology.

Eligibility for admission

The Resolutions of the Senate state, in part, that:

1. (1) The Faculty of Science, on the recommendation of the appropriate Interdepartmental Committee, may admit to candidature the following:

(b) Graduate Diploma in Science (Psychology): an applicant who is a holder of a Bachelors degree with an APS accredited major in Psychology within the past 10 years from a recognised tertiary institution and has achieved a minimum of Credit average in senior (third) year units of study which includes a unit in statistics/research methods which meets the requirements of the School. Entrance may be limited by a quota. Entry is normally based on academic merit.

Course requirements

The program involves attending lectures and seminars in 5 core and 2 optional units. The compulsory (core) units are PSYC 4500 Research Project (A), PSYC 4501 Psychological Research Methods, PSYC 4502 Ethics, PSYC 4503 Special Fields Topic and PSYC 4505 Research Project (B). The optional units offered are PSYC 4506 Health and Safety Psychology Issues, PSYC 4507 Counselling Psychology and PSYC 4508 Psychology of Addiction. A full-time load will require 3 days of attendance per week. Part-time candidates will complete the PSYC 4500 Research Project (A), PSYC 4505 Research Project (B), and PSYC 4501 Psychological Research Methods in their first year.

Course Resolutions: see chapter 7.

Entry to other postgraduate programs

Students who have completed the Graduate Diploma in Science (Psychology) are eligible to apply for fifth and sixth year university programs in Psychology.

Current Departmental rules on progress

Candidates will not normally be allowed to repeat failed units of study if they have also failed the research project. Candidates who have passed the research project may be allowed to repeat up to two failed units of study.

Graduate Diploma in Science (Psychology)

Unit of study		Credit points
Full-time students		
Semester 1 Core units – 24 credit points		
PSYC 4500	Research Project (A)	10
PSYC 4501	Psychological Research Methods	8
PSYC 4503	Special Fields Topic (A)	6
Semester 2 Core units – 24 credit points		
PSYC 4505	Research Project (B)	10
PSYC 4502	Ethics and Current Issues in Psychology	2
Semester 2 Optional units of study (select 2 electives)		
PSYC 4509	Problem Gambling	6
PSYC 4506	Health & Safety Psychology Issues	6
PSYC 4507	Counselling Psychology	6
PSYC 4508	Psychology of Addiction	6
Part-time students		
Year 1, Semester 1 – 18 credit points		
PSYC 4500	Research Project (A)	10
PSYC 4501	Psychological Research Methods	8
Year 1, Semester 2 – 12 credit points		
PSYC 4505	Research Project (B)	10
PSYC 4502	Ethics	2
Year 2, Semester 1 – 6 credit points		
PSYC 4503	Special Fields Topic	6
Year 2, Semester 2– 12 credit points		
Two Electives		12

PSYC 4501 **Psychological Research Methods**

8 credit points. **Session**: 1. **Classes**: 44 hrs/semester. **Assumed knowledge**: Nothing in excess of requirements set for admission into the GradDipSc(Psych) program. **Prohibition**: PSYC 4711. **Assessment**: 9000 word report.

EXPERIMENTAL DESIGN AND STATISTICAL ANALYSIS (EDSA)

The aim of this course is to expand the menu of statistical tools available to students for their research, and to develop their understanding of the conceptual bases of these tools. Tutorial work will involve exposure to the features available in a large statistical package (SPSS) while at the same time reinforcing the concepts discussed in lectures.

FIELD RESEARCH METHODS (FRM)

The aim of this course is to:

'develop students' awareness of the methods of field research in Psychology;

'to encourage a critical evaluation of the methods and develop an awareness of the problems in obtaining accurate field research data;

'to encourage a creative attitude and awareness of ways in which these problems might be overcome;

'overall, to develop students' expertise in carrying out quality field research and to be a critical consumer of others' field research.

The lecture series, supplemented by other reading, follows a progressive consideration of all stages that may be encountered in a field research project, from decisions on the appropriate statement of the research problem, methods of gathering data, sampling procedures, coding of data, etc.

The tutorial sessions utilize a series of in class and out of class exercises to give students a 'hands on' awareness of the methods, problems and developing solutions in the field research process.

PSYC 4502 **Ethics**

2 credit points. **Session**: 2. **Classes**: 1 x 1 hour lecture/week x 7 weeks. **Prohibition**: PSYC 4712. **Assessment**: Examination (1.5 hours) 100%.

This unit covers current ethical and professional issues in Psychology. Lectures concerning current ethical and professional issues will be given by Psychologists working in a range of professional settings, such as clinical, counselling, organizational, assessment, educational, health and research settings. The lecturers will discuss professional and ethical issues that commonly arise in these settings.

Textbooks

APS Code of Conduct for Psychologists. Other references vary with topics covered each year.

PSYC 4503 **Special Fields Topic**

6 credit points. **Session**: 1. **Classes**: 1 x 1 hour seminar/week x 12 weeks. **Prohibition**: PSYC 4715, PSYC 4719. **Assessment**: Assignments.

Students choose one of the topics available. The research seminar areas currently available are: Cognitive Processes, Conceptual Foundations of Quantitative Methods, Developmental Psychology, Health and Safety Psychology Issues, Individual Differences, Learning, Neuroscience, Perception, Social Psychology and Theory & Systems, which are also offered as part of the Psychology Honours program. This list could change subject to staff availability.

PSYC 4506 **Health and Safety Psychology Issues**

6 credit points. **Session**: 2. **Classes**: 25 hrs/sem. **Prohibition**: PSYC 4716. **Assessment**: Class presentation (25%) and exam (75%).

This course will elucidate the principles of health psychology (which is concerned with human behaviour in the context of health & illness), via critical evaluation of their relevance to various health problems.

PSYC 4507 **Counselling Psychology**

6 credit points. **Session**: 2. **Classes**: 25 hrs/sem. **Prohibition**: PSYC 4717. **Assessment**: Examination and seminars.

The weekly meetings will consist of lectures, seminar papers, discussions, role plays and demonstrations. The main aim of the course is to consider the application of general skills and theories of counselling to specific areas of counselling.

Topics will be selected from those listed below on the basis of the experience and interests of the class members.

Defining counselling. Skills oriented models of individual counselling and the organizing principles of counselling as proposed by various theoretical viewpoints. Relational counselling: Extending theories and principles of individual counselling to relational work and issues. Practice: Applying counselling theory and skills in various community settings; Industry, education, personal growth, vocational guidance, rehabilitation, health, grief, contemporary issues (eg, domestic violence, suicide), multicultural issues. Professional issues: Supervision; burnout; ethics; professional associations; using research to guide and inform counselling practice.

Textbooks

Corey, G. (2001). Theory and Practice of Counseling and Psychotherapy. Brooks-Cole.

Egan, G. (2001). The Skilled Helper: A Problem Management Approach to Helping. Brooks-Cole.

PSYC 4508 **Psychology of Addiction**

6 credit points. **Session**: 2. **Classes**: 25 hrs/sem. **Prohibition**: PSYC 4718. **Assessment**: Report and examination.

The course is concerned with addictive behaviours such as smoking, alcohol consumption, illicit drug use, eating, gambling, and playing computer games. The course begins with a critical examination of the meaning of 'addiction'. The remainder of the course is divided between addictive behaviour where drugs are not involved (so-called 'psychological addictions') and addictive behaviour where consumption of drugs is involved (so-called 'drug addictions'). The focus of the first segment on psychological addiction is the question of whether such behaviour meets the criteria for description as addictive, and what is gained by broadening or weakening the notion of addiction to include psychological addiction. The behaviours used as the primary examples of psychological addictions are excessive eating and pathological gambling. The focus of the second segment on drug addiction is the biology, pharmacology, genetics and socio-political climate of drug consumption. Emphasis is placed on the question of whether nicotine is an addictive substance. Throughout the unit, there is a strong emphasis on clinical aspects of addictive behaviour and preferred treatment options. The course is intended to be a useful introduction to students who are contemplating a career in drug and alcohol work, in addictions counselling and in the treatment of pathological gambling.

PSYC 4509 **Problem Gambling**

6 credit points. **Session**: 2. **Classes**: 25 hrs/sem. **Assessment**: Report and examination.

This unit is intended to provide a comprehensive coverage of the causes, assessment and treatment of problem gambling. The syllabus includes:

History of gambling; explanations for gambling behaviour; concepts of compulsive gambling, pathological gambling, excessive gambling and problem gambling; prevalence of problem and pathological gambling; theories of causation of pathological gambling; assessment of excessive gambling and the problems caused by excessive gambling; treatment of pathological gambling: behavioural, cognitive, client centred, and other methods; effectiveness of different treatment approaches; preventive strategies.

PSYC 4500 **Research Project (A)**

10 credit points. **Session**: 1. **Classes**: 1 hr/week. **Corequisite**: PSYC 4501. **Prohibition**: PSYC 4710. **Assessment**: 9000 word report.

This is the largest single component of the Graduate Diploma program. The Research Project is a yearlong component and is intended to demonstrate the capability of students to conceive and carry out original high level research. The Research Project is supervised by either a member of the academic staff or an approved supervisor from outside the School. Each supervisor has nominated a specific research area on which a small group of students will work. Each student in the research group must generate their individual hypothesis or hypotheses and prepare and submit their own independently written report, although a single experiment/survey will be carried out and the collection of data and data sets may be shared. A completed draft of each student's report will be read by the supervisor prior to the writing of a final version. The text of the report must not exceed 9,000 words in length (excluding abstract, tables, appendices and references).

PSYC 4505 **Research Project (B)**

10 credit points. **Session**: 2. **Classes**: 1 hour supervision/week. **Corequisite**: PSYC 4501. **Prohibition**: PSYC 4720. **Assessment**: 9000 word report.

See description under Research Project A (PSYC 4500) above.

Master of Psychology

Note: This award course is not available to new students from 2002.

Master of Psychology Resolutions: See chapter 7.

Units of study available in 2003

PSYC 5106 **Research Thesis A**

6 credit points. **Session**: 1.

NB: Department permission required for enrolment.

PSYC 5107 **Assessment Placement**

6 credit points. **Session**: 2.

NB: Department permission required for enrolment.

PSYC 5109 **Family, Couple and Sex Therapy**

4 credit points. **Session**: 2.

NB: Department permission required for enrolment.

PSYC 5201 **Option 1**

4 credit points. **Session**: 1.

NB: Department permission required for enrolment.

Advanced training in areas which may include child or adult therapy or clinical neuropsychology.

PSYC 5202 **Option 2**

4 credit points. **Session**: 2.

NB: Department permission required for enrolment.

Advanced training in areas which may include child or adult therapy or clinical neuropsychology.

PSYC 5203 **Clinical Placements A**

6 credit points. **Session**: 1.

NB: Department permission required for enrolment.

PSYC 5204 **Case Discussions A**

6 credit points. **Session**: 1.

NB: Department permission required for enrolment.

PSYC 5205 **Case Discussions B**

6 credit points. **Session**: 2.

NB: Department permission required for enrolment.

PSYC 5206 **Clinical Placements B**
6 credit points. **Session**: 2.
NB: Department permission required for enrolment.

PSYC 5207 **Research Thesis B**
6 credit points. **Session**: 2.
NB: Department permission required for enrolment.

■ Coursework degrees in Applied Science

Graduate Certificate in Applied Science

Graduate Diploma in Applied Science

Master of Applied Science

Course overview

The Graduate Certificate in Applied Science, Graduate Diploma in Applied Science and Master of Applied Science are articulated coursework programs available in the following subject areas:

Bioinformatics
Coastal Management
Environmental Science
Informatics and Communication
Microscopy and Microanalysis
Molecular Biotechnology
Neuroscience
Photonics
Psychology of Coaching
Surface Coatings
Wildlife Health and Population Management

Course outcomes

Upon completion of the Graduate Certificate graduates will possess a practical and theoretical background in some aspects of the field of study; this will be extended upon completion of the Graduate Diploma and further extended to include research and practical skills upon completion of the Masters program.

Admission requirements

Applicants for the Graduate Certificate should hold a Bachelor's degree appropriate for the field of study, or experience which is considered to demonstrate the knowledge and aptitude required to undertake the course.

Applicants for the Graduate Diploma should hold a Bachelor's degree appropriate for the field of study, or an equivalent standard of knowledge; or have completed the Graduate Certificate in Applied Science in the same field of study.

Applicants for the Master in Applied Science should hold a Bachelor's degree appropriate for the field of study, or an equivalent standard of knowledge; or have completed the Graduate Diploma in Applied Science in the same field of study.

Some subject areas are not yet available as a fully articulated program. See sections for individual subject areas below.

For particular subject areas there may be additional admission requirements. See sections for individual subject areas below.

Course requirements

To qualify for award of the Graduate Certificate in Applied Science candidates must complete 24 credit points of units of study approved for the relevant field of study.

To qualify for award of the Graduate Diploma in Applied Science candidates must complete 36 credit points of units of study approved for the field of study.

To qualify for award of the Master of Applied Science candidates must complete 48 credit points of units of study approved for the field of study.

All units of study for a particular subject area may not 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.

Credit for previous study

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, except at the discretion of the Dean.

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.

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.

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 within the same Applied Science program and receive credit for the units of study completed.

Course Resolutions: see chapter 7.

■ Bioinformatics

Graduate Certificate in Applied Science (Bioinformatics)

Graduate Diploma in Applied Science (Bioinformatics)

Master of Applied Science (Bioinformatics)

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 will follow Stream A. Students who have a strong background in molecular biology and want to study bioinformatics, statistics and computer science should 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 Postgraduate Program in Applied Information Technology).

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 Masters, graduates will have a broad understanding of the topic of bioinformatics. In addition, the Masters will provide the option of experience in carrying out and completing a research project and report.

Admission Requirements

Applicants for the Graduate Certificate in Applied Science (Bioinformatics) should hold a first degree in science (computer science or molecular biology).

Applicants for the Graduate Diploma in Applied Science (Bioinformatics) similarly should hold a first degree in science (computer science or molecular biology), or have completed the Graduate Certificate in Applied Science (Bioinformatics).

Applicants for the Master of Applied Science (Bioinformatics) should hold a first degree in science (computer science or molecular biology), or have completed the Graduate Diploma in Applied Science (Bioinformatics).

Course Requirements

To qualify for award of the Graduate Certificate in Applied Science (Bioinformatics), candidates must complete 24 credit points from the four core units of study (Stream A and B).

To qualify for award of the Graduate Diploma in Applied Science (Bioinformatics), candidates must complete 24 credit points from the four core units and 12 credit points from the optional units of study shown (Stream A), or 30 credit points

from the five core units and 6 credit points from the optional units of study (Stream B), as described in the table below.

To qualify for award of the Master of Applied Science (Bioinformatics), candidates must complete 24 credit points from four core units and 24 credit points from the optional units of study (Stream A), or 30 credit points from five core units and 18 credit points from the optional units of study (Stream B), as described in the table below.

Not all units of study will 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.

Credit for previous study

See Graduate Certificate, Graduate Diploma and Master of Applied Science in this chapter or Course Resolutions in chapter 7.

Master of Applied Science (Bioinformatics)

Unit of study		Core
Unless otherwise indicated, all units are worth 6 credit points		
Stream A		
Graduate Certificate		
BCHM 5001	Structural & Functional Proteomics	C
BIOL 5001	Molecular Genetics & Inheritance	C
BIOL 5002	Bioinformatics: Sequences & Genomes	C
STAT 5001	Applied Statistics for Bioinformatics	C
Graduate Diploma and Masters additional units		
BINF 5002	Bioinformatics Research Project A	
BINF 5003	Bioinformatics Research Project B	
COMP 5213	Computer & Network Organisation	
COMP 5214	Software Development in Java	
Stream B		
Graduate Certificate		
BCHM 5001	Structural & Functional Proteomics	C
BIOL 5002	Bioinformatics: Sequences & Genomes	C
COMP 5213	Computer & Network Organisation	C
STAT 5001	Applied Statistics for Bioinformatics	C
Graduate Diploma and Masters additional units		
COMP 5214	Software Development in Java	C
BIOL 5001	Molecular Genetics & Inheritance	
BINF 5002	Bioinformatics Research Project A	
BINF 5003	Bioinformatics Research Project B	

BCHM 5001 **Structural and Functional Proteomics**

6 credit points. **Session**: 1. **Prohibition**: BCHM 3098.

Introduction to the emerging fields of and structural and functional proteomics. Topics covered will include: structural and functional relationships, methods of structure determination, structure refinement and molecular modelling approaches including protein structure prediction methods of threading and homology modelling; Introduction to packages and their capabilities; Introduction to protein structural motifs and structural domains. Genome and protein databases; insights gained from genome analysis; the analysis of protein expression in eukaryotes and prokaryotes; domain, protein and organism function; gene expression technology; DNA, oligonucleotide and protein microarrays; mutagenic screening in yeast; gene expression; status of genomics and proteomics arenas; two dimensional gel electrophoresis, mass spectrometry, mass maps and tags, protein sequencing, automation and sample handling, robotics, HTML and other web based languages, tools for sequence identification.

BINF 5002 **Bioinformatics Research Project A**

6 credit points. **Session**: 1, 2. **Corequisite**: BIOL (5001 and 5002) and BCHM 5001 and STAT 5001. Stream A students must also enrol in BIOL 5001.

NB: Department permission required for enrolment.

BINF 5002 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, maths and stats, 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.

BINF 5003 **Bioinformatics Research Project B**

6 credit points. **Session**: 1, 2. **Corequisite**: BIOL (5001 and 5002) and BCHM 5001 and STAT 5001. Stream A students must also enrol in BIOL 5001.

NB: Department permission required for enrolment.

BINF 5003 comprises the continuation of a research project commenced in BINF 5002 on a topic with significant emphasis on the use of bioinformatics tools to address important questions in the areas of biology, biochemistry, maths and stats, 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. The research project will be 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.

BIOL 5001 **Molecular Genetics and Inheritance**

6 credit points. **Session**: 2.

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.

BIOL 5002 **Bioinformatics: Sequences and Genomes**

6 credit points. **Session**: 2. **Corequisite**: BIOL 5001.

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.

COMP 5213 **Computer and Network Organisation**

6 credit points. **Session**: 1, 2. **Classes**: 2 lec & 1 tut/wk. **Assessment**: Assignments, written exam.

Elementary

This unit of study is an overview of hardware and system infrastructure software including compilers, operating systems, device drivers, network protocols, etc. It also includes user-level Unix skills and network usability.

Objectives

This unit of study provides an overview of hardware and system infrastructure software including compilers, operating systems, device drivers, network protocols, etc. It also includes user-level Unix skills and network usability.

COMP 5214 **Software Development in Java**

6 credit points. **Session**: 1, 2. **Classes**: 2 lec & 1 tut/wk. **Assessment**: Assignments, written exam.

Elementary

This unit of study introduces software development method with main emphasis on the 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 programming background and will not go into programming but want to know computer software.

Objectives

This unit of study covers system analysis, design methodology, quality assurance, group collaboration, version control, software delivery and system documentation.

STAT 5001 **Applied Statistics for Bioinformatics**

6 credit points. **Session**: 1.

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, Splus. 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.

■ Coastal Management

Graduate Certificate in Applied Science (Coastal Management)

Graduate Diploma in Applied Science (Coastal Management)

Master of Applied Science (Coastal Management)

Course Overview

The University of Sydney Institute of Marine Science in collaboration with the Department of Land and Water 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 new (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 Masters 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 Masters program.

Admission Requirements

Applicants for the Graduate Certificate should hold a Bachelor's degree appropriate for the field of study, or experience which is considered to demonstrate the knowledge and aptitude required to undertake the units of study.

Applicants for the Graduate Diploma should hold a Bachelor's degree appropriate for the field of study, or have an equivalent standard of knowledge; or have completed the Graduate Certificate in Applied Science (Coastal Management).

Applicants for the Master of Applied Coastal Management should hold a Bachelor's degree appropriate for the field of study, or have an equivalent standard of knowledge; or have completed the Graduate Diploma in Applied Science (Coastal Management).

Course Requirements

To qualify for award of the Graduate Certificate in Applied Science (Coastal Management) students are required to satisfactorily complete 24 credit points of units of study including 12 from the core units and 12 from the remaining core and/or optional units, as described in the table below.

To qualify for award of the Graduate Diploma in Applied Science (Coastal Management) students are required to satisfactorily complete 36 credit points of units of study including 24 from the core units and 12 from the optional units, as described in the table below.

To qualify for award of the Masters of Applied Science (Coastal Management) students are required to satisfactorily complete 48 credit points of units of study including 24 from the core units and 24 from the optional units, as described in the table below.

Credit for previous study

See Graduate Certificate, Graduate Diploma and Master of Applied Science in this chapter or Course Resolutions in chapter 7.

Master of Applied Science (Coastal Management)

Unit of study		Core/ option
Unless otherwise indicated, all units are worth 6 credit points		
Graduate Certificate		
MARS 5001	Coastal Processes & Systems	C/O
MARS 5002	Coastal Zone Management	C/O
MARS 5003	Beach Management	C/O
GEOG 5001	Geographic Information Systems (Intro)	C/O
Graduate Diploma and Masters		
MARS 5001	Coastal Processes & Systems	C
MARS 5002	Coastal Zone Management	C
MARS 5003	Beach Management	C
GEOG 5001	Geographic Information Systems	C
MARS 5004	Coastal Management Field School	O
NTMP 5005	Tropical Costal Management	O
Masters		
MARS 5005	Coastal Management Project (12cp)	O
Optional units – all degrees		
CHEM 5001	Information Retrieval in the Sciences	O
ENVI 5705	Ecological Principles for Scientists	O
ENVI 5803	Law & the Environment	O
ENVI 5808	Applied Ecology for Environmental Scientists	O
ENVI 5809	Computer Modelling & Resource Management	O
GEOG 5002	Geographic Information Science (Adv)	O
ICOM 5002	Science Communication	O
QMEC 5110	Structure & management of Research Projects	O
QMEC 5150	Ecological Sci. & Environmental Imapct Assess.	O

MARS 5001 **Coastal Processes and Systems**

6 credit points. **Session**: 1. **Corequisite**: MARS 5002, MARS 5003 and GEOG 5001.

This unit of study will examine the major coastal processes and systems of relevance to coastal zone management. These will include nearshore, estuarine and aeolian processes. Systems investigated will include rocky coasts and bluffs; beaches, barriers and dunes; and estuaries and inlets. The interaction between these processes and systems that are of most relevance to coastal management will be highlighted. These will include coastal hazards such as beach erosion, dune migration, bluff retreat, coastal flooding, inlet closure, and anthropogenic impacts such as pollution, storm water and acid sulphate soils. The unit will be presented both in lectures and field excursions, the latter enabling each system to be examined first hand.

MARS 5002 **Coastal Zone Management**

6 credit points. **Session**: 2. **Corequisite**: MARS 5001, MARS 5003 and GEOG 5001.

This unit explores various approaches to coastal zone management with an emphasis on the mamagement process adopted in NSW. Students will explore a range of coastal management issues such as beach erosion, water quality, habitat conservation and climate change and discuss various policies and planning approaches to address these issues. The practicals, tutorials and field excursions will introduce students to a range of

coastal zone issues and management responses with in the Sydney area.

MARS 5003 **Beach Management**
6 credit points. **Session**: 2. **Corequisite**: MARS 5001, MARS 5002 and GEOG 5001.
This unit of study focuses on the fundamental issues, strategies and infrastructure involved in the management of urban, rural and resort beach environments. At present, the concept and application of beach management is poorly defined. The goal of this unit of study is to provide an integrated and comprehensive template for beach management covering a range of issues such as beach hazard recognition and assessment, public safety and awareness, patterns of public beach usage, and the planning and undertaking of major events. Specific topics covered include hazardous wave and surf conditions, rip currents, lifeguarding, beach capacity, demographics of beach users, beach infrastructure, beach auditing, surf carnivals, sporting events and concerts. The unit will use lectures, real-world scenarios, case studies and field exercises to enable students to develop beach management plans appropriate to their backgrounds.

MARS 5004 **Coastal Management Field School**
6 credit points. **Session**: N/A in 2004. **Corequisite**: MARS 5001, MARS 5002, MARS 5003 and GEOG 5001.
The field school will be based around visits to a series of coastal sites along the NSW coast. The unit will include a series of introductory lectures followed by visits to the sites where both unit staff and local coastal managers and stakeholders will address the students on the nature of the site, its historical development and contemporary coastal management issues and solutions. Sites will be selected to the representative of both the range of coastal systems present along the NSW coast, as well as the range of management issues presented by the sites.

MARS 5005 **Coastal Management Project**
12 credit points. **Session**: 1, 2. **Prerequisite**: MARS 5001, MARS 5002, MARS 5003 and GEOG 5001.
NB: Department permission required for enrolment.
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.

NTMP 5005 **Tropical Coastal Management**
6 credit points. Prof Andy Short. **Session**: 2. **Classes**: Fieldschool 80hrs intensive. **Corequisite**: MARS (5002 and 5003). **Prohibition**: NTMP 3005. **Assessment**: Presentation, teamwork, assignment, 1 hr exam.
NB: Department permission required for enrolment. Limited quota of places.
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
Nil. Handouts provided.

GEOG 5001 **Geographic Information Systems (Intro)**
6 credit points. **Session**: 1, 2.
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.

■ Environmental Science

Graduate Certificate in Applied Science (Environmental Science)

Graduate Diploma in Applied Science (Environmental Science)

Master of Applied Science (Environmental Science)

Further information can be found on the Environmental Science Web site: 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 Masters 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.

Admission Requirements

Applicants for the Graduate Certificate in Applied Science (Environmental Science) should either hold a Bachelor's degree in Science or in a field of study appropriate for expansion into Environmental Science, or possess experience which is considered to demonstrate the knowledge and aptitude required to undertake this award course.

Similarly, applicants for the Graduate Diploma in Applied Science (Environmental Science) should hold a Bachelor's degree in a field of study appropriate for expansion into Environmental Science, or possess an equivalent standard of knowledge, or have completed the Graduate Certificate in Applied Science (Environmental Science).

Applicants for the Master in Applied Science should hold a Bachelor's degree in a field of study appropriate for expansion into Environmental Science, or an equivalent standard of knowledge, or have completed the Graduate Diploma in Applied Science (Environmental Science).

Course Requirements

To qualify for award of the Graduate Certificate in Applied Science (Environmental Science) candidates must complete one of two core units of study (ENVI 5708 or 5808) and 18 credit points from optional units of study, as described in the table below.

To qualify for award of the Graduate Diploma in Applied Science (Environmental Science) candidates must complete 36

credit points of units of study including 18 credit points from the core units (ENVI 5707 and 5808 and either 5708 or 5904) and 18 credit points from the optional units of study as described in the table below.

To qualify for award of the Master of Applied Science (Environmental Science) candidates must complete 48 credit points of units of study including 18 credit points from the core units (ENVI 5707 and 5808 and either 5708 or 5904) and 30 credit points from the optional units of study as described in the table below.

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.

See Graduate Certificate, Graduate Diploma and Master of Applied Science in this chapter or Course Resolutions in chapter 7.

Master of Applied Science (Environmental Science)

Unit of study		Core/ option
Unless otherwise indicated, all units are worth 6 credit points		
Graduate Certificate		
ENVI 5705	Ecological Principles for Environmental Scientists	C
ENVI 5808	Applied Ecology for Environmental Scientists	C
Graduate Diploma and Masters		
ENVI 5705	Ecological Principles for Environmental Scientists	C
ENVI 5708	Introduction to Environmental Chemistry	C
ENVI 5808	Applied Ecology for Environmental Scientists	C
ENVI 5904	Understanding Environmental Uncertainty	C
Optional units – Masters degree only		
ENVI 5501	Environmental Research Project	O
Optional units – all degrees		
ENVI 5801	Social Science of the Environment	O
ENVI 5802	Resources and Regional Development	O
ENVI 5904	Understandinf Environmental Uncertainty	O
GEOG 5002	Geographic Information Systems (Advanced)	O
MARS 5001	Coastal Processes and Systems	O
MARS 5002	Coastal Zone Management	O
MARS 5003	Beach Management	O
PHIL 5926	Questioning Sustainability and Technology	O
ENVI 5501	Environmental Research Project (12cp)	O
ENVI 5707	Energy – Sources, Uses & Alternatives	O
ENVI 5803	Law & the Environment	O
ENVI 5805	The Urban Environment & Planning	O
ENVI 5809	Computer Modelling & Resource Management	O
ENVI 5901	Weathering Processes & Applications	O
ENVI 5903	Sustainable Development	O
ENVI 5904	Understanding Environmental Uncertainty	O
ENGG 5601	Greenhouse Gas Mitigation	O
GEOG 5001	Geographic Information Systems (Intro)	O
CHEM 5001	Information Retrieval in the Sciences	O
PACS 6903	Peace & the Environment	O
QMEC 5110	Structure & Management of Research Projects	O
QMEC 5120	Design & Analysis of Sampling (Intro)	O
QMEC 5150	Ecological Sci. & Environmental Impact Assess	O
WILD 5001	Australian Wildlife: Introduction	O
WILD 5002	Australian Wildlife: Field Studies	O
WILD 5007	Sustainable Uses & Stewardship of Wildlife	O

ENGG 5601 **Greenhouse Gas Mitigation**

6 credit points. A/Professor Ian Jones otg@otg.usyd.edu.au. **Session**: 2. **Classes**: 26 hours lectures 13 hours tutorial/lab/site visits. **Assessment**: Assignments and final examination.

NB: Unit Administration: Web CT

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.

ENVI 5501 **Environmental Research Project**

12 credit points. **Session**: 1, 2.

A valuable opportunity to apply some of the knowledge gained from earlier coursework, ENVI 5501 consists of a research project on a topic having significant environmental emphasis 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 research with and without guidance. This project is not conducted by way of contact hours per week for a semester, but instead the student will 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 (Environmental Science).

ENVI 5705 **Ecolog Principles for Environ Scientists**

6 credit points. **Session**: 1.

NB: This is a compulsory course for all levels of the 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.

ENVI 5707 **Energy – Sources, Uses and Alternatives**

6 credit points. **Session**: 1.

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.

ENVI 5708 **Introduction to Environmental Chemistry**

6 credit points. **Session**: 1.

NB: 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.

ENVI 5801 **Social Science of Environment**

6 credit points. Associate Professor Philip Hirsch. **Session**: 2. **Classes**: 2 lec, 2 sem, 3 field/w. **Assessment**: 2000 w assignment, seminar presentation, field report.

This unit provides key background concepts for the analysis of relationships between society and environment and natural resources. It deals with both broad theoretical approaches to the societal analysis of relationships between people and the environment, notably 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. It pays particular attention to the implications of heterogeneous and conflicting interests for environmental and natural resource management and explores ways of dealing with diverse stakeholder interests. The unit draws on examples from various countries, with special emphasis on Southeast Asia and Australia. The aim of the course 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, reading-based seminars and a pre-sessional field visit.

ENVI 5802 **Resources and Regional Development**
6 credit points. Assoc Prof Philip Hirsch. **Session**: 2. **Classes**: 2 lec, 2 sem, 3 field/w. **Assessment**: 2000 w assignment, seminar presentation, field report.
This unit investigates the range of multipliers and impacts that resource development brings to the regions in which it is located. The unit deals with economic, social and political aspects of resource regions, investigating both direct and indirect spatial distributions of costs and benefits and means by which these are dealt with in specific contexts. The unit draws on examples of mining, forestry, tourism and dams to develop skills in resource impact analysis. The critical social science approach is designed to give planners, advocacy groups and resource developers tools with which to anticipate and act on regionally specific impacts of resource development. The unit is taught through a combination of reading-based seminars, lectures and a field visit.

ENVI 5803 **Law and the Environment**
6 credit points. **Session**: 1.
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.

ENVI 5805 **The Urban Environment and Planning**
6 credit points. **Session**: 1.
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.

ENVI 5808 **App Ecology for Environmental Scientists**
6 credit points. **Session**: 2.
NB: This is a compulsory unit for all levels of the Applied Science (Environmental Science) program
This unit of study compliments ENVI 5705, and covers in depth the concerns of modern ecology pertaining to both marine and terrestrial creatures. An understanding of the complex issue of biodiversity and impact of the Threatened Species Conservation Act is also provided.

ENVI 5809 **Computer Modelling & Resource Management**
6 credit points. **Session**: 1.
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.

ENVI 5901 **Weathering Processes and Applications**
6 credit points. **Session**: 2.
The physical, chemical and biological weathering processes operating in different rocks and weathering environments will be considered in relation to: solution weathering and its acceleration following environmental acidification; the weathering of building and monumental stone; and, the use of weathering products (eg, desert varnish) as environmental indicators.

ENVI 5903 **Sustainable Development**
6 credit points. **Session**: 2.
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.

ENVI 5904 **Understanding Environmental Uncertainty**
6 credit points. Professor Anthony Underwood. **Session**: 2.
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.

GEOG 5001 **Geographic Information Systems (Intro)**
6 credit points. **Session**: 1, 2.
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.

GEOG 5002 **Geographic Information Science (Adv)**
6 credit points. Associate Professor Philip Hirsch. **Session**: 2. **Classes**: 2 lec, 1 tut, 3 prac/w. **Assumed knowledge**: assumed knowledge to standard of GEOG 5001. **Assessment**: 2500 w 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.

PACS 6903 **Peace and the Environment**
6 credit points. **Session**: 1.
This unit considers the relationship betwen environmental degradation and human conflict in a range of geographical and cultural settings. Students investigate their personal relationships with 'nature' before exploring the reasons why the environment is being degraded. In Part 1 attention is focused on the reasons why individuals in Western industrialisesd nations have come to see nature as 'other', 'separate' or 'removed'. From Plato onwards we explore Western environmental discourse in order to understand why human beings appear to have an increasingly violent relationship with nature. In Part 2 the links between environmental degradation and conflict are explored using the impacts of the anthropogenic greenhouse effects as a case study. Part 3 is the solutions part of the course. The concept of sustainability is explored, its contradictions highlighted and new approaches to environmental security advanced. Finally, attention is focused on the whole issue of peace building through environmental protection at the local, regional and international levels.

Environmental Science: other units

For detailed descriptions of optional units see the listings under the appropriate headings of postgraduate Degrees in Science and the Applied Science articulated coursework programs. Special attention should be paid to any prerequisite studies that may be required. Other options are possible with permission of the Director of Environmental Science.

■ Informatics and Communication

Graduate Certificate in Applied Science (Informatics and Communication)

Graduate Diploma in Applied Science (Informatics and Communication)

May not be offered in 2004

Course Overview

The program is designed to train people to become effective in information retrieval in the sciences, in science communication, in the development of databases, in Internet activities of importance to scientists, and in the legal and technical issues associated with scientific research.

The Certificate will require attainment of 24 credit points and the Diploma will require attainment of 36 credit points made up of combinations of units of study offered. Units of study generally are of 6 credit points value. Each credit point will approximate to 6 contact hours and the principal contact hours will involve lectures and workshops. Projects will be an

important part of the course, and contact hours will be allocated according to the complexity of the project.

All units of study may not 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.

Course Resolutions: see chapter 7.

CHEM 5001 **Information Retrieval in the Sciences**

6 credit points. **Session**: 1.

NB: Department permission required for enrolment.

This unit of study alerts scientists to opportunities concerning information retrieval in the sciences and instructs how to effectively retrieve science information. Lectures first describe the worldwide web, search engines, scientific publishers including their products, roles, and distribution mechanisms, e-journals, e-patents, and reference linking. Following an overview of these primary sources, the second part of the lecture course discusses database producers, including their roles, products, and policies. Access points to, and search options, in key databases in the physical and life sciences, and in engineering are discussed, and final lectures deal with the special role of patent information.

CHEM 5002 **Information Retrieval in Chem Sciences**

6 credit points. **Session**: 1.

NB: Department permission required for enrolment.

This unit of study deals with chemical bibliographic, chemical substance and chemical reaction databases all of which are important not only to the chemical sciences but also to the life sciences, to environmental sciences, to toxicological and health information, to geological sciences, and to material sciences. Lectures include discussion of databases produced by the Chemical Abstracts Service, by the US Department of Health, by the Beilstein Institute, and by other suppliers for example MDL. Issues relating to the indexing of substances, to searching for substances, and then to finding information on substances are discussed.

ICOM 5001 **The Internet as a Resource in Science**

6 credit points. **Session**: 1, 2.

NB: Department permission required for enrolment.

This unit of study aims to explore recent developments in the use of the Internet by teachers and students of science. The background educational principles will be investigated, which will apply when teaching is taken out of the classroom and transferred to the Web Features of the Internet which are relevant to education will be examined and how these can be harnessed to the job of teaching and learning science. Real life examples where this kind of teaching is done will be evaluated, with an eye to judging whether those enterprises are successful, and where their future may lie.

ICOM 5002 **Science Communication**

6 credit points. **Session**: N/A in 2004.

This unit of study aims to provide students with an understanding the operations, pressures, and limitations of mainstream media. Issues confronting science in the media will be discussed. Also covered will be strategies the practising researcher can use when dealing with the media to ensure the message is communicated effectively. Researchers will be competent in working effectively with the media and in communicating their research to the general public.

ICOM 5003 **Commercialisation of Science**

6 credit points. **Session**: 2.

NB: Department permission required for enrolment.

A lecture series led by experts operating in related fields, as well as a seminar series built around relevant case studies, students in this course will develop:

- a high level understanding of intellectual property as an input and product of research;
- an understanding of the different types of intellectual property and the mechanisms and procedures designed to provide creators with the capacity to exercise rights over the intellectual property they create;
- the capacity to apply the knowledge in the preceding points in a manner that maintains value in the intellectual property created and maximises the opportunities for utilisation of that intellectual property, particularly in commercial applications;
- an understanding of the effect of employer policies, relevant legislation and contractual obligation on the rights of creators of new intellectual property; and,
- the capacity to assess the intellectual property implications of a research or consultancy opportunity and make judgements about the benefits that the project presents.

INFS 6005 **Internet for Commerce**

6 credit points. **Session**: N/A in 2004.

This unit of study is for people who want an overview of current developments in commerce on the Internet. It analyses issues concerning networks – infrastructure, the Internet: architecture and protocols, the World Wide Web: protocols, browsers, java, javascript, activeX, security, privacy. Questions of security are developed at length – eg, secure transactions, cryptography, digital signatures, authentication, integrity and privacy, web server security and firewalls. The course studies electronic payment systems, focusing on digital tokens, electronic cash, smart cards and EDI.

INFS 6010 **Databases**

6 credit points. **Session**: N/A in 2004.

The organisation of data and means for access to them form the core of all information systems. Database systems are computer systems that provide storage of, and methods of access to, data. They range from small, single user systems to large, distributed, networked systems with thousands of users. Common to all of these are the underlying concepts of data integrity, database design, and tools providing data access.

Issues studied in detail include; normalisation, database design using the entity-relationship model, formal relational database languages, industry standard relational database language, SQL, both in its interactive mode and embedded in application programs, underlying database structures, and the problems of concurrent database access.

GEOG 5001 **Geographic Information Systems (Intro)**

6 credit points. **Session**: 1, 2.

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.

■ Micrcoscopy and Microanalysis

Graduate Certificate in Applied Science (Microscopy and Microanalysis)

Graduate Diploma in Applied Science (Microscopy and Microanalysis)

Master of Applied Science (Microscopy and Microanalysis)

Course Overview

The Graduate Certificate in Applied Science (Microscopy & Microanalysis), Graduate Diploma in Applied Science (Microscopy & Microanalysis) and Master of Applied Science (Microscopy & 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, maintenance of electron microscopes, 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 Masters will provide experience in designing, carrying out and completing an independent project and report.

Admission Requirements

Applicants for the Graduate Certificate in Applied Science (Microscopy and Microanalysis) should have a Bachelor of Science, Bachelor of Applied Science, Bachelor of Engineering, or equivalent qualifications or experience. Applications will also be considered from those with a Bachelor of Arts who wish to acquire microscopy and microanalysis skills for such areas as archaeology, history of art and museum studies.

Applicants for the Graduate Diploma in Applied Science (Microscopy and Microanalysis) should have a Bachelor of Science, Bachelor of Applied Science, Bachelor of Engineering or equivalent degree or have completed the Graduate Certificate in Applied Science (Microscopy & Microanalysis). Applications will also be considered from those with a Bachelor of Arts who wish to acquire microscopy and microanalysis skills for such areas as archaeology, history of art and museum studies.

Applicants for the Master of Applied Science (Microscopy and Microanalysis) should have a Bachelor of Science, Bachelor of Applied Science, Bachelor of Engineering or equivalent degree, with Honours, or have completed the Graduate Diploma in Applied Science (Microscopy & Microanalysis) at credit level.

Course Requirements

To qualify for award of the Graduate Certificate in Applied Science (Microscopy and Microanalysis), candidates must complete 12 credit points from core units and 12 credit points from optional units shown below.

To qualify for award of the Graduate Diploma in Applied Science (Microscopy and Microanalysis), candidates must complete 36 credit points, 12 from core units and 24 from optional units shown below.

To qualify for award of the Master of Applied Science (Microscopy and Microanalysis), candidates must complete 48 credit points, 24 from core units, 12 from optional units and 12 from an independent project and report.

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.

Credit for previous study

See Graduate Certificate, Graduate Diploma and Master of Applied Science in this chapter or Course Resolutions in chapter 7.

Master of Applied Science (Microscopy and Microanalysis)

Unit of study		Core/ option
All units are worth 6 credit points		
Graduate Certificate, Graduate Diploma and Masters core units		
MCAN 5005	Microscopy & Optical Microscopes	C
MCAN 5006	Electron Microscopy	C
Masters additional core units		
MCAN 5201	Project & Report A	C
MCAN 5202	Project & Report B	C
Optional units		
MCAN 5101	Confocal & Flourescence Microscopy	O
MCAN 5102	Biological Specimen Preparation	O
MCAN 5103	Materials Microscopy & Microanalysis	O
MCAN 5104	Image Analysis	O
MCAN 5105	Diffraction Techniques	O
MCAN 5106	Microanalysis	O
MCAN 5107	Advanced Techniques in Biological EM	O
MCAN 5108	High Resolution Microscopy	O
MCAN 5109	SPM & Advanced Optical Methods	O

MCAN 5005 **Microscopy and Optical Microscopes**

6 credit points. **Session**: 1, 2.

Introduces the general principles of microscopy and microanalysis, and reviews the basic physical principles on which they are based, including optics and image formation.

Gives students a basic understanding of the workings of the optical microscope and the practical ability to use it effectively. Polarisation, phase-contrast, dark field, DIC and fluorescence are covered at an elementary level.

MCAN 5006 **Electron Microscopy**

6 credit points. **Session**: 1, 2.

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.

MCAN 5101 **Confocal & Fluorescence Microscopy**

6 credit points. **Session**: 1, 2. **Prerequisite**: MCAN 5005.

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.

MCAN 5102 **Biological Specimen Preparation**

6 credit points. **Session**: 1, 2.

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.

MCAN 5103 **Materials Microscopy & Microanalysis**

6 credit points. **Session**: 1, 2.

Gives practical training in the preparation of specimens from a wide range of materials for electron microscopy, including metals, semiconductors, powders, ceramics and polymers, using a comprehensive range of preparation techniques including electropolishing, tripod polishing, ion milling, dimple grinding, ultramicrotomy and cleavage. Approaches to microscopy and microanalysis for materials analysis will be developed and specific techniques introduced.

MCAN 5104 **Image Analysis**

6 credit points. **Session**: 1, 2.

This unit of study covers the nature and processing of images and the extraction of quantitative data from them. Emphasis will be on the correct treatment of real data to provide a basis for reliable research. Participants will develop a sound working knowledge of image processing which is based on an understanding of both the strengths and the limitations that are inherent in image data, and the technology applied to it. This will be set in the context of the nature of the analysis which is to follow processing, directed at extracting quantitative parameters characteristic of the content of the image. Emphasis will be on the application of these techniques to typical problems encountered in microscopy based imaging. Participants will develop a sound working knowledge of image analysis which is based on an understanding of both the strengths and the limitations of the techniques of analysis. 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 an overview of classification techniques used to discriminate measured objects. Provides a general overview of stereology, including global, specific, manual and computerised measurements, geometric probability, density estimation and sampling.

MCAN 5105 **Diffraction Techniques**

6 credit points. **Session**: 1, 2.

Introduces the basics of diffraction theory and its applications to powder diffraction and elementary single crystal diffraction. Participants are trained to collect, process and interpret powder diffraction data using electrons, neutrons and X-rays. Assumes mathematical ability including elementary complex numbers and integration. Provides training in advanced structural analysis using X-ray, electron and neutron techniques.

MCAN 5106 **Microanalysis**

6 credit points. **Session**: 1, 2.

Provides a theoretical introduction and practical training in a broad range of microanalytical techniques which rely on the interaction of electrons with materials, including EDS and WDS techniques, the electron probe, electron energy loss spectroscopy (EELS) and X-ray Fluorescence. Other techniques covered include a range of surface science analytical methods, infra-red and Raman spectroscopy and ion beam analysis techniques. On completion of this unit of study, the student will be aware of the

wide range of materials characterisation techniques available and understand their strengths and weaknesses.

MCAN 5107 **Advanced Techniques in Biological EM**
6 credit points. **Session**: 1, 2. **Prerequisite**: MCAN (5006 and 5102).
Develops further the knowledge and skills in biological specimen preparation techniques and image interpretation obtained in Biological Specimen Preparation, with specific training in specialised techniques including cryotechniques and immunolabelling. Provides an introduction to a broad range of microanalytical techniques which rely on the interaction of electrons with materials including EDS and EELS, with particular emphasis on qualitative and quantitative analytical techniques appropriate for biological applications, especially analysis of soluble and mobile ions.

MCAN 5108 **High Resolution Microscopy**
6 credit points. **Session**: 1, 2. **Prerequisite**: MCAN 5006.
Provides training in advanced imaging and diffraction techniques, especially those skills required to obtain atomic or molecular levels of resolution in transmission, scanning and scanning transmission electron microscopes.

MCAN 5109 **SPM & Advanced Optical Methods**
6 credit points. **Session**: 1, 2. **Prerequisite**: MCAN (5005 and 5101).
Provides advanced training in confocal and non-linear optical microscopy, and an introduction to wide-field deconvolution. Acquisition and presentation of three-dimensional images is covered in detail. It also covers the nature of surfaces and the imaging techniques that can be used to obtain topographical, spectroscopic and structural information about them. Techniques include various scanning probe microscopies (eg, scanning tunnelling microscopy, atomic force microscopy and near-field scanning optical microscopy), optical interference microscopies for surface studies, and surface profilometry.

MCAN 5201 **Project and Report A**
6 credit points. **Session**: 1, 2.
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 MCAN 5202.

MCAN 5202 **Project and Report B**
6 credit points. **Session**: 1, 2. **Corequisite**: MCAN 5201.
See MCAN 5201.

■ Molecular Biotechnology

Graduate Certificate in Applied Science (Molecular Biotechnology)

Graduate Diploma in Applied Science (Molecular Biotechnology)

Master of Applied Science (Molecular Biotechnology)

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 extend 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.

Admission requirements
Applicants for the Graduate Certificate in Applied Science (Molecular Biotechnology) should hold either a Bachelors degree in Science (or equivalent) or previous experience in a relevant area that is considered to demonstrate the knowledge and aptitude required to undertake this award course.

Applicants for the Graduate Diploma in Applied Science (Molecular Biotechnology) should hold a suitable Bachelors degree (or equivalent) or previous experience in a relevant area that is considered to demonstrate the knowledge and aptitude required to undertake this award course, or have completed the Graduate Certificate in Applied Science (Molecular Biotechnology).

Applicants for a Master of Applied Science (Molecular Biotechnology) should hold a suitable Bachelors degree (or equivalent) and previous experience in a relevant area, or have completed the Graduate Diploma in Applied Science (Molecular Biotechnology) or equivalent.

Course Requirements
To qualify for award of the Graduate Certificate in Applied Science (Molecular Biotechnology) candidates must complete 24 credit points of core units of study: MOBT 5101 and MOBT 5102 as described in the table below. The design of these units allows flexibility for students who are working and is geared toward industry needs.

To qualify for award of the Graduate Diploma in Applied Science (Molecular Biotechnology) candidates must complete 36 credit points of units of study including 24 credit points of core units of study (MOBT 5101 and MOBT 5102) and 12 credit points of optional units of study as described in the table below.

To qualify for award of the Master of Applied Science (Molecular Biotechnology) candidates must complete 48 credit points of units of study including 36 credit points of core units of study (MOBT 5101, MOBT 5102 and MOBT 5103) and 12 credit points of optional units of study as described in the table below.

Optional units
Students may select optional units from any of the other Graduate Diploma or Masters courses offered by the Faculty, subject to timetable constraints. These optional units are listed in the surrounding pages of this handbook. The following list of relevant units may assist with your selection:

BCHM 5001 Structural and Functional Proteomics
BIOL 5001 Molecular Biology and Inheritance
CHEM 5001 Information Retrieval in the Sciences
COMP 5215 Foundational Database Systems
ENVI 5705 Ecology Principles for Environ Scientists
MCAN 5005 Microscopy and Optical Microscopes

Please note, the unit MOBT 5103 is not an allowable elective for Graduate Diploma students.

Credit for previous study
See Graduate Certificate, Graduate Diploma and Master of Applied Science in this chapter or Course Resolutions in chapter 7.

Master of Applied Science (Molecular Biotechnology)

Unit of study		Core/ option
Unless otherwise indicated, all units are worth 12 credit points		
Core units – all degrees		
MOBT 5101	Applied Molecular Biotechnology A	C
MOBT 5102	Applied Molecular Biotechnology B	C
Core units – Masters only		
MOBT 5103	Applied Molecular Biotechnology C	C/O

MOBT 5101 **Applied Molecular Biotechnology A**
12 credit points. **Session**: 1.
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.

MOBT 5102 **Applied Molecular Biotechnology B**
12 credit points. **Session**: 2.
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.

MOBT 5103 **Applied Molecular Biotechnology C**

12 credit points. **Session**: 1, 2.

NB: Department permission required for enrolment in Session 1.

This unit of study combines hands-on experience in association with industry partners. This will typically involve part-time placement in an approved partner's facility or an on-campus project conducted in association with an industry affiliate, supplemented by lectures and tutorials. Entry is limited by a quota and availability of facilities and projects. All students enrolled in this unit are required to undertake a laboratory skills test. The results of this test do not count towards assessment for the unit, but will help determine the type of placement to which students will be allocated.

MOBT 5104 **Life Science Entrepreneurship**

6 credit points. **Session**: N/A in 2004.

The Life Science Entrepreneurship unit is an innovative course that is aimed at providing participants with the ability to package and present life science developments to the business community. Australia's growing biotechnology industry relies heavily on the integration of business and science concepts. This unit will provide a critical framework that enables participants to move developments from the laboratory to the marketplace. The unit would dramatically improve participants' business skills and ability to promote investment opportunities arising from their work.

■ Neuroscience

Graduate Certificate in Applied Science (Neuroscience)

Graduate Diploma in Applied Science (Neuroscience)

Master of Applied Science (Neuroscience)

Course overview

The Graduate Certificate in Applied Science (Neuroscience), Graduate Diploma in Applied Science (Neuroscience) and Master of Applied Science (Neuroscience) are articulated programs that allow flexible combinations of units of study. The programs cover basic concepts in neuroscience together with advanced treatment of most major current research areas in neuroscience, particularly those with medical and other potential applications, and an introduction to related developments in other disciplines.

Course Outcomes

The study of the brains and nervous systems of living creatures represents one of the most exciting and fast moving fields in 21st century science. It is also one that is having a considerable impact on attempts to solve major problems in health, including various neural diseases, current social problems such as addiction, and longer term social trends such as aging. The programs are designed both for graduates already working in a field where development of their expertise in at least some aspects of neuroscience is important and for recent graduates who wish to acquire a solid and broad grounding in this area.

Many professionals, particularly in health-related areas, find that they need to update or broaden their knowledge and understanding of the structure and function of the nervous system. Traditionally such training has been provided within individual departments, such as anatomy, physiology, pharmacology or psychology, and consequently has tended to be narrow in focus. The present programs have from the outset been designed to be inter-disciplinary; most units of study are taught by staff from at least three different departments. This is to meet the aim of providing a broad and comprehensive treatment of neuroscience.

Upon completion of the Graduate Certificate, graduates will have a solid grounding in basic principles of neuroscience and more specialised understanding of four different areas. This is supplemented in the Diploma by inclusion of a fifth area and by acquisition of some project skills by working on either a library- or laboratory-based project. Extension of these project skills is obtained during completion of the Masters by working on a total of three unrelated projects, of which two would normally be laboratory-based.

Admission Requirements

Applicants for Applied Science (Neuroscience) should either hold a Bachelor's degree in Science or in a field of study appropriate for expansion into Neuroscience, or possess experience which is considered to demonstrate the knowledge and aptitude required to take this award course. Students may elect to begin with a Graduate Certificate or Graduate Diploma and build on these to gain a higher qualification, up to Master, within the articulated series. Students may also elect to enrol directly into the Masters program.

Course Requirements

To qualify for award of the Graduate Certificate in Applied Science (Neuroscience) candidates must complete 24 credit points of approved units of study as described in the table below.

To qualify for award of the Graduate Diploma in Applied Science (Neuroscience) candidates must complete 36 credit points of approved units of study of which 6 credit points are project based units of study, as described in the table below.

To qualify for award of the Master in Applied Science (Neuroscience) candidates must complete 48 credit points of approved units of study, of which 18 credit points are from project based units of study in Neuroscience, as described in the table below.

Normally a unit of study is available for only 1 semester each year. Not all units of study are 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.

Credit for previous study

See Graduate Certificate, Graduate Diploma and Master of Applied Science in this chapter or Course Resolutions in chapter 7.

Master of Applied Science (Neuroscience)

Unit of study	
All units are worth 6 credit points	
Optional units – all degrees	
NEUR 5101	Neurobiology of Addicition
NEUR 5102	Neuroscience of Aging
NEUR 5103	Brain Development
NEUR 5104	Psychobiology of Learning & Memory
NEUR 5105	Movement & Motor Control
NEUR 5106	Pain
NEUR 5108	Visual Neuroscience
Project units – Graduate Diploma and Masters only	
NEUR 5001	Neuroscience Library Project
NEUR 5002	Neuroscience Laboratory Project A
NEUR 5003	Neuroscience Laboratory Project B
NEUR 5004	Neuroscience Laboratory Project C

NEUR 5001 **Neuroscience Library Project**

6 credit points. **Session**: 1, 2. **Prerequisite**: 12 credit points from NEUR (5101, 5102, 5103, 5104, 5105, 5106, 5107, 5108).

This provides the opportunity to develop knowledge gained from units of study on a specialised topic. The topic and nature of supervision will be arranged between the student and an appropriate supervisor, subject to the approval of the Coordinator of the Neuroscience Program. This unit of study is available only to students enrolled in the Graduate Diploma of Applied Science (Neuroscience) or in the Master in Applied Science (Neuroscience). It would normally be available only after a student has completed two units of study in the Neuroscience program or equivalent units of study approved by the Dean.

NEUR 5002 **Neuroscience Laboratory Project A**

6 credit points. **Session**: 1, 2. **Prerequisite**: 24 credit points from NEUR (5101, 5102, 5103, 5104, 5105, 5106, 5107, 5108).

This provides the opportunity to develop laboratory skills by participation in a research project on a specialised topic. The topic and nature of supervision will be arranged between the student and an appropriate supervisor, subject to the approval of the Coordinator of the Neuroscience Program. This unit of study is available only to students enrolled in the Graduate Diploma of Applied Science (Neuroscience) or in the Master in Applied Science (Neuroscience). It would normally be available only after a student has completed four units of study in the Neuroscience program or equivalent units of study approved by the Dean.

NEUR 5003 **Neuroscience Laboratory Project B**
6 credit points. **Session**: 1, 2. **Prerequisite**: NEUR 5002.
This is similar to NEUR 5002, but would involve a different supervisor and a topic in a different discipline from those for the project a student undertook for NEUR 5002. A student is normally required to complete NEUR 5002 before enrolling in NEUR 5003.

NEUR 5004 **Neuroscience Laboratory Project C**
6 credit points. **Session**: 1, 2. **Prerequisite**: NEUR 5002 and 5003.
This is similar to NEUR 5002, but would involve a different supervisor and a topic in a different discipline from those for the projects a student undertook for NEUR 5002 and NEUR 5003. A student is normally required to complete NEUR 5002 and NEUR 5003 before enrolling in NEUR 5004.

NEUR 5101 **Neurobiology of Addiction**
6 credit points. **Session**: 2.
The goal of this course is to develop knowledge of the aspects of neuroscience that underpin current understanding of drug addiction. It examines patterns of use, prevalence, harms and social costs of the major addictive drugs: opioids, psychostimulants, alcohol, nicotine, and cannabis. Major topics include common features of addictive drugs such as the psychology and neuroanatomy of reward and reinforcement, as well as the particular molecular and neurochemical targets of individual drugs and the molecular and cellular mechanisms of tolerance and dependence. Finally, it will examine current treatment of addictive disorders.

NEUR 5102 **Neuroscience of Aging**
6 credit points. **Session**: 1.
The unit of study will examine changes with age in the structure of the brain and the various forms of neuropathology and types of dementia that can occur. Models of Alzheimer's disease are covered, from tissue culture and cell biology to transgenic mice. Topics also include aspects of the neuropsychology of aging, including testing for different types of dementia, and the use of PET and MRI scans to assess aging of the brain.

NEUR 5103 **Brain Development**
6 credit points. **Session**: 1.
The topics covered will include: neuronal induction; mechanisms of cell generation and migration; gene expression and environmental factors in the determination of cell fate; the growth cone; general development of early neural pathways; transient neurones; the external environment and neonatal development; cell death in the developing brain; glial cells; early vascular invasion; and the process of regeneration during development and in adulthood.

NEUR 5104 **Psychobiology of Learning and Memory**
6 credit points. **Session**: 2.
The topics covered will include: types of learning and of memory; current models at a psychological level; procedures for testing animal models of human learning and memory; memory disorders (amnesia); clinical and brain scan evidence on neural structures involved in learning and memory; synaptic plasticity and long term potentiation; pharmacological factors; neurological diseases affecting human memory.

NEUR 5105 **Movement and Motor Control**
6 credit points. **Session**: 2.
Major topics include: control of contraction in muscle cells; the neuromuscular junction; organization and recruitment of the motor neuron pool; action potential propagation in myelinated nerves; activation of motor neurons in antagonist muscles; sensory afferents and reflexes; neuronal integration of excitatory and inhibitory synaptic inputs to the motor neuron; development of central pattern generators in the spinal cord; motor neuron diseases; descending projections from the brain; disorders affecting motor projections, including multiple sclerosis and paraplegia; learning to move, the development of gross and skilled movements, and training following damage to the motor system.

NEUR 5106 **Pain**
6 credit points. **Session**: 2.
This unit will look at concepts of pain, including the view that pain is not only sensory event, but also a motivational state. It will evaluate current knowledge of transduction mechanisms and central representations of acute pain. Further topics include: the change from acute pain to chronic pain; mechanisms and central representations of chronic pain; central modulation of acute and chronic pain; and neuropharmacological research on endogenous analgesia.

NEUR 5108 **Visual Neuroscience**
6 credit points. **Session**: 2.
After providing an overview of the visual system and its functions, the specific topics covered by this unit of study will include: the optics, image properties, and contrast properties of visual stimuli; colour vision and defects; the development of the visual system; retinal mechanisms such as transduction, synaptic action and receptive fields; organization of optic pathways, including streams, columns, areas and maps; the neural basis of form perception, from centre/surround to models from information technology; visual perception of motion, from magnocellular to Movshon; binocular vision, including stereopsis, binocular single vision, and interocular suppression; and visual loss, including scotomas, achromatopsia, akinetopsia and acatoradog.

■ Nutrition and Dietetics

Graduate Certificate in Applied Science (Nutrition and Dietetics)

Graduate Diploma in Applied Science (Nutrition and Dietetics)

Master of Applied Science (Nutrition and Dietetics)

Course overview

The aim of this articulated coursework and clinical program is to provide graduate dietitians who have a minimum of three years experience in the workforce, with a coordinated approach to advanced nutritional support in the clinical setting. Upon completion of the Graduate Certificate, Graduate Diploma or Masters, graduates will have a broad understanding of advanced nutritional support (the core unit of study). Optional units of study will provide a wider range of advanced nutritional support in the disciplines of critical care, gastroenterology (both medical and surgical), liver disease, burns, gerontology and developmental disabilities. This course has core and optional units of study that will produce graduates with skills in the advanced nutritional support. It is offered on a part-time and a full-time basis to local and international students.

Admission requirements

Applicants for the Graduate Certificate in Applied Science (Nutrition and Dietetics) should hold a first degree in Science with a major in Nutrition and Dietetics, have a minimum of three years professional experience and be eligible for membership of the Dietitians Association of Australia.

Applicants for the Graduate Diploma in Applied Science (Nutrition and Dietetics) should hold a first degree in Science with a major in Nutrition and Dietetics, have a minimum of three years professional experience, be eligible for membership of the Dietitians Association of Australia and have completed the requirements of the Graduate Certificate in Applied Science (Nutrition and Dietetics).

Applicants for the Master in Applied Science (Nutrition and Dietetics) should hold a first degree in Science with a major in Nutrition and Dietetics, have a minimum of three years professional experience, be eligible for membership of the Dietitians Association of Australia and have completed the requirements of the Graduate Diploma in Applied Science (Nutrition and Dietetics).

Course Requirements

To qualify for the award of the Graduate Certificate in Applied Science (Nutrition and Dietetics), candidates must complete 24 credit points from the two core units of study and two optional units of study.

To qualify for the award of the Graduate Diploma in Applied Science (Nutrition and Dietetics), candidates must complete 36 credit points from the two core units of study and four optional units of study.

To qualify for the award of the Master in Applied Science (Nutrition and Dietetics), candidates must complete 48 credit points from the two core units of study and six optional units of study.

Not all units of study will be available every semester. The core coursework and clinical placement units of study must be completed first in that order. Subsequent optional units of study (depending on availability) are to be completed in the same order, coursework followed by clinical placement unit.

Credit for previous study

This course is profession specific and is the first to be offered in Australia. It is unlikely that there will be any units of study that would be appropriate for the granting of credit.

See Graduate Certificate, Graduate Diploma and Master of Applied Science in this chapter or Course Resolutions in chapter 7.

Master of Applied Science (Neutrition and Dietetics)

Unit of study		Core/ option
Unless otherwise indicated, all units are worth 6 credit points		
Core units – all degrees		
NTDT 6001	Advanced nutritional support (theory)	C
NTDT 6011	Advanced nutritional support (clinical)	C
Elective units – all degrees		
NTDT 6002	Critical care nutrition support (theory)	O
NTDT 6012	Critical care nutrition support (clinical)	O
NTDT 6003	Medical Gastroenterology (theory)	O
NTDT 6013	Medical Gastroenterology (clinical)	O
NTDT 6004	Surgical Gastroenterology (theory)	O
NTDT 6014	Surgical Gastroenterology (clinical)	O
NTDT 6005	Nutrition in Liver disease (theory)	O
NTDT 6015	Nutrition in Liver disease (clinical)	O
NTDT 6006	Burns nutrition management (theory)	O
NTDT 6016	Burns nutrition management (clinical)	O
NTDT 6007	Gerontology nutrition (theory)	O
NTDT 6017	Gerontology nutrition (clinical)	O
NTDT 6008	Nutrition in Disability (theory)	O
NTDT 6018	Nutrition in Disability (clinical)	O

NTDT 6001 **Advanced Nutritional Support (Theory)**

6 credit points. **Session**: 1. **Assumed knowledge**: Bachelor of Science degree and eligibility for membership of the Dietitians Association of Australia.

This course is designed to introduce practising dietitians to the nature of therapeutic work with common nutritional support problems of adults and children, through a series of theoretical modules available via Web CT and 'talking head' technology, culminating in assessment by written assignment. Theoretical knowledge of advanced nutrition support builds on a sound knowledge of metabolic pathways, metabolism and an evidence-based approach to nutritional support. Emphasis is placed upon the application of evidence-based therapies to the common nutritional support cases encountered in adults and children.

Textbooks

Relevant information will be supplied via WebCT.

NTDT 6002 **Nutrition Support in Critical Care**

6 credit points. **Session**: 1. **Assumed knowledge**: Bachelor of Science degree and eligibility for membership of the Dietitians Association of Australia. **Prerequisite**: NTDT (6001 or 6011).

This course is designed to introduce practising dietitians to the nature of therapeutic work with common nutritional support problems of adults and children, through a series of theoretical modules available via Web CT and 'talking head' technology, culminating in assessment by written assignment. Theoretical knowledge of critical care builds on a sound knowledge of metabolic pathways, metabolism and an evidence-based approach to nutritional support. Emphasis is placed upon the application of evidence-based therapies to the common critical care cases encountered in adults and children.

Textbooks

Relevant information will be supplied via WebCT.

NTDT 6003 **Medical Gastroenterology (Theory)**

6 credit points. **Session**: 2. **Assumed knowledge**: Bachelor of Science degree and eligibility for membership of the Dietitians Association of Australia. **Prerequisite**: NTDT (6001 or 6011).

This course is designed to introduce practising dietitians to the nature of therapeutic work with common nutritional support problems of adults and children, through a series of theoretical modules available via Web CT and 'talking head' technology,culminating in assessment by written assignment. Theoretical knowledge of nutrition support in medical aspects of gastroenterology builds on a sound knowledge of metabolic pathways, metabolism and an evidence-based approach to nutritional support. Emphasis is placed upon the application of evidence-based therapies to the medical aspects of gastroenterology cases encountered in adults and children.

Textbooks

Relevant information will be supplied via WebCT.

NTDT 6004 **Surgical Gastroenterology (Theory)**

6 credit points. **Session**: 2. **Assumed knowledge**: Bachelor of Science degree and eligibility for membership of the Dietitians Association of Australia. **Prerequisite**: NTDT (6001 or 6011).

This course is designed to introduce practising dietitians to the nature of therapeutic work with common nutritional support problems of adults and children, through a series of theoretical modules available via Web CT and 'talking head' technology, culminating in assessment by written assignment. Theoretical knowledge of nutrition support of surgical aspects of gastroenterology builds on a sound knowledge of metabolic pathways, metabolism and an evidence-based approach to nutritional support. Emphasis is placed upon the application of evidence-based therapies to the surgical aspects of gastroenterology cases encountered in adults and children.

Textbooks

Relevant information will be supplied via WebCT.

NTDT 6011 **Advanced Nutrional Support (Clinical)**

6 credit points. **Session**: 1. **Assumed knowledge**: Bachelor of Science degree and eligibility for membership of the Dietitians Association of Australia. **Prerequisite**: NTDT 6001.

This course is designed to introduce practising dietitians to the nature of therapeutic work with common nutritional support problems of adults and children. This is achieved through a 40-hour clinical placement. Clinical placement is assessed through a clinical viva and ongoing clinical skill assessment. Emphasis is placed on the strong theory/clinical link and skill development. This emphasis reinforces the importance of the interpretation of biochemical indicators, relevant medical history, clinical signs, anthropometry, biochemistry and estimations of nutritional support requirements.

Textbooks

Relevant information will be supplied via WebCT.

NTDT 6012 **Critical Care Nutritional Support**

6 credit points. **Session**: 1. **Assumed knowledge**: Bachelor of Science degree and eligibility for membership of the Dietitians Association of Australia. **Prerequisite**: NTDT (6001 or 6011 or 6002).

This course is designed to introduce practising dietitians to the nature of therapeutic work with common nutritional support problems of adults and children. This is achieved through a 40-hour clinical placement. Clinical placement will be assessed through a clinical viva and ongoing clinical skill assessment. Emphasis is placed on the strong theory/clinical link and skill development. This emphasis reinforces the importance of the interpretation of biochemical indicators, relevant medical history, clinical signs, anthropometry, biochemistry and estimations of nutritional support requirements in critical care.

Textbooks

Relevant information will be supplied via WebCT.

NTDT 6013 **Medical Gastroenterology (Clinical)**

6 credit points. **Session**: 2. **Assumed knowledge**: Bachelor of Science degree and eligibility for membership of the Dietitians Association of Australia. **Prerequisite**: NTDT (6001 or 6011 or 6003).

This course is designed to introduce practising dietitians to the nature of therapeutic work with common nutritional support problems of adults and children. This is achieved through a 40-hour clinical placement. Clinical placement will be assessed through a clinical viva and ongoing clinical skill assessment. Emphasis is placed on the strong theory/clinical link and skill development. This emphasis reinforces the importance of the interpretation of biochemical indicators, relevant medical history, clinical signs, anthropometry, biochemistry and estimations of nutritional support requirements in medical aspects of gastroenterology cases.

Textbooks

Relevant information will be supplied via WebCT.

NTDT 6014 **Surgical Gastroenterology (Clinical)**

6 credit points. **Session**: 2. **Assumed knowledge**: Bachelor of Science degree and eligibility for membership of the Dietitians Association of Australia. **Prerequisite**: NTDT (6001 or 6004 or 6011).

This course is designed to introduce practising dietitians to the nature of therapeutic work with common nutritional support problems of adults and children. This is achieved through a 40-hour clinical placement. Clinical placement will be assessed through a clinical viva and ongoing clinical skill assessment.

Emphasis is placed on the strong theory/clinical link and skill development. This emphasis reinforces the importance of the interpretation of biochemical indicators, relevant medical history, clinical signs, anthropometry, biochemistry and estimations of nutritional support requirements in surgical aspects of gastroenterology cases.

Textbooks

Relevant information will be supplied via WebCT.

■ Photonics

Graduate Certificate in Applied Science (Photonics)

Graduate Diploma in Applied Science (Photonics)

Master of Applied Science (Photonics)

May not be offered in 2004

Course Overview

The Graduate Certificate in Applied Science (Photonics), Graduate Diploma in Applied Science (Photonics), and Master of Applied Science (Photonics) are articulated coursework programs that provide flexibility in the depth at which studies are undertaken. Core units make up three quarters of the Graduate Certificate and Graduate Diploma, with the remaining units to be chosen from a small number of electives. The Graduate Certificate and Graduate Diploma are coursework with the additional requirements for the Masters being project work.

Course Outcomes

This articulated award program in Photonics is designed for both recent graduates wishing to obtain employment in the photonics field and for graduates already working in the field or a related field who are interested in gaining formal qualifications in photonics or extending there knowledge of the subject.

Upon completion of the Graduate Certificate, graduates will possess a practical and theoretical background in the fundamentals of photonics. This can be further supplemented by completion of the Graduate Diploma, and further extended to include research skills by completion of the Masters.

Students completing the full postgraduate program will have a solid grounding in all basics areas of photonics, enabling them to understand this rapidly expanding technology, and to have the knowledge and skills to solve problems relating to the applications of photonics.

Admission Requirements

Applicants for the Graduate Certificate in Applied Science (Photonics) should hold either a bachelor's degree in Science, Engineering or similar technical area, or possess experience which is considered to demonstrate the knowledge and aptitude required to undertake the course.

Applicants for the Graduate Diploma in Applied Science (Photonics) should hold either a bachelor's degree in Science, Engineering or similar technical area, or possess an equivalent standard of knowledge, or have completed the Graduate Certificate in Applied Science (Photonics) or an equivalent course.

Applicants for the Master of Applied Science (Photonics) should hold either a bachelor's degree in Science, Engineering or similar technical area, or possess an equivalent standard of knowledge, or have completed the Graduate Diploma in Applied Science (Photonics) or an equivalent course.

Course Requirements

To qualify for award of the Graduate Certificate in Applied Science (Photonics) candidates must complete 24 credit points of core units of study as described in the table below.

To qualify for award of the Graduate Diploma in Applied Science (Photonics) candidates must complete 36 credit points of units of study, including 30 credit points of core units of study and 6 credit points of optional units of study, as described in the table below.

To qualify for award of Master of Applied Science (Photonics) candidates must complete 48 credit points of units of study, including 42 credit points of core units of study and 6 credit points of optional units of study, as described in the table below.

All units of study may not be available every semester. The faculty may allow substitution of any unit of study by another approved unit of study, including units of study from other postgraduate coursework programs in the faculty or elsewhere in the University.

Credit for previous study

See Graduate Certificate, Graduate Diploma and Master of Applied Science in this chapter or Course Resolutions in chapter 7.

Master of Applied Science (Photonics)

Unit of study		Core/ option
All units are worth 6 credit points		
Core units – all degrees		
PHOT 5001	Fundamentals of Photonics	C
PHOT 5002	Passive Photonics Components	C
PHOT 5003	Active Photonics Components	C
PHOT 5010	Experimental Photonics I	C
Additional core units – Graduate Diploma and Masters		
PHOT 5011	Experimental Photonics II	C
Additional core units – Masters only		
PHOT 5020	Photonics Project A	C
PHOT 5021	Photonics Project B	C
Optional units – Graduate Diploma and Masters		
PHOT 5004	Optical Networks	O
PHOT 5005	Advanced Photonics I	O
PHOT 5006	Advanced Photonics II	O

PHOT 5001 **Fundamentals of Photonics**

6 credit points. **Session**: 1, 2.

NB: Department permission required for enrolment.

This is a core unit for the Graduate Certificate, the Graduate Diploma and the Masters program. It covers basic optical principles, and an introduction to photonic systems and photonic system components. This unit also has a significant practical component.

PHOT 5002 **Passive Photonics Components**

6 credit points. **Session**: 1.

NB: Department permission required for enrolment.

This is a core unit for the Graduate Certificate, the Graduate Diploma and the Masters program. It covers components of a photonic system including optical fibres, planar waveguides, couplers, multipexers and demultiplexers, wavelength division multiplexers, filters,gratings, bragg gratings, long period gratings, isolators and circulators, dispersion compensators.

PHOT 5003 **Active Photonics Components**

6 credit points. **Session**: 2.

NB: Department permission required for enrolment.

This is a core unit for the Graduate Certificate, the Graduate Diploma and the Masters program. It covers light sources, detectors, modulators, amplifiers, fibre lasers, optical switching and wavelength conversion.

PHOT 5004 **Optical Networks**

6 credit points. **Session**: 1, 2.

This is an optional elective unit for the Graduate Diploma and the Masters program. It covers network architectures, fundamentals of optical networks, communications systems, networks, current leading-edge systems and network protocols.

PHOT 5005 **Advanced Photonics I**

6 credit points. **Session**: 1.

NB: Department permission required for enrolment.

This is an optional elective unit for the Graduate Diploma and the Masters program. It covers optical fibre based sensors, fibre interferometry, confocal and near field optical microscopy, data storage, and medical applications.

PHOT 5006 **Advanced Photonics II**

6 credit points. **Session**: 2.

NB: Department permission required for enrolment.

This is an optional elective unit for the Graduate Diploma and the Masters program. It covers nonlinear optics, optical switching, soliton systems, and optical memory.

PHOT 5010 **Experimental Photonics I**

6 credit points. **Session**: 1.

NB: Department permission required for enrolment.

This is a core unit for the Graduate Certificate, the Graduate Diploma and the Masters program. It will include a number of

laboratory based practical exercises relevant to the core units of the Graduate Certificate.

PHOT 5011 **Experimental Photonics II**

6 credit points. **Session**: 2.

NB: Department permission required for enrolment.

This is a core unit for the Graduate Diploma and the Masters program. It will include a number of laboratory based practical exercises relevant to the core units of the Graduate Diploma.

PHOT 5020 **Photonics Project A**

6 credit points. **Session**: 1, 2.

NB: Department permission required for enrolment.

This is a core unit for the Masters program. It consists of a supervised theoretical or experimental research project on a topic determined by consultation with the supervisor. Projects may be on a topic related to the student's employment.

PHOT 5021 **Photonics Project B**

6 credit points. **Session**: 1, 2.

NB: Department permission required for enrolment.

This is a core unit for the Masters program. It consists of a supervised theoretical or experimental research project on a topic determined by consultation with the supervisor. Projects may be on a topic related to the student's employment.

■ Psychology of Coaching

Graduate Certificate in Applied Science (Psychology of Coaching)

Graduate Diploma in Applied Science (Psychology of Coaching)

Master of Applied Science (Psychology of Coaching)

Master of Applied Science(Psychology of Coaching)

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 PSYC 4721 and PSYC 4722; second semester of enrolment and following semesters, PSYC 4724 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 PSYC 4721; PSYC 4722 and other elective units, second semester of enrolment PSYC 4724 and remaining elective units to suit the individual student's needs and interests and to meet degree requirements. PSYC 4721 and PSYC 4722 must be completed before enrolling in PSYC 4724. If PSYC 4741 and PSYC 4722 are taken in separate semesters, students should enrol in PSYC 4721 before PSYC 4722.

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 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.

Admission Requirements

Candidates for the Graduate Certificate in Applied Science (Psychology of Coaching) are required to satisfactorily complete three core units of study PSYC 4721, PSYC 4722 and PSYC 4724, and 6 credit points from elective units of study. Candidates for the Graduate Diploma in Applied Science (Psychology of Coaching) are required to satisfactorily complete three core units of study PSYC 4721, PSYC 4722, and PSYC 4724, and 18 credit points from elective units. Candidates for the Master of Applied Science (Psychology of Coaching) are required to satisfactorily complete three core units of study PSYC 4721, PSYC 4722, and PSYC 4724, and 30 credit points from elective units.

Credit for previous study

See Graduate Certificate, Graduate Diploma and Master of Applied Science in this chapter or Course Resolutions in chapter 7.

Master of Applied Science (Psychology of Coaching)

Unit of study		Core/ option
All units are worth 6 credit points		
Core units – all degrees		
PSYC 4721	Theories & Techniques of Coaching	C
PSYC 4722	Fundamentals of Coaching Practice	C
PSYC 4724	Coaching Practice: Co-coaching & Groups	C
Elective units – Graduate Diploma		
PSYC 4723	Socio-cognitive Issues in Coaching Psych	O
PSYC 4725	Assessment & Selection	O
PSYC 4727	Coaching in Organisations	O
PSYC 4729	Groups Teams & Systems	O
PSYC 4730	Personal and Work/Life Coaching	O

PSYC 4721 **Theories & Techniques of Coaching Psych**

6 credit points. **Session**: 1, 2.

This unit outlines the emergence of Coaching from its roots in personal development, sports coaching, management consulting, clinical and counselling psychology, and details the fundamental models and techniques of coaching. Theories and techniques will be evaluated by reference to empirical research and conceptual analysis. Drawing on a broad base of established Behavioural Science, primary attention will be paid to cognitive-behavioural and solution-focused theories and techniques of behaviour change and their application to coaching clients. We will also evaluate key popular psychological approaches to coaching and personal development. 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.

PSYC 4722 **Fundamentals of Coaching Practice**

6 credit points. **Session**: 1, 2. **Corequisite**: PSYC 4721.

This unit teaches the Fundamentals of coaching, and lays the foundations for sound contemporary practice. Drawing on established approaches (eg, Egan, 1974; Whitemore, 1992) students will be trained in the core micro skills of coaching. The unit details key coaching strategies in relation to common applications of coaching; workplace coaching, executive coaching, and personal or life coaching. Core issues relating to mental health problems and coaching practice are addressed, and we explore the essentials of professional practice development/ marketing and Ethical (ICF) practice. 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, students will apply self-coaching strategies to their own lives.

PSYC 4723 **Socio-cognitive Issues in Coaching Psych**

6 credit points. **Session**: 1. **Corequisite**: PSYC (4721 and 4722 and 4724).

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 week's topic in relation to their own personal life/work experience and to participate in group discussion.

PSYC 4724 **Coaching Practice: Co-Coaching & Groups**

6 credit points. **Session**: 1, 2. **Prerequisite**: PSYC (4721 and 4722).
Students will consolidate the theory and skills acquired in PSYC 4721 and PSYC 4722 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 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.

PSYC 4725 **Assessment and Selection**

6 credit points. **Session**: 2. **Corequisite**: PSYC (4721 and 4722 and 4724).
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.

PSYC 4727 **Coaching in Organisations**

6 credit points. **Session**: 2 Intensive. **Prerequisite**: PSYC (4721 and 4722 and 4724).
Executive and management coaching have emerged as key factors in the enhancement of performance within organisations and corporations. This unit examines key issues in contemporary executive and management 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 solution-focused and cognitive-behavioural approaches to executive coaching, psychodynamic (eg, Kilburg) and systems (eg, O'Neil) approaches are also considered. The course covers issues in senior executive coaching, coaching middle management, establishing manger-as-coach programs, mentoring in the workplace. This unit assumes knowledge of core coaching theories and techniques. It is strongly suggested that students enrol in this unit after completing PSYC 4721 and PSYC 4722.

PSYC 4729 **Groups, Teams and Systems**

6 credit points. **Session**: 2.
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.

PSYC 4730 **Personal and Work/Life Coaching**

6 credit points. **Session**: 1.
This unit of study considers both the theory and practice of coaching adults in relation to work/life issues. Self-directed career development and imposed career transitions are important issues increasingly faced by adults. In addition, work/life balance is recognised as being an important factor in creating and maintaining well-being. Thus personal (or life) coaches have a major role to play. This unit of study details the role of the personal coach, and gives students an introduction to major theoretical perspectives on work/life balance, and career development theory and practice. Students will study key psychological theories of adult development as they relate to personal (or life) coaching practice. The perspectives covered include Work Adjustment Theory, Trait and Type Theory, and Life Span Theory. The course will focus on coaching clients through important work/life transitions, with an emphasis on understanding individual differences in relation to gender, age and personality

■ Surface Coatings

Graduate Certificate in Applied Science (Surface Coatings)

Graduate Diploma in Applied Science (Surface Coatings)

May not be offered in 2004

Course Overview

The Graduate Certificate in Science (Surface Coatings) and Graduate Diploma in Applied Science (Surface Coatings) articulated coursework programs provide a professional qualification to workers in the surface coatings industry or those seeking to work in that field. The program is primarily web-based, with two intensive weeks of lecture and practical work each semester.

Course Outcomes

On completion of the Graduate Certificate, the graduate will possess a sound theoretical and practical background in the formulation and testing of a range of surface coatings, and have the skills to design and carry out development work in the surface coatings field.

On completion of the Graduate Diploma, the graduate will have the knowledge and skills to devise novel surface coatings and create significant improvements in the production and application of pre-existing surface coatings.

Admission Requirements

Applicants for the Graduate Certificate in Applied Science (Surface Coatings) should hold either a bachelor's degree in Science, Engineering or similar technical area, or possess experience which is considered to demonstrate the knowledge and aptitude required to undertake the course.

Applicants for the Graduate Diploma in Applied Science (Surface Coatings) should hold either a bachelor's degree in Science, Engineering or similar technical area, or possess an equivalent standard of knowledge, or have completed the Graduate Certificate in Applied Science (Surface Coatings) or an equivalent course.

Course Requirements

To qualify for award of the Graduate Certificate in Applied Science (Surface Coatings) candidates must complete 24 credit points of core units of study as described in the table below.

To qualify for award of the Graduate Diploma in Applied Science (Surface Coatings) candidates must complete 36 credit points of core units of study as described in the table below.

All units of study may not 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.

Credit for previous study

See Graduate Certificate, Graduate Diploma and Master of Applied Science in this chapter or Course Resolutions in chapter 7.

Graduate Diploma in Applied Science (Surface Coatings)

Unit of study		Core/ option
All units are worth 6 credit points		
Core units – all degrees		
SUCO 4001	Polymer Science, Emulsion	C
SUCO 4002	Synthetic Resin Technology & Design	C
SUCO 4003	Interfacial Science & Technology & Design	C
SUCO 4004	Coating Formulation, Manufacture & Application	C
Additional core units – Graduate Diploma		
SUCO 4005	Surface Coatings Project A	C
SUCO 4006	Surface Coatings Project B	C

SUCO 4001 **Polymer Science, Emulsion Polymerisation**

6 credit points. **Session**: 1, 2.

NB: Department permission required for enrolment.

The first part of this unit deals with basic polymer science, plus the characterisation, rheology and mechanical properties of polymers. It addresses the nature of polymers, including their molecular weight; mechanisms and processes of polymer synthesis; kinetics of polymerisation and copolymerisation; conformations and morphology of polymers in solutions and melt; polymer phase transitions; thermodynamics of polymer solutions and blends; polymer characterisation; mechanical and rheological properties of polymers. The second part of this unit deals with the mechanisms of emulsion polymerisation and the specific processes and properties of latex coatings synthesised by emulsion polymerisation. It addresses basic emulsion polymerisation mechanism; the three intervals of emulsion polymerisation; common latex components and properties; intelligent design of latexes; film formation. It incorporates both lecture and practical components.

SUCO 4002 **Synthetic Resin Technology & Design**

6 credit points. **Session**: 1, 2.

NB: Department permission required for enrolment.

The first part of this unit deals with the chemistry of synthetic resins used in adhesive, ink and surface coatings applications. It addresses hard resins, alkyd and water reducible resins; saturated and unsaturated polyesters; formaldehyde resins; solution acrylic resins; urethane resins; epoxy resins; emulsions; silicone and non-convertible resins. The second part of this unit deals with the formulation, synthesis and testing of synthetic resins, through a selection of laboratory experiments on specific resin types. Exercises deal with: (a) formulation, manufacture and evaluation of a number of synthetic resin types; (b) characterisation of synthetic resins and composites using various analytical techniques; and (c) a design study of the formulation of a specific synthetic resin.

SUCO 4003 **Interfacial Sci & Coatings Tech & Design**

6 credit points. **Session**: 1, 2.

NB: Department permission required for enrolment.

The first part of this unit deals with principles of surface and interfacial science and the modification of surfaces by coatings. It addresses surface tension and the effect of solutes on surface tension; solid-liquid and solid-gas interfaces; principles of coatings manufacture; product types and application; evaluation of coating performance. The second part of this unit aims to teach practical skills in relating to aspects of design, production, and testing of surface coatings. Practical exercises involve work on the formulation of coatings and related products, and their testing by standard methods.

SUCO 4004 **Coating Formulation, Manufacture & App**

6 credit points. **Session**: 1, 2.

NB: Department permission required for enrolment.

The first part of this unit deals with the theoretical framework necessary to formulate products for the decorative coatings industry. It addresses formulation parameters in paint manufacture; dispersion theory; dispersion equipment and methods; classifications of decorative coatings; properties of solvent based and latex based decorative coatings. The second part of this unit deals with the theoretical framework necessary to formulate products for the non-decorative surface coatings industry. It addresses automotive coatings; anti-fouling marine paints; industrial coatings; powder coatings; coil coatings; packaging coatings; inks. The third part deals with substrates, substrate preparation, and the application of surface coatings to substrates. It addresses inert and reactive substrates (masonry, timber, metal); methods of applying industrial coatings; corrosion and its prevention; paint defects; rheology of surface coating dispersion.

SUCO 4005 **Surface Coatings Project A**

6 credit points. **Session**: 1, 2.

NB: Department permission required for enrolment.

This unit consists of a supervised theoretical or experimental research project on a topic determined by consultation with the supervisor. Projects may be on a topic related to the student's employment.

SUCO 4006 **Surface Coatings Project B**

6 credit points. **Session**: 1, 2.

NB: Department permission required for enrolment.

This unit consists of a supervised theoretical or experimental research project on a topic determined by consultation with the supervisor. Projects may be on a topic related to the student's employment.

■ Wildlife Health and Population Management

Graduate Certificate in Applied Science (Wildlife Health and Population Management)

Graduate Diploma in Applied Science (Wildlife Health and Population Management)

Master of Applied Science (Wildlife Health and Population Management)

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.

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 Masters, graduates will have a broad understanding of the topic of wildlife management and practical skills developed from field studies. In addition, the Masters will provide experience in designing, carrying out and completing a research project and thesis.

Admission Requirements

Applicants for the Graduate Certificate in Applied Science (Wildlife Health and Population Management) should hold a first degree in science or veterinary science, or have the knowledge and aptitude obtained from professional or other experience required to undertake the award course.

Applicants for the Graduate Diploma in Applied Science (Wildlife Health and Population Management) similarly should hold a first degree in science or veterinary science, or have the knowledge and aptitude obtained from professional or other experience required to undertake the award course, or have completed the Graduate Certificate in Applied Science (Wildlife Health and Population Management).

Applicants for the Master of Applied Science (Wildlife Health and Population Management) should hold a first degree in science or veterinary science, or have the knowledge and aptitude obtained from professional or other experience required to undertake the award course, or have completed the Graduate

Diploma in Applied Science (Wildlife Health and Population Management).

Course Requirements

To qualify for award of the Graduate Certificate in Applied Science (Wildlife Health and Population Management), candidates must complete 24 credit points from the two six credit point core units and two of the six optional units of study, as described in the table below.

To qualify for award of the Graduate Diploma in Applied Science (Wildlife Health and Population Management), candidates must complete 36 credit points from the two six credit point core units and four of the six optional units of study, as described in the table below.

To qualify for award of the Master of Applied Science (Wildlife Health and Population Management), candidates must complete 48 credit points from all the core units and a selection of the optional units of study, as described in the table below.

Not all units of study will 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.

Credit for previous study

See Graduate Certificate, Graduate Diploma and Master of Applied Science in this chapter or Course Resolutions in chapter 7.

Master of Applied Science (Wildlife Health and Population Management)

Unit of study		Core/ option
Unless otherwise indicated, all units are worth 6 credit points		
Core units – all degrees		
WILD 5001	Australian Wildlife: Introduction	C
WILD 5002	Australian Wildlife: Field Studies	C
Additional core unit – Masters		
WILD 5009	Research Project (12cp)	C
Optional units		
WILD 5003	Wildlife Health	O
WILD 5004	Vertebrate Pest Management	O
WILD 5005	In Situ Wildlife Management	O
WILD 5006	Ex Situ Wildlife Management	O
WILD 5007	Sustainable Wildlife Use & Stewardship	O
WILD 5008	Community Relations & Education	O

WILD 5001 **Australian Wildlife: Introduction**

6 credit points. **Session**: 1.

NB: Core

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.

WILD 5002 **Australian Wildlife: Field Studies**

6 credit points. **Session**: 1.

NB: Core

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 WILD 5001 and provides practical experience via a five day field trip.

WILD 5009 **Research Project**

12 credit points. **Session**: 1, 2.

NB: Core for the Masters program

A valuable opportunity to apply some of the knowledge gained from earlier coursework, WILD 5009 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).

WILD 5003 **Wildlife Health**

6 credit points. **Session**: 1.

NB: Optional

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 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.

WILD 5004 **Vertebrate Pest Management**

6 credit points. **Session**: 2.

NB: Optional

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 via immunocontraception.

WILD 5005 **In Situ Wildlife Management**

6 credit points. **Session**: 1, 2.

NB: Optional

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.

WILD 5006 **Ex Situ Wildlife Management**

6 credit points. **Session**: 2.

NB: Optional

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 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.

WILD 5007 **Sustainable Wildlife Use and Stewardship**

6 credit points. **Session**: 2.

NB: Optional

The unit considers the potential for sustainable use of wildlife to contribute to the conservation of biodiversity and the economic well-being of local communities. There will be consideration of both consumptive and non-consumptive utilisation programs,

using both Australian and international examples. Ethical and animal welfare issues will be considered in some detail.

A case study on the Australian kangaroo harvesting industry will provide an opportunity to examine all the factors that need to be taken into account – biological, socio-cultural, economic and animal welfare issues.

The unit is presented by Associate Professor Tony English from the Faculty of Veterinary Science.

WILD 5008 **Community Relations and Education**

6 credit points. **Session**: 2.

NB: Optional

Techniques in wildlife health and population management are sometimes developed and used with little regard for the people for whom the management is designed. This unit provides an understanding of how management is assisted by the inclusion of all stakeholders at different stages of program development and implementation. Issues of community involvement and 'ownership' are illustrated using case studies with indigenous and non-indigenous peoples in the Australasian region.

Wildlife Health and Population Management optional units of study

The following optional units are available. For detailed descriptions see the listings under the appropriate headings of postgraduate Degrees in Applied Science articulated coursework programs. Special attention should be paid to any prerequisite studies that may be required.

- ENVI 5808 Applied Ecology for Environmental Scientists
- ICOM 5002 Science Communication
- QMEC 5110 Structure and Management of Research Projects.

7 Postgraduate degree regulations

The postgraduate degrees in the Faculty of Science are:

Degrees of Doctor

DSc – Doctor of Science
PhD – Doctor of Philosophy
DCP/PhD – Doctor of Clinical Psychology/Doctor of Philosophy
DCP/MSc – Doctor of Clinical Psychology/Master of Science
DCN/PhD – Doctor of Clinical Neuropsychology/Doctor of Philosophy
DCN/MSc – Doctor of Clinical Neuropsychology/Master of Science

Degrees of Master

MSc – Master of Science
MSc(EnvironSc) – Master of Science (Environmental Science)
MSc(Micr&An) – Master of Science (Microscopy and Microanalysis)
MInfTech – Master of Information Technology
MApplIT –Master of Applied Information Technology
MMedPhys – Master of Medical Physics
MNutrDiet – Master of Nutrition and Dietetics
MNutrSc – Master of Nutritional Science
MPsych – Master of Psychology
MEnviSciLaw –Master of Environmental Science and Law
MQuantMarEcol – Master of Quantitative Marine Ecology
MApplSc – Master of Applied Science
MApplSc(Bioinf) – Master of Applied Science (Bioinformatics)
MApplSc(Coastal Mgt) – Master of Applied Science (Coastal Management)
MApplSc(EnvSc) – Master of Applied Science (Environmental Science)
MApplSc(Microsc & Microanal) – Master of Applied Science (Microscopy and Microanalysis)
MApplSc(MBT) – Master of Applied Science (Molecular Biotechnology)
MApplSc(NeuroSc) – Master of Applied Science (Neuroscience)
MApplSc(Neut & Diet) – Master of Applied Science (Nutrition and Dietetics)
MApplSc(Photonics) – Master of Applied Science (Photonics)
MApplSc(PsycCoach) – Master of Applied Science (Psychology of Coaching)
MApplSc(WildHlthPopMan) – Master of Applied Science (Wildlife Health and Population Management)

Diplomas

GradDipSc – Graduate Diploma in Science
GradDipSc(Psych) – Graduate Diploma in Science (Psychology)
GradDipInfTech – Graduate Diploma in Information Technology
GradDipApplIT – Graduate Diploma in Applied Information Technology
GradDipMedPhys - Graduate Diploma in Medical Physics
GradDipPsych – Graduate Diploma in Psychology
GradDipQuantMarEcol – Graduate Diploma in Quantitative Marine Ecology
GradDipApplSc – Graduate Diploma in Applied Science
GradDipApplSc(Bioinf) – Graduate Diploma in Applied Science (Bioinformatics)
GradDipApplSc(Coastal Mgt) – Graduate Diploma in Applied Science (Coastal Management)
GradDipApplSc(EnvSc) – Graduate Diploma in Applied Science (Environmental Science)
GradDipApplSc(Inf&Comm) – Graduate Diploma in Applied Science (Informatics and Communication)
GradDipApplSc(Microsc & Microanal) – Graduate Diploma in Applied Science (Microscopy and Microanalysis)
GradDipApplSc(MBT) – Graduate Diploma in Applied Science (Molecular Biotechnology)
GradDipApplSc(NeuroSc) – Graduate Diploma in Applied Science (Neuroscience)
GradDipApplSc(Neut & Diet) – Graduate Diploma in Applied Science (Nutrition and Dietetics)
GradDipApplSc(Photonics) – Graduate Diploma in Applied Science (Photonics)
GradDipApplSc(PsycCoach) – Graduate Diploma in Applied Science (Psychology of Coaching)
GradDipApplSc(SurfaceCoatings) – Graduate Diploma in Applied Science (Surface Coatings)
GradDipApplSc(WildHlthPopMan) – Graduate Diploma in Applied Science (Wildlife Health and Population Management)

Certificates

GradCertSc(HPS) – Graduate Certificate in Science (History and Philosophy of Science)
GradCertSc(Micr&An) – Graduate Certificate in Science (Microscopy & Microanalysis)
GradCertInfTech – Graduate Certificate in Information Technology
GradCertApplIT – Graduate Certificate in Applied Information Technology
GradCertQuantMarEcol – Graduate Certificate in Quantitative Marine Ecology
GradCertApplSc – Graduate Certificate in Applied Science
GradCertApplSc(Bioinf) – Graduate Certificate in Applied Science (Bioinformatics)
GradCertApplSc(Coastal Mgt) – Graduate Certificate in Applied Science (Coastal Management)
GradCertApplSc(EnvSc) – Graduate Certificate in Applied Science (Environmental Science)
GradCertApplSc(Inf&Comm) – Graduate Certificate in Applied Science (Informatics and Communication)
GradCertApplSc(Microsc & Microanal) – Graduate Certificate in Applied Science (Microscopy and Microanalysis)
GradCertApplSc(MBT) – Graduate Certificate in Applied Science (Molecular Biotechnology)
GradCertApplSc(NeuroSc) – Graduate Certificate in Applied Science (Neuroscience)
GradCertApplSc(Neut & Diet) – Graduate Certificate in Applied Science (Nutrition and Dietetics)
GradCertApplSc(Photonics) – Graduate Certificate in Applied Science (Photonics)
GradCertApplSc(PsychCoach) – Graduate Certificate in Applied Science (Psychology of Coaching)
GradCertApplSc(SurfaceCoatings) – Graduate Certificate in Applied Science (Surface Coatings)
GradCertApplSc(WildHlthPopMan) – Graduate Certificate in Applied Science (Wildlife Health and Population Management)

Prospective candidates for these awards should consult with the appropriate postgraduate adviser (see chapter 2) or Head of the Department most closely concerned, as early as possible.

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 advisors in the Faculty office.

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

Preliminary

Rules relating to Coursework Award Courses

Division 1Award course requirements, credit points and assessment
Division 2Enrolment
Division 3Credit, cross-institutional study and their upper limits
Division 4Progression
Division 5Discontinuation of enrolment and suspension of candidature
Division 6Unsatisfactory progress and exclusion
Division 7Exceptional circumstances
Division 8Award of degrees, diplomas and certificates
Division 9Transitional provisions

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

Preliminary

1. Commencement and purpose of Rule

(1) This Rule is made by the Senate pursuant to section 37(1) of The University of Sydney Act 1989 for the purposes of The University of Sydney By-law 1999.

(2) This Rule comes into force on 1 January 2001.

(3) This Rule governs all coursework award courses in the University. It is to be read in conjunction with The University of Sydney (Amendment Act) Rule 1999 and the Resolutions of the Senate and the faculty resolutions relating to each award course in that faculty.

Rules relating to Coursework Award Courses

1. Definitions

In this Rule:

award course means a formally approved program of study which can lead to an academic award granted by the University.

coursework means 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, supervised research, other forms of instruction and learning normally will be dominant. All undergraduate award courses are coursework award courses;

credit means advanced standing based on previous attainment in another award course at the University or at another institution. The advanced standing is expressed as credit points granted towards the award course. Credit may be granted as specific credit or non-specific credit.

Specific credit means the recognition of previously completed studies as directly equivalent to units of study.

Non-specific credit means 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;

credit points mean a measure of value indicating the contribution each unit of study provides towards meeting award course completion requirements stated as a total credit point value;

dean means the dean of a faculty or the director or principal of an academic college or the chairperson of a board of studies;

degree means a degree at the level of bachelor or master for the purpose of this Rule;

embedded courses/programs means award courses in the graduate certificate / graduate diploma / master's degree by coursework sequence which allow unit of study credit points to count in more than one of the awards;

faculty means a faculty, college board, a board of studies or the Australian Graduate School of Management Limited as established in each case by its constitution and in these Rules refers to the faculty or faculties responsible for the award course concerned;

major means a defined program of study, generally comprising specified units of study from later stages of the award course;

minor means a defined program of study, generally comprising units of study from later stages of the award course and requiring a smaller number of credit points than a major;

postgraduate award course means an award course leading to the award of a graduate certificate, graduate diploma, degree of master or a doctorate. Normally, a postgraduate award course requires the prior completion of a relevant undergraduate degree or diploma.

research award course means an award course in which students undertake and report systematic, creative work in order to increase the stock of knowledge. The research award courses offered by the University are: higher doctorate, Doctor of Philosophy, doctorates by research and advanced coursework, and certain degrees of master designated as research degrees. The systematic, creative component of a research award course must comprise at least 66% of the overall award course requirements;

stream means a defined program of study within an award course, which requires the completion of a program of study specified by the award course rules for the particular stream, in addition to the core program specified by award course rules for the award course. *student* means a person enrolled as a candidate for a course;

testamur means a certificate of award provided to a graduate, usually at a graduation ceremony;

transcript or *academic transcript* means a printed statement setting out a student's academic record at the University;

unit of study means the smallest stand-alone component of a student's award course that is recordable on a student's transcript. Units of study have an integer credit point value, normally in the range 3-24;

undergraduate award course means an award course leading to the award of an associate diploma, diploma, advanced diploma or degree of bachelor.

2. Authorities and responsibilities

(1) Authorities and responsibilities for the functions set out in this Rule are also defined in the document Academic Delegations of Authority. The latter document sets out the mechanisms by which a person who has delegated authority may appoint an agent to perform a particular function.

(2) The procedures for consideration of, and deadlines for submission of, proposals for new and amended award courses will be determined by the Academic Board.

Division 1: Award course requirements, credit points and assessment

3. Award course requirements

(1) To qualify for the award of a degree, diploma or certificate, a student must:

(a) complete the award course requirements specified by the Senate for the award of the degree, diploma or certificate concerned;

(b) complete any other award course requirements specified by the Academic Board on the recommendation of the faculty and published in the faculty resolutions relating to the award course;

(c) complete any other award course requirements specified by the faculty in accordance with its delegated authority and published in the faculty resolutions relating to the award course; and

(d) satisfy the requirements of all other relevant –by-laws, rules and resolutions of the University.

4. Units of study and credit points

(1)(a) A unit of study comprises the forms of teaching and learning approved by a faculty. Where the unit of study is being provided specifically for an award course which is the responsibility of another faculty, that faculty must also provide approval.

(b) Any faculty considering the inclusion of a unit of study in the tables of units available for an award course for which it is responsible may review the forms of teaching and learning of that unit, may consult with the approving faculty about aspects of that unit and may specify additional conditions with respect to inclusion of that unit of study.

(2) A student completes a unit of study if the student:

(a) participates in the learning experiences provided for the unit of study;

(b) meets the standards required by the University for academic honesty;

(c) meets all examination, assessment and attendance requirements for the unit of study; and

(d) passes the required assessments for the unit of study.

(3) Each unit of study is assigned a specified number of credit points by the faculty responsible for the unit of study.

(4) The total number of credit points required for completion of an award course will be as specified in the Senate resolutions relating to the award course.

(5) The total number of credit points required for completion of award courses in an approved combined award course will be specified in the Senate or faculty resolutions relating to the award course.

(6) A student may, under special circumstances, and in accordance with faculty resolutions, be permitted by the relevant dean to undertake a unit or units of study other than those specified in the faculty resolutions relating to the award course and have that unit or those units of study counted towards fulfilling the requirements of the award course in which the student is enrolled.

5. Unit of study assessment

(1) A student who completes a unit of study will normally be awarded grades of high distinction, distinction, credit or pass, in accordance with policies established by the Academic

Board. The grades high distinction, distinction and credit indicate work of a standard higher than that required for a pass.

(2) A student who completes a unit of study for which only a pass/fail result is available will be recorded as having satisfied requirements.

(3) In determining the results of a student in any unit of study, the whole of the student's work in the unit of study may be taken into account.

(4) Examination and assessment in the University are conducted in accordance with the policies and directions of the Academic Board.

6. Attendance

(1) A faculty has authority to specify the attendance requirements for courses or units of study in that faculty. A faculty must take into account any University policies concerning modes of attendance, equity and disabled access.

(2) A faculty has authority to specify the circumstances under which a student who does not satisfy attendance requirements may be deemed not to have completed a unit of study or an award course.

Division 2: Enrolment

7. Enrolment restrictions

(1) A student who has completed a unit of study towards the requirements of an award course may not re-enrol in that unit of study, except as permitted by faculty resolution or with the written permission of the dean. A student permitted to re-enrol may receive a higher or lower grade, but not additional credit points.

(2) Except as provided in sub-section (1), a student may not enrol in any unit of study which overlaps substantially in content with a unit that has already been completed or for which credit or exemption has been granted towards the award course requirements.

(3) A student may not enrol in units of study additional to award course requirements without first obtaining permission from the relevant dean.

(4) Except as prescribed in faculty resolutions or with the permission of the relevant dean:

(a) a student enrolled in an undergraduate course may not enrol in units of study with a total value of more than 32 credit points in any one semester, or 16 credit points in the summer session; and

(b) a student enrolled in a postgraduate award course may not enrol in units of study with a total value of more than 24 credit points in any one semester, or 12 credit points in the summer session.

Division 3: Credit, cross-institutional study and their upper limits

8. Credit for previous studies

(1) Students may be granted credit on the basis of previous studies.

(2) Notwithstanding any credit granted on the basis of work completed or prior learning in another award course at The University of Sydney or in another institution, in order to qualify for an award a student must:

(a) for undergraduate award courses, complete a minimum of the equivalent of two full-time semesters of the award course at the University; and

(b) for postgraduate award courses, complete at least fifty percent of the requirements prescribed for the award course at the University.

These requirements may be varied where the work was completed as part of an embedded program at the University or as part of an award course approved by the University in an approved conjoint venture with another institution.

(3) The credit granted on the basis of work completed at an institution other than a university normally should not exceed one third of the overall award course requirements.

(4) A faculty has authority to establish embedded academic sequences in closely related graduate certificate, graduate diploma and master's degree award courses. In such embedded sequences, a student may be granted credit for all or some of the units of study completed in one award of the sequence towards any other award in the sequence, irrespective of whether or not the award has been conferred.

(5) In an award course offered as part of an approved conjoint venture the provisions for the granting of credit are prescribed in the Resolutions of the Senate and the faculty resolutions relating to that award course.

9. Cross-institutional study

(1) The relevant dean may permit a student to complete a unit or units of study at another university or institution and have that unit or those units of study credited to the student's award course.

(2) The relevant dean has authority to determine any conditions applying to cross-institutional study.

Division 4: Progression

10. Repeating a unit of study

(1) A student who repeats a unit of study shall, unless granted exemption by the relevant dean:

(a) participate in the learning experiences provided for the unit of study; and

(b) meet all examination, assessment and attendance requirements for the unit of study.

(2) A student who presents for re-assessment in any unit of study is not eligible for any prize or scholarship awarded in connection with that unit of study without the permission of the relevant dean.

11. Time limits

A student must complete all the requirements for an award course within ten calendar years or any lesser period if specified by Resolution of the Senate or the faculty.

Division 5: Discontinuation of enrolment and suspension of candidature

12. Discontinuation of enrolment

(1) A student who wishes to discontinue enrolment in an award course or a unit of study must apply to the relevant dean and will be presumed to have discontinued enrolment from the date of that application, unless evidence is produced showing:

(a) that the discontinuation occurred at an earlier date; and

(b) that there was good reason why the application could not be made at the earlier time.

(2) A student who discontinues enrolment during the first year of enrolment in an award course may not re-enrol in that award course unless:

(a) the relevant dean has granted prior permission to re-enrol; or

(b) the student is reselected for admission to candidature for that course.

(3) No student may discontinue enrolment in an award course or unit of study after the end of classes in that award course or unit of study, unless he or she produces evidence that:

(a) the discontinuation occurred at an earlier date; and

(b) there was good reason why the application could not be made at the earlier time.

(4) A discontinuation of enrolment may be recorded as *Withdrawn (W)* or *Discontinued Not To Count As Failure (DNF)* where that discontinuation occurs within the time-frames specified by the University and published by the faculty, or where the student meets other conditions as specified by the relevant faculty.

13. Suspension of candidature

(1) A student must be enrolled in each semester in which he or she is actively completing the requirements for the award course. A student who wishes to suspend candidature must first obtain approval from the relevant dean.

(2) The candidature of a student who has not re-enrolled and who has not obtained approval from the dean for suspension will be deemed to have lapsed.

(3) A student whose candidature has lapsed must apply for re-admission in accordance with procedures determined by the relevant faculty.

(4) A student who enrols after suspending candidature shall complete the requirements for the award course under such conditions as determined by the dean.

Division 6: Unsatisfactory progress and exclusion

14. Satisfactory progress

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.

15.Requirement to show good cause

(1) For the purposes of this Rule, good cause means circumstances beyond the reasonable control of a student, which may include serious ill health or misadventure, but does not include demands of employers, pressure of employment or time devoted to non-University activities, unless these are relevant to serious ill health or misadventure. In all cases the onus is on the student to provide the University with satisfactory evidence to establish good cause. The University may take into account relevant aspects of a student's record in other courses or units of study within the University and relevant aspects of academic studies at other institutions provided that the student presents this information to the University.

(2) The relevant dean may require a student who has not made satisfactory progress to show good cause why he or she should be allowed to re-enrol.

(3) The dean will permit a student who has shown good cause to re-enrol.

16.Exclusion for failure to show good cause

The dean may, where good cause has not been established:

(1) exclude the student from the relevant course; or

(2) permit the student to re-enrol in the relevant award course subject to restrictions on units of study, which may include, but are not restricted to:

(a) completion of a unit or units of study within a specified time;

(b) exclusion from a unit or units of study, provided that the dean must first consult the head of the department responsible for the unit or units of study; and

(c) specification of the earliest date upon which a student may re-enrol in a unit or units of study.

17.Applying for re-admission after exclusion

(1) A student who has been excluded from an award course or from a unit or units of study may apply to the relevant dean for readmission to the award course or re-enrolment in the unit or units of study concerned after at least 4 semesters, and that dean may readmit the student to the award course or permit the student to re-enrol in the unit or units of study concerned.

(2) With the written approval of the relevant dean, a student who has been excluded may be given credit for any work completed elsewhere in the University or in another university during a period of exclusion.

18.Appeals against exclusion

(1) In this Rule a reference to the Appeals Committee is a reference to the Senate Student Appeals Committee (Exclusions and Readmissions).

(2) (a) (i) A student who has been excluded in accordance with this Rule may appeal to the Appeals Committee.

(ii) A student who has applied for readmission to an award course or re-enrolment in a unit of study after a period of exclusion, and who is refused readmission or re-enrolment may also apply to the Appeals Committee.

(b) The Appeals Committee shall comprise:

(i) 3 ex officio members (the Chancellor, the Deputy Chancellor and the Vice-Chancellor and Principal);

(ii) the Chair and Deputy Chairs of the Academic Board;

(iii) 2 student Fellows; and

(iv) up to 4 other Fellows.

(c) The Appeals Committee may meet as one or more sub-committees providing that each sub-committee shall include at least 1 member of each of the categories of:

(i) ex officio member;

(ii) Chair or Deputy Chair of the Academic Board;

(iii) student Fellow; and

(iv) other Fellows.

(d) Three members shall constitute a quorum for a meeting of the Appeals Committee or a sub-committee.

(e) The Appeals Committee and its sub-committees have authority to hear and determine all such appeals and must report its decision to the Senate annually.

(f) The Appeals Committee or a sub-committee may uphold or disallow any appeal and, at its discretion, may determine the earliest date within a maximum of four semesters at which a student who has been excluded shall be permitted to apply to re-enrol.

(g) No appeal shall be determined without granting the student the opportunity to appear in person before the Appeals Committee or sub-committee considering the appeal. A student so appearing may be accompanied by a friend or adviser.

(h) The Appeals Committee or sub-committee may hear the relevant dean but that dean may only be present at those stages at which the student is permitted to be present. Similarly, the dean is entitled to be present when the Committee or sub-committee hears the student.

(i) If, due notice having been given, a student fails to attend a meeting of the Appeals Committee or sub-committee scheduled to consider that student's appeal, the Appeals Committee or sub-committee, at its discretion, may defer consideration of the appeal or may proceed to determine the appeal.

(j) A student who has been excluded in accordance with these resolutions and has lodged a timely appeal against that exclusion may re-enrol pending determination of that appeal if it has not been determined by the commencement of classes in the next appropriate semester.

Division 7: Exceptional circumstances

19.Variation of award course requirements in exceptional circumstances

The relevant dean may vary any requirement for a particular student enrolled in an award course in that faculty where, in the opinion of the dean, exceptional circumstances exist.

Division 8: Award of degrees, diplomas and certificates

20.Classes of award

(1) Undergraduate diplomas may be awarded in five grades – pass, pass with merit, pass with distinction, pass with high distinction or honours.

(2) Degrees of bachelor may be awarded in two grades – pass or honours.

(3) Graduate diplomas and graduate certificates may be awarded in one grade only – pass.

(4) Degrees of master by coursework may be awarded three grades – pass, pass with merit or honours.

21.Award of the degree of bachelor with honours

(1) The award of honours is reserved to indicate special proficiency. The basis on which a student may qualify for the award of honours in a particular award course is specified in the faculty resolutions relating to the course.

(2) Each faculty shall publish the grading systems and criteria for the award of honours in that faculty.

(3) Classes which may be used for the award of honours are:
First Class
Second Class/Division 1
Second Class/Division 2
Third Class.

(4) With respect to award courses which include an additional honours year:

(a) a student may not graduate with the pass degree while enrolled in the honours year;

(b) on the recommendation of the head of the department concerned, a dean may permit a student who has been awarded the pass degree at a recognised tertiary institution to enrol in the honours year in that faculty;

(c) faculties may prescribe the conditions under which a student may enrol part-time in the honours year;

(d) a student who fails or discontinues the honours year may not re-enrol in it, except with the approval of the dean.

22.University Medal

An honours bachelor's degree student with an outstanding academic record throughout the award course may be eligible for the award of a University medal, in accordance with Academic Board policy and the requirements of the faculty resolutions relating to the award course concerned.

23.Award of the degree of master with honours or merit

The award of honours or pass with merit is reserved to indicate special proficiency or particular pathways to completion. The basis on which a student may qualify for the award of honours or the award with merit in a particular degree is specified in the faculty resolutions relating to that degree.

24. Transcripts and testamurs

(1) A student who has completed an award course or a unit of study at the University will receive an academic transcript upon application and payment of any charges required.

(2) Testamurs may indicate streams or majors or both as specified in the relevant faculty resolutions.

Division 9: Transitional provisions

25. Application of this Rule during transition

This Rule applies to all candidates for degrees, diplomas and certificates who commence candidature after 1 January 2001. Candidates who commenced candidature prior to this date may choose to proceed in accordance with the resolutions of the Senate in force at the time they enrolled, except that the faculty may determine specific conditions for any student who has re-enrolled in an award course after a period of suspension.

■ Degrees of Doctor

Doctor of Science (DSc)

Resolutions of the Senate

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:

Resolutions of the Faculty

(i) 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.

(ii) 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.

(iii) If a prospective candidate, as a first step tenders the introduction called for in (ii) 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.

(iv) 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 (PhD)

Resolutions of the Senate

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/Doctor of Philosophy (DCP/PhD)

Resolutions of the Senate

Award of the degrees

1. The degrees of Doctor of Clinical Psychology and Doctor of Philosophy shall only be awarded on satisfactory completion of the requirements for both degrees, except as provided by the Resolutions of the Academic Board relating to the degree of Doctor of Philosophy.

Eligibility for admission

2. The Dean of the Faculty of Science may admit to candidature:
   (1) (a) graduates of The University of Sydney 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) in psychology with a result of 2:1 or better or any other equivalent award of The University of Sydney; or
   (b) graduates of other universities who have qualifications equivalent to those specified in subsection (1); and
   (2) 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.

Availability

3. (1) Admission to candidature may be limited by a quota. In determining the quota, the University will take into account:
   (a) availability of resources including space, laboratory and computing facilities; and
   (b) availability of adequate and appropriate supervision.
   (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 section 2 above.

Method of progression

4. A candidate for the combined award course shall proceed by completing units of study, clinical internships, research and thesis in accordance with Sections 7 and 8.

Time limits

5. (1) A candidate may proceed on either a full-time or a part-time basis.
   (2) A candidate shall complete the requirements for the combined award course in a minimum of nine semesters and a maximum of fifteen semesters, and except with permission of the Dean within nine calendar years of admission to candidature.
   (3) The Director of Clinical Training in consultation with the members of the Clinical Psychology unit shall approve any period of absence.

Requirements for the combined award course

6. Candidates for the combined award course are required to:
   (1) complete satisfactorily 96 credit points from approved units of study. 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:
   (a) to attend all the lectures and the meetings, if any, for seminars or tutorial instruction;
   (b) to complete satisfactorily the essays, exercises, practical and project work if any; and
   (c) to pass any other examination of the unit of study that may apply;
   (2) pursue a course of advanced study and research leading to the submission of a thesis in an area of clinical research
   (3) complete satisfactorily clinical internships in accordance with Sections 7 and 8; and
   (4) complete satisfactorily two specialist seminars in clinical psychology.
7. The following are the requirements for the combined award course. 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 Table 7.1: 'DCP/PhD requirements'.

Examination

8. The procedures for the examination and award of the Doctor of Philosophy (including the provision for transfer to Master's candidature if the degree is not awarded) shall be prescribed in the Resolutions of the Academic Board and Senate relating to that degree
9. 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.

Progress

10. (1) The Dean may:
   (a) 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
   (b) terminate the candidature where the candidate does not show good cause.
   (2) Satisfactory progress is prescribed as:
   (a) a candidate for the combined award course must complete satisfactorily (at a pass level) all units of study.

Table 7.1: DCP/PhD requirements

Year	Sem.	Therapy Knowledge and Skills	Assessment Knowledge and Skills	Clinical Internships	Case Seminars	Research
1	1	Adult Psychological Disorders	Psychological Assessment of Adults	Clinical Internship 1	Ethics and Professional Practice Case Seminars 1	Research 1
	2	Child Psychological Disorders Family Therapy	Psychological Assessment of Children	Clinical Internship 2	Case Seminars 2	Research 2
2	1	Advanced Adult Psychological Disorders Adult Health Psychology	Adult Neuropsychological Disorders	Clinical Internship 3	Case Seminars 3	Research 3
	2	Specialist Seminars	Paediatric Neuropsychological Disorders	Clinical Internship 4	Case Seminars 4	Research 4
3	1	Advanced Seminars	Nil	Clinical Internship 5	Case Seminars 5	Research 5
	2	Nil	Nil	Clinical Internship 6	Case Seminars 6	Research 6
4	1	Nil	Nil	Nil	Nil	Research 7
	2	Nil	Nil	Nil	Nil	Research 8
5		Nil	Nil	Nil	Nil	Research 9

(b) 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. They may not begin the next unit of study within the same key topic area until the previous unit of study has been satisfactorily completed.

(c) 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.

(d) 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.

Credit

11. 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.

Transfer to Doctor of Philosophy candidature

12. The Director of Clinical Training in consultation with the Head of Department may recommend 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 Dean may determine.

Doctor of Clinical Psychology/Master of Science (DCP/MSc)

Resolutions of the Senate

Award of the degrees

1. The degrees of Doctor of Clinical Psychology and Master of Science shall only be awarded on satisfactory completion of the requirements for both degrees, except as provided by the Resolutions of the Senate relating to the degree of Master of Science.

Eligibility for admission

2. The Dean of the Faculty of Science may admit to candidature:
   (1) (a) graduates of The University of Sydney 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) in psychology with a result of 2:1 or better or any other equivalent award of The University of Sydney; or
   (b) graduates of other universities who have qualifications equivalent to those specified in subsection (1); and
   (2) 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.

Availability

3. (1) Admission to candidature may be limited by a quota. In determining the quota, the University will take into account:
   (a) availability of resources including space, laboratory and computing facilities; and
   (b) availability of adequate and appropriate supervision.
   (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 section 2 above.

Method of progression

4. A candidate for the combined award course shall proceed by completing units of study, clinical internships, research and thesis in accordance with Sections 7 and 8.

Time limits

5. (1) A candidate may proceed on either a full-time or a part-time basis.
   (2) A candidate shall complete the requirements for the combined award course in a minimum of six semesters and a maximum of twelve semesters, and except with permission of the Dean within nine calendar years of admission to candidature.
   (3) The Director of Clinical Training in consultation with the members of the Clinical Psychology unit shall approve any period of absence.

Requirements for the combined award course

6. Candidates for the combined award course are required to:
   (1) complete satisfactorily 96 credit points from approved units of study. 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:
   (a) to attend all the lectures and the meetings, if any, for seminars or tutorial instruction;
   (b) to complete satisfactorily the essays, exercises, practical and project work if any; and
   (c) to pass any other examination of the unit of study that may apply;
   (2) pursue a course of advanced study and research leading to the submission of a thesis in an area of clinical research;
   (3) complete satisfactorily clinical internships in accordance with Sections 7 and 8; and
   (4) complete satisfactorily two specialist seminars in clinical psychology.

Table 7.2: DCP/MSc requirements

Year	Sem.	Therapy Knowledge and Skills	Assessment Knowledge and Skills	Clinical Internships	Case Seminars	Research
1	1	Adult Psychological Disorders	Psychological Assessment of Adults	Clinical Internship 1	Ethics and Professional Practice Case Seminars 1	Research 1
	2	Child Psychological Disorders Family Therapy	Psychological Assessment of Children	Clinical Internship 2	Case Seminars 2	Research 2
2	1	Advanced Adult Psychological Disorders Adult Health Psychology	Adult Neuropsychological Disorders	Clinical Internship 3	Case Seminars 3	Research 3
	2	Specialist Seminars	Paediatric Neuropsychological Disorders	Clinical Internship 4	Case Seminars 4	Research 4
3	1	Advanced Seminars	Nil	Clinical Internship 5	Case Seminars 5	Research 5
	2	Nil	Nil	Clinical Internship 6	Case Seminars 6	Research 6

7. The following are the requirements for the combined award course. 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 Table 7.2: 'DCP/MSc requirements'.

Examination

8. The procedures for the examination and award of the Master of Science shall be prescribed in the Resolutions of the Senate relating to that degree.
9. 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.

Progress

10.(1)The Dean may:
- (a) 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
- (b) terminate the candidature where the candidate does not show good cause.

(2) Satisfactory progress is prescribed as:
- (a) a candidate for the combined award course must complete satisfactorily (at a pass level) all units of study;
- (b) 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. They may not begin the next unit of study within the same key topic area until the previous unit of study has been satisfactorily completed;
- (c) 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
- (d) 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.

Credit

11.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.

Transfer to Master of Science candidature

12.The Director of Clinical Training in consultation with the Head of Department may recommend that a candidate withdraw from candidature for the combined award course and complete requirements for the degree of Master of Science under such conditions as the Dean may determine.

Doctor of Clinical Neuropsychology / Doctor of Philosophy (DCN/PhD)

Resolutions of the Senate

Award of the degrees

1. The degrees of Doctor of Clinical Neuropsychology and Doctor of Philosophy shall only be awarded on satisfactory completion of the requirements for both degrees, except as provided by the Resolutions of the Academic Board relating to the degree of Doctor of Philosophy.

Eligibility for admission

2. The Dean of the Faculty of Science may admit to candidature:
   (1)(a)graduates of The University of Sydney 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) in psychology with a result of 2:1 or better or any other equivalent award of The University of Sydney; or
   (b) graduates of other universities who have qualifications equivalent to those specified in subsection (1); and
   (2) 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.

Availability

3. (1) Admission to candidature may be limited by a quota. In determining the quota, the University will take into account:
   (a) availability of resources including space, laboratory and computing facilities; and
   (b) availability of adequate and appropriate supervision.

(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 section 2 above.

Method of progression

4. A candidate for the combined award course shall proceed by completing units of study, clinical internships, research and thesis in accordance with Sections 7 and 8.

Time limits

5. (1) A candidate may proceed on either a full-time or a part-time basis
   (2) A candidate shall complete the requirements for the combined award course in a minimum of nine semesters and a maximum of twelve semesters, and except with permission of the Dean within nine calendar years of admission to candidature.
   (3) The Director of Clinical Training in consultation with the members of the Clinical Psychology unit shall approve any period of absence.

Requirements for the combined award course

6. Candidates for the combined award course are required to:
   (1) complete satisfactorily 96 credit points from approved units of study. A unit of study shall consist of such lectures, seminars, tutorial instruction, essays, exercises, practical

Table 7.3 DCN/PhD requirements

Year	Sem.	Therapy Knowledge and Skills	Assessment Knowledge and Skills	Clinical Internships	Case Seminars	Research
1	1	Adult Psychological Disorders	Psychological Assessment of Adults	Neuropsychology Clinical Internships 1	Ethics and Professional Practice Neuropsychology Case Seminars 1	Research 1
	2	Family Therapy	Psychological Assessment of Children Neuroanatomy	Neuropsychology Clinical Internships 2	Neuropsychology Case Seminars 2	Research 2
2	1	Adult Neuropsychological Disorders	Adult Neuropsychological Disorders	Neuropsychology Clinical Internships 3	Neuropsychology Case Seminars 3	Research 3
	2	Paediatric Neuropsychological Disorders	Paediatric Neuropsychological Disorders	Neuropsychology Clinical Internships 4	Neuropsychology Case Seminars 4	Research 4
3	1	Nil	Nil	Neuropsychology Clinical Internships 5	Neuropsychology Case Seminars 5	Research 5
	2	Nil	Nil	Neuropsychology Clinical Internships 6	Neuropsychology Case Seminars 6	Research 6
4	1	Nil	Nil	Nil	Nil	Research 7
	2	Nil	Nil	Nil	Nil	Research 8
5		Nil	Nil	Nil	Nil	Research 9

work, or project work as may be prescribed. In these resolutions, 'to complete a unit of study' or any derivative expression means:

(a) to attend all the lectures and the meetings, if any, for seminars or tutorial instruction;

(b) to complete satisfactorily the essays, exercises, practical and project work if any; and

(c) to pass any other examination of the unit of study that may apply.

(2) pursue a course of advanced study and research leading to the submission of a thesis in an area of clinical neuropsychology research

(3) complete satisfactorily clinical internships in accordance with Sections 7 and 8

(4) complete satisfactorily two specialist seminars in clinical neuropsychology

7. The following are the requirements for the combined award course. The structure of the course is arranged to cover areas from five key topics, namely: Assessment Knowledge and Skills, Therapy Knowledge and Skills, Clinical Internships, Ethics and Professional Practice and Research arranged as shown in Table 7.3: 'DCN/PhD requirements'.

Examination

8. The procedures for the examination and award of the Doctor of Philosophy (including the provision for transfer to Master's candidature if the degree is not awarded) shall be prescribed in the Resolutions of the Academic Board and Senate relating to that degree

9. 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.

Progress

10.(1) The Dean may:

(a) 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

(b) where the candidate does not show good cause, terminate the candidature.

(2) Satisfactory progress is prescribed as:

(a) a candidate for the combined award course must complete satisfactorily (at a pass level) all units of study.

(b) 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. They may not begin the next unit of study within the same key topic area until the previous unit of study has been satisfactorily completed.

(c) 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

(d) 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

Credit

11. 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.

Transfer to Doctor of Philosophy Candidature

12. The Director of Clinical Training in consultation with the Head of Department may recommend 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 Dean may determine.

Doctor of Clinical Neurosychology / Master of Science (DCN/MSc)

Resolutions of the Senate

Award of the degrees

1. The degrees of Doctor of Clinical Neuropsychology and Master of Science shall only be awarded on satisfactory completion of the requirements for both degrees, except as provided by the Resolutions of the Academic Board relating to the degree of Master of Science.

Eligibility for admission

2. The Dean of the Faculty of Science may admit to candidature:

(1) (a) graduates of The University of Sydney 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) in psychology with a result of 2:1 or better or any other equivalent award of The University of Sydney; or

(b) graduates of other universities who have qualifications equivalent to those specified in subsection (1); and

(2) 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.

Table 7.4 DCN/MSc requirements

Year	Sem.	Therapy Knowledge and Skills	Assessment Knowledge and Skills	Clinical Internships	Case Seminars	Research
1	1	Adult Psychological Disorders	Psychological Assessment of Adults	Neuropsychology Clinical Internships 1	Ethics and Professional Practice Neuropsychology Case Seminars 1	Research 1
	2	Family Therapy	Psychological Assessment of Children Neuroanatomy	Neuropsychology Clinical Internships 2	Neuropsychology Case Seminars 2	Research 2
2	1	Adult Neuropsychological Disorders	Adult Neuropsychological Disorders	Neuropsychology Clinical Internships 3	Neuropsychology Case Seminars 3	Research 3
	2	Paediatric Neuropsychological Disorders	Paediatric Neuropsychological Disorders	Neuropsychology Clinical Internships 4	Neuropsychology Case Seminars 4	Research 4
3	1	Nil	Nil	Neuropsychology Clinical Internships 5	Neuropsychology Case Seminars 5	Research 5
	2	Nil	Nil	Neuropsychology Clinical Internships 6	Neuropsychology Case Seminars 6	Research 6

Availability

3. (1) Admission to candidature may be limited by a quota. In determining the quota, the University will take into account:
   (a) availability of resources including space, laboratory and computing facilities; and
   (b) availability of adequate and appropriate supervision.
   (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 section 2 above.

Method of progression

4. A candidate for the combined award course shall proceed by completing units of study, clinical internships, research and thesis in accordance with Sections 7 and 8.

Time limits

5. (1) A candidate may proceed on either a full-time or a part-time basis.
   (2) A candidate shall complete the requirements for the combined award course in a minimum of six semesters and a maximum of nine semesters, and except with permission of the Dean within nine calendar years of admission to candidature.
   (3) The Director of Clinical Training in consultation with the members of the Clinical Psychology unit shall approve any period of absence.

Requirements for the combined award course

6. Candidates for the combined award course are required to:
   (1) complete satisfactorily 96 credit points from approved units of study. 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:
      (a) to attend all the lectures and the meetings, if any, for seminars or tutorial instruction;
      (b) to complete satisfactorily the essays, exercises, practical and project work if any; and
      (c) to pass any other examination of the unit of study that may apply.
   (2) pursue a course of advanced study and research leading to the submission of a thesis in an area of clinical neuropsychology research
   (3) complete satisfactorily clinical internships in accordance with Sections 7 and 8
   (4) complete satisfactorily two specialist seminars in clinical neuropsychology

7. The following are the requirements for the combined award course. The structure of the course is arranged to cover areas from five key topics, namely: Assessment Knowledge and Skills, Therapy Knowledge and Skills, Clinical Internships, Ethics and Professional Practice and Research arranged as shown in Table 7.4: 'DCN/PhD requirements'.

Examination

8. The procedures for the examination and award of the Master of Science shall be prescribed in the Resolutions of the Academic Board and Senate relating to that degree.
9. 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.

Progress

10. (1) The Dean may –
      (a) 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
      (b) where the candidate does not show good cause, terminate the candidature.
   (2) Satisfactory progress is prescribed as:
      (a) a candidate for the combined award course must complete satisfactorily (at a pass level) all units of study.
      (b) 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. They may not begin the next unit of study within the same key topic area until the previous unit of study has been satisfactorily completed.
      (c) 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
      (d) 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

Credit

11. 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.

Transfer to Doctor of Philosophy Candidature

12. The Director of Clinical Training in consultation with the Head of Department may recommend that a candidate withdraw from candidature for the combined award course and complete requirements for the degree of Master of Science under such conditions as the Dean may determine.

■ Degrees of Master

Master of Science (MSc)

Resolutions of the Senate

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:
   (a) is a graduate of The University of Sydney; and
   (b) has, in the opinion of the Faculty, reached a first or second class Honours standard:
      (i) in the final year of an Honours unit of study for the degree of Bachelor of Science; or
      (ii) in a unit of study considered by the Faculty to be equivalent to a unit of study referred to in subsection (i), 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 (i);
   (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.

1a. Subject to the approval of the Head of the Department, a candidate for the degree shall elect to proceed:
   (a) either as a full-time or as a part-time candidate;
   (b) either by research and thesis in accordance with section 6 or by coursework and essay in accordance with section 7; and
   (c) 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.

2. (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.
   (2) A candidate who does not comply with subsection (1) shall be regarded as a part-time candidate.

3. (1) A candidate shall not present for examination for the degree earlier than one year after commencement of candidature.
   (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.
   (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.

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.

5. (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.
   (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.
   (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.
   (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.
   (5) 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.

6. (1) A candidate proceeding by research and thesis shall:
   (a) carry out an original investigation on a topic approved by the Head of the Department concerned;
   (b) 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;
   (c) lodge with the Registrar three copies of the thesis, typewritten and bound; and
   (d) if required by the examiners, sit for an examination in the branch or branches of science to which the thesis relates.
   (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.
   (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.
   (4) The examiners shall report to the Faculty which shall determine the result of the examination.
   (5) 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.
   (6) The Registrar shall lodge one copy of the thesis with the Librarian if the degree is awarded.

7. (1) A candidate proceeding by course work and essay shall:
   (a) attend such course of study and pass such examinations in each unit of study as the Faculty, on the recommendation of the Department concerned, shall by resolution prescribe;
   (b) write a substantial essay on a topic approved by the Head of the Department concerned and state in the essay, generally in a preface and specifically in notes, the sources from which the information was taken and the extent to which the work of others has been used; and
   (c) lodge with the Registrar two typewritten copies of the essay.
   (2) The Dean of the Faculty, on the recommendation of the Head of the Department concerned, shall appoint two examiners to examine the essay. One may be the person appointed to act as supervisor of the candidate.
   (3) The examiners shall report to the Faculty which shall determine the result of the examination.
   (4) The candidate may not present as the essay any work which has been presented for an award course at this or another tertiary institution, but the candidate will not be precluded from incorporating such in the essay, provided that in presenting the essay the candidate indicates the part of work which has been so incorporated.

Master of Science (Environmental Science) (MSc(EnvironSc))

Resolutions of the Senate

Eligibility for admission

1. The Dean of the Faculty of Science may admit to candidature:
   (i) 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
   (ii) 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 per section 9; or
   (iii) graduates who have completed prior postgraduate study in a Science discipline that has a significant environmental emphasis, or in Environmental Science.

Availability

2. (1) Admission to candidature may be limited by a quota. In determining the quota the University will take into account:
   (i) availability of resources including space, laboratory and computing facilities; and
   (ii) availability of adequate and appropriate supervision.
   (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.

Method of progression

3. (1) A candidate for the degree shall proceed by research and thesis in accordance with section 6.
   (2) A candidate for the degree must complete all other requirements for the degree as dictated by the Chair of the Program Committee for Environmental Science and in accordance with section 6.

Time limits

4. A candidate may proceed on either a full-time or a part-time basis.
5. (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 Section 10 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.
   (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 Section 10 or unless otherwise determined by the Faculty.
   (3) Any candidate who does not comply with subsection 1 shall be deemed to be a part-time candidate.

Requirements for the degree

6. (1) A candidate for the degree is required to:
   (i) carry out an original investigation on a topic approved by the Chair of the Program Committee for Environmental Science; and
   (ii) 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) Candidates for the degree must prove to the satisfaction of the Program Committee for Environmental Science a breadth of knowledge in environmental issues.
   (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. A unit of coursework study shall consist of such lectures, seminars, tutorial instruction, essays, exercises or practical work as may be prescribed. In these resolutions, 'to complete a unit of study' or any derivative expression means:
   (i) to attend the lectures, and the meetings, if any, for seminars or tutorial instruction;
   (ii) to complete satisfactorily the essays, exercises and practical work if any; and
   (iii) to pass any other examination of the unit of study that may apply.

Examination

7. (1) A candidate shall:
   (a) attend such course of study and pass such examinations in each unit of study as the Faculty, on the recommendation of the Chair of the Program Committee – Environmental Science, shall by resolution prescribe;
   (b) carry out an original investigation on a topic approved by Chair of the Program Committee – Environmental Science;
   (c) 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;
   (d) lodge with the Registrar three copies of the thesis, typewritten and bound; and
   (e) if required by the examiners, sit for an examination in the branch or branches of science to which the thesis relates.
   (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.
   (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.
   (4) The examiners shall report to the Faculty which shall determine the result of the examination
   (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.
   (6) The Registrar shall lodge one copy of the thesis with the Librarian if the degree is awarded.

Progress

8. The Faculty may:
   (i) 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
   (ii) terminate the candidature where the candidate does not show good cause.

Admission from a Graduate Diploma of Science

9. 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) 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 per section 6.
   (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 per section 6.
10. 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:
   (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.
   (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.

   In these resolutions, the term 'immediately' means that the Graduate Diploma requirements were completed in the previous semester.

Master of Science (Microscopy and Microanalysis) (MSc(Micr&An))

Note: This degree is no longer available to new students from 2002.

Resolutions of the Senate

Eligibility for admission

1. An applicant for admission to candidature for the degree shall, except as provided in Part 9 of The University of Sydney (Amendment Act) Rule 1999:
   (i) have completed a degree in Science, Engineering or equivalent; or
   (ii) have completed the requirements for the Graduate Diploma of Science (Microscopy and Microanalysis) at credit level.

Availability

2. (1)Admission to candidature may be limited by a quota. In determining the quota, the University will take into account:
   (i) availability of resources including space, laboratory and computing facilities; and
   (ii) availability of adequate and appropriate supervision.
   (2) In considering an application for admission to candidature the Faculty shall take account of the quota and will select, in preference, applicants who are most meritorious in terms of section 1 above.

Method of progression

3. (1) A candidate for the degree shall proceed by completing units of study and a project as prescribed by the Faculty.
   (2) A unit of study shall consist of such lectures, seminars, tutorial instruction, essays, exercises or practical work as may be prescribed. In these resolutions, 'to complete a unit of study' or any derivative expression means:
   (i) to attend the lectures and the meetings, if any, for seminars or tutorial instruction;
   (ii) to complete satisfactorily the essays, exercises and practical work if any; and
   (iii) to pass any other examination of the unit of study that may apply.

Time limits

4. A candidate may proceed on either a full-time or a part-time basis.
5. (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 fifth semester of candidature, unless otherwise determined by the Faculty.
   (2) A part-time candidate shall complete the requirements for the degree not earlier than the end of the fourth semester and not later than the end of the eighth semester of candidature, unless otherwise determined by the Faculty.

Requirements for the degree

6. Candidates for the degree are required to complete satisfactorily:
   (i) units of coursework granting a minimum of 48 credit points of study selected from units of study satisfying the conditions approved from time to time by the Faculty; and
   (ii) supervised projects and essays worth 24 credit points.

Examination

7. On completion of the requirements for the degree, the Faculty shall determine the results of the candidature, on the recommendation of the Head of the School of Physics.

Progress

8. The Faculty may:
   (i) 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
   (ii) terminate the candidature where the candidate does not show good cause.

Credit

9. A candidate who, before admission to candidature, has spent time in graduate study and has completed coursework considered by the Faculty to be equivalent to units of study prescribed for the degree, may receive credit of up to 48 credit points towards the requirements for the degree, provided that the completed work was not counted towards the requirements of another degree.

Master of Information Technology (MInfTech)

Resolutions of the Senate

Eligibility for admission.

1. The Dean of the Faculty of Science may admit to candidature:
   (1) graduates who have completed a Bachelor's degree, with results equivalent to Credit average or above in a major sequence of study in any aspect of Information Technology; or
   (2) graduates who have completed a Bachelor of Engineering degree with results equivalent to Credit average or above in a major sequence of study in Computer Engineering, Software Engineering or Telecommunications Engineering; or
   (3) persons who have completed the GradDipIT at The University of Sydney, with Credit average results or above.

Eligibility for admission to majors

2. The Dean of the Faculty of Science shall only admit students to units of study in the defined majors in the Master of Information Technology, who have completed preliminary study in the relevant major area of study.

Availability

3. (1) Admission to the Master of Information Technology may be limited by a quota.
   (2) In determining the quota the University will take into account:
   (a) availability of resources including space, laboratory and computing facilities; and
   (b) availability of adequate and appropriate supervision.
   (3) In considering an application for admission to candidature, the Head of the School of Information Technologies and the Dean shall select, in preference, applicants who are most meritorious in terms of section 1 above.

Time limits

4. A candidate may proceed on either a full-time or a part-time basis.
   (1) A full-time candidate shall complete the requirements for the award not earlier than the end of the second semester of candidature, and not later than the end of the fourth semester of candidature, unless otherwise determined by the Dean.
   (2) A part-time candidate shall complete the requirements of the award not earlier than the end of the fourth semester of candidature, and not later than the end of the eighth semester of candidature, unless otherwise determined by the Dean.

Resolutions of the Faculty

Requirements for the courses (Graduate Certificate in Information Technology, Graduate Diploma in Information Technology and Master of Information Technology)

1. (1) Candidates for the Graduate Certificate in Information Technology are required to complete satisfactorily units of study granting a minimum of 24 credit points selected from units of study, excluding IT project units of study, approved for the Master of Information Technology.
   (2) Candidates for the Graduate Diploma in Information Technology are required to complete satisfactorily units of study granting a minimum of 36 credit points selected from units of study approved for the Master of Information Technology. Of the 36 credit points, a maximum of 24 credit points can be selected from Foundational units of study; and at least 12 credit points should come from Specialist units of study, excluding IT project units of study.
   (3) Candidates for the Master of Information Technology are required to complete satisfactorily units of study granting a minimum of 48 credit points selected from the units of study approved for the Master of Information Technology, satisfying the conditions approved from time to time by the Faculty. Of the 48 credit points, a maximum of 24 credit points can be selected from Foundational units; and at least 24 credit points should come from Specialist units or IT projects. Enrolment in IT projects will be approved only for those students who have completed at least 24 credit points from Foundational or Specialist units at Credit average or above and may be limited by quota.
   (4) (a)To qualify for the award of Master of Information Technology students must complete one of the defined majors.

(b) The defined majors for the Master of Information Technology are Software Engineering, Multimedia Technology, Database Management Systems, E-business, Business Information Systems, Telecommunications Engineering, Computer Engineering, Computer Science and Computer Networks.

(c) The testamur for the Master of Information Technology shall specify the major(s) completed in order to qualify for the award.

Examination

2. On completion of the requirements for the course, the Faculty shall determine the results of the candidature.

Progress

3. The Dean may:
   (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 requirements for the Graduate Certificate in Information Technology, the Graduate Diploma in Information Technology or the Master of Information Technology; and
   (2) where the candidate does not show good cause, terminate the candidature.

Credit

4. Credit is available in the Graduate Certificate in Information Technology, Graduate Diploma in Information Technology and Master of Information Technology for postgraduate study which has been undertaken in these award courses within the previous three years and for which no award has been conferred. If an award has been conferred, credit for study in these award courses is limited to 12 credit points.

Transfer

5. Students enrolled in either the GradCertIT, GradDipIT, or MInfTech are not permitted to transfer to the Master of Applied Information Technology course.

Master of Applied Information Technology (MApplIT)

Resolutions of the Senate

Eligibility for admission.

1. The Dean of the Faculty of Science may admit to candidature:
   (1) graduates who have completed a Bachelor's degree in Physical Science or Engineering, or a Bachelor's degree with some background in Information Technology or Mathematics; or
   (2) persons who have completed the GradDipApplIT at The University of Sydney, with Credit average results or above.

Availability

2. (1) Admission to the Master of Applied Information Technology may be limited by a quota.
   (2) In determining the quota, the University will take into account:
      (a) availability of resources including space, laboratory and computing facilities; and
      (b) availability of adequate and appropriate supervision.
   (3) In considering an application for admission to candidature, the Head of the School of Information Technologies and the Dean shall select, in preference, applicants who are most meritorious in terms of section 1 above.

Time limits

3. A candidate may proceed on either a full-time or a part-time basis. In determining the length of candidacy below, the Dean shall include time previously spent as a candidate for the GradCertApplIT or the GradDipApplIT course.
   (1) A full-time candidate shall complete the requirements for the award not earlier than the end of the third semester of candidature, and not later than the end of the sixth semester of candidature, unless otherwise determined by the Dean.
   (2) A part-time candidate shall complete the requirements of the award not earlier than the end of the sixth semester of candidature, and not later than the end of the tenth semester of candidature, unless otherwise determined by the Dean.

Resolutions of the Faculty

Requirements for the courses (Graduate Certificate in Applied Information Technology, Graduate Diploma in Applied Information Technology and Master of Applied Information Technology)

1. (1) Candidates for the Graduate Certificate in Applied Information Technology are required to complete satisfactorily units of study granting a minimum of 36 credit points selected from units of study approved for the Master of Applied Information Technology. Of the 36 credit points, 24 credit points must be selected from Elementary units of study; and at least 12 credit points should come from Foundational and Specialist units of study, excluding INFO 5990 and IT project units of study.
   (2) Candidates for the Graduate Diploma in Applied Information Technology are required to complete satisfactorily units of study granting a minimum of 48 credit points selected from units of study approved for the Master of Applied Information Technology. Of the 48 credit points 24 credit points must be selected from Elementary units of study; and at least 24 credit points should come from Foundational and Specialist units of study, excluding INFO 5990 and IT project units of study.
   (3) Candidates for the Master of Applied Information Technology are required to complete satisfactorily units of study granting a minimum of 72 credit points selected from the units of study approved for the Master of Applied Information Technology. Of the 72 credit points, 24 credit points must be from Elementary units of study; a maximum of 24 credit points must be selected from Foundational units of study; and at least 24 credit points should come from Specialist or IT project units of study. Enrolment in IT projects will be approved only for those students who have completed at least 24 credit points from Foundational or Specialist units at Credit average or above and may be limited by quota.

(4) (a) To qualify for the award of Master of Applied Information Technology students must complete one of the defined majors.

(b) The defined majors for the Master of Applied Information Technology are Computer Networks, Computer Science, Database Management Systems, Multimedia Technology and Software Engineering.

(c) The testamur for the Master of Applied Information Technology shall specify the major completed in order to qualify for the award.

Examination

2. On completion of the requirements for the course, the Faculty shall determine the results of the candidature.

Progress

3. The Dean may:
   (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 requirements for the Master of Applied Information Technology; and
   (2) terminate the candidature where the candidate does not show good cause.

Credit

4. Credit is available in the Graduate Certificate in Applied Information Technology, Graduate Diploma in Applied Information Technology and Master of Applied Information Technology for postgraduate study which has been undertaken in these award courses within the previous three years and for which no award has been conferred. If an award has been conferred, credit for study in these award courses is limited to 12 credit points.

Transfer

5. Students enrolled in either the GradCertApplIT, GradDipApplIT, or MApplIT are not permitted to transfer to the Master of Information Technology course.

Master of Medical Physics (MMedPhys)

Resolutions of the Senate

* As of 1 October 2003, this qualification was subject to the approval of Senate.

Eligibility for admission

1. The Faculty may, on the recommendation of the Head of the School of Physics, admit to candidature for:

(1) the Graduate Diploma in Medical Physics
(i) to an applicant who is the holder of a bachelors degree in Science or Engineering from The University of Sydney provided the applicant has achieved a major in physics, or equivalent.
(ii) to a graduate of another university or appropriate institution who has equivalent qualifications to those specified in subsection (a);
(2) the Master of Medical Physics to a person who has the qualifications specified in subsection (1)(i), or a person who has completed requirements for the Graduate Diploma in Medical Science.

Availability

2. (1) Admission to either course may be limited by quota.
(2) In determining the quota the University will take into account:
(i) availability of resources including space, library, equipment, laboratory and computing facilities; and
(ii) availability of adequate and appropriate supervision.
(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.

Time limits

3. A candidate may proceed on either a full-time or part-time basis.
(1) for the Graduate Diploma:
(i) 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.
(ii) 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 eighth semester of candidature.
(2) for the Masters:
(i) 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.
(ii) 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 eighth semester of candidature.

Method of progression

4. (1) A candidate for the Graduate Diploma or Masters shall proceed by completing units of study as prescribed by the Faculty.
(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:
(i) to attend lectures and meetings, if any, for seminars and tutorial instruction;
(ii) to complete satisfactorily the essays, exercises, practical and project work if any; and
(iii) to pass any other examination of the unit of study that may apply.

Examination

5. 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.

Progress

6. The Faculty may:
(1) call upon any candidate to show cause why that candidature should not be terminated by reason of unsatisfactory progress towards completion of the course; and
(2) terminate the candidature where the candidate does not show good cause.

Master of Nutrition and Dietetics (MNutrDiet)

■ Resolutions of the Senate

Award of the Degree

1. The degree of Master of Nutrition and Dietetics shall be awarded in two grades, namely Pass and, in the case of an outstanding candidate, Pass with Merit.

Eligibility for Admission

2. (1) The Faculty of Science, on the recommendation of the Nutritional Science Program Committee, may admit to candidature for the degree:
(i) graduates of The University of Sydney who have, unless exempted by the Nutritional Science Program Committee, completed acceptable units of study in Biochemistry and Physiology; or
(ii) persons who have satisfied the requirements for the award of the Diploma of Nutrition and Dietetics.

Method of Progression and Degree Requirements

3. (1) (a) A candidate for the degree shall proceed full-time and, except with the permission of the Faculty of Science, shall complete the requirements for the degree no later than two years from the date of first enrolment.
(b) Entry to the second year of candidature shall be subject to satisfactory progress in the first year. If progress is not considered satisfactory, a candidate may be asked by the Faculty to show cause why he or she should be permitted to re-enrol.
(c) A candidate for the degree who has been admitted on the basis of having satisfied the requirements for the award of the Diploma in Nutrition and Dietetics, may elect to proceed as a full-time or part-time candidate and shall complete the requirements for the degree not later than six months from the date of first enrolment, in the case of a full-time candidate and not more than twelve months from the date of enrolment, in the case of a part-time candidate.
(d) A unit of study shall consist of lectures together with such tutorial instruction, essays, exercises or practical work as may be prescribed.
(2) A candidate shall complete in the first year of candidature such courses as may be prescribed by the Nutritional Science Program Committee in: Nutritional Biochemistry, Nutritional Science, Foods and Food Science, Nutrition in Individuals, Nutrition in Populations, Principles of Dietetic Practice, Clinical Nutrition, Nutrition Management, Communications.
(3) In the second year of candidature a candidate will:
(a) undertake training in the dietetics departments of primary health care settings;
(b) complete further units of study as prescribed by the Nutritional Science Program Committee; and
(c) undertake a project approved by the Head of the Human Nutrition unit. The result of this project shall be presented for examination in the form of a long essay.
4. A candidate admitted under section 2(1)(ii):
(a) may be granted credit for up to three semesters towards the degree; and
(b) will undertake a project approved by the Head of the Human Nutrition unit. The result of this project shall be presented for examination in the form of a long essay.

Examination

5. On completion of the requirements for the degree, the Faculty shall determine the result of the candidature, on the recommendation of the Nutritional Science Program Committee, acting on a report from the Head of the Human Nutrition unit.

Master of Nutritional Science (MNutrSc)

Resolutions of the Senate

Award of the degree

1. The degree of Master of Nutritional Science shall be awarded in two grades, namely Pass and, in the case of an outstanding candidate, Pass with Merit.

Eligibility for admission

2. (1) The Faculty of Science, on the recommendation of the Nutritional Science Program Committee, may admit to candidature for the degree graduates of The University of Sydney, who have, unless exempted by the Nutritional Science Program Committee, completed acceptable units of study in Biochemistry and Physiology.
(2) The Academic Board, on the recommendation of the Nutritional Science Program Committee and of the Faculty, may admit to candidature for the degree graduates of other universities who have qualifications equivalent, in

the opinion of the Academic Board, to those specified in subsection (1), and on such conditions as the Nutritional Science Program Committee may prescribe.

Method of progression and degree requirements

3. (1)(a) A candidate for the degree shall proceed full-time and, except with the permission of the Faculty of Science, shall complete the requirements for the degree no later than two years from the date of first enrolment.
   (b) Entry to the second year of candidature shall be subject to satisfactory progress in the first year. If progress is not considered satisfactory, a candidate may be asked by the Faculty to show cause why he or she should be permitted to re-enrol.
   (c) A unit of study shall consist of lectures together with such tutorial instruction, essays, exercises or practical work as may be prescribed.
   (2) A candidate shall complete in the first year of candidature such courses as may be prescribed by the Nutritional Science Program Committee in: Nutritional Biochemistry, Nutritional Science, Foods and Food Science, Nutrition in Individuals, Nutrition in Populations, Principles of Dietetic Practice, Clinical Nutrition, Nutrition Management, Communications
   (3) A candidate in the second year of candidature shall proceed by research and thesis. A candidate shall:
      (a) carry out an original investigation on a topic approved by the Head of the Human Nutrition unit;
      (b) write a short thesis embodying the results of the 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 made use of, and the proportion of the thesis which the student claims as original; and
      (c) lodge with the Registrar three copies of the thesis, typewritten and bound.
4. (1) The thesis shall be accompanied by a certificate from the supervisor stating whether in his or her opinion the form of the presentation of the thesis is satisfactory.
   (2) A candidate may not present as the thesis any work which has been presented for a degree at this or another tertiary institution, but shall not be precluded from incorporating such work in the thesis, provided that in presenting the thesis indications are given to the part of the work which has been so incorporated.
   (3) The Registrar shall lodge one copy of the thesis with the Librarian if the degree is awarded.

Supervision

5. The Faculty of Science shall appoint, on the recommendation of the Head of the Human Nutrition unit, a full-time member of the teaching staff of the University to act as the supervisor for each candidate.

Examination

6. The Dean of the Faculty, on the recommendation of the Head of the Human Nutrition unit, shall appoint two or, where the Dean considers it appropriate, more than two examiners of whom one may be the person appointed to act as supervisor of the candidate.
7. On completion of the requirements for the degree, the Faculty shall determine the results of the candidature, on the recommendation of the Nutritional Science Program Committee, acting on a report from the Head of the Human Nutrition unit.

Master of Psychology (MPsych)

Note: This degree is no longer available to new students from 2002.

Resolutions of the Senate

Award of the degree

1. The degree of Master of Psychology shall be awarded in two grades, namely Pass and, in the case of an outstanding candidate, Pass with Merit.

Eligibility for admission

2. An applicant for admission to candidature for the degree shall, except as provided in Part 9 of The University of Sydney (Amendment Act) Rule 1999:
   (a) have completed units of study in Abnormal Psychology acceptable to the Faculty; and
   (b) be a Bachelor of Arts or Bachelor of Science of The University of Sydney; and
   (c) have obtained fourth year Honours in Psychology; or
   (d) be a graduate of the University other than as specified in (b) and hold qualifications considered by the Faculty to be equivalent to fourth year Honours in Psychology at The University of Sydney; or
   (e) have completed the requirements for the degree of Master of Science in Psychology or Master of Arts (Honours) or Master of Philosophy in Psychology of The University of Sydney; and
   (f) have satisfied the Faculty of their personal suitability for the practice of clinical psychology. When evaluating personal suitability the Faculty may take into account previous relevant experience, reports of the referees and the outcome of selection interviews.

Method of progression

3. (1) A candidate for the degree shall proceed by completing units of study as prescribed by the Faculty.
   (2) A unit of study shall consist of lectures, together with such seminars, tutorial instruction, essays, exercises or practical work as may be prescribed.
   (3) In these resolutions the expression 'to complete a unit of study' means:
      (a) to attend the lectures, and the meetings, if any, for seminars or tutorial instruction;
      (b) to complete satisfactorily the essays, exercises and practical work if any; and
      (c) to pass the examinations of the unit of study.

Time limits

4. A candidate may proceed on either a full-time or a part-time basis.
5. (1) A full-time candidate shall complete the requirements for the degree not later than the end of the second year of candidature, unless otherwise determined by the Faculty.
   (2) A part-time candidate shall complete the requirements for the degree not later than the end of the fourth year of candidature, unless otherwise determined by the Faculty.

Requirements for the degree

6. The following are the requirements for the degree of Master of Psychology:
   (1) Candidates for the degree are required to complete satisfactorily:
      (a) a coursework component according to the syllabus approved by the Faculty;
      (b) a practicum component involving both training in therapeutic and assessment techniques and field placements; and
      (c) a research project and submit a dissertation on that project.
   (2) The requirements for the degree shall be completed in two Parts, namely Part I and Part II.
   (3) A candidate must complete Part I to the satisfaction of the Faculty before proceeding to Part II.
   (4) Full-time candidates are required, except with permission of the Faculty, to complete the requirements of Part I of the course within one year of first enrolment and to complete Part II of the course within two years of first enrolment.
   (5) Part-time candidates are required, except with the permission of the Faculty, to complete the requirements of Part I within two years of first enrolment and to complete Part II within four years of first enrolment.

Master of Psychology/Doctor of Philosophy

[See also Master of Psychology/PhD Resolutions below.]

7. A person may proceed concurrently as a candidate for the degrees of Master of Psychology and Doctor of Philosophy. For further details refer to the resolutions of the Senate for the combined award course for the degrees of Master of Psychology and Doctor of Philosophy.

Examination

8. On completion of requirements for the degree, the Faculty shall determine the results of the candidature, on the recommendation of the Head of the Department of Psychology.

Progress

9. The Faculty may:

(a) 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

(b) terminate the candidature where the candidate does not show good cause.

Master of Psychology/PhD (MPsych/PhD)

Note: This degree is no longer available to new students from 1999.

Resolutions of the Senate

The Resolutions of the Senate relating to candidature for the degrees of Master of Psychology and Doctor of Philosophy shall apply to the combined award course for the degrees of Master of Psychology and Doctor of Philosophy except for sections 1, 5, 6 and 7 of the resolutions of the Senate relating to the degrees of Master of Psychology and sections 7 and 8 of the resolutions of the Senate relating to the degrees of Doctor of Philosophy, which are replaced by the following:

Award of the degrees

1. (1) The degrees of Master of Psychology shall be awarded in two grades, namely Pass and, in the case of an outstanding candidate, Pass with Merit;

   (2) The degrees of Master of Psychology shall only be awarded on satisfactory completion of the requirements for the degrees of Doctor of Philosophy, except as provided by section 15 of the resolutions of the Academic Board relating to the degrees of Doctor of Philosophy.

Time limits

2. (1) A full-time candidate shall complete the requirements for both degrees not earlier than the end of the fourth year of candidature and, unless otherwise determined by the Faculty, not later than the end of the sixth year of candidature.

   (2) A part-time candidate shall complete the requirements for both degrees not earlier than the end of the fourth year of candidature and, unless otherwise determined by the Faculty, not later than the end of the seventh year of candidature.

   (3) Notwithstanding sub-sections (1) and (2), a candidate who meets the requirements of sections 7(2) and (3) of the Resolutions of the Senate relating to the degrees of Doctor of Philosophy may be permitted to complete the requirements at an earlier date.

Requirements for the Degrees

3. The following are the requirements for the combined award course for the degrees of Master of Psychology and Doctor of Philosophy:

   (1) Candidates for the degrees are required

   (a) to complete satisfactorily a coursework component according to the syllabus approved by the Faculty;

   (b) to complete satisfactorily a practicum component involving both training in therapeutic and assessment techniques and field placements; and

   (c) to pursue a course of advanced study and research leading to the submission of a thesis in an area of clinical research as approved by the Head of the Department of Psychology.

   (2) The requirements for both degrees shall be completed in three parts, namely Part I, Part IIA and Part III.

   (3) A candidate must complete Part I to the satisfaction of the Faculty before proceeding to Part IIA.

   (4) Full-time candidates are required, except with permission of the Faculty, to complete the requirements of Part I within one year of first enrolment, to complete Part IIA within two years of first enrolment and to complete Part III within six years of first enrolment.

   (5) Part-time candidates are required, except with the permission of the Faculty, to complete the requirements of Part I within two years of first enrolment, to complete Part IIA within four years of first enrolment and to complete Part III within seven years of first enrolment.

   (6) Part III of the requirements for the degrees of Master of Psychology is satisfied under sub-section (1)(c) above.

Transfer to Master of Psychology candidature

4. The Head of the Department of Psychology may recommend that a candidate withdraw from candidature for the combined degrees and complete the requirements for the degrees of Master of Psychology under such conditions as the Faculty may determine.

Examination

5. The procedures for the examination and award of the degrees of Doctor of Philosophy (including the provision for transfer to Master's candidature if the degrees is not awarded) shall be as prescribed in the resolutions of the Senate and of the Academic Board relating to that degrees.
6. On completion of Parts I, IIA and III of the requirements for the degrees, and following the award of the degrees of Doctor of Philosophy, the Faculty shall determine the results of the candidature for the degrees of Master of Psychology, on the recommendation of the Head of the Department of Psychology.

Master of Environmental Science and Law (MEnviSciLaw)

Resolutions of the Senate

Eligibility for admission

1. The Dean of the Faculty of Science may admit to candidature:
   (1) graduates of The University of Sydney holding the degree of Bachelor of Science or Bachelor of Laws; or
   (2) graduates of other universities or other appropriate institutions who have qualifications equivalent to those specified in subsection (1).

Availability

2. (1) Admission to candidature may be limited by a quota. In determining the quota, the Dean will take into account:
   (a) availability of resources including space, laboratory and computing facilities; and
   (b) availability of adequate and appropriate supervision.
   (2) 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 1 above.

Availability of units of study

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

Time limits

4. A candidate may proceed on either a full-time, or a part-time basis.
   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.

Authority of the Deans

5. The Deans of Science and Law shall jointly exercise authority in any matter concerning the course not otherwise dealt with in these resolutions.

Resolutions of the Faculty

Requirements for the degree

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:
   (1) a core unit of study (LAWS 6044);
   (2) a minimum of 24 credit points selected from units of study offered by each Faculty.

Examination

2. On completion of the requirements for the degree, the Dean shall determine the results of the candidature.

Progress

3. The Dean may:
   (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
   (2) terminate the candidature where the candidate does not show good cause.

Credit

4. 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, may receive credit of up to 12 credit points towards the requirements for the degree of Masters of Environmental Science and Law.

■ Graduate diplomas

Graduate Diploma in Science (GradDipSc)

Resolutions of the Senate

Eligibility for 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.
   (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 for the graduate diploma graduates who have qualifications equivalent, in the opinion of the Academic Board, to those specified in subsection (i).

Availability

2. (1) Admission to the graduate diploma may be limited by quota.
   (2) In determining the quota the University will take into account:
   (a) availability of resources including space, library, equipment, laboratory and computing facilities; and
   (b) availability of adequate and appropriate supervision.
   (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.

Method of progression and time limits

3. 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.

Examination

4. 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.

Progress

5. 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.

Graduate Diploma in Science (Psychology) (GradDipSc(Psych))

Resolutions of the Senate

Eligibility for admission

1. (1) The Faculty of Science, on the recommendation of the appropriate Interdepartmental Committee, may admit to candidature the following:
   (a) Graduate Diploma in Science (Microscopy and Microanalysis): An applicant who is a holder of the award course of Bachelor of Science or Bachelor of Engineering, or any other award course of The University of Sydney.
   (b) Graduate Diploma in Science (Psychology): An applicant who is a holder of a Bachelors degree with an APS accredited major in Psychology from a recognised tertiary institution within the past ten years and who has achieved a minimum of credit average in Senior (third year) units of study which includes units of study in statistics/research methods which meet the requirements of the Department.
   (2) The Academic Board, on the recommendation of the appropriate Interdepartmental Committee and of the Faculty, may admit to candidature for the graduate diploma graduates of other universities or other appropriate institutions who have qualifications equivalent, in the opinion of the Academic Board, to those specified in subsection (1).

Availability

2. (1) Admission to the graduate diploma may be limited by quota.
   (2) In determining the quota the University will take into account:
   (a) availability of resources including space, library, equipment, laboratory and computing facilities; and
   (b) availability of adequate and appropriate supervision.
   (3) In considering an application for admission to candidature the Interdepartmental Committee 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.

Time limits

3. A candidate for the Graduate Diploma in Science (Psychology) shall proceed as a full-time student for a period of two semesters or, with the approval of the Interdepartmental Committee, as a part-time student for four semesters; a candidate for the Graduate Diploma in Science (Microscopy and Microanalysis) shall proceed as a full-time student for a period of two semesters or as a part-time student for up to eight semesters.

Method of progression

4. A candidate shall complete coursework for the graduate diploma as prescribed from time to time by resolution of the Faculty.

Examination

5. A candidate may be tested by written and oral examinations, assignments, exercises and practical work or any combination of these.
6. On completion of the requirements for the graduate diploma the results of the examination of the coursework and participation in the seminar series shall be reported by the Interdepartmental Committee to the Faculty which shall determine the result of the candidature.

Progress

7. 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.

Resolutions of the Faculty

1. A unit of study shall consist of lectures together with such tutorial instructions, essays, exercises or practical work as may be prescribed. In these resolutions, to 'complete a unit of study' and derivative expressions shall mean:
   (i) to attend the lectures and the meetings, if any, for tutorial instruction;
   (ii) to complete satisfactorily the essays, exercises and the practical work, if any; and
   (iii) to pass the examination on the unit of study.
2. A candidate shall complete coursework to the value of 48 credit points. The structure of the program is:
3. Satisfactory progress shall be as determined by the Faculty.

Unit of study		Credit points
Full-time students		
Semester 1 Core units – 24 credit points		
PSYC 4500	Research Project (A)	10
PSYC 4501	Psychological Research Methods	8
PSYC 4503	Special Fields Topic (A)	6
Semester 2 Core units – 24 credit points		
PSYC 4505	Research Project (B)	10
PSYC 4502	Ethics and Current Issues in Psychology	2
Semester 2 Optional units of study (select 2 electives)		
PSYC 4509	Problem Gambling	6
PSYC 4506	Health & Safety Psychology Issues	6

Unit of study		Credit points
PSYC 4507	Counselling Psychology	6
PSYC 4508	Psychology of Addiction	6
Part-time students		
Year 1, Semester 1 – 18 credit points		
PSYC 4500	Research Project (A)	10
PSYC 4501	Psychological Research Methods	8
Year 1, Semester 2 – 12 credit points		
PSYC 4505	Research Project (B)	10
PSYC 4502	Ethics	2
Year 2, Semester 1 – 6 credit points		
PSYC 4503	Special Fields Topic	6
Year 2, Semester 2– 12 credit points		
Two Electives		12

Current departmental rules on progress

A candidate cannot repeat any part of the Graduate Diploma if he or she fails the Research project and at least one other component OR passes the Research Project but fails more than two components. If the candidate fails either the Research Project or one other component, permission may be granted for the candidate to repeat that unit the following year.

Graduate Diploma in Information Technology (GradDipInfTech)

Resolutions of the Senate

Eligibility for admission.

1. The Dean of the Faculty of Science may admit to candidature:
   (1) graduates who have completed a Bachelor's degree in any aspect of Information Technology; or
   (2) graduates who have completed a Bachelor of Engineering degree with a major sequence of study in Computer Engineering, Software Engineering or Telecommunications Engineering; or
   (3) persons who have completed the GradCertIT at The University of Sydney, with Credit average results or above.

Availability

2. (1) Admission to the Graduate Diploma in Information Technology may be limited by a quota.
   (2) In determining the quota the University will take into account:
   (a) availability of resources including space, laboratory and computing facilities; and
   (b) availability of adequate and appropriate supervision.
   (3) In considering an application for admission to candidature, the Head of the School of Information Technologies and the Dean shall select in preference applicants who are most meritorious in terms of section 1 above.

Time limits

3. A candidate may proceed on either a full-time or a part-time basis. In determining the length of candidacy below, the Dean shall include time previously spent as candidate for the GradCertIT.
   (1) A full-time candidate shall complete the requirements for the award not earlier than the end of the second semester of candidature, and not later than the end of the third semester of candidature, unless otherwise determined by the Dean.
   (2) A part-time candidate shall complete the requirements of the award not earlier than the end of the third semester of candidature, and not later than the end of the sixth semester of candidature, unless otherwise determined by the Dean.

Resolutions of the Faculty

See entry for the Master of Information Technology.

Graduate Diploma in Applied Information Technology (GradDipApplIT)

Resolutions of the Senate

Eligibility for admission

1. The Dean of the Faculty of Science may admit to candidature:
   (1) graduates who have completed a Bachelor's degree in Physical Science or Engineering, or a Bachelor's degree with some background in Information Technology or Mathematics; or
   (2) persons who have completed the GradCertApplIT at The University of Sydney, with Credit average results or above.

Availability

2. (1) Admission to the Graduate Diploma in Applied Information Technology may be limited by a quota.
   (2) In determining the quota, the University will take into account:
   (a) availability of resources including space, laboratory and computing facilities; and
   (b) availability of adequate and appropriate supervision.
   (3) In considering an application for admission to candidature, the Head of the School of Information Technologies and the Dean shall select, in preference, applicants who are most meritorious in terms of section 1 above.

Time limits

3. A candidate may proceed on either a full-time or a part-time basis. In determining the length of candidacy below, the Dean shall include time previously spent as a candidate for the GradCertApplIT course.
   (1) A full-time candidate shall complete the requirements for the award not earlier than the end of the second semester of candidature, and not later than the end of the fourth semester of candidature, unless otherwise determined by the Dean.
   (2) A part-time candidate shall complete the requirements of the award not earlier than the end of the fourth semester of candidature, and not later than the end of the eighth semester of candidature, unless otherwise determined by the Dean.

Resolutions of the Faculty

See entry for the Master of Applied Information Technology.

Graduate Diploma in Psychology (GradDipPsych)

Resolutions of the Senate

Eligibility for admission

1. The Faculty of Science may admit to candidature 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 an equivalent degree as deemed by the Faculty, who have not previously completed a major in Psychology. When assessing an applicant, both undergraduate record and UAI (or equivalent) may be taken into account.
2. Applicants must have already successfully completed 12 credit points of Junior Psychology (currently PSYC 1001 and 1002) or equivalent.
3. Conditions of candidature are prescribed by Resolution of the Faculty.

Resolutions of the Faculty

Requirements for the course

1. A unit of study shall consist of lectures together with such tutorial instructions, essays, exercises or practical work as may be prescribed. In these resolutions, to 'complete a unit of study' and derivative expressions shall mean:
   (i) to attend lectures and the meetings, if any, for tutorial instruction;
   (ii) to complete satisfactorily the essays, exercises and the practical work, if any; and
   (iii) to pass the examination on the unit of study.
2. A candidate shall complete coursework to the value of 48 credit points comprising 16 cp of Intermediate units of study in Psychology and 32 cp of Senior units of study in Psychology which must, except with Departmental approval, include PSYC 3201 and PSYC 3202. The prerequisites and progression requirements for these units of study as set out in Table I for the BSc must be met.

Time limits

3. A candidate for the GradDipPsych shall normally proceed as a part-time student for at least four semesters.

Examination

4. A candidate may be tested by written and oral examinations, assignments, exercises and practical work or any combination of these.
5. On completion of the requirements for each unit of study comprising the GradDipPsych the results of the examination of the coursework and participation in the seminar series for that unit of study shall be reported by the Department of Psychology to the Faculty which shall determine the result of the candidature.

Progress

6. Satisfactory progress shall be as determined by the Faculty.
7. 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 GradDipPsych and where, in the opinion of the Faculty, the candidate does not show good cause, terminate the candidature.

Credit

8. 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 GradDipPsych. Such units of study must have been completed within the previous ten years.

■ Graduate certificates

Graduate Certificate in Science (History and Philosophy of Science)

Resolutions of the Senate

Eligibility for admission

1. (1) The Dean of the Faculty of Science, on the recommendation of the appropriate committee may admit to candidature for the Graduate Certificate in Science (History and Philosophy of Science) an applicant who is:
   (a) the holder of the 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 The University of Sydney; or
   (b) a graduate of another university or other appropriate institution who has qualifications equivalent to those specified in subsection (a).

Time limits

2. 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.

Requirements

3. The requirements for the graduate certificate shall be as prescribed by the Resolution of the Faculty.

Resolutions of the Faculty

1. A unit of study shall consist of seminars together with such essays, exercises or practical work as may be prescribed. In these resolutions, to 'complete a unit of study' and derivative expressions shall mean:
   (i) to attend seminars and other meetings as recommended; and
   (ii) to complete satisfactorily any practical and theoretical assignments.
2. A candidate shall complete course work to the value of 24 credit points selected from the following table and including HPSC 4108 (if they have not completed a major in History and Philosophy of Science, or equivalent program of study, at another institution).

Unit of study		Credit points
HPSC 4108	Core Topics in HPS	6
HPSC 4101	Philosophy of Science	6
HPSC 4102	History of Science	6
HPSC 4103	Sociology of Science	6
HPSC 4104	Recent Topics in HPS	6
HPSC 4105	HPS Research Methods	6

Graduate Certificate in Science (Microscopy and Microanalysis) (GradCertSc(Micr&An))

Note: This degree is no longer available to new students from 2002.

Resolutions of the Senate

Eligibility for admission

1. (1) The Faculty of Science, on the recommendation of the appropriate Committee, may admit to candidature for the Graduate Certificate in Science (Microscopy and Microanalysis) an applicant who is the holder of the degree of Bachelor of Science or Bachelor of Engineering, or any other award of The University of Sydney.
   (2) The Academic Board, on the recommendation of the Faculty, may admit to candidature for the graduate certificate graduates of other universities or other appropriate institutions who have qualifications equivalent, in the opinion of the Academic Board, to those specified in subsection (1).

Availability

2. (1) Admission to the graduate certificate may be limited by quota.
   (2) In determining the quota the University will take into account:
   (a) availability of resources including space, library, equipment, laboratory and computing facilities; and
   (b) availability of adequate and appropriate supervision.
   (3) In considering an application for admission to candidature the Faculty shall take account of the quota and will select in preference applicants who are most meritorious in terms of section 1 above.

Time limits

3. 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.

Requirements

4. The requirements for the Graduate Certificate shall be as prescribed by Resolution of the Faculty.

Resolutions of the Faculty

1. A unit of study shall consist of lectures together with such tutorial instruction, essays, exercises or practical work in the laboratory as may be prescribed. In these resolutions, to 'complete a unit of study' and derivative expressions shall mean:
   (i) to attend the lectures, laboratories, tutorials and meetings as recommended;
   (ii) to complete satisfactorily any practical and theoretical assignments; and
   (iii) to pass the examination on the unit of study.
2. A candidate shall complete coursework to the value of 24 credit points from core units of study, selected from the following table:

Unit of study		Credit points
MCAN 4001	Principles of Microscopy & Microanalysis	2
MCAN 4301	Instrumentation – Introduction to Light Microscopy	4
MCAN 4302	Instrumentation – Introduction to Transmission EM	4
MCAN 4007	Instrumentation – Monitoring & Maintenance EM	2
MCAN 4303	Instrumentation – Introduction to Scanning EM	4
MCAN 4008	Introductory Specimen Preparation for Optical Microscopy	2
MCAN 4101	Biological Specimen Preparation – TEM & SEM	4
MCAN 4102	Materials Specimen Preparation – TEM & SEM	4
MCAN 4105	Optical X-ray & Electron Spectroscopy	4
MCAN 4304	Instrumentation – Introduction to Confocal Microscopy	4
MCAN 4108	Independent Project & Report	4

Graduate Certificate in Information Technology (GradCertInfTech)

Resolutions of the Senate

Eligibility for admission

1. The Dean of the Faculty of Science may admit to candidature:
   (1) graduates who have completed a Bachelor's degree, with a substantial study of a relevant field of Information Technology; or
   (2) graduates who have completed a Bachelor of Engineering degree with a major sequence of study in Computer Engineering, Software Engineering or Telecommunications Engineering; or
   (3) persons who offer evidence of recognised prior learning which is considered to demonstrate the knowledge and aptitude required to undertake the units of study.

Availability

2. (1) Admission to the Graduate Certificate in Information Technology may be limited by a quota.

(2) In determining the quota the University will take into account:
(a) availability of resources including space, laboratory and computing facilities; and
(b) availability of adequate and appropriate supervision.
(3) In considering an application for admission to candidature, the head of the School of Information Technologies and the Dean shall select in preference applicants who are most meritorious in terms of section 1 above.

Time limits

4. A candidate may proceed on either a full-time or a part-time basis.
(1) A full-time candidate shall complete the requirements for the award not earlier than the end of the first semester of candidature, and not later than the end of the second semester of candidature, unless otherwise determined by the Dean.
(2) A part-time candidate shall complete the requirements of the award not earlier than the end of the second semester of candidature, and not later than the end of the fifth semester of candidature, unless otherwise determined by the Dean.

Progress

5. The Dean may:
(a) call upon any candidate to show cause why that candidature should not be terminated by reason of unsatisfactory progress towards the completion of the requirements for the Graduate Certificate; and
(b) terminate the candidature where the candidate does not show good cause.

Resolutions of the Faculty

See entry for the Master of Information Technology.

Graduate Certificate in Applied Information Technology (GradCertApplIT)

Resolutions of the Senate

Eligibility for admission

1. The Dean of the Faculty of Science may admit to candidature:
(1) graduates who have completed a Bachelor's degree in Physical Science or Engineering, or a Bachelor's degree with some background in Information Technology or Mathematics; or
(2) persons who have worked in the area of Information Technology for more than eight years and can offer evidence of recognized prior learning which is considered to demonstrate the knowledge and aptitude required to undertake the units of study.

Availability

2. (1) Admission to the Graduate Certificate in Applied Information Technology may be limited by a quota.
(2) In determining the quota, the University will take into account:
(a) availability of resources including space, laboratory and computing facilities; and
(b) availability of adequate and appropriate supervision.
(3) In considering an application for admission to candidature, the Head of the School of Information Technologies and the Dean shall select, in preference, applicants who are most meritorious in terms of section 1 above.

Time limits

3. A candidate may proceed on either a full-time or a part-time basis.
(1) A full-time candidate shall complete the requirements for the award not earlier than the end of the second semester of candidature, and not later than the end of the third semester of candidature, unless otherwise determined by the Dean.
(2) A part-time candidate shall complete the requirements of the award not earlier than the end of the third semester of candidature, and not later than the end of the sixth semester of candidature, unless otherwise determined by the Dean.

Resolutions of the Faculty

See entry for the Master of Applied Information Technology.

■ Articulated programs

Quantitative Marine Ecology

Graduate Certificate in Quantitative Marine Ecology (GradCertQuantMarEcol)

Graduate Diploma in Quantitative Marine Ecology (GradDipQuantMarEcol)

Master of Quantitative Marine Ecology (MQuantMarEcol)

Resolutions of the Senate

The Graduate Certificate in Quantitative Marine Ecology, the Graduate Diploma in Quantitative Marine Ecology and the Master of Quantitative Marine Ecology will be offered in fields of study approved from time to time by the Faculty of Science.

Eligibility for admission

1. The Dean of the Faculty of Science may admit to candidature for:
(i) the Graduate Certificate in Quantitative Marine Ecology
(a) an applicant who is the holder of the degree of Bachelor of Science or any other equivalent award of The University of Sydney;
(b) graduates of other universities or other appropriate institutions who have qualifications equivalent to those specified in subsection (a); or
(c) a person who has experience which is considered to demonstrate the knowledge and aptitude required to undertake the units of study;
(ii) the Graduate Diploma in Quantitative Marine Ecology
a person who has completed requirements for the Graduate Certificate in Quantitative Marine Ecology, or equivalent; and
(iii) the Master of Quantitative Marine Ecology
a person who has completed requirements for the Graduate Diploma in Quantitative Marine Ecology, or equivalent.

Availability

2. (1) Admission to candidature may be limited by a quota. In determining the quota, the University will take into account:
(i) availability of resources including space, laboratory and computing facilities; and
(ii) availability of adequate and appropriate supervision.
(2) 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 1 above.

Method of progression

3. (1) A candidate for the degree, graduate diploma or graduate certificate shall proceed by completing units of study as prescribed by the Faculty.
(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:
(i) to attend the lectures and the meetings, if any, for seminars or tutorial instruction;
(ii) to complete satisfactorily the essays, exercises, practical and project work if any; and
(iii) to pass any other examination of the unit of study that may apply.

Time limits

4. A candidate may proceed on either a full-time or a part-time basis.
5. (1) A candidate for the Graduate Certificate in Quantitative Marine Ecology shall complete the requirements for the award in a minimum of one semester and a maximum of four semesters, and except with permission of the Dean within three calendar years of admission to candidature.
(2) A candidate for the Graduate Diploma in Quantitative Marine Ecology shall complete the requirements for the award in a minimum of two semesters and a maximum of eight semesters, and except with permission of the Dean within six calendar years of admission to candidature.

(3) A candidate for the Master of Quantitative Marine Ecology shall normally complete the requirements for the award in a minimum of three semesters and a maximum of twelve semesters, and except with permission of the Dean within nine calendar years of admission to candidature.

Requirements for the degree

6. (1) Candidates for the Graduate Certificate in Quantitative Marine Ecology 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.
(2) Candidates for the Graduate Diploma in Quantitative Marine Ecology 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) Candidates for the Master of Quantitative Marine Ecology 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.

Examination

7. On completion of the requirements for the course, the Faculty shall determine the results of the candidature.

Progress

8. The Faculty may:
(1) call upon any candidate to show cause why that candidature should not be terminated by reason of unsatisfactory progress towards completion of the course; and
(2) terminate the candidature where the candidate does not show good cause.

Credit

9. (1) Credit is not available in the Graduate Certificate in Quantitative Marine Ecology, Graduate Diploma in Quantitative Marine Ecology and Master of Quantitative Marine Ecology for postgraduate study which has not been undertaken in these award courses within the previous three years, except at the discretion of the Dean.
(2) A candidate who has qualified for the award of the Graduate Certificate in Quantitative Marine Ecology may transfer, within three years, to the Graduate Diploma in Quantitative Marine Ecology and receive credit for up to 24 credit points from the Graduate Certificate in Quantitative Marine Ecology.
(3) A candidate who has qualified for the award of the Graduate Diploma in Quantitative Marine Ecology may transfer, within three years, to the Master of Quantitative Marine Ecology and receive credit for up to 36 credit points from the Graduate Diploma in Quantitative Marine Ecology.
(4) A candidate who has completed units of study in the Quantitative Marine Ecology program within the previous three years, but has not qualified for an award, may transfer to another award within the Quantitative Marine Ecology program and receive credit for the units of study completed.

■ Applied Science

Graduate Certificate in Applied Science (GradCertApplSc)

Graduate Diploma in Applied Science (GradDipApplSci)

Master of Applied Science (MApplSc)

Resolutions of the Senate

1. The Graduate Certificate in Applied Science, the Graduate Diploma in Applied Science, and the Master of Applied Science will be offered in the following subject areas, and the testamur for the award will specify the subject area:
Bioinformatics
Coastal Management
Environmental Science
Informatics and Communication
Microscopy & Microanalysis
Molecular Biotechnology
Neuroscience
Nutrition and Dietetics
Photonics
Psychology of Coaching
Surface Coatings
Wildlife Health and Population Management

Eligibility for admission

2. (1) The Dean of the Faculty of Science may admit to candidature for:
(i) the Graduate Certificate in Applied Science:
(a) graduates of The University of Sydney holding the degree of Bachelor of Science or any other equivalent award of The University of Sydney;
(b) graduates of other universities or other appropriate institutions who have qualifications equivalent to those specified in subsection (a); or
(c) persons who have experience which is considered to demonstrate the knowledge and aptitude required to undertake the units of study;
(ii) the Graduate Diploma in Applied Science:
(a) graduates of The University of Sydney holding the degree of Bachelor of Science or any other equivalent award of The University of Sydney;
(b) graduates of other universities or other appropriate institutions who have qualifications equivalent to those specified in subsection (a); or
(c) persons who have completed requirements for the Graduate Certificate in Applied Science, or equivalent;
(iii) the Master of Applied Science:
(a) graduates of The University of Sydney holding the degree of Bachelor of Science or any other equivalent award of The University of Sydney;
(b) graduates of other universities or other appropriate institutions who have qualifications equivalent to those specified in subsection (a); or
(c) persons who have completed requirements for the Graduate Diploma in Applied Science, or equivalent.
(2) In relation to particular subject areas the Dean may require applicants to satisfy additional specific requirements relating to that subject area.

Availability

3. (1) Admission to candidature may be limited by a quota. In determining the quota, the University will take into account:
(i) availability of resources including space, laboratory and computing facilities; and
(ii) availability of adequate and appropriate supervision.
(2) 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.

Method of progression

4. (1) A candidate for the course shall proceed by completing units of study as prescribed by the Faculty.
(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:
(i) to attend the lectures and the meetings, if any, for seminars or tutorial instruction;
(ii) to complete satisfactorily the essays, exercises, practical and project work if any; and
(iii) to pass any other examination of the unit of study that may apply.

Availability of unit of study

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

Time limits

6. A candidate may proceed on either a full-time or a part-time basis.
7. (1) A candidate for the Graduate Certificate in Applied Science shall complete the requirements for the award in a minimum of one semester and a maximum of four semesters, and except with permission of the Dean within three calendar years of admission to candidature.

(2) A candidate for the Graduate Diploma in Applied Science shall complete the requirements for the award in a minimum of two semesters and a maximum of eight semesters, and except with permission of the Dean within six calendar years of admission to candidature.
(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 twelve semesters, and except with permission of the Dean within nine calendar years of admission to candidature.

Requirements for the course

8. (1) Candidates for the Graduate Certificate in Applied Science 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.
(2) Candidates for the Graduate Diploma in Applied Science 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) Candidates for the Master of Applied Science 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.
9. Candidates for the Master of Applied Science can enrol in 12 credit point project units of study only after successful completion of at least 24 credit points of study.

Examination

10. On completion of the requirements for the course, the Faculty shall determine the results of the candidature.

Progress

11. The Faculty may:
(1) call upon any candidate to show cause why that candidature should not be terminated by reason of unsatisfactory progress towards completion of the course; and
(2) terminate the candidature where the candidate does not show good cause.

Credit

12. (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, except at the discretion of the Dean.
(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.
(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
(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 within the same Applied Science program and receive credit for the units of study completed.

Resolutions of the Faculty

Graduate Certificate in Applied Science (Bioinformatics) (GradCertApplSc (Bioinf))

Graduate Diploma in Applied Science (Bioinformatics) (GradDipApplSc(Bioinf))

Master of Applied Science (Bioinformatics) (MApplSc (Bioinf))

Requirements for the degree

1. (1) Candidates for the Graduate Certificate in Applied Science (Bioinformatics) are required to complete satisfactorily four core units of study (BIOL 5001, BIOL 5002, BCHM 5001, STAT 5001) (Stream A) or four core units of study (BIOL 5002, BCHM 5001, STAT 5001, COMP 5213) (Stream B).
(2) Candidates for the Graduate Diploma in Applied Science (Bioinformatics) are required to complete satisfactorily four core units of study (BIOL 5001, BIOL 5002, BCHM 5001, STAT 5001) and 12 credit points from optional units of study (Stream A) or five core units of study (BIOL 5002, BCHM 5001, STAT 5001, COMP 5213, COMP 5214) and 6 credit points from optional units of study (Stream B).
(3) Candidates for the Master of Applied Science (Bioinformatics) are required to complete satisfactorily four core units of study (BIOL 5001, BIOL 5002, BCHM 5001, STAT 5001) and 24 credit points from optional units of study (Stream A) or five core units of study (BIOL 5002, BCHM 5001, STAT 5001, COMP 5213, COMP 5214) and 18 credit points from optional units of study.

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))

Requirements for the degree

1. (1) Candidates for the Graduate Certificate in Applied Science (Coastal Management) are required to complete satisfactorily at least two core units of study (MARS 5001, MARS 5002, MARS 5003, GEOG 5001) and 12 credit points from the following optional units of study; MARS 5001, MARS 5002, MARS 5003, GEOG 5001, CHEM 5001, ENVI 5705, ENVI 5803, ENVI 5808, ENVI 5809, ICOM 5002, ICOM 5003, QMEC 5110, QMEC 5150.
(2) Candidates for the Graduate Diploma in Applied Science (Coastal Management) are required to complete satisfactorily four core units of study (MARS 5001, MARS 5002, MARS 5003, GEOG 5001) and 12 credit points from the following optional units of study;(MARS 5004, CHEM 5001, ENVI 5705, ENVI 5803, ENVI 5808, ENVI 5809, ICOM 5002, ICOM 5003, QMEC 5110, QMEC 5150.
(3) Candidates for the Master of Applied Science (Coastal Management) are required to complete satisfactorily four core units of study (MARS 5001, MARS 5002, MARS 5003, GEOG 5001) and 24 credit points from the following optional units of study; MARS 5004, MARS 5005, CHEM 5001, ENVI 5705, ENVI 5803, ENVI 5808, ENVI 5809, ICOM 5002, ICOM 5003, QMEC 5110, QMEC 5150.

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))

Requirements for the degree

1. (1) Candidates for the Graduate Diploma in Applied Science (Environmental Science) are required to satisfactorily complete 36 credit points of units of study including 18 credit points from the core units (ENVI 5707 and 5808 and either 5708 or 5904) and 18 credit points from the optional units of study.
(2) Candidates for the Graduate Diploma in Applied Science (Environmental Science) are required to satisfactorily complete three core units of study (ENVI 5705 and ENVI 5808 and either ENVI 5708 or ENVI 5904), and 18 credit points from optional units of study.
(3) Candidates for the Masters of Applied Science (Environmental Science) are required to satisfactorily complete three core units of study (ENVI 5705 and ENVI 5808 and either ENVI 5708 or ENVI 5904), and 30 credit points from optional units of study.

Graduate Certificate in Applied Science (Informatics and Communication) (GradCertApplSc(Inf&Comm))

Graduate Diploma in Applied Science (Informatics and Communication) (GradDipApplSc(Inf&Comm))

Requirements for the degree

1. (1) Candidates for the Graduate Certificate in Applied Science (Informatics and Communication) are required to complete satisfactorily four 6 credit point units of study selected from CHEM 5001, CHEM 5002, ICOM 5001, ICOM 5002, ICOM 5003, INFS 6005, INFS 6010 or GEOG 5001.

(2) Candidates for the Graduate Diploma in Applied Science (Informatics and Communication) are required to complete satisfactorily six 6 credit point units of study selected from CHEM 5001, CHEM 5002, ICOM 5001, ICOM 5002, ICOM 5003, INFS 6005, INFS 6010 or GEOG 5001.

Graduate Certificate in Applied Science (Microscopy and Microanalysis) (GradCertAppSc (Microsc & Microanal))

Graduate Diploma in Applied Science (Microscopy and Microanalysis) (GradDipApplSc (Microsc & Microanal))

Master of Applied Science (Microscopy and Microanalysis) (MApplSc (Microsc & Microanal))

Requirements for the degree

1. (1) Candidates for the Graduate Certificate in Applied Science (Microscopy & Microanalysis) are required to complete satisfactorily 12 credit points from core units of study and 12 credit points from optional units of study.
   (2) Candidates for the Graduate Diploma in Applied Science (Microscopy & 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) Candidates for the Master of Applied Science (Microscopy & 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, and an independent research project and report.

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))

Requirements for the degree

1. (1) Candidates for the Graduate Certificate in Applied Science (Molecular Biotechnology) are required to complete satisfactorily two core units of study (MOBT 5101 and MOBT 5102).
   (2) Candidates for the Graduate Diploma in Applied Science (Molecular Biotechnology) are required to complete satisfactorily two core units of study (MOBT 5101 and MOBT 5102) and 12 credit points from optional units of study.
   (3) Candidates for the Master of Applied Science (Molecular Biotechnology) are required to complete satisfactorily three core units of study (MOBT 5101, MOBT 5102 and MOBT 5103) and 12 credit points from optional units of study.

Graduate Certificate in Applied Science (Neuroscience) (GradCertApplSc(NeuroSc))

Graduate Diploma in Applied Science (Neuroscience) (GradDipApplSc(NeuroSc))

Master of Applied Science (Neuroscience) (MApplSc(NeuroSc))

Requirements for the degree

1. (1) Candidates for the Graduate Certificate in Applied Science (Neuroscience) are required to complete satisfactorily four units of study selected from NEUR 5101, NEUR 5102, NEUR 5103, NEUR 5104, NEUR 5105, NEUR 5106, NEUR 5107 or NEUR 5108.
   (2) Candidates for the Graduate Diploma in Applied Science (Neuroscience) are required to complete satisfactorily five units of study selected from NEUR 5101, NEUR 5102, NEUR 5103, NEUR 5104, NEUR 5105, NEUR 5106, NEUR 5107 or NEUR 5108 and either NEUR 5001 or NEUR 5002.
   (3) Candidates for the Master of Applied Science (Neuroscience) are required to complete satisfactorily five units of study selected from NEUR 5101, NEUR 5102, NEUR 5103, NEUR 5104, NEUR 5105, NEUR 5106, NEUR 5107 or NEUR 5108 and three units of study selected from NEUR 5001, NEUR 5002, NEUR 5003, NEUR 5004.

Graduate Certificate in Applied Science (Nutrition and Dietetics) (GradCertApplSc(NutrDiet))

Graduate Diploma in Applied Science (Nutrition and Dietetics) (GradDipApplSc(NutrDiet))

Master of Applied Science (Nutrition and Dietetics) (MApplSc(NutrDiet))

Eligibility for admission

1. An applicant for admission will satisfy the admission requirements for the Graduate Diploma in Applied Science and:
   (1) should be eligible for FULL membership of the Dietitians Association of Australia; and
   (2) have at least 3 years experience as a professional dietitian.

Requirements for the degree

2. (1) Candidates for the Graduate Certificate in Applied Science (Nutrition and Dietetics) are required to satisfactorily complete two core units of study (NTDT6001 and NTDT6011) and 12 credit points from optional units of study.
   (2) Candidates for the Graduate Diploma in Applied Science (Nutrition and Dietetics) are required to satisfactorily complete two core units of study (NTDT6001 and NTDT6011) and 24 credit points from optional units of study.
   (3) Candidates for the Masters of Applied Science (Nutrition and Dietetics) are required to satisfactorily complete two core units of study (NTDT 6001 and NTDT 6011), and 36 credit points from optional units of study.

Graduate Certificate in Applied Science (Photonics) (GradCertApplSc(Photonics))

Graduate Diploma in Applied Science (Photonics) (GradDipApplSc(Photonics))

Master of Applied Science (Photonics) (MApplSc(Photonics))

Requirements for the degree

1. (1) Candidates for the Graduate Certificate in Applied Science (Photonics) are required to complete four core 6 credit point units (PHOT 5001, PHOT 5002, PHOT 5003, PHOT 5010).
   (2) Candidates for the Graduate Diploma in Applied Science (Photonics) are required to complete five core 6 credit point units (PHOT 5001, PHOT 5002, PHOT 5003, PHOT 5010, PHOT 5011), and one 6 credit point optional unit chosen from PHOT 5004, PHOT 5005, and PHOT 5006.
   (3) Candidates for the Master of Applied Science (Photonics) are required to complete five core 6 credit point coursework units (PHOT 5001, PHOT 5002, PHOT 5003, PHOT 5010, PHOT 5011), one 6 credit point optional coursework unit chosen from PHOT 5004, PHOT 5005, and PHOT 5006, and 12 credit points of project work (PHOT 5020 and PHOT 5021).

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))

Eligibility for admission

1. An applicant for admission will satisfy the admission requirements for the Graduate Certificate in Applied Science or the Graduate Diploma in Applied Science and:
   (1) have completed a 4 year full-time (or equivalent part-time) course in Psychology; or
   (2) have a 3 year sequence in Psychology and/or relevant work/life experience.
   (3) Candidates for the Master of Applied Science (Psychology of Coaching) are required to complete satisfactorily three core units of study PSYC 4721, PSYC 4722 and PSYC 4724 and a further 30 credit points from elective units of study.

Requirements for the degree

2. (1) Candidates for the Graduate Certificate in Applied Science (Psychology of Coaching) are required to satisfactorily complete three core units of study PSYC 4721, PSYC 4722 and PSYC 4724 and 6 credit points from elective units.
   (2) Candidates for the Graduate Diploma in Applied Science (Psychology of Coaching) are required to satisfactorily complete three core units of study PSYC 4721, PSYC 4722 and PSYC 4724 and 18 credit points from elective units.
   (3) Candidates for the Master of Applied Science (Psychology of Coaching) are required to complete satisfactorily three core units of study PSYC 4721, PSYC 4722 and PSYC 4724 and a further 30 credit points from elective units of study.

Graduate Certificate in Applied Science (Surface Coatings) (GradCertApplSc(SurfaceCoatings))

Graduate Diploma in Applied Science (Surface Coatings) (GradDipApplSc(SurfaceCoatings))

Requirements for the degree

1. (1) Candidates for the Graduate Certificate in Applied Science (Surface Coatings) are required to complete SUCO 4001, SUCO 4002, SUCO 4003 & SUCO 4004.
   (2) Candidates for the Graduate Diploma in Applied Science (Surface Coatings) are required to complete SUCO 4001, SUCO 4002, SUCO 4003, SUCO 4004, SUCO 4005 & SUCO 4006.

Graduate Certificate in Applied Science (Wildlife Health and Population Management) (GradCertApplSc(WildHlthPopMan))

Graduate Diploma in Applied Science (Wildlife Health and Population Management) (GradDipApplSc(WildHlthPopMan))

Master of Applied Science (Wildlife Health and Population Management) (MApplSc(WildHlthPopMan))

Requirements for the degree

1. (1) Candidates for the Graduate Certificate in Applied Science (Wildlife Health and Population Management) are required to complete satisfactorily two core units of study (WILD 5001 and WILD 5002) and 12 credit points from optional units of study.
   (2) Candidates for the Graduate Diploma in Applied Science (Wildlife Health and Population Management) are required to complete satisfactorily two core units of study (WILD 5001 and WILD 5002) and 24 credit points from optional units of study.
   (3) Candidates for the Master of Applied Science (Wildlife Health and Population Management) are required to complete satisfactorily three core units of study (WILD 5001, WILD 5002 and WILD 5009) and 24 credit points from optional units of study.

8 Staff

■ Faculty of Science

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Faculty Finance Manager
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Christine Askew
Administrative Assistant
Sutira Teh
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Jenny Henderson, DipEd *Flin* MSc
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Associate Professor Anthony F Masters, BSc *Melb* PhD *ANU*, FRACI CChem
Associate Professor Mary Peat, BSc *Birm* PhD *Brist*
Associate Professor Ian Spence, BSc PhD *Monash*

■ Faculty and Student Information Office

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Brenden Mischewski, MA *Waik*
Postgraduate Manager
Cheryl Collins, BA
Postgraduate Student Adviser
Di Taylor, BA *Macq*
Postgraduate Assistant
Matthew Charet BA MPhil
Undergraduate Manager
Position vacant
Undergraduate Student Adviser
Linda Kristian, MA(Journalism) *UTS* BA(Hons)
Undergraduate Assistant
Jordan Spence
International Student Adviser
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Computer Systems Officer
Anthony Butler, BA *Melb* GradDipCompStud *Canberra*

■ Marketing and Communication unit

Marketing Manager
Jasmine Chambers, GDipComm *UTS* BSc
Marketing & Schools Liaison Officer
Ainsley Piper, B.Teach, B.Ed *UNE*
Web Developer
Alex Bannigan, BSc(Hons)

■ Agricultural Chemistry and Soil Science

Professor and Dean, Faculty of Agriculture
Les Copeland, BSc PhD, MRACI CChem. Appointed 2001
Professor in Agricultural and Environmental Chemistry (Personal Chair)
Ivan R Kennedy, PhD DSc(Agric) *WAust* FRACI CChem. Appointed 1996
Professor in Soil Science
Alexander B McBratney, BSc PhD *Aberd*. Appointed 1995
Senior Lecturers
Robert A Caldwell, MSc PhD, MRACI CChem
Stephen R Cattle, BScAgr PhD
Edith M Lees, BSc PhD *Lond*
Balwant Singh, MSc *Haryana Agric Univ* HISAR *India* PhD *WAust*
McCaughey Lecturer in Hydrology and Catchment Management
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Rosalind Deaker, BSc MScAgr PhD
Damian Field, BSc PhD
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Norman K Matheson, PhD *Edin* MSc

■ Anatomy and Histology

Bosch Professor of Histology and Embryology
Christopher R Murphy, BSc *Adel* PhD *Flin* DSc. Appointed 2003
Chair of Anatomy and Pain Management
Richard J Bandler, BA *Miami (Ohio)* PhD *Carnegie-Mellon* DSc
Personal Chair in Visual Neuroscience
Bogdan Dreher, MS PhD *Warsaw* DSc
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Cristobal G dos Remedios, PhD DSc
Johnston W McAvoy, BSc *Belf* PhD *Flin*. Appointed 2001
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Kevin A Keay, BSc *Leeds* PhD *Sheff*
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John Mitrofanis, BSc *UNSW* PhD
Margaret A Swan, BSc PhD
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■ Biological Sciences

Professor of Biology
David Joseph Patterson, PhD Brist DSc Qu. Appointed 1992
ARC Australian Professorial Fellow
Richard Shine, BSc ANU PhD NE DSc, FAA Appointed 1993 as Professor in Evolutionary Biology (Personal Chair)
Professor of Biology (Genetics)
Ronald Anthony Skurray, AUAPharm PhD DSc *Adel*, MASM FAIBiol. Appointed 1991
Professor in Experimental Ecology (Personal Chair)
Antony J Underwood, PhD DSc *Brist*, FAA FLS FIBiol FAIBiol CBiol. Appointed 1992
Reader
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Lars Jermiin, Cand Scient *Aarhus* PhD *LaTrobe*
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Caretaker Crommelin Biological Research Station
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George Humphrey, LLB *UNSW* BA PhD
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Mats Olsson, BSc PhD *Goteborg*
John Palmer, MSc PhD *Sheff*
Kerryn Parry-Jones, DipEd *STC* MAppSc PhD *UNSW* BSc
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Winston Ponder, MSc PhD DSc *Auck*
Graham Pyke, PhD *Chic* BSc
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Maurizio Rossetto, BSc *La Trobe* MSc PhD *WA*
Gregory Rouse, MSc *Qld* PhD
William Rudman, PhD DSc *Auck*
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Donelle Trautman, BSc PhD *Murdoch*
George Wilson, BA *Indiana* MSc *UCSD* PhD *La Jolla*
Dedee Woodside, BSc *Carleton* PhD *ANU*
Kirk Zigler, BA *Ohio* PhD *Duke*
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Sharon Minsuk, BS *Stan* PhD *UCLA Berkeley*
Elizabeth Raff, BS *Penn* State PhD *Duke*
Andrew Smith AB *UCLA Berkeley* PhD *UCLA Los Angeles*
James Stewart, PhD *Tulsa*
Jeffery Villinski, BA *Minn* MS *Houston*

■ Chemistry

Professor of Chemistry (Organic Chemistry)
Maxwell J Crossley, BSc PhD *Melb*, FAA FRACI CChem. Appointed 1999
Professor in Chemistry (Organic Chemistry)(Personal Chair)
Leslie D Field, PhD DSc, FAA FRACI CChem. Appointed 1994
Professor in Chemistry (Polymer Chemistry)(Personal Chair)
Robert G Gilbert, PhD *ANU* BSc, FAA FRACI CChem. Appointed 1992
Professor in Chemistry (Inorganic Chemistry)(Personal Chair)
Peter A Lay, BSc *Melb* PhD *ANU*, FRACI CChem. Appointed 1997
Professor of Chemistry (Inorganic Chemistry)
Len Lindoy, PhD DSc *UNSW*, FAA FRACI CChem FRSC. Appointed 1996
Professor and Head of School
Trevor W Hambley, BSc *WAust* PhD *Adel*, FRACI CChem. Appointed 2002
Professor of Chemistry
Damon D Ridley, BSc PhD, FRACI CChem Appointed 2003
Research Professor
Leo Radom, MSc PhD Appointed 2003
Readers
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Scott H Kable, BSc PhD *Griff* DipBusAdmin *QIT*
Brendan J Kennedy, BEd *Melb* SC PhD *Monash*
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Gregory G Warr, BSc PhD *Melb*, FRACI CChem
Director of First Year Studies
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Ronald J Clarke, BSc PhD *Adel*
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Cameron J Kepert, BSc *UWA* PhD *Lond*
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Louis M Rendina, BSc PhD *ANU*
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Lecturers
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Carolyn Dillon, BSc PhD (joint with EMU)
Malcolm D McLeod, BSc *Monash* PhD *Camb*
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ARC QEII Fellows
Katrina A Jolliffe, BSc PhD *UNSW*, MRACI CChem
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Senior Research Fellow
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Christopher Fellows, BSc PhD *JamesCook*
Principal Research Fellow
Brian Hawkett, BSc PhD DipEd
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David E Hibbs, BSc *Wales* PhD *Cardiff*
U2000 Postdoctoral Fellow
Heping Zeng, BSc *Peking* PhD *Chinese Acad Sc*
Senior Research Associates
Antonio M Bonin, PhD
Aviva Levina, MSc PhD *Riga*
Research Associates
Zhengli Cai, MSc PhD *Chinese AcadSci*
Scott Cohen, BSc *San Diego* PhD *CalTech*
Timothy W Failes, PhD
Marina Fainerman-Melnikova, PhD

John C McMurtrie, BSc *Macq* PhD *UNSW*
Hsiu Lin Li, BSc PhD *Monash*
Level A Academics
Christopher J Ferguson, BSc PhD *Cant*
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Iain M Blake, MChem *StAnd* DPhil *Oxf*
B Klaas Nauta, PhD *Nth Carolina*
Qingdi Zhou, PhD
Professional Officers
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Jaroslaw T Popiolkiewicz (Electronics)
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Professional Assistant
S Warren Lazer, BSc PhD
Laboratory Manager
John Duckworth
High School Liaison Officer
Jeanette K Hurst, BSc PhD
Administrative Officers
Shanthi Perera
Catherine H Woods, BA
Administrative Assistants
Sophie Patsalides
Philip Penwright
Anne Woods
Lisa Wu, BBus *CSturt*
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Sever Sternhell, PhD DSc DIC *Lond* MSc, FAA FRACI CChem
Walter C Taylor, PhD DSc *Mancs* MSc, FRACI CChem
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Dalway J Swaine, MSc *Melb* PhD *Aberd*, FRACI CChem (Inorganic Chemistry)
Honorary Professor
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Robert J Hunter, BSc PhD, AM FAA FRACI CChem
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Barbara Messerle, BSc PhD, MRACI CChem
Richard W O'Brien, BE *UNSW* PhD *Camb*
Jane Weder, BPharm PhD
Paul Wormell, BSc PhD

■ Geosciences

Professor and Head of School
John Connell, BA PhD *Lond.* Appointed 2001 Professor
Andrew D Short, MA *Hawaii* PhD *Louisiana State* BA. Appointed 2003
Edgeworth David Professor of Geology and William Hilton Hovell Lecturer
Peter John Davies, BSc Leic PhD Sheff. Appointed 1991
Professor of Geophysics
Iain M Mason, BScEng *CapeT* PhD *Edin*. Appointed 1995
Associate Professors
Deirdre Dragovich, MA *Adel* PhD
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Jock B Keene, BAgEc ME PhD *Calif* BSc
Geoffrey L Clarke, BSc PhD *Melb*
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Gavin F Birch, MSc PhD GradDipIndAdmin *CapeT*
Eleanor M Bruce, PhD *WAust*
Peter J Cowell, BA PhD
Stephen J Gale, MA *Oxf* PhD *Keele*
Thomas CT Hubble, MAppSc *UNSW* MSc DipEd
Michael Glen Hughes, BSc PhD
Dietmar Müller, BSc *Kiel* PhD *Calif*
Lecturers
Philip McManus, BA GradDip MES PhD
Melissa R Neave, PhD *N.Y.State*
William Pritchard, BA PhD
Patrice Rey, BSc PhD *Thèse Troisième Cycle, Montpellier-Lyon-Grenoble (France)*
Scott Salmon, PhD *Syr*
Derek Wyman, BSc *Ont* PhD *Sask*
Research Fellow
Adriana Dutkiewicz, PhD *Flin*
Jonathan Hargreaves, BSc *York* SPhil *Oxf*
Daniel A Penny, BA PhD *Monash*
Emeritus Professors
Maurice T Daly, BA PhD
Trevor Langford-Smith, BA *Melb* MSc *Adel* PhD *ANU* BSc
Honorary Professor
Eric Waddell, BA *Oxf* MA *McGill* PhD *ANU*
Honorary Associates
David F Branagan, PhD, FGS
David E M Chapman, MEngSc *UNSW* BA PhD
Greg Crough
Donald W Emerson, BE MSc *UNSW* PhD, FAIG FAIMM
Wayne Erskine
Richard Facer, BSc PhD
Stephanie Fahey, BA PhD
Gabor Foldvary
James Gardner, PhD
Peter Hatherly
Hendrik Heijnis
John P Hudson, MA PhD *ANU*
Mark Hutchinson
Ronald Horvath, MA PhD
Robert A Jones, BEng *WAust* MEng *Auck* MSc *Lond*
Keith Klepeis
Louis Moresi, PhD
Gordon Packham, BSc PhD
Graeme Philip, PhD *Cant* DSc *Melb*
Peter Roy, BSc PhD *ImpColl*
Robin F Warner, BA *Birm* PhD *NE*
Edward Wheelwright, DFC MA *StAnd*
Senior Technical Officers
Nelson Cano
Graham Lloyd
Philip Manning
David Mitchell
Tom E Savage, BE
Senior Computer Systems Officers
Ivan Teliatnikov
John S Twyman, BSc
Finance/Administration Manager
Jennifer Reeks, BA

■ Infectious Diseases

Bosch Professor
Yvonne Edna Cossart, AO DCP Lond BSc(Med) MB BS, FRCPA . Appointed 1985
Clinical Professor
Gwendolyn Lesley Gilbert, MD BS Melb, FRACP FRCPA FASM (with Medicine) . Appointed 1990
Associate Professors
Colin Harbour, BSc *Wales* PhD *Lond* (Head of Department)
Raymond Kearney, BSc PhD *Qld*
Clinical Associate Professors
Richard Alan Vickery Benn, DipBact *Lond* BSc(Med)MB BS, FRCPA FRACP FASM (with Medicine)
Margaret Anne Burgess MD BS, FRACP MACP (with Paediatrics and Child Health and Centre for Immunisation Research New Children's Hospital)
Peter John Colignon, MB BS BSc(Med), FRACP RCPA MASM (with Canberra Clinical School and Medicine)

Senior Lecturers
Bernard J Hudson, MB BS, DTPH, FRACP FAFPHM FRCPA
Carol H Thompson, BA MVSc PhD, MACVSc FASM
Clinical Senior Lecturers
Ross Bradbury, MB BS, FRACP FRCPA
Thomas Gottlieb, MB BS, FRACP FRCPA
Colin MacLeod, MB BS, FRCPA FRACP MASM FAFPHM (with Medicine)
Lecturers
George Kotsiou, MB BS *Adel*, FRCPA FRACP
Senior Research Fellows
Barbara R Rose, BSc PhD, FAIMLS AAIMLT MASM
Karen Vickery, BVSc(Hon), MVSc, PhD

■ Information Technologies

Professor and Head of School
David (Dagan) Feng, ME SJTU MS PhD *UCLA*. Appointed 2000
Professors
Peter Eades, BA (Hons) PhD *ANU*. Appointed Chair of Software Technology, 2000
David Everitt, BE PhD *Qld*. Appointed Chair of Internetworking 2001
Jon D Patrick, DipBehHealthPsych *La Trobe* Dipl Surv RMIT BSc *Deakin* MSc *Dub* PhD *Monash*. Appointed Chair of Information Systems, 1998
Albert Zomaya, BEng *Cairo* MSc PhD McG. Appointed Cisco Systems Chair of Internetworking, 2001
Associate Professors
Joseph G Davis, BSc *Calicut* PostGradDipMgmt *IIMA* PhD *Pitt*
Alan Fekete, PhD *Harv* BSc
Jesse Jin, PhD *Otago* MSc CTU BSc SJTU
Judy Kay, BSc PhD
Robert J Kummerfeld, BSc PhD
Senior Lecturers
Edmund Balnaves, BA *CCA* MBA *NTU*
Sanjay Chawla, PhD *Tennessee* BA *Delhi*
Jonathan Gray, PhD *Sheffield City Polytechnic* BA Uni*versity of Sheffield*
Geoffrey Kennedy, PhD *Otago* MA *Kent* MSc *Macq* BSc *UNSW*
Bjorn Landfeldt, PhD *UNSW* Cisco Senior Lecturer in Internet Technologies (jointly with EIE)
Ian A Parkin, PhD *Adel* BSc
Selvakennedy Selvadurai PhD *UPM*
Andrea Stern, BA *Macq* Diploma *UNSW*
Masahiro Takatsuka, PhD *Monash* ME *TokyoInst Tech*
Bing Bing Zhou, PhD *ANU* BSc *Nanjing*
Lecturers
Weidong (Tom) Cai, BSc *HuaQiao* PhD
Vera Chung, PhD *QUT*
Seok Hee Hong, PhD *Ewha* MS
Geoffrey Kennedy, PhD *Otago* MA *Kent* MSc *Macq* BSc *NSW*
Irena Koprinska, PhD *Sofia* MSc *TU-Sofia*
Josiah Poon, PhD MSc *Deakin* BSv (Hons) ManchesterGradCertEd UQ
Muhammad Salam
Mark Sifer, PhD *UTS*
Kalina Yacef, PhD *Paris* MSc *Paris* DEA *Paris*
Ying Zhou, PhD *NUS* MEng *Nanjing* BSc *Nanjing*
Associate Lecturers
Simon Poon, MEng *UTS* BSc GradCert MathsSci *UTS*
Postdoctoral Fellows
Zhiyong Wang, PhD (submitted) HK Polytechnic (to Feb 2004)
Snr. Research Fellow
Aaron Quigley, PhD Newcastle BS (Mod) Hons *Trinity College Dublin*
Computer Systems Supervisor
Greg Ryan, BSc (Hons)
Computer Systems Officers
Roy Giles, BSc *Wales*
Prabhat Gupta
Bruce Janson, BSc (Hons)
Ronald Jore, BSc (Hons) TU *Berlin*
Abdallah (Abed) Kassis
Piers R Lauder, BSc *Warw* DipCompSc *Brad*
Chief Technical Officer
Remo Di Giovanni
Senior Technical Officers
Allan Creighton
Arthur Scott
Technical Officers
Robert Calabrese
Witold Janus
Administrative Officers
Shari Lee, MA BA *Sing*
Helene Orr, BA *UNE*
Administrative Assistants
Richard Bailey, LLB *UTS*
Sharon Chambers
Kimberley Davis
Wei Ying Ho
Judith Maddison
Josephine Spongberg
Honorary Appointmemts
John Baker, PhD UNSW
Em Professor John Makepeace Bennett AO, PhD *Camb* BE(Civ) BE(Mech&Elec) BSc *Qld*, FTS FACS FBCS FIEAust *FIMA*
Rex Di Bona, PhD BE(Hons)
Zheru Chi, PhD MEng BEng *Zhejiang*
Peter Chubb, PhD *UNSW*
Stefan Eberl, PhD MSc *UNSW*
Norman Foo, PhD *Mich* ME *Cant*
Michael Fulham, MB BS *UNSW*
Roger Fulton, PhD MSc *UTS*
Vance Gledhill, PhD *Melb* BSc, FACS
Ian Gorton, PhD *Sheff*
Michael Hitchens, PhD *N'cle (NSW)*
Doan B Hoang, PhD *N'cle (NSW)* ME BE *WAust*
Brian Hutton, PhD UTS MSc *Aberd* BSc (Hons)
Jeffrey H Kingston, BSc (Hons) PhD
Anna Liu, PhD *UNSW*
Chris Maltby, BSc *UNSW*
Gordon McCalla, PhD BrCol MSc BSc (Hons) *Alta*
Steve Meikle, PhD *UNSW*
Eric McCreath, PhD *UNSW* BE
Agathe Merceron, PhD *Paris*
Cecile Paris, PhD *Col*
Jack R Phillips, PhD *Melb* BMechE
John Rosenberg, PhD *Monash* BSc (Hons)
Antonis Symvonis, PhD *UTexas*
Eric Tsui, PhD *Deakin*
David Zhang, PhD *HarbinIT* PhD *UWaterloo*
Hong Jiang Zhang, PhD *Denmark* BS *Zhengzhou*
Ya-Qin Zhang, ScD *GWashUniv*

■ Mathematics and Statistics

Professor in Mathematical Statistics (Personal Chair)
John Robinson, BSc *Qld* PhD. Appointed 1991
Professor in Pure Mathematics (Personal Chair)
Gustav I Lehrer, PhD *Warw* BSc, FAA. Appointed 1990
Professors
John J Cannon, MSc PhD. Appointed 2000
Edward Norman Dancer, BSc *ANU* PhD *Camb*, FAA. Appointed 1993
Nalini Joshi, MA PhD *Prin* BSc. Appointed 2002
Eugene Seneta, MSc *Adel* PhD *ANU*, FAA. Appointed 1979
Readers
Donald I Cartwright, PhD *Ill* BSc
Jonathan Hillman, BSc *WAust* AM *Harv* PhD *ANU*
King-Fai Lai, BSc *Lond* MPhil PhD *Yale*
Associate Professor and Head of School
Donald E Taylor, MSc *Monash* DPhil *Oxf*
Associate Professors
William G Gibson, MSc *Cant* PhD *UNSW*
Robert B Howlett, BA PhD *Adel*
Ronald W James, BSc PhD
Charles C Macaskill, BSc PhD *Adel*
Malcolm P Quine, MSc *Lond* PhD *ANU*
Neville C Weber, MSc PhD
Director of Junior Studies
Sandra C Britton, BSc *UNSW* MA
Senior Lecturers
Peter W Buchen, PhD *Camb* BSc
Koo-Guan Choo, BSc *Nan* MSc *Ott* PhD *BrCol*
Christopher M Cosgrove, BSc PhD
David Easdown, BA *ANU* PhD *Monash*
Roger W Eyland, PhD *Camb* MSc

David J Galloway, BA PhD *Camb*
Jenny Henderson, DipEd *Flin* MSc
Hugh C Luckock, BSc *Auck* PhD *N'cle(UK),* ASIA
Alexander I Molev, Diploma PhD *Moscow*
Gordon P Monro, BSc *Monash* PhD *Brist*
Mary R Myerscough, DPhil *Oxf* MSc
Nigel R O'Brian, MA *Camb* PhD *Warw*
William D Palmer, MLitt MA *NE* BSc PhD DipEd
M Shelton Peiris, DipMath MSc *Peradeniya* PhD *Monash*
Mary C Phipps, MSc
Rosemary S Thompson, BSc *ANU* PhD
James N Ward, BSc PhD
Ruibin Zhang, BSc *Shandong* PhD *Tas*
Kang Zuo BS *Chinese UST* MS PhD *Bonn*
Lecturers
Sanjeeva Balasuriya, BS *Lafayette* ScM PhD *Brown*
Clare Coleman, BSc DipEd *Adel* DipSc PhD
Howard J D'Abrera, PhD *Calif* BSc
Daniel Daners, PhD *Zurich*
Humphrey M Gastineau-Hills, MSc PhD
Georg Gottwald, PhD *Monash* Diploma *Düsseldorf*
David J Ivers, BSc PhD
David R Kohel, BSc *Texas* A&M PhD *Berkeley*
Andrew P Mathas, BSc MSc PhD *Ill*
Adrian M Nelson, PhD *Lond* BSc
Laurentiu Paunescu, MSc *Bucharest* PhD
Marc E Raimondo, MSc DipStats PhD *Paris VII*
Paul F Slade BSc Phd *Monash*
Qiying Wang, BSc *Anhui* MSc *S & T China* PhD *W'gong*
Associate Lecturer
Michael I Stewart, BSc MA PhD
Postdoctoral Fellows
Anthony Henderson, PhD *MIT* BSc
Shusen Yan, MS *South China UnitTech* PhD *Wuhan Inst*
Sesqui Postdoctoral Fellow
Martine F Girard LM MM PhD *Paris 7*
Scott H Murray, BSc *ANU* SM PhD *Chic*
Alison E Parker PhD *London* BSc
U2000 Postdoctoral Fellow
Joost van Hamel, PhD *Amsterdam*
Research Fellows
Claus Fieker, DipMath *Heinrich-Heine* PhD *Berlin*
Sinaed L Lyle BA *Oxf* MSc *Edin* PhD *London*
Senior Research Associates
Leslie Farnell, MA DPhil *Oxf* DipEd *Canberra*
Alan K Steel, BA
Robin Steel BSc *Edin* MSc *Napier* PhD *Wales*
Yucai Su BSc MSc *Xiamen* PhD *Chinese AS*
William R Unger, BSc PhD
Research Associates
Geoffrey M Bailey, BSc
Research Assistants
Anne P Cannon, BA MPhil
Nicole J Sutherland, BSc *Macq*
Computing Manager
James S Richardson, PhD *Warw* MSc
Computer Systems Officers
Robert B Pearson, BSc BIT *CSturt* ADipA *Mitchell CAE*
Paul Szabo, BSc *Havana*
Michael R Wilson, BSc
Software Engineer
Damien K Fisher BSc *UNSW*
Administration Manager
Paul G Harbon, MBA DipMngmt *Deakin* ADipMath *SQld* BSc
Finance Officer
Julie L Small
Administrative Assistants
Flora Armaghanian
Janet R Doyle
Jan M Love
Sonia Morr
Emeritus Professors
Gregory M Kelly, BA PhD *Camb* BSc, FAA
Gordon E Wall, BSc *Adel* PhD *Camb*, FAA
Peter R Wilson, BA MSc *Melb* PhD, FRAS
Visiting Professors
Richard Cowan, BSc PhD GradDip
Nicholas I Fisher, PhD *NthCarolina* DSc
Honorary Reader
Tzee-Char Kuo, BS *Natnl Taiwan* PhD *Chic*
Honorary Associate Professors
Edward D Fackerell, MSc PhD
Terence M Gagen, BSc *Qld* PhD *ANU*
John M Mack, MA *Camb* BSc PhD
Robert FC Walters, MSc *Qld* PhD *ANU*
Denis E Winch, MSc PhD, FRAS
Honorary Senior Lecturer
W Barrie Fraser, BSc ME *Cant* SM PhD *Harv*
Karl H Wehrhahn, BSc *Alta* PhD
Honorary Associates
Geoffrey R Ball, BA
Donald W Barnes, DPhil *Oxf* BSc
Clare Chapman PhD
Diana Combe MSc *London* BSc PhD
Wen Dai, BSc *Yunnan* MSc *Beijing* PhD *ANU*
David C Edelman, SM *MIT* MPhil PhD *Col*
Brian Gray, BSc PhD *Manc*, FRACI FRSC
Michael S Johnson, BSc PhD
Stephen G Lack, BSc PhD *Camb*
Arjen Lenstra, MA PhD *Amsterdam*
Rupert Littlewood, PhD
Philip Lo, BA BSc *Melb* Dipl *Vienna*
Ben Martin PhD
Leanne Rylands, MSc PhD
Jane Sexton, BSc PhD *Qld*
Ross H Street, BSc PhD

■ Molecular and Microbial Biosciences

Biochemistry

Professor of Molecular Biology
Iain L Campbell, BSc PhD Appointed 2004
Professor
Richard I Christopherson, BSc PhD *Melb* (Personal Chair) Appointed 1998
McCaughey Professor and ARC Australian Professorial Fellow
Philip W Kuchel, BMedSc MB BS *Adel* PhD *ANU*, FAA Appointed 1980
Associate Professors
Arthur D Conigrave, BSc(Med) MB BS MSc PhD, FRACP
P Merlin Crossley, BSc *Melb* DPhil *Oxf*
Alan R Jones, PhD *Manc* MSc
Emma Whitelaw, BSc *ANU* DPhil *Oxf*
Senior Lecturers
Charles A Collyer, BSc *Flin* PhD
Gareth S Denyer, BA DPhil *Oxf*
Simon B Easterbrook-Smith, BSc *Well* PhD *Adel*
Joel P Mackay, BSc *Auck* PhD *Camb*
Lecturer
Jill M Johnston, BSc *Qld* DipEd *CatholicCE(Syd)*
Associate Lecturer
Dale P Hancock, BSc PhD
Principal Research Fellow
J Mitchell Guss, BSc PhD
Senior Research Fellow
William A Bubb, DIC *Lond* BSc PhD
ARC Australian QEII Fellow
Elizabeth J Harry, BSc PhD
ARC Australian Research Fellow
Jacqueline M Matthews, BSc *UNSW* PhD *Camb*
CJ Martin Fellow
Linda A Crofts, PhD UNSW BSc
NHMRC R.D. Wright Research Fellow
Caroline Rae, BSc PhD
Research Fellows
Adrienne Adams, BSc PhD, Melb
Larissa Belov BSc *Qld* PhD *Macq*
Bogdan E Chapman, BSc PhD *ANU*
Jason A Lowry, BS *Case W. Reserve* PhD *N. Carolina State*
Margaret Sunde, BSc *CapeT* PhD *Camb* (part-time)
Allan H Torres, BSc *UPLB* PhD *Alberta*
ARC Australian Postdoctoral Fellow
David A Gell, BSc PhD *Camb*
Megan J Maher, BSc *Qld* BSc PhD *Melb* (part-time)

Postdoctoral Fellows
Suyinn Chong, BAppSc PhD *TechnolSyd*
Anthony P Duff, BSc PhD *UNSW*
Peter Ellmark, BSc PhD *Lund*
Thomas R Eykyn, BSc *Oxf* PhD *Lausanne*
Alison Franks, BSc PhD
Slade Jensen, BMedSci PhD
David Langley, BSc PhD
Neelan J Marianayagam, BS *Calif Irvine* MPhil PhD *Camb*
Konstantin Momot, BSc *Novosibirsk* PhD *Arizona*
Jose S Perdomo, BAppSc(BCT) *UWS* BSc PhD
Alexis Verger, BSc PhD *Paris*
Level A Research Only Academic
Anthea L Newton, BSc
Clinical Associate Professors
Peter Stewart, MB BS MBA, FRACP FRCPA
David R Sullivan, MB BS, FRACP FRCPA
Senior Technical Officers
Robert T Czolij, BSc *Macq* BiolTechCert *STC*
Joseph Dimauro, MSc
William G Lowe, BiolTechCert *STC*
Karl R Schultz, BAgSc *Adel*
Ross I Taylor, FittMachCert ToolmakingCert *STC*
Technical Officers
John C Foster, BSc *UNSW* GradDip (EnvStud) *Macq*
Cesar De La Paz
Margaret Espejel, AssocDipMedSc *Riverina CAE* (part-time)
Debra Phillips, QTACert *NZIMLT*
Research Assistants
Pauline Y-H Huang, BAppSc(MedSc) *QldUT* BSc *Qld* MScMed DipChemEng *KuangWu*
Mi Hwa Lee, MSc *Pohang* (part-time)
Caroline Leong, BMedSc
Suzanne M Mithieux, BSc *UNSW*
Orsola M Regaglia, BSc WS*yd*
Lyndal Thompson, BSc *UNSW*
Laboratory Assistants
Peter W Kerr
Ben Monaghan, DipHealthSc *TAFE NSW*
Cassandra Music (part-time)
Glassware Cleaners
Joyce Menouhos (part-time)
Lynette T Menouhos (part-time)
Jun Wang
Emeritus Professors
Hans C Freeman, MSc PhD, FAA FRACI FRSC CChem
Clifford H Gallagher, PhD *Lond* DVSc, FACVSc FRCPath
Noel S Hush, DSc *Manc* MSc, FRS FAA FRACI
Robert G Wake, MSc PhD, FAA
Adjunct Professor
Robert C Baxter, PhD DSc, FAACB
Adjunct Senior Lecturer
Stephen P Mulligan, MB BS *UNSW* PhD, FRACP FRCPA
Honorary Associates
Nihal S Agar, MVetSci PhD *Agra*
Renze Bais, BSc PhD *Adel*
Gheorghe Benga, MSc PhD MD *Cluj*
Leslie Burnett, BSc *Melb* MBBS PhD
Roderick JD Clifton-Bligh, BSc(Med) MB BS PhD *Camb*
Ivan Darvey, BSc PhD *UNSW*
Christopher J Garvey, MSc
Uwe Himmelreich, MSc(Dipl Chem) PhD *Leipzig*
Glenn F King, BSc PhD
Michael A Messer, MSc PhD *Melb*
Peter J Mulquiney, BSc PhD
Hossein Nouri-Sorkhabi, BSc *Tabriz*, PhD *Wales*
Michael Slaytor, MSc PhD
Robert G Wake, MSc PhD, FAA
Vivian KL Whittaker, MB BS *Qld* PhD *ANU*
James S Wiley, BA *Oxf* MB BS MD
Visiting Scholar
Shigeki Moriya, BPharm MPharmSc *Toyama* PhD *Kanazawa*

Human Nutrition Unit

Boden Professor of Human Nutrition
Ian D Caterson, BSc MB BS PhD, FRACP. Appointed 1997
Professor
Janette C Brand-Miller, BSc PhD *UNSW*, FAIFST (Personal Chair). Appointed 2002
Associate Professor
Samir Samman, BSc PhD
Senior Lecturers
Karen Webb, BSc MPH *UC Berkeley* PhD
Lecturer
Soumela Amanatidis, BSc DipNutrDiet, APD (half-time)
Kim Bell-Anderson, BSc PhD *UNSW*
Kellogg Lecturer
Dianne H Volker, BHSc PhD *N'cle(NSW),* APD
Clinical Lecturers
Merryl Ireland, BSc DipNutrDiet
Jenny Ravens, BSc CertDiet MHM *NE*
Beth Rohrlach, BSc DipNutrDiet, APD
Clinical Associate Lecturer
Maria Kokkinakos, BSc DipNutrDiet
Research Manager, IOTF
Timothy P Gill, BSc *Tas* BSc GradDipDiet PhD *Deakin*
Clinical Trials Manager
Philippa V Lee
Postdoctoral Staff
Bing Wang, MD *Tianjin* PhD
Research Manager, SUGiRS
Susanna Holt, BSc MNutrDiet PhD
Professional Officer
Ziaul I Ahmad, MAppSc *TechnolSyd*
Administrative Assistants
Isa Hopwood
Joyce Calvitto
Marianne Alexander (part time)
Emeritus Professor
A Stewart Truswell, AO, MB ChB MD *CapeT* DSc, FRCP FRACP FFPHM
Honorary Clinical Supervisors
Maggie Aitken, BSc *Surrey*
Karen Allsopp, BSc Aberd MNutrDiet
Sami Azad, BSc *Iraq* MSC *Rdg* PhD DipNutrDiet
Leanne Brown, BHSc(NutrDiet) *N'cle(NSW)*
GradCertPaedNutrDiet *Melb* GradCertSportNutr *Deakin*
Lyn Brown, DipIM CertDiet *Melb*
Michele Carroll, BHlthSc (NutrDiet) *N'cle(NSW)*Meredith Burn, MSc *Lond* MBA *Monash* GradDipDiet *Deakin*
Marina Dron, BApplSc *QldUT* DipNutrDiet *QldUT*
Lisa Eldridge, BSc MNutrDiet
Mari Eronen, MNutrDiet
Rebecca Fisher, BSc(ExSc&Nut) MSc(NutrDiet) *W'gong*
Margaret Forbes, CertDiet *RMH* MBA *NTerritory*
Jane Ford, DipNutrDiet *Leeds*
Bernadette Galing-Aquino, BSc DipNutrDiet
Mia Hemingbrough, BSc MNutrDiet GradDipEd
Karen Hester, BSc MNutrDiet
Margaret Holyday, BSc DipNutrDiet
Michelle Hughes, BSc DipNutrDiet
Josephine Kirkwood, BApplSc (BiomedSc) *TechnolSyd*, MNutrDiet
Caryn Kneale, BSc *Macq* MNutrDiet
Lyn Lace, BSc DipNutrDiet
Robert Lange, BSc *Qld* GradDipNutrDiet *QldUT* GradCertDiabetesEduc *Deakin*
Marion Lee, BSc CertDiet
Maria Loveday, BSc *Deakin* CertDiet *Vic*
Jenny McQueen, BSc MHlthSc GradDipDiet GradDipInfoStud
Marcelle Middleton, BSc *ANU* DipNutrDiet
Lesley Miller, BSc DipNutrDiet
Linda Morris, BA(Dietetics) *University of North Colorado*
Radha Murthi, MNutrDiet *Madr*
Rita Nicolaou, BSc DipNutrDiet
Gillian Nisbet, BSc DipNutrDiet
Nola Patterson, BSc *Qld* DipNutrDiet
Aditi Patwardhan, BSc MNutrDiet
Joanne Prendergast, BSc *Acad Pdt Montr* MHPEd *UNSW*
Nicola Riley, BSc MNutrDiet
Beth Rohrlach, BSc DipNutrDiet
Elizabeth Scott, BSc DipNutrDiet
Mary Ann Silvers, BSc *Monash* DipNutrDiet *Flin*
Marie Smith, MNutrDiet
Karen Storer, BSc MNutrDiet
Susannah Summons, BHlthSc MNutrDiet
Lydia Sutakowsky, BSc *Qld* DipNutrDiet *TechnolSyd*
Anne Swain, BSc DipNutrDiet PhD

Peter Talbot, BSc MSc(Med) DipNutrDiet
Scott Wagner, BSc DipNutrDiet GradCertPaedDiet
Kellie Ward, BHSc(N&D) *N'cle(NSW)*
Cheryl Watterson, BSc DipNutrDiet
Justin Wright, BSc GradDipNutrDiet
Honorary Community Supervisors
Soumela Amanatidis, BSc DipNutrDiet MPH
Anjanette Casey, BHlthSc (NutrDiet) *N'cle(NSW)*
Kathy Chapman, BSc MNutrDiet
Gina Davis, MSc *Qld* DipNutrDiet *QldUT*
Matthew Dick, BSc *Qld* MPH(Hons)
Susan Dumbrell, BSc MNutrDiet
Barbara Eden, MA(Educ) *Macq* MSc(NutrDiet) *W'gong* AdvDipSecEd *Macq*
Meghan Finch, BHlthSc (NutrDiet) *N'cle(NSW)*
Gladys Hitchen, MSc (NutrDiet) *Lima Peru*
Effie Houvardes, MSc(NutrDiet) *W'gong*
Elizabeth Jeffries, BApplSc DipNutrDiet
Judith Leahy, BSc *UNSW* DipNutrDiet
Melissa Macdouall, BHlthSc(NutrDiet) *N'cle(NSW)*
Michelle Nolan, BHlthSc(NutrDiet) *N'cle(NSW)*
Louisa Smith, BSc *Qld* DipNutrDiet *QldUT*
Lynette Stewart, BScAgr BA DipNutrDiet *Macq*
Maxine Toogood, BHlthSc(NutrDiet) *N'cle(NSW)*
Robyn Young, BSc MNutrDiet
Honorary Food Service Supervisors
Susan Burke, BSc DipFoodTech *UNSW* DipNutrDiet
Ruth Crawford, BSc *Deakin* MNutrDiet *Flinders* GradDipEd CertSportsNutr *Melb*
Maria Kokkinakos, BSc DipNutrDiet
Carmel Lazarus, BSc MNutrDiet GradDipBusAdmin TechnolSyd
Fifi Spechler, BSc DipNutrDiet
Honorary Industry Supervisors
Rebecca Bousted, BSc MSc (NutrDiet) *W'gong*
Coral Colyer, BSc(FoodTech) MNutrDiet
Megan Cobcroft, BSc MPH DipNutrDiet
Louise Macan, BSc *UNSW* MNutrDiet
Sara Grafenauer, BSc(Nutr) MSc(NutrDiet) *W'gong*
Sharon Natoli, BSc BNutrDiet *Flin* GradDipBus *RMIT*
Honorary Associates
John F Ashton, BSc PhD *N'cle(NSW)* MSc *Tas*, FRACI
Timothy P Gill, BSc *Tas* BSc GradDipDiet PhD *Deakin*
Robert J Parker, MEd PhD DipEd, FACHPER

Microbiology

Professor
Peter Richard Reeves, BSc PhD *Lond*, FAA MASM. Appointed 1985
Reader
Thomas Ferenci, BSc *Lond* PhD *Leic*
Senior Lecturers
Deidre A Carter, BSc *Otago* PhD *Lond* (part-time)
Andrew J Holmes, BSc PhD *Qld*
Peter B New, BAgrSc *Tas* PhD *Adel*
Lecturer
Helen M Agus, MSc *UNSW*, MASM
Postdoctoral Fellow
Nicholas V Coleman, BSc PhD
Gabrielle N Samuel, BSc *Birm* PhD *Adel*
Research Assistants
Tien M T Bui, BMedSc
Kathy M Donohoe, BSc (Molecular Biology & Genetics)
Lucinda S McRobb, BSc (part-time)
Shona J Seeto, BSc
Gordon Stevenson, BSc *Adel*
Technical Officers
Emma Hastings, BSc
Vincent Lai, BMedSc
Laboratory Assistant
Georgina Nield, DipLabTech *TAFE NSW*
Glassware Cleaners
Ana M Julca (part-time)
Trudie T Smith (part-time)
Administrative Assistant
Annie Au
Adjunct Professor
Timothy G Littlejohn, BSc PhD *Melb*, CIAR (Associate)
Adjunct Senior Lecturer
Ruiting Lan, BScAgr *Jiangxi* PhD
Honorary Senior Lecturer
Trevor Duxbury, BSc PhD *Liv*, MASM
Honorary Associates
K Yip Cho, BSc *UNSW* PhD *ANU*
William G Murrell, PhD *Oxf* DScAgr, FAIFST MASM

Molecular Biotechnology

Professor and Director
Anthony S Weiss, BSc PhD
Senior Lecturers
W Bret Church, BSc *UNSW* PhD
Kevin Downard, BSc PhD *Adel*
Lecturers
Rachel Codd, BSc *Macq* PhD
Christopher Fellows, BSc PhD *JamesCook*
Neville Firth, BSc PhD *Monash*
Molecular Biotechnology Program Coordinator
Kathryn Murray, BMus (Perf) *Griff* GCAEMgt *Deakin*
Honorary Appointments
Adjunct Professor
Keith Williams, BAgSc *Melb* PhD *ANU*
Visiting Scholars
Shoba Ranganathan, BSc PhD *NUSing*
Carl J Sundberg, MD PhD *Karolinska*
School Administrative Staff
Laboratory Manager
Terry P Brown, MASM
Administrative Officer
Danielle Wells, BSc *UNSW*
Finance Officer
Stephen P Conaghan
Information Technology Officer
Douglas J Chappell, BA BSc PhD DipEd
Computer Systems Manager
Jennifer Wong, BSc
Administrative Assistants
Bronwyn G Ferguson (part-time)
Christopher Trott, BA *Car* (part-time)
Attendant
A Max Francis

■ Pathology

Professor
Nicholas H Hunt, BSc PhD *Aston*. Appointed 1989
Associate Professors
John Hilton, RFD MB ChB *St Andrews,* FRCPA
Nicholas JC King, MB ChB *Cape T* PhD *ANU*
Senior Lecturers
Shishan Bao, MB BS *Shanghai* PhD
Brett D Hambly, BSc(Med) MB BS PhD
Roger S Pamphlett, BSc(Med) MD ChB *Cape T,* FRACP MRCPath

■ Pharmacology

Professor of Clinical Pharmacology
J Paul Seale, MB BS PhD *Lond*, FRACP. Appointed 1992
Professors
Judith L Black, MB BS PhD, FRACP. Appointed 1997
MacDonald J Christie, BSc *Flin* PhD. Appointed 2001
Graham A R Johnston, AM, MSc PhD *Camb*, CChem FRACI FTSE. Appointed 1980
Clinical Professor
Gillian M Shenfield, MA BCh DM *Oxf*, FRCP FRACP. Appointed 1993
Associate Professor and Head of Department
Ewan J Mylecharane, BPharm *VIC* BSc PhD *Melb*
Associate Professors
Robin D Allan, BSc *Qld* PhD *James Cook*
Christopher Liddle, MB BS BSc(Med) *UNSW* PhD, FRACP
Ian Spence, BSc PhD *Monash*
Graham A Starmer, MSc *Manc* PhD
Senior Lecturers
Peter RA Johnson, BSc PhD

Hilary GE Lloyd, BSc *Brist* MSc PhD *Lond*
Robert J Vandenberg, BSc PhD
Clinical Senior Lecturers
Michael Kassiou, BSc PhD *UNSW*
Laurent P Rivory, BVSc PhD *Qld*
Lecturer
Jonathan C Arnold, BSc PhD
Jasmine M Henderson, BSc DipNutrDiet PhD
Associate Lecturer
Rosario Carlo-Stella, BSc
Research Fellows
Elena E Bagley, BPharm PhD
Janet K Burgess, BSc *Adel* PhD *UNSW*
Billy Chin Hak Chieng, BPharm PhD
Mark A Connor, BSc PhD *Wash*
Helen M Dodds, BSc DipClinBioch MPhil *Griff* PhD *Qld*
Stephen P Hack, BSc *Sus* MRes *Manc* PhD *Birm*
Department Manager
Vacant
Adjunct Professor
Susan M Pond, AM, MB BS MD *UNSW*, FRACP FTSE
Conjoint Associate Professor in Physiology and Pharmacology
Paul M Pilowsky, BMedSc BMBS PhD *Flin*
Honorary Associate Professors
Rosemarie Einstein, BSc PhD
Michael Roth, Dipl *Goethe* PhD *Basel*
Honorary Associates
Sandra D Anderson, PhD *Lond* BSc
Gregory B Chesher, MSc PhD
L Bruce Cobbin, BSc *Melb* PhD
Gavin Dixon, PhD
Richard Donnelly, MB ChB MD *Birm* PhD *Glasgow*, MRCP FRACP
Peter Gray, BSc PhD
Annette S Gross, BPharm PhD
Herbert F Jelinek, BSc *UNSW* GradDipNeurosci *ANU* PhD
David IB Kerr, BSc PhD *Adel*
Desmond J Maddalena, MAppSc DipTech *NSWIT* PhD
Karen McKay, BSc PhD
Jennifer Ong, BSc PhD *Adel*
Xianqin Qu, PhD
Diana M Temple, AM, BSc *WAust* MSc PhD
Christopher W Vaughan, BE MBiomedE *UNSW* PhD
Sandra N Webb, BPharm *VIC* PhD *Strath*

■ Physics

Professor of Physics (Astrophysics)
Vacant
Professor in Physics (Material Physics)
David R McKenzie, BSc PhD *UNSW*
Professor in Physics (Electromagnetic Physics)
Ross C McPhedran, BSc PhD *Tas*
Professor in Theoretical Physics & CUDOS
Martijn de Sterke, MEng *Delft* PhD *Roch*
Professor in Astrophysics
Richard W Hunstead, BSc PhD
Associate Professor and Head of School
Brian W James, BSc PhD
Associate Professors
Timothy R Bedding BSc PhD
Senior Lecturers
Anne Green, BSc *Melb* PhD
Serdyar Kuyucak
Geraint Lewis, BSc *Lond* PhD *Camb*
John W O'Byrne, BSc PhD
J Gordon Robertson, BSc *Adel* PhD
Joseph Khachan, BSc PhD *UNSW*
Manjula D Sharma, Msc DAPh *SPac*
Lecturers
Ian J Cooper, BSc MPhys DipEd *UNSW*
Clive Baldock
Federation Fellows
Marcela M Bilek, BSc PhD *Camb* MBA *Roch*
Benjamin J Eggleton BSc PhD
Peter A Robinson, BSc PhD
Catherine Stampfl BSc (Hons) *La T*, PhD *La T*
Australian Professorial Fellow
Donald B Melrose, BSc *Tas* MPhil *Oxf*
Senior Research Fellows
David R Mills, BSc PhD *UNSW*
Jennifer A Nicholls, BSc Flin PhD Durh
Mark A Walker, *BA* Oxf PhD *Penn*
ARC Senior Research Fellow
Iver H Cairns, BSc PhD
Elaine M Sadler, BSc *Qld* PhD *ANU*
Kevin E Varvell, BSc *WAust* DPhil *Oxf*
Serguei Vladimirov, MSc PhD Mosc
ARC Queen Elizabeth II Research Fellows
Simon Johnston, BSc *Edin* PhD *Manc*
Michael S Wheatland, BSc PhD
Australian Research Fellow
Peter G Tuthill, BSc *Qld* BSc (Hons) *ANU* PhD *Camb*
Research Fellow
Dixon Kwok, BSc PhD *Camb*
S Reza Hashemi-Nezhad, MSc PhD *Birm*
Qinghuan Luo, BSc *NIHM* MSc *Heilongjiang* PhD
Yongbai Yin MSc *Nankai* PhD
ARC Postdoctoral Research Fellow
Andrew J Willes, BSc PhD
Postdoctoral Fellows
Kerrie Balla, BSc PhD *UNSW*
Stephen Bosi, BSc PhD *UNSW*
Christopher Dey, BSc PhD
Bee Kwan Gan, BSc PhD
Alexei Ivanoc, MSc *Tajik State* PhD *Mos*
Zdenka Kuncic, BSc PhD *ANU*
Manfred Lenzen, PhD Dip *Bonn*
Bo L Li, MSc *Nankai* PhD *JCUNQ*
Nigel Marks BSc PhD
Senthilvelan Murugaian, BSc *Madras* MSc MPhil Phd *Bharathidasan*
Andrew Norton, PhD *UNSW* BSc
Michael Proschek, BSc PhD *Vienna*
Maitreyee Roy, MSc MPhil rani Dorgauati PhD
Jeanette I Weise, BSc PhD *Melb*
Chengmin Zhang, MSc *Dalian* PhD *HK*
U2000 Postdoctoral Fellow
Alex Samarian, MSc *Kiev PhD RAS (Mosc)*
Level A Research only
Richard Tarrant, BA MSc
Julius Sumner Miller Fellow
Karl Kruszelnicki, BSc MBioMedE *UNSW* MB BS
Professional Officer
Duncan Campbell-Wilson, BSc *ANU*
School Administration Manager
Paul Harbon
Outreach Officer
Owen Shepperd, BSc *UNSW*
Physics Workshop Manager
Graham Mannes
Emeritus Professors
Maxwell Howard Brennan AO, HonDSc *Flin* BSc PhD
Richard Edward Collins, BSc PhD *NY*
John Davis, BSc PhD *Manc*
Harry Messel, CBE, BSc *Qu* PhD *NUI*
Bernard Y Mills, BSc ME DScEng,
Adjunct Professors
Russell D Cannon, MA PhD *Camb*
Michael M Gore AM, BSc PhD *Leeds*
Richard N Manchester, BSc *Cant* PhD *N'cle (NSW)*
Honorary Associate
Michael Breakspear, BA BSc MB BS
Honorary Professors
David J H Cockayne, MSc *Melb* DPhil *Oxf*
Colin JR Sheppard, MA PhD *Camb* DSc *Oxf*. Appointed 1989
Barry S Thornton AM,MSc PhD *UNSW* DSc
Honorary Reader
Graham Derrick, BSc *Qld* PhD
Honorary Associate Professors
Rodney C Cross, BSc PhD DipEd
Robert G Hewitt, BSc PhD
Veronica James OAM, BA BSc *Qld* PhD *UNSW*
Ian D S Johnston, BSc *Qld* PhD

Brian McInnes, BSc PhD *Qld*
Lawrence S Peak, BSc PhD
Murray Winn, BSc PhD *Birm*
Honorary Senior Lecturers
Roy Allen BSc PhD *Manc*
Ian M Basset, MSc PhD *Melb*
G Fergus Brand MSc *Otago* PhD
Carol Cogswell, MA MArch *Oregon*
Neil F Cramer, BSc PhD
David F Crawford, BSc PhD
Ian S Falconer MSc *NZ* PhD *ANU*
Bruce McAdam, MSc *NZ* PhD *Camb*
James B T McCaughan, MSc PhD
Ian Sefton, MSc
Robert Shobbrook, BSc *StAnd* PhD
William J Tango, BSc *Calif* PhD *Colorado*
Anthony J Turtle, BA PhD *Camb*
Juris Ulrichs, BSc PhD
Honorary Research Associates
Ara Astatrian, MSc *Yerevan State Uni* PhD *Mosc*
Andrew Bakich, MSc
Lewis T Ball, BSc PhD
Joss Bland-Hawthorn, BSc *AU Birm* PhD *Sus & RGO*
Lindsay C Botten, BSc *Tas* PhD
Pal Fekete, BSc PhD
Anthony Fischer-Cripps, BAppSc *UTS* PhD
Catherine Foley, BSc DipEd *Macq* PhD
Peter French PhD *Deakin* MSc
Julienne I Harnett, BA *Macq* DipT *Tas CAE* PhD
Rolf Howlett, BVSc PhD
Carole Jackson MA PhD *Camb*
David L Jauncey BSc PhD
Tim Langtry BS PhD *UNSW* MAppSc *UTS*
Maryanne Large BSc PhD *Dub*
James K Lowry BA *Rich (Virg)* MA *Coll William and Mary Virg* PhD *Cant*
Pamela McNamara B Sc *Swansea (Wales),* MSc *Sheff* PhD *Bangor (Wales)*
Phillip Martin BSc *AU(Birm),* PhD *ANU*
Graham Morrison BE PhD *Melb*
Bhaskar Mukherjee BE *Calc* MSc PhD *Technisch*
Andrew R Perker BSc *JM Liv*, PhD *Macq*
Christopher Rennie BSc *ANU* MBioEng *UNSW*
Michael Sholz BSc *Tuebingen* MSc PhD *Hamburg*
Geoff Smith MSc *Witw* PhD *UNSW*
Lindsey F Smith BSc PhD *ANU*
Nalalka Suchoweska, BSc *Birm* MSc *UTS* PhD
Mark J Wardle MSc *Auck* PhD *Prin*
Kinwah Wu, BSc *HK* MSc PhD *Louisiana*

■ Physiology

Professors
John Atherton Young, AO, BSc(Path) MD BS DSc *Qld*, FRACP FAA. Appointed 1976
Maxwell Richard Bennett, BE MSc PhD *Melb* DSc, FAA. Appointed 1983
David Grant Allen, BSc MB BS PhD *Lond*. Appointed 1989
Roger AL Dampney, PhD DSc. Appointed 1997
David I Cook, BSc(Med) MB BS MSc (the University of Sydney Medical Foundation Fellow). Appointed 1997
Brian J Morris, BSc *Adel* PhD *Monash* DSc. Appointed 1999
Reader
Joseph FY Hoh, PhD *ANU* BSc(Med) MB BS DSc
Associate Professors
Rebecca S Mason, MB BS PhD
Christopher O'Neill, BSc PhD *N'cle(NSW)* (Clinical Associate Professor at Royal North Shore Hospital)
Paul Pilowsky, BMedSc BMBS PhD *Flin* (Principal Research Fellow at NHMRC)
Simon Carlile, BSc PhD
Senior Lecturers
William D Phillips, BSc PhD
Lynne J Cottee, BSc PhD (half-time & Research Officer)
Miriam Frommer, PhD *Lond* BSc
Lecturers
Margot Day, BSc PhD – NHMRC
Francoise Janod-Groves, BSc *NSWIT* MApplSc *UTS*
Ann Goodchild, BSc PhD
Catherine Leamey,
Meloni Muir, BSc *Purdue* PhD *McG*
Dario Protti PhD *Buenos Aires*
Irene Schneider, BSc *UNSW* MSc(Prelim)
Research Fellows
Anuwat Dinudom, MSc PhD – Medical Foundation
Philip Poronnik, BSc PhD - ARC
Postdoctoral Research Fellows
Oliver Behrend
Yutaka Hosoda BSc PhD
Craig Jin BSc *Stanford* MSc *Caltech* PhD
Guo Jun Liu MD *Changchun, China* PhD *Gifu, Japan*
Andrea Markus BSc PhD *Mainz* (Germany)
Xiaohui Xiao, MD PhD *Beijing Med Uni*
Senior Research Officers
Chris Balnave, BSc PhD – NHMRC
Jouji Horiuchi BSc PhD Yamanashi
Lele Jiang, Beng MSc *Beijing* PhD
Permsak Komwatana, MS MCV PhD *UVa*
Yue-Kun Ju, MD *Xian* PhD *ANU*
Elizabeth Millar, BSc
Anne Nelson, BSc PhD – NHMRC
Angeles Sanchez-Perez, BSc PhD *Salamanca – NHMRC*
Qi-Jian Sun, BSc *China* PhD *ANU*
Nicola Winston, BSc *Lond* PhD *Cant* - NHMRC
Research Officers
Wenbing Huang
Qun Li, MM *Shanghai* PhD
William Lin BSc *China* MSc *China* MSc PhD
Christine Lucas, BSc PhD NHHMRC
Research Assistants
Anandhi Anandan, BSc *Bharathiyar Univ*
Paul Dickens, BSc(Adv)(Hons)
Ann Novello Hogarth, BSc PhD *NUS*
Suzanne Killinger, BMedSc(Hons)
Anan Lara, BSc *Univ Republic*
Helena Mangs MSc *Karolinskalast, Sweden,* Lic
Lauren O'Mullane, BBiomedSc *W'gong*
Anne Turnbull, BMedSc
Leonie Wood
CJ Martin Fellows
David Adams BSc *UTS PhD (Sanger Centre UK)*
Sam Solomon BBiotech *Flinders* PhD
Research Laboratory Staff
Judith O'Neill, RN BA(Health Sci-Nursing) *CSturt*
Class Laboratory Staff
John F Cossey, BTC *STC* – Senior Technical Officer (in-charge)
Adel Mitry, BVSc *Cairo* ACC *STC* – Senior Technical Officer
Electronics Workshop Staff
Vincent HW Cheung, HND *H K Polytechnic* CEI Part 2 UK – Senior Technical Officer
Computing Staff
John WA Dodson, HNC *Lond* MIEEIE I Eng – Computer Network Manager
Li Jin
Joseph Pridham
Department Manager
Louise Loomes, BA GradDipAcctg
Administrative Officers
Neville Dabboussy
Louise Harrison
Lali Jo Jacob
David Lawrey
Honorary Associate Professors
David F Davey, BSc MScMed PhD *McG*
Barry S Gow, MDS PhD, FRACDS
Honorary Senior Lecturer
Annick Ansselin, BA *Macq* MSc PhD
Honorary Associates
David le Couteur
Peter Maitz
Ainsley Marsh,, BAdvSc
Elaine Mulcahy, PhD
William Wang, MM BS

■ Psychology

Head of School and Professor of Vestibular Function (Personal Chair)
Ian S Curthoys, BA PhD *Monash*. Appointed 1997
McCaughey Professor of Psychology
Robert Alan Boakes, BA *Cant* PhD *Harv*. Appointed 1989
Professor of Clinical Psychology
Stephen W Touyz, BSc PhD *Cape T* BSc *Witw*. Appointed 1996
Professors
Sally Andrews, BA PhD *UNSW*. Appointed 2002
Alex Blaszczynski, MA PhD *UNSW*. Appointed 2001
Associate Professors
David Grayson, BA PhD
Iain McGregor, MA *Oxf* PhD
Joel B Michell, BA PhD
R F Soames Job, BA PhD
Leanne Williams, BSSc BA PhD *NE*
Senior Lecturers
Diana Caine, BA *NE* BSc MA *Melb* PhD
Colin Clifford, MA *Camb* MSc *Sussex* PhD *Lond*
Alan E Craddock, BA PhD
Justin Harris, BSc PhD *UNSW*
Pauline Howie, BA PhD *UNSW*
Caroline Hunt, BSc MPscyhol PhD *UNSW*
David J Livesey, BSc PhD *WAust*
John M Predebon, BA PhD
Michael B Walker, BSc *UWA* BA *Adel* DPhil *Oxf*
Louise Sharpe, BA MPsych PhD *Lond*
Lecturers
Margaret A Charles, BA PhD
Karen Croot, BA *Macq* PhD *Camb*
Anthony Grant, BA MA *Macq* PhD *Macq*
Julie Hatfield, BA PhD
Fiona Hibberd, BA PhD
Sunny Lah, BA *Zagreb* MSc PhD *Macq*
Caleb Owens, BSc PhD *UNSW*
Elizabeth Rieger, BA MClinPsych,PhD
Tatjana Seizova-Cajic, MPsych *Belgrade*
Marianna Szabo, BA *UNSW* PhD *UNSW*
Fiona White, BA PhD
Associate Lecturers
Michael Cavanagh, BA
David Horry, BSc *Macq*
Sabina Kleitman, BA
Gerry Pallier, BA MA
Gina Sartore, BSc Grad Dip Sci (Comm) *ANU*
Professional Officer
Kate Baggs, BA MPsych
Sadhana Raju, BSc
Jason Gallate, BA
Manager, Finance and Administration
Sandra Cheng, BBus *UTS* MCom *CPA*
Manager, Teaching Administration
Anne Kwan, BA DipEd *CUHK*
Administrative Assistants
Belinda Ingram, BSc
Rachel Moerman, BA
Tracy Watts, BA *Well*
Administrative Assistants
Cindy Li, DipComSec *HKPU*
Keiko Narushima, BSc BA
Head of Computer and Technical Services
John Holden
Manager of Computer Services
Andrew Cartwright, BSc PhD
Computer Systems Officers
Ethel Harris, DipEd *Karlstad*
Nenad Petkovsky BSc EE *Belgrade*
Senior Technical Officers
Warren Davies
Raja Vijayenthiran
Animal House Manager
Darek Figa, DipAppSc(Animal Technology) *SIT* MIAT *UK*
Animal House Attendants
Deborah Brookes
Kerry Smith
Emeritus Professor
Philip Ley, BA *Manc* DipPsych *Lond* PhD *Liv*
Honorary Professors
Pierre J Beumont, MB ChB *Pretoria* DPM (RCP) *Lond* MRCP *Edin* M Phil *Lond* MRCPsych *UK* MSc *Oxf,* FRC PsychUK FRACP FRANZCP FRCP *Edin*
Lazar Stankov, MA Belgrade PhD Denver
Gillian Straker-Bryce, BA MClinPsych PhD *Wits*
Honorary Associate Professor
Helen Beh, BA PhD *NE*
Cyril R Latimer, BA PhD
David Kavanagh, BA MA PhD *Stan*
Honorary Reader
Dale M Atrens, BA *Windsor* MA *Hollins* PhD *Rutgers*
Honorary Senior Lecturers
Olga Katchan, BA
Terence McMullen, BA PhD
Roslyn Markhan, BA MA PhD
George Oliphant, BA PhD
Alison M Turtle, MA
Honorary Lecturer
James Dalziel, BA PhD
Honorary Clinical Senior Lecturers and Lecturers
Clive Allcock, BSc MB ChB *NZ*
Susan Ballinger, BA *Macq* PhD
Nora Breen, BSc MClinPsych *Melb*
Phyllis Burtow, MClinPsych ANU PhD
Sandra Heriot, BA *Wgtn* MA *Akld* PhD *Waikato*
Helen McCathie, BA MClinPsych PhD
Michael Perdices, BA *Melb* PhD *UNSW*
Reinhard Ronnebeck, BA *Mich* MA PhD *Houston*
Timothy Sharp, BSc MPsych *UNSW* PhD
Stephanie Whitmont, BA MPsych PhD
Honorary Associates
Laurel Bornholt, BA *Melb* PhD *Macq*
Robyn Boyle, BA PhD *Macq*
Marita Brack, BA MPsych
Julie Braithwaite, BA MClinPsych *Macq*
Michael Breakspear, BSc BA MBBS PhD
Phyllis Butow, MClinPsych *ANU* PhD
Anna Cohen, BA MPsych *Woll*
Carissa Coulston, BSc *ANU* MPsych
Sarah Elders, BSc *Ulster* DClinPsych *N'cle*
Paul Gertler, BSc *N'cle* MPsych
Stuart Godley, BSc *UNSW* PhD *Monash*
Catherine Hicks, BA MA *Port Eliz*
Brian Kearney, BA MPsych
Susan Kennedy, BA MPsych
Julie Kozyk, BSc *UNSW* MPsych
Claire Lamphugh, BA *Exe* PhD *S'ton*
Glen Larner, BA DipPsych
Jae Lee, BSc MPsych *UNSW*
Michelle Lovenfosse, MA *W'gong*
Justine Lum, BA MPsych
Anna Mandalis, BBehSc MclinPsych PhD *LaTrobe*
Jane McGregor, BA *Macq* MClinPsych
Robin Murray, BA MA *George Wash* PhD *Calif*
Alison O'Neill, BA MClinPsych
Robert Preedy, BA MPsych *Woll*
Nadine Reynolds, BA *N'cle* MPsych
Paul Rhodes, BSc *Lancs* MClinPsych *Macq*
Elizabeth Rieger, BA MClinPsych
Geraldine Robinson, MSc PhD *Balt*
Claudia Sanniable, BA MPsych *N'cle(NSW)* PhD *UNSW*
Louise Shepherd, BA MPsych
Margaret Tadros, BA MPsych
David Watson, BSocSc MAClinPsych *Port Eliz*
Ann Wignall, BA *Tas* MClinPsych *UNSW*

■ Other units

Australian Key Centre for Microscopy and Microanalysis

Associate Professor and Director
Simon P Ringer, BAppSc *SA* PhD *UNSW*, FIEAust
Associate Professor
Guy C Cox, MA DPhil *Oxf*

Associate Professor and Director, NWG Macintosh Centre for Quaternary Research
Michael Barbetti, BSc *WAust* MSc Manit PhD ANU
Senior Lecturers
Allan S Jones, BAppSc *UTS* PhD *UNSW*
Huai Y Zhu, BSc *Inner Mongolia* MSc *Nankai* PhD *Antwerp*
Lecturers
Vicki J Keast, BSc *USyd* MS PhD *Lehigh*
Carolyn Dillon BSc (Hons) *USyd* PhD *USyd*
Research Associates
Jin Zou, BSc MEng *Beijing* PhD
Anya Salih, MSc *Khartoum* PhD
Dan Penny, BA(Hons) *Monash*, PhD *Monash*
Dr Pall Thordarson, BSc, *Iceland*, PhD, *USyd*
Dr Zhaohui Han, PhD
Associate Lecturers
Wendy Reade, BAppSc *Canberra* GDipAncientDoc *Macq* BA
Kyle Ratinac, BE PhD *UNSW*
Lisa Stadtmueller
Technical and Professional Staff
Dennis M Dwarte, BSc *UNSW* MSc (Lab. Manager)
Rosie Hicks (General Manager)
Ian J Kaplin, MSc PhD *UNSW* BSc(CE)
Peter Hines, BME, PhD
Michael D Speak, DipCompSci UNE, NZCE REA(*NZ*)
Anne Simpson
Eleanor P Kable, BSc *Griff* MSc *Qld*
Shaun Bulcock, MSc *Melb*
Adam Sikorski, MMechEng *Warsaw Tech Univ*
Anthony Romeo, BSc *Melb*
Toshi Arakawa
Tom Joyce
Bruno Melanie
Administrative Staff
Ronald Cheong
Rosemary Perrett

Centre for Research on Ecological Impacts of Coastal Cities

Director
Antony J Underwood, PhD DSc Brist, FAA FLS FIBiol FAIBiol CBiol
Deputy Directors
M Gee Chapman, BSc Natal MSc PhD
Athur Dye, BSc PhD *Pt Eliz* MPhil *Stell*
Senior Research Fellows
Theresa Lasiak, BSc *Liv* PhD *Pt Eliz*
Postdoctoral Fellows
Richard Murphy, BSc *Lond* PhD *R'dg*
Craig Styan, BSc PhD *Adel* (U 2000 Research Fellow)
Trevor Tolhurst, BSc PhD *StAnd*
Senior Support Staff
Elizabeth Sakker, BSc PhD DipEd *UNE* MEdAdmin *UNSW*
Research Support Staff
David Blockley BSc (Hons)
Simon Gartenstein, BSc(Hons)
Sean Gaudron BA
Andres Grigaliunas, BSc *Jorge Tadeo Colombia* GradDip(IntEnvManag) *Los Andes Colombia*
Penny Harrington, AdvCertAccounting AssocDipWelfareWork *TAFE*
Grant Kaplan, BAppSc *SCU*
Elena Lazzorotto, BAppSc(Hons) BSc(Hons) *Deakin*
Craig Myers, BSc (Hons)
Amy Palmer, BSc
Julie People BSc (Hons) GradDipEnvSc
Hwee Ying Pulford, BAppSc *RMIT*
Rene Reinfrank, BAppSc *Aust Maritime Coll*
Matthew Sage, BSc GradDipEnvSci
Honorary Appointments
Brian L Bayne, BSc PhD *Wales*
L Benedetti-Cecchi, PhD *Pisa*
K R Clarke, BSc PhD *Plymouth*
J S Gray, BSc *Lond* PhD *Wales*
Stephen J Kennelly, PhD DSc
M J Keough, BSc PhD *Adel*
G C B Poore, PhD *Cant*
R M Warwick, PhD DSc *Exe*

Coastal Studies unit

Director
Andrew D Short, MA *Hawaii* PhD *Louisana State* BA
Members
Eleanor M Bruce, PhD *WAust*
David E M Chapman, MEngSc *UNSW* BA PhD
Peter J Cowell, BA PhD

History and Philosophy of Science unit

Director
Rachel A Ankeny, BA *St John's College* MA PhD *Pitt*
Lecturers
Ofer Gal, BA *Tel-Aviv*, MA *Tel Aviv*, PhD *Pitt*
Jason Grossman, MA *Cantab* MPH
Hans Pols, MA *York,* MA *Groningen*, PhD *Penn*
Visiting Professor
Evelleen Richards, BSc *Qld* MA PhD *UNSW*
Alan Chalmers, BSc *Brist* MSc *Manc* PhD *Lond*
Visiting Lecturer
Susan Hardy, BA PhD *UNSW*
Administrative Assistant
Gail Stewart, BA GDipSecStudies
Research Assistant
Fiona Mackenzie, B.AppSc, BSc(Hons)
Honorary Associates
Peter Anstey, BA PhD
Alison Bashford, PhD
David Braddon-Mitchell, BA PhD *ANU*
Jullian Holland BA DipMuseumStud, MscSoc
Stephen Gaukroger, BA *Lond* BA PhD *Cantab*, FAHA
Stephen Ross Leeder, BSc(Med) MB BS PhD FRACP FFPHM, FAFPHM
Roy MacLeod, AB *Harv* PhD *Cantab* FAS FASSA FRHistS
John Miles Little, AM, MD MS, FRACS
Gabrielle O'Sullivan, BSc *Dub* PhD *Lond*
Huw Price, BA *ANU* MSc *Oxf* PhD *Cantab*, FAHA

Immunology unit

Unit Head and Professor
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Senior Lecturer
Helen Briscoe, BSc PhD *Edin*
Robert H Loblay, MB BS PhD, FRACP
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Bernardette M Saunders, BSc PhD *Melb*
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Jason Compton, ADiplAppSc TechCertPhotography
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Professor Antony Basten, AO, MB BS DPhil *Oxf*, FAA FTSE FRCP FRACP FRCPA
Associate Professor Gary M Halliday, BSc PhD *Monash*
Clinical Senior Lecturer Stephen Adelstein, MB BCh PhD, FRACP FRCPA
Clinical Senior Lecturer Roger J Garsia, MB BS PhD, FRACP FRCPA
Alan Baxter, MB BS PhD *Melb*
G Alex Bishop, MScAgr PhD
Barbara D Fazekas de St Groth, BSc(Med) PhD *Melb* MB BS
Mark D Gorrell, BSc PhD *ANU*

Key Centre for Polymer Colloids

Director
Robert G Gilbert, PhD *ANU* BSc, FAA FRACI CChem.
Principal Research Fellow and Development Manager
Brian Hawkett, BSc DipEd PhD
Scientific Projects and Education Officer
Christopher Fellows, BSc PhD JamesCook
Postdoctoral Research Fellows (Level A Academics)
In-Woo Cheong, MSc PhD *Yonsei*
Christopher J Ferguson, BSc PhD *Cant*
Robert J Hughes, BSc PhD *Flin*
Thi Thuy Binh Pham, MSc *Hanoi*
Paul Perry, BSc (Hons) PhD *Hull*
Laboratory Manager
Jelica Strauch, BAppSc (Materials) (Hons) *UTS*

Postdoctoral Research Fellow & Senior Technical Officer
Hank de Bruyn, BSc PhD
Technical Officers
Stephen Wood, BE (Chem)
Duc Ngoc Nguyen, BSc (Hons) *UWS*
Jeffrey Castro, BSc Adv (Hons)
Senior Administrative and Finance Officer
Jacqui Harrison, BA BA(Police Studies) GradDipArts(Music) GradDipArts(Asian Studies) *Monash*, BA(Defence Studies) *Deakin*, CertBusAdmin&Acc *OTEN* BA (Hons)
Administrative Assistant
Patricia Matterson
Honorary Associate Professor
Michael Montiero, MSc PhD *Griff*
Honorary Lecturer
Richard Hughes, BSc
Honorary Research Associates
Peter Hidi, MSc *Bud,* FRACI MIACIS
David Sangster, BSc (Hons) FRACI

University of Sydney Institute of Marine Science

Director
Dietmar Müller, BSc *Kiel* PhD *Calif*
Members
Eleanor M Bruce, PhD *WAust*
Maria Byrne, BSc *Galway* PhD *VicBC*
Peter J Cowell, BA PhD
Rosalind T Hinde, BSc PhD
Michael Glen Hughes, BSc PhD
Ian Jones
Jock B Keene, BAgEc ME PhD *Calif* BSc
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Antony J Underwood, PhD DSc Brist, FAA FLS FIBiol FAIBiol CBiol
Administrative Officer
Craig Barnes, BSc PhD
Administrative Assistant
Maria Cardona

9 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 Web site: www.usyd.edu.au/study/scholarships.shtml and from the Research Office Web site: www.usyd.edu.au/su/reschols/welcome.html.

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 Web sites 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.

■ Undergraduate Prizes and Scholarships

Undergraduate prizes and scholarships

Award	Value	(p.a.)	Tenure (yrs)	Number	Brief Description
Scholarships awarded by the Faculty to students entering first year					
Science Alumni Entry Scholarship	$1000		5	6	Awarded to highly ranked University of Sydney Undergraduate Scholarship applicants who do not obtain one of these scholarships. Minimum UAI 98.
Science Entry Scholarship	$2000		1	6	Awarded to highly ranked University of Sydney Undergraduate Scholarship applicants who do not obtain one of these scholarships. Minimum UAI 95.
Science Alumni Achievement Scholarship	$1000		2	7	Awarded to highly ranked University of Sydney Undergraduate Scholarship applicants who do not obtain one of these scholarships. Minimum UAI 95.
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.
Environmental Science Entry Scholarship	$2000		1	1	Awarded automatically on the basis of UAI to students entering the BSc (Environmental) . 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.
Information Technology Entry Scholarship	$2000		1	2	Awarded automatically on the basis of UAI to students entering the BSCT or BIT. Cannot be held with other scholarships of equal or greater value.
Liberal Studies Entry Scholarship	$2000		1	1	Awarded automatically on the basis of UAI to students entering the BLibStud. 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	Awarded automatically on the basis of UAI to students entering the BMedSc. Cannot be held with other scholarships of equal or greater value.
Physics Entry Scholarship	$2000		1	2	Awarded automatically on the basis of academic merit in the HSC to intending BSc Physics majors. 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).
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.
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 with Distinction	$8000		5	approx 10	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 98.

Undergraduate prizes and scholarships

University of Sydney Scholarships with Merit	$5000	5	approx 24	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.
University of Sydney Scholarships	$3000	1	approx 60	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.
University of Sydney Outstanding Achievement Scholarships	$5000	5	Varies	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.
Access Scholarships	$3000	5	approx 60	Access Scholarships are available to students who demonstrate academic ability as well as meeting the criteria of one or more of the following categories: financial disadvantage, disability or rural/remote area. Applications to the Scholarships Unit by 30 September in the year preceding first enrolment.
Group of Eight (G08) Access Scholarships	$3000	4	approx 4	Awarded to school leavers on the basis of academic merit and financial need as part of an initiative launched in 2001 by the group of Australia's eight leading research universities (the Go8). Scholarship holders may apply to transfer to another Group of Eight University after successfully completing the first year of undergraduate study. Applications to the Scholarships Unit by 30 September in the year prior to enrolment.
Bruton Educational Trust Scholarship	$10000	5	1	Scholarship to support candidate relocating from regional NSW to attend any degree at the University of Sydney. Awarded on the basis of the NSW HSC examination results, financial need and other criteria. Applications to the Scholarships Unit in the year preceding enrolment.
Barker Scholarship No. III	$600	1	1	Awarded automatically after enrolment for proficiency in Mathematics in the HSC. Must enrol in 12 credit points of Junior Mathematics in the Faculties of either Arts, Engineering or Science.
E. Trenchard Miller Memorial Scholarships	$1000	5	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.
Horner Exhibition	$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 Junior Mathematics.
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				
Helen Beh Award for Citizenship	$250	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 Honour List		1		Students of the Faculty of Science (including students in the Bachelor of Liberal Studies) earn a place on the Dean's Honours List 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	$3000	1	3	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.
Brian Rawson Memorial Prize	$250	1	1	Most improved performance from Junior to Intermediate Science.
Henry Chamberlain Russell Prize	$1400	1	1	Essay, thesis or research report on Astronomy.
Korner Prize	$100	1	1	Awarded for proficiency in the Intermediate year of the Bachelor of Medical Science
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.
Science Staff Prize	$300	1	Varies	On academic merit to full time candidates in an award course in the Faculty of Science.
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				
Continuing Undergraduate Scholarship	$2000	1	approx 60	Awarded without application to continuing undergraduate students in the Faculty of Science on the basis of merit.
Full Fee Scholarship	$4000	1	Varies	Awarded on the basis of equity to new students and continuing students. Valued at $4000 to be offset against course fees.
Honours Scholarship	$2000	1	approx 60	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 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				

Undergraduate prizes and scholarships

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				
Mary Besly Memorial Prize	$100		1	Merit in Intermediate or Senior invertebrate zoology.
Ilma Brewer Prize	$600		1	Excellence in botany or plant sciences honours.
G.S. Caird Scholarship in Botany	$650	1	1	Merit in Senior plant biology to a student proceeding to plant biology honours.
G.S. Caird Scholarship in Zoology	$650	1	1	Merit in Senior animal biology to a student proceeding to animal biology honours.
Eleanor Chase Memorial Prize	$200		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	$160		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	$250		1	For excellence in the subject of Zoology to a student gaining first class honours in Biology.
John H. Elliott Memorial Prize	$150			For merit in an honours thesis on animal biology.
Haswell Prize	$120		1	Proficiency in 24 credit points of Senior zoology.
E.N. (Ted) O'Reilly Memorial Prize	$275		1	Merit in Senior plant physiology.
Eva Saunders Memorial Prize	$60		1	To a female student for merit in Intermediate or Senior plant biology.
Slade Prize in Junior Biology	$80		1	For proficiency in Junior biology practicals.
Professor Spencer Smith-White Prize	$200		1	For merit in genetics honours.
Gabriella Wittman Prize	$140		1	Proficiency in Senior genetics.
Chemistry				
Arthur Hollis Memorial Prize	$150		1	For excellence in Intermediate Chemistry.
Australia-USA Foundation Prize	$250		1	Greatest improvement between Junior and Intermediate Chemistry.
C.H. Wilson Prize	$70		1	Highest grade in Organic Chemistry Honours.
Charles E. Fawsitt Prize	$120		1	Proficiency in Junior Chemistry.
Edna Maude Goulston Prize in Organic Chemistry	$275		1	Merit in Organic Chemistry in the Honours year.
Frank E. Dixon Scholarship	$650	1	1	Merit in Senior Chemistry for a student proceeding to Honours.
G.S. Caird Scholarships (in Chemistry)	$800	1	3	Merit in Senior Chemistry for a student proceeding to Honours.
Hush Prize in Theoretical Chemistry	$350		1	Merit in Senior Theoretical Chemistry.
Inglis Hudson Scholarships	1 x $300 & 2 x $150	1	3	Merit in Senior Chemistry for a student proceeding to Organic Chemistry Honours.
Iredale Prize	$95		1	For merit in Intermediate Chemistry.
Janet Elspeth Crawford Prize In Chemistry	$1400		1	To a female graduate for merit in Chemistry Honours.
Levey Scholarship No. 2	$525	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	$80		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.
Environmental Science				
University of Sydney Prize for Junior Environmental Science	$1000		1	For the best performing student in the two Junior ENVI units of study in the BSc (Environmental) degree program.
University of Sydney Prize for Intermediate Environmental Science	$1000		1	For the best performing student in the two Intermediate ENVI units of study in the BSc (Environmental) degree program.
University of Sydney Prize for Senior Environmental Science	$2000		1	For the best performing student in the two Senior ENVI units of study in the BSc (Environmental) degree program.
University of Sydney Achievement Prize in Environmental Science	$500		1	For the student who shows the greatest improvement in performance when comparing the results for the Senior ENVI units of study to those of the Intermediate ENVI units of study. This prize cannot be awarded in conjunction with the Senior Environmental Science prize.
University of Sydney Prize for Honours in Environmental Science	$500		1	For the best performing student in the honours year of the BSc (Environmental) degree program.
Geosciences				
AusIMM: Charles Marshall Thesis Prize			1	Proficiency in Honours in a mining related field.

Undergraduate prizes and scholarships

AusIMM: Mining and Metallurgical Bursaries	$500 + $100 book voucher		3	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	$50		1	For merit in Intermediate Geology fieldwork.
G.S. Caird Scholarship (in Geography)	$650	1	1	For merit in Senior Geography.
Leo A. Cotton Prize in Exploration Geophysics	$80		1	For proficiency in Senior year studies in the field of Exploration Geophysics.
Deas-Thomson Scholarship in Mineralogy	$1000	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	$600	1	4	Merit in first semester Junior Geology.
Earth Resources Foundation Second Year Scholarships	$800	1	4	For merit in Junior Geology to students proceeding to Intermediate Geology.
Earth Resources Foundation Third Year Scholarships	$1000	1	3	For merit in Intermediate Geology to students proceeding to Senior Geology and/or Geophysics.
Earth Resources Foundation Honours Year Scholarships	$1000	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	$275	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	$90		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.
MIM Explorations Honours Scholarship in Economic Geology	$6000	1	1	A scholarship for an honours student to undertake research in economic geology, or exploration geophysics. Students should send an application stating why they feel their results and future potential are deemed to be outstanding; including their past academic record together with a brief c.v., and also indicate the project they wish to undertake. Applications must be endorsed by the School of Geosciences. Applications close 31 January each year.
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	$700	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	$210		1	Awarded to the Senior Geology student who submits the best field report.
Quodling Testimonial Prize	$200		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 Geology Practical	$100		1	Proficiency in Junior Geology practicals.
Slade Prize in Intermediate Geology Practical	$80		1	Proficiency in Intermediate Geology practicals.
University Prize for Geology	$10		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	$100		1	Merit in Intermediate History ad Philosophy of Science.
Ian Langham Memorial Prize	$150		1	Merit in Senior History and Philosophy of Science.
Information Technologies				
Accenture Prize	$1000		1	Established in 2000 with the offer of an annual donation by Andersen Consulting. The prize will be shared equally by the students in that group which is judged to have performed its project in ISYS3207 Information Systems Project at the highest professional standard.

Undergraduate prizes and scholarships

G.S. Caird Scholarship (in Computer Science)	$650	1	1	Awarded for proficiency in Intermediate Computer Science. The scholar is required to attend Senior Computer Science during tenure of the scholarship.
CISCO Prize	$500		1	The prize will be awarded annually to the student with the best overall result in the Senior unit of study Networked Systems.
Foundation for Information Technology Prizes	$300 and $200		2	One prize, valued at $300, shall be awarded annually to the most proficient student in Junior Computer Science and the other prize, valued at $200, shall be awarded to the next most proficient student, provided that the work is of sufficient merit.
Foundation for Information Technology Portfolio Entry Prizes	$500 and $250		2	Awarded annually to the two students who enrol in the BIT, BCST or BCST(Adv), who have submitted the highest quality portfolios of their programming work as an additional selection criterion. $500 (first prize), $250 (second prize).
Ian Jackson Memorial Prize	$50		1	Awarded for proficiency in Senior Computer Science.
Information Technology Entry International Scholarship	$2000	1	2	Up to two Scholarships for first year international candidates for the BCST, BCST(Advanced) or BIT.
Professor John Rosenberg Prize for Excellence in Computer Science	$550		1	The prize will be awarded to the student with the most outstanding performance in senior systems units of study.
Soprano Software Engineering Prize	$1000		1	For excellence in Computer Science or Information Systems honours.
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 STAT3905 Markov Processes Advanced who demonstrates the greatest proficiency.
Australian Federation of University Women (N.S.W.) 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	$600	1	1	Awarded for proficiency in Intermediate Mathematics. The scholar is required to have attended 48 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.
Barker Scholarship, No. II	$600	1	1	Awarded for proficiency in Junior mathematics. The scholar is required to attend 24 credit points of Intermediate units of study in the School of Mathematics and Statistics during the tenure of the scholarship.
Tim Brown Prize No. 1	$130		1	For proficiency in 16 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 & 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 & Statistics to the 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	$200		1	Awarded for creativity and originality in any undergraduate Pure Mathematics unit of study.
Joye Prize in Mathematics	$5650		1	To the most outstanding student completing fourth year Honours in Applied Mathematics, Pure Mathematics or Mathematical Statistic
Merrill Lynch Scholarship No.I	$3000	1	1	To the student who enrols full-time in Honours in the School who has shown the greatest academic merit in Mathematics and Statistics. May not be held together with another award offered by the School of Mathematics and Statistics of equal or greater value.
Merrill Lynch Scholarship No.II	$2000	1	1	To the student who enrols full-time in Honours in the School who has shown great academic merit in Mathematics and Statistics. May not be held together with another award offered by the School of Mathematics and Statistics of equal or greater value.
Merrill Lynch Scholarship No.III	$1000	1	1	To the student who enrols full-time in Honours in the School who has shown great academic merit in Mathematics and Statistics. May not be held together with another award offered by the School of Mathematics and Statistics of equal or greater value.
Norbert Quirk Prizes	$130		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),
Veronica Thomas Prize	$100		1	For proficiency in the combined units of study STAT 1021 and 1022.
Wadsworth Publishers Prize	$125		1	For proficiency in Junior Mathematics.
Molecular and Microbial Biosciences				
Allman Prize	$300	1	1	Awarded annually to the student in the clinical stream on the Honours year in the BSc(Nutrition) who obtains the top aggregate mark in NUTR 4001 and NUTR 4002.

Undergraduate prizes and scholarships

G.S. Caird Scholarship (in Biochemistry)	$650	1	1	Awarded for greatest proficiency in the units of study MBLG 2001 and either BCHM 2011 or BCHM 2002 or BCHM 2902.
Roslyn Flora Goulston Prize	$530		1	Awarded for greatest proficiency in BCHM 3001 and either 3002 or 3902 OR BCHM 3901 and either 3902 or 3002 to an undergraduate in science who intends proceeding to a BSc degree with honours in that subject.
Sigma-Aldrich Molecular Biotechnology Second Year Award	$500	1	1	The award recognises the best overall grade performance in MOBT 2002 and MOBT 2001 by students enrolled in the BSc (Molecular Biotechnology) undergraduate degree.
Sigma-Aldrich Molecular Biotechnology Third Year Award	$500	1	1	The award recognises the best overall grade performance in MOBT 3001 and MOBT 3002 by students enrolled in the BSc (Molecular Biotechnology) undergraduate degree.
Slade Prize in Intermediate Biochemistry	$80		1	Awarded for proficiency in the units of study MBLG 2001 and either BCHM 2011 or BCHM 2002 or BCHM 2902.
Sydney Chinese Association Prize	$100		1	To the student in the Faculty of Science or Agriculture who shows the greatest proficiency in the units of study MICR (3001 or 3901) and (3002 or 3902), or Agricultural Microbiology MICR 3102 or in TSP units.
Pharmacology				
Dorothy Thorp Prize in Science Communication	$200		1	Merit in Pharmacology Honours.
Roland H. Thorp Prize	$200		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	Awarded annually to a student for proficiency in practical work in Intermediate Physics.
Walter Burfitt Scholarship No. II	$750		1	Awarded annually, on the recommendation of the Head of the School of Physics, for proficiency in Senior Physics in the Faculty of Science.
Cadbury - 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 16 credit points of Intermediate Physics.
Cadbury - 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 24 credit points of Senior Physics.
Cadbury - Julius Sumner Miller Scholarships for Academic Excellence No. 3	$900	1	2	To the most proficient students in Senior Physics provided that their work is of sufficient merit and they enrol in 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.
Denison Postgraduate Award	$1500	3	1	To the most academically-able new PhD student who has met the eligibility criteria for the APA/UPA awards
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 Scholarships	$825	1	1	Awarded for proficiency in Junior Physics to a student in the Faculty of Arts, Science or Engineering who enrols in 16 credit points of Intermediate Physics.
Science Foundation for Physics Scholarships No. 1	$750	1	5	Up to five scholarships for proficiency in Junior Physics, provided that the student enrols in 16 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 enrols in 24 credit points of Senior Physics.
Science Foundation for Physics Scholarships No. 3	$900	1	5	Up to five scholarships for proficiency in Senior Physics, provided 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.
Slade Prize in Intermediate Physics Practical	$250		1	Proficiency in Intermediate Physics practicals.
Smith Prize	$200		1	Awarded to the best undergraduate in Junior Experimental Physics.
W.I.B. Smith Prize	$300		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	$1500	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.
Physiology				
Claude Bernard Prize	$150		1	Proficiency in PHSI 3003/3903.
Colin Dunlop Prize	$100		1	Merit in Physiology Honours.
Frank Cotton Memorial Prize	$250		1	For merit in PHSI 3004 Human Cellular Physiology or PHSI 3904 Human Cellular Physiology (Advanced)
Y E Knight Neuroscience Essay Prize	$100		1	For the best essay or report in PHSI 3001/3901.
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.

Undergraduate prizes and scholarships

Blanka Buring Prize	$400		1	Awarded to the student enrolled in Arts who demonstrates the greatest proficiency in a minimum of 32 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	$650	1	1	Awarded for proficiency in Psychology 1001 and 1002. The scholar is required to attend PSYC 2111 and 2112, PSYC 2113 and 2114.
Lithgow Scholarship No. VI	$650	1	1	Awarded for proficiency in PSYC 2111 and 2112, PSYC2113 and 2114. The scholar is required to attend a minimum of 32 credit points of Psychology 3000 level units of study.
Lithgow Scholarship No. VII	$650	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.

Prize compositions

Details of these may be obtained from the Scholarships Office with which 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.

■ Postgraduate Prizes and Scholarships

Research Office

Postgraduate and intending postgraduate research students are advised to consult the Research Office Web site for comprehensive information on a wide range of scholarships available: www.usyd.edu.au/su/reschols/welcome.html.

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 Main Quadrangle.

Postgraduate prizes and scholarships

Award	Value (p.a.)	Tenure (yrs)	Number	Brief Description
Scholarships and prizes awarded by the University				
Australian Postgraduate Awards (APAs)	$17609	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, it's contribution to its field and its likelihood of timely completion.
Chemistry				

Postgraduate prizes and scholarships

Agnes Campbell Prizes	Varies			For excellence in Organic Chemistry in either an honours year or in a research Masters or PhD.
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	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	$1200	1	1	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				
John Coutts Scholarship	$2750	3	1	Awarded 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				
Beckman-Coulter Molecular Biotechnology Postgraduate Award	$1000	1	1	For the best overall grade performance by a postgraduate student enrolled in MOBT 5101 and MOBT 5102.
The Jo Rogers Memorial Prize	Varies		1	Awarded annually to the top student in the final year of the Master of Nutrition and Dietetics course at the University of Sydney.
Physics				
Denison Postgraduate Award	$17609	3	1	Scholarship holders must be enrolled for a full time Doctoral postgraduate research degree at the University of Sydney.
Denison Merit Award	Varies	3.5	1	Scholarship holders must be enrolled for a full time Doctoral postgraduate research degree at the University of Sydney.
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	$250		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	$250		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.
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.

10 General University information

See also the Glossary for administrative information relating to particular terms.

Accommodation Service

The Accommodation Service assists students to find off-campus accommodation by maintaining an extensive database of suitable accommodation close to the Camperdown/Darlington campus or within easy access via public transport.

Level 7, Education Building, A35
The University of Sydney
NSW 2006 Australia
Phone: (02) 9351 3312
Fax: (02) 9351 8262
Email: accomm@stuserv.usyd.edu.au
Web: www.usyd.edu.au/accom

Admissions Office

The Admissions Office is responsible for overseeing the distribution of offers of undergraduate admission and can advise prospective local undergraduate students regarding admission requirements. Postgraduate students should contact the appropriate faculty. If you are an Australian citizen or a permanent resident but have qualifications from a non-Australian institution, phone (02) 9351 4118 for more information. For enquiries regarding special admissions (including mature-age entry), phone (02) 9351 3615. Applicants without Australian citizenship or permanent residency should contact the International Office.

Student Centre
Ground Floor, Carslaw Building, F07
The University of Sydney
NSW 2006 Australia
Phone: (02) 9351 4117 or (02) 9351 4118
Fax: (02) 9351 4869
Email: admissions@records.usyd.edu.au

Applying for a course

Local applicants for undergraduate courses and programs of study

Citizens and permanent residents of Australia and citizens of New Zealand are considered local applicants for the purpose of admission and enrolment. If you are in this group and you wish to apply for admission into an undergraduate course, you would generally apply through the Universities Admissions Centre (UAC) by the last working day of September of the year before enrolment. Go to www.uac.edu.au for more information.

Note that some faculties, such as Pharmacy, the Sydney Conservatorium of Music and Sydney College of the Arts, have additional application procedures.

Local applicants for postgraduate courses and programs of study

Citizens and permanent residents of Australia and citizens of New Zealand are considered local applicants for the purpose of admission and enrolment. Application is direct to the faculty (not to the department, Student Centre or the Admissions Office) which offers the course in which you are interested. Application forms for postgraduate coursework, postgraduate research and the Master's qualifying or preliminary program, or for non-award postgraduate study can be found at www.usyd.edu.au/su/studentcentre/applications/applications.html.

Please note that not all faculties use these application forms for admission into their courses. Some faculties prefer to use their own specially tailored application forms rather than the standard ones. Please contact the relevant faculty.

International applicants for all course types (undergraduate and postgraduate)

All applicants other than Australian citizens, Australian permanent residents and citizens of New Zealand are considered to be international applicants. In the vast majority of cases applicants apply for admission through the University's International Office. All of the information international applicants need, as well as downloadable application forms, is available from the Web site of the International Office, www.usyd.edu.au/io.

Assessment

For matters regarding assessment, refer to the relevant department or school.

Careers Information

Provides careers information and advice, and help in finding course-related employment both while you're studying and when you commence your career.

Careers Centre
Ground Floor, Mackie Building, K01
The University of Sydney
NSW 2006 Australia
Phone: (02) 9351 3481
Fax: (02) 9351 5134
Email: info@careers.usyd.edu.au
Web: www.careers.usyd.edu.au

Casual Employment Service

The Casual Employment Service helps currently enrolled students find casual and part-time work during their studies and University vacations.

Level 7, Education Building, A35
The University of Sydney
NSW 2006 Australia
Phone: (02) 9351 8714
Fax: (02) 9351 8717
Email: ces@stuserv.usyd.edu.au
Web: www.usyd.edu.au/cas–emp

Centre for Continuing Education

The Centre for Continuing Education offers a wide range of short courses for special interest, university preparation and professional development. Subject areas include IT, business, languages, history and culture, overseas study tours, creative arts and social sciences. Courses are open to everyone.

The Centre will be relocating at the end of 2003. Please refer to the Centre's Web site for up-to-date information on location/contact details, or phone the existing general enquiry number (02) 9351 2907 for redirection.

Mackie Building, KO1
The University of Sydney
NSW 2006 Australia Ph: (02) 9351 2907
Fax: (02) 9351 5022
Email: info@cce.usyd.edu.au
Web: www.cce.usyd.edu.au

Centre for English Teaching

CET offers a range of English language courses including Academic English, General English, Business English and IELTS preparation. The University is now also an IELTS testing centre. The English programs help international students to reach the required English levels for entry to degrees at the University. At the end of their language training, students have the opportunity to take the CET university direct entry test (e-test).

Level 2, Building F, 88 Mallett St
University of Sydney (MO2)
NSW 2006 Australia
Phone: (02) 9351 0706
Fax: (02) 9351 0710
Email: info@cet.usyd.edu.au
Web: www.usyd.edu.au/cet

Child care

Contact the Child Care Information Officer for information about children's services for students and staff of the University who are parents.

Child Care Information Officer
Level 7, Education Building, A35
Phone: (02) 9351 5667
Fax: (02) 9351 7055
Email: childc@stuserv.usyd.edu.au
Web: www.usyd.edu.au/childcare

The Co-op Bookshop

In addition to providing the required course textbooks, the Co-op Bookshop stocks a wide range of supplementary material, including recommended readings, course notes, study aids and reference books.

We also house an extensive range of general books including fiction, non-fiction, academic and professional titles.

A one-off membership fee of $25 entitles discounts on most books.

Software for students and academics is available at up to 70% off the usual RRP.

The Co-op is situated in the Sydney University Sports and Aquatic Centre, just off City Road.

Phone: (02) 9351 3705 or (02) 9351 2807
Fax: (02) 9660 5256
Email: sydu@coop-bookshop.com.au
Web: www.coop-bookshop.com.au

Counselling Service

The Counselling Service aims to help students fulfil their academic, individual and social goals through professional counselling which is free and confidential. Counselling presents an opportunity to: gain greater self awareness; learn to cope more efficiently with the problem at hand; discuss any work related, social or personal issues that cause concern; explore options with professionally trained staff. In addition, workshops are offered each semester on topics such as stress management, relaxation, exam anxiety, communication skills and others.

Level 7, Education Building, A35
The University of Sydney
NSW 2006 Australia
Phone: (02) 9351 2228
Fax: (02) 9351 7055
Email: counsell@mail.usyd.edu.au
Web: www.usyd.edu.au/counsel

Disability Services

Disability Services is the principal point of contact and advice on assistance available for students with disabilities. The Service works closely with academic and administrative staff to ensure that students receive reasonable accommodations in all areas of their study. Assistance available includes the provision of note taking, interpreters, and advocacy with academic staff to negotiate assessment and course requirement modifications where appropriate.

Level 7, Education Building, A35
The University of Sydney
NSW 2006 Australia
Phone: (02) 9351 7040
Fax: (02) 9351 3320TTY: (02) 9351 3412
Email: disserv@stuserv.usyd.edu.au
Web: www.usyd.edu.au/disability

Enrolment and pre-enrolment

Students entering first year

Details of the enrolment procedures will be sent with the UAC Offer of Enrolment. Enrolment takes place at a specific time and date, depending on your surname and the Faculty in which you are enrolling, but is usually within the last week of January. You must attend the University in person or else nominate, in writing, somebody to act on your behalf. On the enrolment day, you pay the compulsory fees for joining the Student Union, the Students' Representative Council and sporting bodies and nominate your preferred 'up front' or deferred payment for your Higher Contribution Scheme (HECS) liability. You also choose your first-year units of study, so it's important to consult the Handbook before enrolling.

All other students

A pre-enrolment package is sent to all enrolled students in late September, and contains instructions on the procedure for pre-enrolment.

Examinations

The Examinations and Exclusions Office looks after the majority of exam papers, timetables and exclusions. Some faculties, such as the Sydney Conservatorium of Music, make all examination arrangements for the units of study that they offer.

Examinations and Exclusions Office
Student CentreLevel 1, Carslaw Building, F07
The University of Sydney
NSW 2006 Australia
Phone: (02) 9351 4005 or (02) 9351 4006
Fax: (02) 9351 7330
Email: exams.office@exams.usyd.edu.au

Fees

The Fees Office provides information on how to pay fees, where to pay fees and if payments have been received. The Fees Office also has information on obtaining a refund for fee payments.

Fees Office
Margaret Telfer Building, K07
The University of Sydney
NSW 2006 Australia
Phone: (02) 9351 5222
Fax: (02) 9351 4202

Financial Assistance Office

The University has a number of loan funds and bursaries to assist students who experience financial difficulties. Assistance is not intended to provide the principal means of support, but to help in emergencies and to supplement other income.

Level 7, Education Building, A35
The University of Sydney
NSW 2006 Australia
Phone: (02) 9351 2416
Fax: (02) 9351 7055
Email: fao@stuserv.usyd.edu.au
Web: 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;
- 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.

  (Note that 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 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 FOI activities on a regular basis. The two reports produced are the Statement of Affairs and the Summary of Affairs. 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.

Further information and copies of the current reports may be found at www.usyd.edu.au/arms/foi.

Graduations Office

The Graduations Office is responsible for organising graduation ceremonies and informing students of their graduation arrangements.

Student Centre
Carslaw Building, F07
The University of Sydney
NSW 2006 Australia
Phone: (02) 9351 3199, (02) 9351 4009, Protocol (02) 9351 4612
Fax: (02) 9351 5072

(Grievances) appeals

Many decisions about academic and non-academic matters are made each year and you may consider that a particular decision affecting your candidature for a degree or other activities at the University may not have taken into account all the relevant matters.

In some cases the by-laws or resolutions of the Senate (see University Calendar) specifically 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, at the SRC, and on the University's Web site at www.usyd.edu.au/su/planning/policy/.

If you wish to seek assistance or advice regarding an appeal, contact:

Students' Representative Council
Level 1, Wentworth Building, G01
The University of Sydney
NSW 2006 Australia
Phone: (02) 9660 5222

HECS and PELS

Student Centre
Ground Floor, Carslaw Building, F07
The University of Sydney
NSW 2006 Australia
Phone: (02) 9351 5659, (02) 9351 5062, (02) 9351 2086
Fax: (02) 9351 5081

Information Technology Services (ITS)

Information Technology Services oversees the University's computing infrastructure. Students can contact ITS either through the ITS Helpdesk (www.helpdesk.usyd.edu.au) on(02) 9351 6000, located in the University Computer Centre (Building H08), or through the University Access Labs (www.usyd.edu.au/su/is/labs/). The access labs on main campus are located in:

- Fisher Library (Level 2)
- Carslaw (Room 201)
- Education (Room 232)
- The Link Building (Room 222)
- Pharmacy (Room 510)

Other labs are available at the Law, Orange, Westmead and Cumberland campuses.

The labs allow students free access to computers, including office and desktop publishing software and storage, at-cost Internet access, printing facilities and the opportunity to host their own Web site.

Each student is supplied with an account, called a 'Unikey' or 'extro' account, which allows access to a number of services including:

- Free Email: (www-mail.usyd.edu.au);
- Access to the Internet both from home and from the access labs (www.helpdesk.usyd.edu.au/services.html);
- Online course material (www.groucho.ucc.usyd.edu.au:9000/webct/public/home.pl);
- Student facilities via the intranet (www.intranet.usyd.edu.au), including exam results and seating, student timetables and bulletin boards; and
- Free courses in Microsoft Word and Excel, Photoshop, Internet use and html.

International Student Centre

The International Student Centre consists of the International Office (IO), the International Student Services unit (ISSU) and the Study Abroad and Exchange Office. The International Office provides assistance with application, admission and enrolment procedures and administers scholarships for international students. The ISSU provides a wide range of international student support services including orientation and assistance with finding accommodation for new arrivals and psychological counselling and welfare advice for international students and their families. The Study Abroad and Exchange unit assists both domestic and international students who wish to enrol for Study Abroad or Exchange programs.

International Student Centre

Services Building, G12
The University of Sydney
NSW 2006 Australia
Phone: (02) 9351 4079
Fax: (02) 9351 4013
Email: info@io.usyd.edu.au
Web: www.usyd.edu.au/io

International Student Services unit

Phone: (02) 9351 4749
Fax: (02) 9351 6818
Email: info@issu.usyd.edu.au
Web: www.usyd.edu.au/issu

Study Abroad and Exchange unit

Study Abroad

Phone: (02) 9351 3699
Fax: (02) 9351 2795
Email: studyabroad@io.usyd.edu.au
Web: www.usyd.edu.au/io/studyabroad

Exchange

Phone: (02) 9351 3699
Fax: (02) 9351 2795
Email: exchange@io.usyd.edu.au
Web: www.usyd.edu.au/io/exchange

Koori Centre and Yooroang Garang

The Koori Centre provides programs, services and facilities to encourage and support the involvement of Aboriginal and Torres Strait Islander people in all aspects of tertiary education at The University of Sydney. The Centre provides tutorial assistance, access to computers, an Indigenous Research library, study rooms, an orientation program at the beginning of the year and assistance in study and learning skills. In particular the Koori Centre aims to increase the successful participation of Aboriginal and Torres Strait Islander people 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.

Close collaboration is also maintained with Yooroang Garang, School of Indigenous Health Studies in the Faculty of Health Sciences on the University's Cumberland campus. Yooroang Garang provides advice, assistance and academic support for Indigenous Health Sciences students, as well as preparatory undergraduate and postgraduate courses in Aboriginal Health and Community.

Koori Centre

Ground Floor, Old Teachers College, A22
The University of Sydney
NSW 2006 Australia
Phone: (02) 9351 2046 (General Enquiries)
Toll Free: 1800 622 742
Community Liaison Officer (02) 9351 7003
Fax: (02) 9351 6923
Email: koori@koori.usyd.edu.au
Web: www.koori.usyd.edu.au

Yooroang Garang

T Block, Level 4
Cumberland Campus, C42
The University of Sydney
NSW 2006 Australia
Phone: (02) 9351 9393
Toll Free: 1800 000 418
Fax: (02) 9351 9400
Email: yginfo@fhs.usyd.edu.au
Web: www.yg.fhs.usyd.edu.au

Language Centre

The Language Centre provides multimedia teaching rooms for Faculty of Arts courses. Technical support for teaching staff is available on site. Student self-access facilities for curriculum materials, access to multilingual satellite television broadcasts and a broadcast copying service are also provided by the centre. The centre maintains a resource collection of multimedia language materials in 140+ languages and has three language laboratories, four audiovisual classrooms, two access computer labs and one student audiovisual study room.

Level 2, Christopher Brennan Building, A18
The University of Sydney
NSW 2006 Australia
Phone: (02) 9351 2371
Fax: (02) 9351 3626

Email: language.enquiries@language.usyd.edu.au
Web: www.arts.usyd.edu.au/Arts/departs/langcent

Learning Centre

The Learning Centre helps students to develop the generic learning and communication skills which are necessary for university study and beyond. The Centre is committed to helping students achieve their academic potential throughout their undergraduate and postgraduate studies. 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 special program for international students, faculty-based workshops, computer-based learning resources, publications of learning resources and library facilities.

Level 7, Education Building, A35
The University of Sydney
NSW 2006 Australia
Phone: (02) 9351 3853
Fax: (02) 9351 4865
Email: lc@stuserv.usyd.edu.au
Web: www.usyd.edu.au/lc

Library

Students are welcome to use any of the 19 libraries in the University. The student card is also the library borrower's card. Further details of the libraries, including services provided, locations and opening hours are available on the Library's Web page, www.library.usyd.edu.au, as well as in the printed Library Guide, available at any library. Consult the Library staff for assistance.

The libraries listed below are located on the Camperdown/Darlington campus unless otherwise specified.

Architecture Library

Wilkinson Building, G04
Phone: (02) 9351 2775
Fax: (02) 9351 4782
Email: architecture@library.usyd.edu.au

Badham Library

Badham Building, A16
Phone: (02) 9351 2728
Fax: (02) 9351 3852
Email: badham@library.usyd.edu.au

Biochemistry Library

Expected to close in December 2003 and collection transferred to other libraries in the University.

Burkitt-Ford Library

Sir Edward Ford Building, A27
Phone: (02) 9351 4364
Fax: (02) 9351 7125
Email: burkittford@library.usyd.edu.au

Camden Library

University Farms, Werombi Rd, Camden, C15
Phone: (02) 9351 1627
Fax: (02) 4655 6719
Email: camden@library.usyd.edu.au

Dentistry Library

United Dental Hospital, 2 Chalmers St, Surry Hills, C12
Phone: (02) 9351 8331
Fax: 9212 5149
Email: dentistry@library.usyd.edu.au

Engineering Library

PN Russell Building, J02
Phone: (02) 9351 2138
Fax: (02) 9351 7466
Email: engineering@library.usyd.edu.au

Fisher Library

Eastern Ave, F03
Phone: (02) 9351 2993
Fax: (02) 9351 2890
Email: fishinf@library.usyd.edu.au

Health Sciences Library

East St, Lidcombe, C42
Phone: (02) 9351 9423
Fax: (02) 9351 9421
Email: library@fhs.usyd.edu.au

Law Library

Law School, 173–175 Phillip St, Sydney, C13
Phone: (02) 9351 0216
Fax: (02) 9351 0301
Email: library@law.usyd.edu.au

Madsen Library

Madsen Building, F09
Phone: (02) 9351 6456
Fax: (02) 9351 6459
Email: madsen@library.usyd.edu.au

Mathematics Library

Carslaw Building, F07
Phone: (02) 9351 2974
Fax: (02) 9351 5766
Email: mathematics@library.usyd.edu.au

Medical Library

Bosch Building, D05
Phone: (02) 9351 2413
Fax: (02) 9351 2427
Email: medical@library.usyd.edu.au

Music Library

Seymour Centre, J09
Phone: (02) 9351 3534
Fax: (02) 9351 7343
Email: music@library.usyd.edu.au

Nursing Library

88 Mallett St, Camperdown, M02
Phone: (02) 9351 0541
Fax: (02) 9351 0634
Email: nursing@library.usyd.edu.au

Orange Library

Leeds Parade, Orange
Phone: (02) 6360 5593
Fax: (02) 6360 5637
Email: lib@orange.usyd.edu.au

Physics Library

New Wing, Physics Building, A29
Phone: (02) 9351 2550
Fax: (02) 9351 7767
Email: physics@library.usyd.edu.au

Schaeffer Fine Arts Library

Mills Building, A26
Phone: (02) 9351 2148
Fax: (02) 9351 7624
Email: john.spencer@arthist.usyd.edu.au

Sydney College of the Arts Library

Balmain Rd, Rozelle, N01
Phone: (02) 9351 1036
Fax: (02) 9351 1043
Email: scalib@sca.usyd.edu.au

Sydney Conservatorium of Music Library

Macquarie St (opposite Bridge St), Sydney, C41
Phone: (02) 9351 1316
Fax: (02) 9351 1372
Email: library@conmusic.usyd.edu.au

Mathematics Learning Centre

The Mathematics Learning Centre assists students to develop the mathematical knowledge, skills and confidence that are needed for studying their 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 on-going support during the year through individual assistance and small group tutorials to eligible students.

Level 4, Carslaw Building, F07
The University of Sydney
NSW 2006 Australia
Phone: (02) 9351 4061
Fax: (02) 9351 5797
Email: mlc@stuserv.usyd.edu.au
Web: www.usyd.edu.au/mlc

Part-time, full-time

Undergraduate students

Undergraduate students are normally considered as full-time if they have a HECS weighting 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)

Whether a postgraduate coursework student is part-time or full-time is determined solely by credit-point load for all coursework programs. A student is classed as enrolled full-time in a semester if he/she is enrolled in units of study which total at least 18 credit points. Anything under this amount is considered a part-time study load. Please note that classes for some coursework programs are held in the evenings (generally 6–9 pm).

Postgraduate students (research)

Full-time candidates for research degrees do not keep to the normal semester schedule, instead they work continuously throughout the year except for a period of four weeks' recreation leave. There is no strict definition of what constitutes full-time candidature but, generally speaking, 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 as may be required) you should enrol as a part-time candidate. If in doubt you should consult your faculty or supervisor.

International students

International students who are resident in Australia are normally required under the terms of their entry visa to undertake full-time candidature only.

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 the 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 new 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:

Tim Robinson: (02) 9351 4263; or Anne Picot: (02) 9351 7262
Email: foi@mail.usyd.edu.au

Scholarships for undergraduates

Scholarships unit, Room 147
Ground Floor, Mackie Building, KO1
The University of Sydney
NSW 2006 Australia
Phone: (02) 9351 2717
Fax: (02) 9351 5134
Email: scholarships@careers.usyd.edu.au
Web: www.usyd.edu.au/scholarships

Student Centre

Ground Floor, Carslaw Building, F07
The University of Sydney
NSW 2006 Australia
Phone: (02) 9351 3023 General Enquiries
(02) 9351 4109 Academic Records
(02) 9351 3023 Discontinuation of Enrolment
(02) 9351 5057 Handbooks
(02) 9351 5060 Prizes
Fax: (02) 9351 5081, (02) 9351 5350 Academic Records
Web: www.usyd.edu.au/su/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 for a range of purposes within the University. The card must be carried at all times on the grounds of the University and must be shown on demand. Students are required to provide a passport-sized colour photograph incorporating head and shoulders only for lamination to this card. Free lamination is provided at a range of sites throughout the University during the January/February enrolment/pre-enrolment period. Cards that are not laminated, or do not include a photograph, will not be accepted. New identity cards are required for each year of a student enrolment.

The Student Intranet

The University is continually increasing the amount of information and services for students it provides through the Web. The new Student Intranet (intranet.usyd.edu.au/student/) gathers information and services together in one place and organises them by the use of tabs.

Categories such as 'MyStudy' provide links to courses and units of study information, student administration matters (eg, exam results, Web Enrolment Variations, etc.) and links to online learning courses – and of course the study-related services available to all students provided by the Library. Communication services – such as access to free student Email:, the online phone directory and face-to-face services provided by the Student Centre, International Office and ITS Help Desk – is another category.

The Services category provides access to student services such as Child Care, Counselling, I.T. Help and guidance in the use of the online Student Administration services. While Student Life focuses on campus life – accommodation, employment, sporting facilities, political life and where to eat and drink.

News and Events and Campuses provide links to what is happening right across the large and diverse learning community that is The University of Sydney.

MyUni is the personalised section of the intranet. All staff and students are provided with access to MyUni through a login name and password. MyUni enables them to receive delivery of personal information such as exam results, enrolment variations and seat numbers. MyUni is a portal from which students and staff can complete tasks that were previously only able to be done in person, offline.

Student Services

Student Services exists to help you achieve your educational goals by providing personal, welfare, and academic support services to facilitate your success at University. Many factors can impact on your well being while studying at University and Student Services can assist you in managing and handling these more effectively. Refer to Accommodation Service, Casual Employment Service, Child Care, Counselling Service, Disability Services, Financial Assistance Office, Learning Centre and Mathematics Learning Centre. The Web site is at www.usyd.edu.au/stuserv.

The Sydney Summer School

Most faculties at the University offer units of study from undergraduate degree programs during January/February. There are also some units of study available from postgraduate coursework programs from some faculties. As the University uses its entire HECS quota in first and second semester, these units are full fee-paying for both local and international students and enrolment is entirely voluntary. However, Summer School units enable students to accelerate their degree progress, make up for a failed unit or fit in a unit which otherwise would not suit their timetables. New students may also gain a head start by completing requisite subjects before they commence their degrees. Units start on 5 January and run for up to six weeks (followed by an examination week). Notice of the units available is contained in the various faculty handbooks, on the summer school Web site (www.summer.usyd.edu.au) and is usually circulated to students with their results notices. A small Winter School is also run from the Summer School office. This has mainly postgraduate offerings with a few undergraduate units of study. Information can be found on the summer school Web site.

Timetabling unit

The timetabling unit in the Student Centre is responsible for producing students' class and tutorial timetables. Students can obtain their Semester 1 timetables from the Wednesday of Orientation Week via the Web.

The Sydney Conservatorium of Music operates in accordance with a local calendar of dates and produces a complete timetable for all teaching that it delivers. The timetable is available on enrolment at the Conservatorium.

University Health Service

The University Health Service provides full general practitioner services and emergency medical care to all members of the University community. Medical centres on the Camperdown and Darlington Campuses offer general practioners, physiotherapy and some specialist services.

Email: director@unihealth.usyd.edu.au
Web: www.unihealth.usyd.edu.au

University Health Service (Wentworth)

Level 3, Wentworth Building, G01
The University of Sydney
NSW 2006 Australia
Phone: (02) 9351 3484
Fax: (02) 9351 4110

University Health Service (Holme)

Science Rd Entry, Holme Building, A09
The University of Sydney
NSW 2006 Australia
Phone: (02) 9351 4095
Fax: (02) 9351 4338

■ Student organisations

Students' Representative Council

The Students' Representative Council is the organisation which represents undergraduates both within the University and in the wider community. All students enrolling in an undergraduate course automatically become members of the SRC.

Level 1, Wentworth Building, G01
The University of Sydney
NSW 2006 Australia
Phone: (02) 9660 5222 Editors, Honi Soit/Legal Aid
(02) 9660 4756 Second-hand Bookshop
(02) 9351 0691 Mallett St
(02) 9351 1291 Pitt St – Conservatorium
Fax: (02) 9660 4260
Email: postmaster@src.usyd.edu.au
Web: www.src.usyd.edu.au

Sydney University Postgraduate Representative Association (SUPRA)

SUPRA is an organisation that provides services to and represents the interests of postgraduate students.

All postgraduate students at The University of Sydney are members of SUPRA.

Raglan Street Building, G10
University of Sydney
NSW 2006 Australia
Phone: (02) 9351 3715
Freecall: 1800 249 950
Fax: (02) 9351 6400
Email: supra@mail.usyd.edu.au
Web: www.usyd.edu.au/supra/

Sydney University Sport

Sydney University Sport provides services, facilities and clubs for sport, recreation and fitness.

Noel Martin Sports and Aquatic Centre, G09
The University of Sydney
NSW 2006 Australia
Phone: (02) 9351 4960
Fax: (02) 9351 4962
Email: admin@susport.usyd.edu.au

University of Sydney Union

Main provider of catering facilities, retail services, welfare programs and social and cultural events for the University community on the Camperdown and Darlington campuses and at many of the University's affiliated campuses.

University of Sydney Union
Foyer, Holme Building, A09
Science Rd, The University of Sydney
NSW 2006 Australia
Phone: 1800 013 201 (Switchboard)
Fax: (02) 9563 6216
Email: info@usu.usyd.edu.au
Web: www.usydunion.com

Abbreviations and Glossary

■ Abbreviations

Listed below are the more commonly used acronyms that appear in University documents and publications.

A	
AARNet	Australian Academic Research Network
AAT	Administrative Appeals Tribunal
AAUT	Australian Awards for University Teaching
ABC	Activity Based Costing
ABS	Australian Bureau of Statistics
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 Co-operation
APF	Australian Postdoctoral Fellowship
AQF	Australian Qualifications Framework
ARC	Australian Research Council
ARCA	Australian Research Council Act
ASDOT	Assessment Fee Subsidy for Disadvantaged Overseas Students
ATN	Australian Technology Network
ATO	Australian Taxation Office
ATP	Australian Technology Park
ATPL	Australian Technology Park Limited
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
CAUT	Committee for Advancement of University Teaching
CDP	Capital Development Program
CDP-IT	Capital Development Program - Information Technology
CEP	Country Education Profile
CEQ	Course Experience Questionnaire
CFO	Chief Financial Officer
CHASS	College of Humanities and Social Sciences
CHS	College of Health Sciences
CIO	Chief Information Officer
CPI	Consumer Price Index
CPSU	Community and Public Sector Union
CRC	Cooperative Research Centre
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
CUSTD	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
D-IRD	Discovery-Indigenous Researchers Development Program
DISR	Department of Industry, Science and Resources
DoFA	Department of Finance and Administration
DVC	Deputy Vice-Chancellor
E	
EB	Enterprise Bargaining
EFTSU	Equivalent Full Time Student Unit
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	
FlexSIS	Flexible Student Information System
FMO	Facilities Management Office
FOS	Field of Study
FTE	Full Time Equivalent (Staff)
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
GST	Goods and Services Tax
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
HEIP	Higher Education Innovation Programme (DEST)
HEO	Higher Education Officer
HERDC	Higher Education Research Data Collection
I	
IAS	Institute of Advanced Studies
ICT	Information and Communication Technology
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
IT	Information Technology
ITC	Information Technology Committee
ITL	Institute for Teaching and Learning
ITS	Information Technology Services
J	
JASON	Joint Academic Scholarships On-line Network
L	
LBOTE	Language Background Other Than English
M	
MBA	Master of Business Administration
MISG	Management Information Steering Group
MNRF	Major National Research Facilities Scheme
MOU	Memorandum of Understanding
MPG	Major Projects Group

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 Co-operation and Development
OLA	Open Learning Australia
OLDPS	Open Learning Deferred Payment Scheme
OPRS	Overseas Postgraduate Research Scholarships
P	
PAYE	Pay As You Earn
PAYG	Pay As You Go
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
SDVC	Senior Deputy Vice-Chancellor
SEG	Senior Executive Group
SES	Socioeconomic Status
SI	Scholarship Index
SNA	Safety Net Adjustment
SPIRT	Strategic Partnerships with Industry – Research and Training Scheme
SRC	Students' Representative Council
SSR	Student/Staff Ratio
SUPRA	Sydney University Postgraduate Students' Representative Association
SUSport	Sydney University Sport
SUSU	Sydney University Sports Union (now SUS)
SUWSA	Sydney University Women's Sports Association (now SUS)
T	
TAFE	Technical and Further Education
TFN	Tax File Number
TMUI	Treasury Measure of Underlying Inflation

TPI	Teaching Performance Indicator
U	
UAC	Universities Admissions Centre
UMAP	University Mobility in Asia and the Pacific
UNESCO	United Nations Educational, Scientific and Cultural Organization
UPA	University Postgraduate Awards
V	
VCAC	Vice-Chancellor's Advisory Committee
VET	Vocational Education and Training
W	
WIT	Western Institute of TAFE
WRP	Workplace Reform Program
WTO	World Trade Organization

■ Glossary

This glossary describes terminology in use at the University of Sydney.

AAM (Annual Average Mark)

This mark is calculated using the unit of study credit point value for each Semester and for the year. This mark may also be calculated cumulatively for every currently enrolled student, based on all unit of study completions to the end of the last completed semester, as a cumulative measure of progression.

The formula for this calculation is:

$$AAM = \frac{\sum(marks \times creditPointValue)}{\sum(creditPointValue)}$$

The 'marks' used in this formula are the actual marks obtained by the student in each unit of study, as recorded on the student's record, including any marks of less than 50, and in the case of a failing grade with no mark, the mark defaults to 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.)

Academic Board

The senior academic body within the University. In conjunction with Faculties, the Academic Board has responsibility for approving, or recommending to Senate for approval, new or amended courses and units of study and policy relating to the admission of students. (For further information, see the University Calendar.)

Academic cycle

The program of teaching sessions offered over a year. Currently the cycle runs from the enrolment period for Semester 1 through to the completion of the processing of results at the end of Semester 2. (See also Stage.)

Academic dishonesty

A student is suspected of presenting 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.

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. A student's academic record 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 External transcript, Internal transcript.)

Academic year

For the purposes of FlexSIS, an academic year indicates the current calendar year in which the student is currently enrolled. An academic year indicates a calendar year. (See also *Academic cycle, Stage*.)

Addresses

All enrolled students need to have a current postal address recorded on FlexSIS to which all official University correspondence is sent. (See also Business address, Permanent home address, Semester address, Temporary address.)

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. The main admission period takes place before Semester 1, but there may also be an admission period for mid-year applicants before the beginning of Semester 2, and other admission periods.

Admission reply

A code used by FlexSIS to indicate whether an applicant who has received an offer has accepted the offer or not.

Admission result

A code used by FlexSIS to indicate the result of a direct application to study at the University (eg, offer, unsuccessful, withdrawn).

Admission year

The year the student began the course.

Advanced diplomas

See *Award course*.

Advanced standing

See *Credit*.

Advisor

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.)

AGSM (Australian Graduate School of Management)

From 1999 The University of Sydney entered into a joint venture with the University of New South Wales leading to the formation of a new Australian Graduate School of Management (AGSM). The new joint venture AGSM is derived from the Graduate

School of Business at The University of Sydney and the existing AGSM at the University of New South Wales.

Students enrolled at the new joint venture AGSM are students of both The University of Sydney and the University of New South Wales. The agreement for reporting enrolments, load and staff at the joint venture requires that The University of Sydney report all student enrolments and staff numbers, but that only one third of both the Student load (EFTSU) and full-time equivalent staff (FTE) be attributed to The University of Sydney.

Annual Progress Report

A form issued by Faculties which is 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 nominee). The completed form is attached to the student's official file.

FlexSIS records that the form has been sent out and that it has been satisfactorily completed.

APA

Australian Postgraduate Awards. (See also Scholarships, UPA.)

Appeals

Students may lodge appeals against academic or disciplinary decisions. FlexSIS will record an academic appeal (eg, against exclusion) while it is under consideration and will record the outcome of the appeal. Disciplinary (that is, non-academic) appeals are not recorded on FlexSIS.

ARTS

Automated Results Transfer System. This system was developed on behalf of ACTAC (Australasian Conference of Tertiary Admissions Centres) to allow the electronic academic record of a student to be accessible, via an admission centre, between tertiary institutions.

Assessment

The process of measuring the performance of students in units of study and courses. The assessment of performance in a unit of study may include examinations, essays, laboratory projects, or assignments. (See also *Result processing*, *Result processing schedule*.)

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 Advisor, Instrumental supervisor (teacher), Research supervisor, Supervision.)

Assumed knowledge

For some units of study, a student is assumed to have passed a relevant subject at 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

Attendance is classified as full-time, part-time or external. The type of attendance in which a student is classified depends on the student's mode of attendance and the student load.

The mode of attendance is a classification of whether a student is internal, external or multi-modal in accordance with the definition provided by DEST.

Internal mode of attendance

When all units of study for which the student is enrolled are undertaken through attendance at the University on a regular basis. It also refers to the case when the student is undertaking a higher degree course for which regular attendance is not required, but attends the University on an agreed schedule for purposes of supervision and/or instruction.

External mode of attendance

When all units of study for which the student is enrolled involve special arrangements whereby lesson materials, assignments, etc, are delivered to the student, and any associated attendance at the University is of an incidental, irregular, special or voluntary nature.

Multi-modal mode of attendance

When at least one unit of study is undertaken on an internal mode of attendance and at least one unit of study is undertaken on an external mode of attendance.

Students with an external mode of attendance are classified as being external for the type of attendance.

Students with either an internal or multi-modal mode of attendance are classified as being full-time or part-time depending on the load associated with the courses in which they are enrolled. According to the definition provided by DEST, a student whose enrolment in all courses generates 0.373 EFTSU or higher for a semester is classified as full-time, otherwise the student is classified as part-time.

Attendance mode

A DEST classification defining the manner in which a student is undertaking a course – ie, internal, external, mixed or offshore.

Attendance pattern/type

Refers to whether the student is studying part-time or full-time. For coursework students this is a function of course load – ie, the proportion being undertaken by the student of the normal full-time load specified for the course in which the student is enrolled. To be considered full-time, a coursework student must undertake at least 0.75 of the normal full-time load over the academic cycle or at least 0.375 if only enrolling in half of an academic year. It is important to note however that, for some purposes, to be considered full-time a student may need to be enrolled in at least 0.375 in each half year. Research students, with the approval of their faculty, nominate whether they wish to study part-time or full-time. The attendance status is then recorded on FlexSIS as part of the application or enrolment process. (See also Coursework, Student load.)

Attendance status

Full or part time.

AusAID

Australian Agency for International Development.

AUSTUDY

Replaced by Youth Allowance. (See *Youth Allowance*.)

Award course

A formally approved program of study that can lead to an academic award granted by the University. An award course requires the completion of a program of study specified by course rules. (See also Course Rules.) Award courses are approved by Senate, on the recommendation of the Academic Board. Students normally apply to transfer between award courses through the UAC. The award course name will appear on testamurs. The University broadly classifies courses as undergraduate, postgraduate coursework or postgraduate research. The award courses offered by the University are:

- Higher doctorates
- Doctor of philosophy (PhD)
- Doctorates by research and advanced coursework
- Master's degree by research
- Master's degree by coursework
- Graduate diploma
- Graduate certificate
- Bachelor's degree
- Advanced diplomas
- Diplomas
- Certificates

(See also *Bachelor's degree*, *Course rules*, *Diploma*, *Doctorate*, *Major*, *Master's degree*, *Minor*, *PhD*, *Stream*.)

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. Bachelor degree refers to Bachelor (Graduate Entry), Bachelor (Honours) end on, and Bachelor which comprises Bachelor (Pass) and Bachelor (Honours) concurrent. (See also Award course.)

Barrier

An instruction placed on a student's FlexSIS 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 which is similar to a faculty except that it is headed by a chair rather than a dean and does not supervise PhD candidates.

Bursaries

See *Scholarships*.

Business address

FlexSIS can record a student's business address and contact details. (See also *Addresses*, *Permanent home address*, *Semester address*, *Temporary address*.)

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 Islanders in degree courses in all faculties at The University of Sydney.

Applicants seeking admission under the Program are assessed under a broad set of criteria embracing relevant educational background, work and life experience and motivation. An essential aspect of the Program is the provision of academic support.

All applicants are assessed prior to enrolment and on the basis of those assessments may be recommended for alternative study options, including enrolment in a reduced course load in the first year of their degree and concurrent enrolment in an Academic Skills course run by the Koori Centre.

An intensive Orientation Program is conducted immediately prior to the commencement of the academic year and students may request additional tutoring in particular subject areas.

CAF (Cost Adjustment Factor)

The amount by which the Commonwealth increases payments to institutions each year towards increases in salary and non-salary costs.

Campus

The grounds on which the University is situated. There are eleven campuses of The University of Sydney: Burren Street (Institute for International Health, Institute of Transport Studies), Camperdown and Darlington (formerly known as Main Campus), Camden (Agriculture and Veterinary Science), Conservatorium (Sydney Conservatorium of Music), Cumberland (Health Sciences), Mallett Street (Nursing), Orange (Faculty of Rural Management and Centre for Regional Education), Rozelle (Sydney College of the Arts), St James (Law) and Surry Hills (Dentistry).

Cancellation

For non-payment of fees.

Census date

See *HECS census date*.

Centre for Continuing Education

The Centre for Continuing Education develops and conducts courses, conferences and study tours for the general public and professional groups. The Centre offers some 1,000 courses for approximately 20,000 students each year. Most of these courses are held over one of the four main sessions that are conducted each year, though the Centre is offering an increasing number of ad-hoc courses in response to increased competition and changing demands. The Centre operates on a cost recovery/income generation basis. (See also Continuing professional education.)

Centrelink

Centrelink is the agency responsible for providing information and assistance on a range of Commonwealth Government programs including Youth Allowance. (See also *Youth Allowance*.)

Ceremony

See *Graduation ceremony.*

Chancellor

The non-executive head of the University. An honorary position, the Chancellor chairs meetings of the University's governing body, the Senate, and presides over graduation ceremonies amongst other duties.

Class list

A listing of all currently enrolled students in a particular unit of study. (See also *unit of study.*)

College of Health Sciences

Consists of the Faculties of Dentistry; Health Sciences; Medicine; Nursing; and Pharmacy.

College of Humanities and Social Sciences

Consists of the Faculties of Arts; Economics and Business; Education; Law; the Sydney College of the Arts; and the Sydney Conservatorium of Music.

College of Sciences and Technology

Consists of the Faculties of Agriculture, Food and Natural Resources; Architecture; Engineering; Rural Management; Science; and Veterinary Science.

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

See *Combined course*.

Commencing and continuing enrolments

Enrolments are classified as commencing or continuing in accordance with the definition provided by DEST. In general, an enrolment is classified as commencing if a student has enrolled in a particular degree or diploma for the first time between 1 September of the year prior to the current year and 31 August of the current year. There are a number of exceptions to this general rule, of which the most important are:

(a) an enrolment in the LLB is not classified as commencing if the student was previously enrolled in a combined law degree; and,

(b) an enrolment in an Honours degree (Bachelor or Master) is not classified as commencing if the student was previously enrolled in the corresponding Pass degree.

Commencing student

A student enrolling for the first time in an award course at The University of Sydney. The DEST glossary provides a more detailed definition.

Comp subs

See *Compulsory subscriptions*.

Compulsory subscription rates

There are two rates for some annual subscriptions: full-time and part-time. (See also *Compulsory subscriptions*.)

Compulsory subscription waiver provision

Certain students over a certain age or with disabilities or medical conditions may be exempted from the subscription to the sports body.

Students with a conscientious objection to the payment of subscriptions to unions of any kind may apply to the Registrar for exemption. The Registrar may permit such a student to make the payment to the Jean Foley Bursary Fund instead. (See also *Compulsory subscriptions*.)

Compulsory subscriptions

Each enrolled student is liable to pay annual (or semester) subscriptions, as determined by the Senate, to the student organisations at the University. These organisations are different on different campuses. There are different organisations for undergraduate and postgraduate students.

At the Camperdown/Darlington Campus, compulsory subscriptions depend on the level of study.

Undergraduate

The University of Sydney Union, Students' Representative Council (SRC) and Sydney University Sport.

Postgraduate

The University of Sydney Union and the Sydney University Postgraduate Representative Association (SUPRA).

Student organisations at other campuses include: the Conservatorium Student Association, the Cumberland Student Guild, the Orange Agricultural College Student Association and the Student Association of Sydney College of the Arts. (See also Compulsory subscription rates, Compulsory subscription waiver provision, Joining fee, Life membership.)

Confirmation of Enrolment form

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.

For postgraduate research students the form also lists candidature details and supervisor information.

Where students have an appointed advisor, the advisor information is also shown.

Conjoint ventures

Two or more institutions co-operate 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 UNSW and UTS whereby 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 and a number of departments and foundations across the University. This process supports the whole of life learning concept and requires/promotes the

maintenance of a long term relationship between the student and the University. It is envisaged that the importance of this mode of education will increase in the future. (See also Centre for Continuing Education.)

Convocation

The body comprising all graduates of the University.

Core unit of study

A unit of study that is compulsory for the 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 of Sydney and a French university for joint supervision and examination of a PhD student as part of an ongoing co-operative 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 award course or non-award course undertaken at The University of Sydney. (See also Award course, Non-award course.)

Course alias

Each course in FlexSIS is identified by a unique five-digit alpha-numeric code.

Course code

See *Course alias*.

Course enrolment status

A student's enrolment status in a course is either 'enrolled' or 'not enrolled'. A course enrolment status of 'not enrolled' is linked to a not enrolled reason.

Course leave

Students (undergraduate and postgraduate) 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 and recorded on FlexSIS (leave for periods of less than one semester are recorded internally by the faculty). 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 reapply formally for admission. The term 'suspension of candidature' was previously used to describe research students on course leave.

Course (Research)

A classification of courses in which students undertake supervised research leading to the production of a thesis or other piece of written or creative work over a prescribed period of time. The research component of a research course must comprise 66% or more of the overall course requirements.

Course rules

Rules which govern the allowable enrolment of a student in a course; – eg, 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; – eg, a candidate must have completed a minimum of 144 credit points. Course rules may be expressed in terms of types of units of study taken, length of study, and credit points accumulated. (See also *Award course*.)

Course suspension

See *Course leave*.

Course transfer

A transfer which occurs where a student changes from one course in the University to another course in the University without the requirement for an application and selection (eg, from a PhD to a master's program in the same faculty).

Course type

A DEST code.

Coursework

A classification used to describe those courses that consist of units of study rather than research work. All undergraduate courses are coursework programs. Postgraduate courses can be either research courses or coursework courses. (See also Course (research).)

Credit

The recognition of previous studies successfully completed at this or another university or tertiary institution (recognised by The University of Sydney) as contributing to the requirements for the award of the course in which the applicant requesting such recognition has been admitted.

Where the University agrees to recognise successfully completed previous studies, their contribution to the requirements for the award of the course in which the applicant has been admitted will be expressed as specific or non-specific credit.

Credit awarded to a credit applicant – whether specific or non-specific – will be recorded with a mark and grade of 50 pass, unless in individual cases the credit is assessed by the faculty as having a mark and grade greater than 50 pass. This equivalent mark and grade will be used for the purposes of calculating a student's weighted average mark and for the purposes of satisfying prerequisite rules where a level of passing grade is specified. (See also *Precedents*, *Specific credit*, *Non-specific credit*, *Waiver*, *Weighted average mark (WAM).*)

Credit points

A measure of value indicating the contribution each unit of study provides towards meeting course completion requirements stated as a total credit point value. Each unit of study will have a credit point value assigned to it, normally in the range 3 to 24. Resolutions of Senate set the number and level of credit points required for graduation.

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 HECS liability or tuition fee charge at the institution at which the unit of study is being undertaken. Students pay compulsory subscriptions to one university only (usually their home university – ie, the university which will award their degree). (See also *Non-award course*, *Enrolment non-award*.)

DAC (Data Audit Committee)

A sub-committee of the VCAC Enrolment Working Party, chaired by the Registrar, with membership including the deans, the Student Centre, FlexSIS and the Planning Support Office. Its role is to oversee the integrity and accuracy of the course and unit of study data as strategic University data. It has a role in advising the Academic Board on suggested policy changes with relation to course and unit of study data.

Deadlines (enrolment variations)

See *Enrolment variation*.

Deadlines (fees)

The University has deadlines for the payment of fees (eg, 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.)

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 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

See *Admission (deferment)*, *Leave*.

Degree

(See also *Award course*, *Bachelor's degree*.)

Delivery mode

Indicates the mode of delivery of the instruction for a unit of study – eg, normal (ie, by attending classes at a campus of the University), distance (ie, remotely by correspondence or other distance means – eg, Web delivery). The delivery mode must be recorded for each unit as distinct from the attendance mode of the student – ie, an internal student may take one or more units by

distance mode and an external student may attend campus for one or more units.

Department or school

The Senate Resolutions define a department or school as consisting of such of the members of the teaching staff and the research staff of the University and such other persons or classes of persons as are appointed to it or assigned to it by the Senate or the Vice-Chancellor on the recommendation of the faculty or college board concerned.

For the purposes of FlexSIS, a department is the academic unit which is responsible for teaching and examining a unit of study. It may be called a school, a department, a centre or a unit within the University.

Increasingly, as departments merge into larger schools, the term department is also used to describe the constituent parts of a school. Alternatively, the term Discipline is used. DEST uses the term Academic Organisational unit (AOU) and for reporting purposes each AOU is assigned a Field of Education classification.

DEST

The Department of Education, Science and Training (DEST) is the Commonwealth Government department responsible for higher education. The University is required to provide DEST with information about its students several times a year and, annually, information about staff, finance, research and space allocation. Among other things, the Government uses this information in its funding deliberations.

Differential HECS

See *Higher Education Contribution Scheme (HECS)*.

Diploma

The award granted following successful completion of diploma course requirements. A diploma course usually requires less study than a degree course. Graduate diploma courses are only available to students who already hold an undergraduate degree. (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, registered on FlexSIS and considered by the relevant department or faculty body. Decisions are recorded on FlexSIS and FlexSIS produces letters to applicants advising them of the outcome. (See also Admission, UAC admissions.)

Disability information

Students may inform the University of any temporary or permanent disability, other than a financial disability, which affects their life as a student. Disability information is recorded in FlexSIS but it is only visible to particular authorised users because of its sensitive nature.

Disciplinary action

Undertaken as the result of academic or other misconduct – eg, plagiarism, cheating, security infringement, criminal activity.

Discipline codes

A four-letter code for each area of study available at the University (eg, CHEM Chemistry, ECON 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 and 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 and flexible learning

A mode of learning which affords the opportunity to provide higher education to a much wider market – including students from anywhere in the world– at times, locations and modes that suit them. (See *Award course*, *Doctorate*, *PhD*.)

Doctorate

A high-level postgraduate award available at The University of Sydney. 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.)

Double degree

Completing a second degree while enrolment is suspended from the first degree – eg, students enrolled in the Bachelor of Engineering may transfer to the Bachelor of Science, complete the requirements for the BSc and then resume the Bachelor of Engineering.

Downgrade

Where a student is enrolled in a PhD and where the research they are undertaking is not at an appropriate level for a PhD and the institution recommends that the student downgrade their degree to a Master's by Research course, or where the student, for personal or academic reasons, seeks to revert to a Master's by Research course. There would be no interval between the candidature for the PhD and Master's degree unless the interval was covered by a period of suspension.

With a downgrade, the research undertaken by the student while enrolled for the PhD would either be continued in the Master's by Research degree or modified to meet the requirements of the Master's program.

Earliest date

See *Research candidature*.

EFTSU

The equivalent full-time student unit (EFTSU) is a measure of student load expressed as a proportion of the workload for a standard annual program for a student undertaking a full year of study in a particular award course. A student undertaking the standard annual program of study (normally 48 credit points) generates one EFTSU.

EFTYR

See *EFTSU*.

Embedded courses/programs

Award courses in the graduate certificate/graduate diploma/master's degree by coursework sequence which allow unit of study credit points to count in more than one of the awards – eg, the Graduate Certificate in Information Technology, Graduate Diploma in Information Technology and Master of Information Technology sequence.

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. The student pays whatever fees are owing to the University by the deadline for that semester. New students currently pay on the day they enrol which is normally in early February. Students already in a course at the University re-enrol each year or semester; for most students pre-enrolment is required. (See also Pre-enrolment.)

Enrolment non-award

An enrolment in a unit or units of study which does not count towards a formal award of the University. Non-award enrolments are recorded in various categories used for reporting and administrative purposes. (See also Cross-institutional Enrolment, Non-award Course.)

Enrolment status

A variable for students both with relation to course and unit of study. (See *Course enrolment status* and *unit of study enrolment status*)

Enrolment variation

Students may vary their enrolment at the beginning of each semester. Each faculty determines its deadlines for variations, but HECS liability depends on the HECS census date. (See also *HECS*.)

Examination

See *Examination paper code*, *Examination period*, *Supplementary exams*.

Examination paper code

A code that identifies each individual examination paper. Used to help organise examinations.

Examination period

The time set each semester for the conduct of formal examinations.

Examiner (coursework)
The person assessing either the written/oral examination, coursework assignments, presentations, etc of a student or group of students.

Exchange student
Either a student of The University of Sydney who is participating in a formally agreed program involving study at an overseas university or an overseas student who is 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 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. 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 exclusion is set out in the University Calendar. (See also *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; and
- the student does not receive a transcript or testamur.

Extended semesters
Distance learning students may be allowed more time to complete a module/program if circumstances are beyond the student's control – eg, drought, flood or illness affect the student's ability to complete the module/program in the specified time.

External
See *Attendance mode*.

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 (but not any unit of study which has the status of withdrawn). It also includes any scholarships or prizes the student has received. Two copies are provided to each student on graduation (one with marks and grades for each unit of study and one with grades only). External transcripts are also produced at the request of the student. The student can elect either to have marks appear on the transcript or not. (See also *Academic transcript*, *Internal transcript*.)

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.)

Fail
A mark of less than 50% which is not a concessional pass. This grade may be used for students with marks of 46–49 in those faculties which do not use PCON. (See also *Results*.)

Fee-paying students
Students who pay tuition fees to the University and are not liable for HECS.

Fee rate
Local fees are charged in bands, a band being a group of subject areas. The bands are recommended by faculties and approved by the Senior Deputy Vice-Chancellor.

Flexible learning
See *Distance and Flexible Learning*.

Flexible Start Date
Full fee-paying distance students are not restricted to the same enrolment time frames as campus-based or HECS students.

FlexSIS
The computer-based Flexible Student Information System at The University of Sydney. Electronically 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. FlexSIS also holds the complete academic records of many (but not all) past students of the University. For past students whose complete records are not held on FlexSIS, there will be a reference on FlexSIS to card or microfiche records where details are kept.

FTE (Full-time equivalent)
This is a measurement of staff resources and relates to the amount of time a staff member devotes to his/her current duties (ie, the job in which a staff member is working at the reference date of 31 March).

A staff member can have either a full-time, fractional full-time or casual work contract. A full-time work contract has an FTE of 1.0. A fractional full-time work contract has a value less than 1.0 (eg, 0.5).

Casual FTE values are calculated in the following manner:

$$Lecturng = \frac{ContactHours}{243}$$

$$Tutoring\backslash\text{Demonstrating} = \frac{ContactHours}{675}$$

$$Marking(\text{sin}gleActivity)\backslash\text{Research}\backslash\text{Other} = \frac{ContactHours}{1820}$$

The denominator values of the above equations represent the hours worked by one full-time staff member in each of the occupation groups – ie, Lecturing, Tutoring/Demonstrating, etc., as imputed by DEST.

Full-time student
See *Attendance status*, *EFTSU*.

Funding Category
Funding Category comprises the following:
(1) Funded from Operating Grant*,
(2) Fee-paying local postgraduates,
(3) Fee-paying local undergraduates,
(4) Fee-paying international students,
(5) Non-fee exchange international students,
(6) Non-award (local fee-paying),
(7) Research outside time limits,
(8) Funded by employer.

**Refers to HECS liable students, local students enrolled under the Research Training Scheme, and local disadvantaged students enrolled in an enabling course or holding a Commonwealth-funded merit-based undergraduate HECS-exemption scholarship.*

GPOF (General Purpose Operating Funds)
GPOF (General Purpose Operating Funds) includes:
General income – eg, Commonwealth and State base operating grants, fee income and miscellaneous income;
Other (Non-DEST) activities include commercial and other internal business activities not receiving a base operating grant allocation;
Specific Operating allocations includes PVC Research allocations (major equipment, etc.); and
Research infrastructure allocations.

Grade
A result outcome for a unit of study normally linked with a mark range. For example, in most faculties 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 Register
A list of all graduates of the University. (See also *Graduation*.)

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. The Registrar publishes the annual schedule of graduation ceremonies.

Head of Department
The head of the academic unit which has responsibility for the relevant unit of study, or equivalent program leader.

HECS (Higher Education Contribution Scheme)
All students, except international students, local fee-paying students and holders of certain scholarships are obliged to contribute towards the cost of their education under the Higher Education Contribution Scheme. HECS liability depends on the load being taken. Current students, except possibly those who began their studies prior to 1997, have a HECS rate charged for each unit of study in their degree program which depends on the 'discipline group' it is in, and the 'band' to which the Government has assigned it. These are all determined annually by the Commonwealth Government.

HECS census date
The date at which a student's enrolment, load and HECS liability are finalised before this information is reported to DEST. The following dates apply:
- Semester 1: 31 March
- Semester 2: 31 August.

Higher Doctorates
See *Award course*.

Higher Education Officer (HEO)
General staff are employed under a ten level Higher Education Officer award structure. The structure, introduced at The University of Sydney in October 1993, applies to general staff in all Australian universities.

Honorary degrees
A degree *honoris causa* (translated from the Latin as 'for the purpose of honouring') is an honorary award which is conferred on a person whom the University wishes to honour.

A degree *ad eundem gradum* (translated as 'at the same level') is awarded to a member of the academic staff who is not a graduate of the University in recognition of outstanding service to the University. The award of an honorary degree is noted on the person's academic record.

Honours
Some degrees may be completed 'with Honours'. This may involve either the completion of a separate Honours year or 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, Class III) and sometimes there are two divisions within Class II.

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.

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 and BMus students on the Camperdown Campus have an instrumental teacher appointed. (See also *Advisor*, *Associate supervisor*, *Research supervisor*, *Supervision*.)

Internal
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
An international student is required to hold a visa to study in Australia and may be liable for international tuition fees. Any student who is not an Australian or New Zealand citizen or a permanent resident of Australia is an international student. New Zealand citizens are not classified as international students but have a special category under HECS that does not permit them to defer their HECS liability. (See also *Local student*, *Student type*.)

Joining fee
Students enrolling for the first time pay, in addition, a joining fee for The University of Sydney Union or equivalent student organisation. (See also *Compulsory subscription*.)

Leave
See *Course leave*.

Legitimate co-operation
Any constructive educational and intellectual practice that aims to facilitate optimal learning outcomes through interaction between students.

Liability status code
A code used by DEST to identify the liability status of a student (eg, 10 – HECS liable deferred, 11 – HECS liable upfront with discount, 13 – PELS, 19 – Local UG full fee paying, 20 – Local PG full fee paying, 22 – International fee paying, etc.)

Life membership
Under some circumstances (eg, after five full-time years of enrolments and contributions) students may be granted life membership of various organisations. This means they are exempt from paying yearly fees. (See also Compulsory subscriptions.)

Load
The sum of the weights of all the units of study in which a student is enrolled. Each unit of study (subject) in which a student may enrol is assigned a weight. This 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. These weights can be aggregated in a number of different ways (by student, degree/course, department, faculty) to give student load. Student load is measured in terms of Equivalent Full-Time Student units (EFTSU).

A full-time research student is counted as 1.0 EFTSU while a part-time research student is counted as 0.5 EFTSU. (See also *EFTSU*, *HECS*.)

Local student
Either an Australian or New Zealand citizen or Australian permanent resident. New Zealand citizens are required to pay their HECS upfront. (See also *Fee type*, *HECS*, *International student*.)

Major
A defined program of study, generally comprising 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 prescribed in order to satisfy course requirements. Majors may be included on testamurs. (See also *Award course*, *Minor*, *Stream*.)

Major Timetable Clash
Used by FlexSIS to denote occasions 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) between 0 and 100 inclusive 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*, *Course (research)*, *Coursework*.)

Minor

A defined program of study, generally comprising units of study from later stages of the award course, and 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 prescribed in order to satisfy course requirements. Minors may be included on testamurs. (See also *Award course*, *Major*, *Stream*.)

Minor Timetable Clash

Used by FlexSIS to denote occasions when a student attempts to enrol in units of study which have some identical times of teaching.

Misconduct

(a) Conduct on the part of a student which is prejudicial to the good order and government of the University or impairs the reasonable freedom of other persons to pursue their studies or research in the University or to participate in the life of the University; and

(b) Refusal by a student to give satisfactory particulars of the student's identity in response to a direction to do so by a prescribed officer and any other form of wilful disobedience to a reasonable direction of a prescribed officer.

Mixed Mode

See *Attendance mode*.

Mode

See *Attendance mode* and *Delivery mode*.

Model income

Income allocated to Colleges through the University's funding model.

Mutually exclusive units of study

See *Prohibited combinations of units of study.*

MyUni

A personalised space for staff and students on The University of Sydney's intranet, called USYDnet. MyUni is used to deliver information and services directly through a central location, while also allowing users to customise certain information. Students are able to access such services as exam seat numbers, results, timetables and FlexSIS pre-enrolment and enrolment variations on MyUni. (See also *USYDnet*.)

Non-award course

A course undertaken by students who are not seeking an award from the University. These may be students enrolled in an award course at another institution or students not seeking an award from any institution. Non-award courses are assigned a course code in the same way as award courses. A separate course code is assigned for each faculty, level (undergraduate or postgraduate) and method (research or coursework) which offers a non-award course. Various categories of non-award enrolment are recorded on FlexSIS for reporting and administrative purposes. (See also Course, Cross-institutional enrolment, Enrolment non-award.)

Non-award enrolment

See *Enrolment non-award*.

Non-specific credit

Non-specific credit is awarded when previous studies are deemed to have satisfied defined components of a course other than named units of study. These components include but are not limited to:

- entire years in courses that progress through the successful completion of a set of prescribed units of study per year
- a set number of credit points within a particular discipline or level (ie, first, second or third year)
- one or more semesters for research courses. (See also Credit, Specific credit.)

Non-standard session

A teaching session other than the standard February and August sessions – eg, Summer School, in which units of study are delivered and assessed in an intensive mode during January of each year, is an example of a non-standard session. (See also *Semester*, *Session*.)

Not enrolled reason

These reasons include: potential enrolment, did not re-enrol, not continuing, cancelled, on leave (suspended), transferred, under examination, completed.

OPRS

Overseas Postgraduate Research Scholarship.

Orientation Week

Orientation or 'O Week', takes place during the week prior to lectures in Semester 1. 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.

Part-time student

See *Attendance status*, *EFTSU*.

PeopleSoft HRMS

The University's Human Resources (HR) IT system.

PELS (Postgraduate Education Loans Scheme)

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).

Permanent home address

The address for all official University correspondence both inside and outside of semester time (eg, during semester breaks), unless overridden by semester address. (See also *Addresses*, *Business address*, *Semester address*, *Temporary 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. Entry to a PhD course often requires completion of a master's degree course. Note that the PhD course is available in most departments in The University of Sydney. In University Statistics publications, entries headed PhD include other Doctorates by advanced coursework and research, such as the S.J.D. and Ed.D. (See also *Award course*, *Doctorate*.)

Plagiarism

Presenting another person's ideas, findings or work as one's own by copying or reproducing them without the acknowledgement of the source.

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.

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 takes place in October for the following year. Students indicate their choice of unit of study enrolment for the following year. After results are approved, registered students are regarded as enrolled in those units of study they chose and for which they are qualified. Their status is 'enrolled' and remains so provided they pay any money owing or comply with other requirements by the due date. Re-enrolling students who do not successfully register 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. Pre-enrolment is also known as provisional re-enrolment. (See also Enrolment.)

Prerequisite

A unit of study that is required to be 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 by the University, a faculty or a department for outstanding academic achievement.

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 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.

Progression

See *Course progression*.

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. A unit related in this way to any other unit is linked in tables of units of study via use of the symbol N to identify related prohibited units.

Provisional re-enrolment
See *Pre-enrolment*.

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.)

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.

Registrar
The Registrar is responsible to the Vice-Chancellor for the keeping of official records and associated policy and procedures within the University. (See the University Calendar for details.)

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 candidature
Master's by research, PhD and other doctorates such as Doctor of Juridical Studies (SJD), but not Higher Doctorates – eg, DSc.

Research course
See Course (*research*).

Research/coursework higher degrees
A student's candidature in a higher degree is deemed to be by Research if 66% or more of the workload over the length of the degree is by research. Otherwise the candidature is deemed to be by Coursework.

A supervisor is appointed to each student undertaking a research postgraduate degree. The person will be a full-time member of the academic staff or a person external to the University appointed in recognition of 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, Instrumental supervisor (teacher), Supervision.)Research supervisor

Resolutions of Senate
Regulations determined by the Senate of The University of Sydney that pertain to degree and diploma course requirements and other academic or administrative matters.

Result processing
Refers to the processing of assessment results for units of study. Departments tabulate results for all assessment activities of a unit of study and assign preliminary results for each unit of study. Preliminary results are considered by the relevant Board of Examiners, which approves final results. Students are notified of results by result notices that list final marks and grades for all units of study. (See also *Assessment*, *Examination period*.)

Result processing schedule
The result processing schedule will be determined for each academic cycle. It is expected that all departments and faculties will comply with this schedule. (See also *Assessment*, *Examination period, Result processing*.)

Results
The official statement of the student's performance in each unit of study attempted as recorded on the academic transcript, usually expressed as a grade:

HD	High distinction	a mark of 85–100
D	Distinction	a mark of 75–84
CR	Credit	a mark of 65–74
P	Pass	a mark of 50–64
R	Satisfied requirements	This is used in pass/fail only outcomes.
UCN	Unit of study continuing	Used at the end of semester for units of study that have been approved to extend into a following semester. This will automatically flag that no final result is required until the end of the last semester of the unit of study.
PCON	Pass (concessional)	a mark of 46–49. Use of this grade is restricted to those courses that allow for a concessional pass of some kind to be awarded. A student may re-enrol in a unit of study for which the result was PCON.–†no more than one sixth of the total credit points for a course can '.
F	Fail	A mark of 0-49. This grade may be used for students with marks of 46–49 in those faculties which do not use PCON.
AF	Absent fail	Includes non-submission of compulsory work (or non-attendance at compulsory labs, etc) as well as failure to attend an examination.
W	Withdrawn	Not recorded on an external transcript. This is the result that obtains where a student applies to discontinue a unit of study by the HECS census date (i.e. within the first four weeks of enrolment).
DNF	† not to count as failure	Recorded on external transcript. This result applies automatically where a student discontinues after the HECS Census Date but before the end of the seventh week of the semester (or before half of the unit of study has run, in the case of units of study which are not semester-length). A faculty may determine that the result of DNF is warranted after this date if the student has made out a special case based on illness or misadventure.
DF	† fail	Recorded on transcript. This applies from the time DNF ceases to be automatically available up to the cessation of classes for the unit of study.
MINC	Incomplete with a mark of at least 50	This result may be used when examiners have grounds (such as illness or misadventure) for seeking further information or for considering additional work from the student before confirming the final mark and passing grade. Except in special cases approved by the Academic Board, this result will be converted to a normal passing mark and grade either: (a) by the dean at the review of examination results conducted pursuant to section 2 (4) of the Academic Board policy 'Examinations and Assessment Procedures'; or automatically to the indicated mark and grade by the third week of the immediately subsequent academic session. Deans are authorised to approve the extension of a MINC grade for individual students having a valid reason for their incomplete status.

INC	Incomplete	This result is used when examiners have grounds (such as illness or misadventure) for seeking further information or for considering additional work from the student before confirming the final result. Except in special cases approved by the Academic Board, this result will be converted to a normal permanent passing or failing grade either: (a) by the dean at the review of examination results conducted pursuant to section 2 (4) of the Academic Board policy 'Examinations and Assessment Procedures'; or automatically to an AF grade by the third week of the immediately subsequent academic session. Deans are authorised to approve the extension of a MINC grade for individual students having a valid reason for their incomplete status.
UCN	Incomplete	A MINC or INC grade is converted, on the advice of the dean, to UCN when all or many students in a unit of study have not completed the requirements of the unit. The students may be engaged in practicum or clinical placements, or in programs extending beyond the end of semester (e.g. Honours).

RTS (Research Training Scheme)
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 Masters by research.

Scholarships
Financial or other forms of support made available by sponsors to assist Australian and international students to pursue their studies at the University. When a student's means are a criterion, scholarships are sometimes called bursaries. (See also *Prizes*.)

School
See *Department*.

Semester
A half-yearly teaching session whose dates 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 teaching period) must be given special permission by the Academic Board. (See also *Session, Non-standard teaching period*.)

Semester address
The address to which all official University correspondence is sent during semester time, if it is different to the permanent address. Unless overridden by a temporary address all official University correspondence during semester (including Session 4 for students enrolled in Summer School) will be sent to this address. (See also *Addresses, Business address, Permanent home address, Temporary address*.)

Senate
The governing body of the University. (See the University Calendar for more details of its charter and powers.)

Senate appeals
Senate appeals are held for those students who, after being excluded by a faculty from a course, appeal to the Senate for readmission. While any student may appeal to the Senate against an academic decision, such an appeal will normally be heard only after the student has exhausted all other avenues – ie, the department, faculty, board of study and, in the case of postgraduates, the Committee for Graduate Studies. (See also *Exclusion*.)

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 1 or 2 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*.

SID (Student Identifier)
A 9-digit number which uniquely identifies a student at the University.

Space allocation
Departmental space has been measured in accordance with space inventory classifications adopted by DEST. Departmental space includes academic staff studies, non-academic staff offices, special purpose teaching rooms such as laboratories, studios, computer terminal rooms, seminar rooms under 35m2, common rooms, workshops, departmental storage spaces, departmental libraries, research space including laboratories and office accommodation, postgraduate rooms and a variety of special purpose departmental rooms. Where space is shared by a number of departments it is apportioned according to use. Departmental spaces do not include general teaching spaces over 35m^2.

Special consideration
Candidates who have medical or other serious problems, which may affect performance in any assessment, may request that they be given special consideration in relation to the determination of their results.

They can obtain an official form from the Student Centre. The Student Centre stamps the form and the medical or other documentation. The student gives a copy of the material to the Student Centre staff and takes copies to the relevant departments. The student retains the originals. The dates for which special consideration is sought are recorded on FlexSIS and printed on the examination register.

Special permission
See *Waiver.*

Specific credit
Awarded when previous studies are entirely equivalent to one or more named units of study offered by The University of Sydney that contribute to the course in which the applicant has been admitted. (See also Credit, Non-specific credit.)

Sponsorship
Financial support of a student by a company or government body. Sponsors are frequently invoiced directly.

SRS
The student record system responsible, prior to FlexSIS, for the processing of student records. The functions of SRS are gradually being incorporated into FlexSIS. (See also *FlexSIS*.)

Stage (equivalent to year/s of enrolment)
For the purposes of administration, a course may be divided into stages to be studied consecutively. Part-time students progress through a course more slowly and would often enrol in the same stage more than once.

Stream
A defined program of study within an award course, which requires the completion of a program of study specified by the course rules for the particular stream, in addition to the core program specified by the course rules for the award course. Students enrolled in award courses that involve streams will have the stream recorded in their enrolment record. Students normally enter streams at the time of admission, although some award courses require students to enrol in streams after the completion of level 1000 units of study. Where permitted to do so by faculty resolution, students may transfer from one stream to another, within an award course, provided they meet criteria approved by the Academic Board on the advice of the faculty concerned. 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 ID Card
All students who enrol are issued with an identification card. The card includes the student 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 Load
See *Load*.

Student/Staff Ratios (SSR)
These are calculated on a departmental/faculty basis by dividing the student load attributable to a particular department/faculty by

the full-time equivalent academic staff employed to teach in or on behalf of that department/faculty.

Student type

Student type can be Local, International – Fee Paying, International – Study Abroad, International – Incoming Exchange, International – Sponsored Award.

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. The program covers a broad spectrum of courses in Liberal Arts, Agriculture, Architecture, Economics, Education, Engineering, Health Sciences, Law, Music, Nursing and Science. (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 – eg, 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'.

Summer School

See *Sydney Summer School*.

Supervising Faculty

The faculty which has the responsibility for managing the academic administration of a particular course – ie, 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 at any given time. Further, in the case where one course is jointly offered by two or more faculties (eg, the Liberal Studies course), a joint committee may make academic decisions about candidature and the student may be assigned a supervising faculty for administration.

The International Office has a supporting role in the administration of the candidatures of international students and alerts the supervising faculty to any special conditions applying to these candidatures (eg, that enrolment must be full-time). (See also *Board of studies*.)

Supervision

Refers to a one-to-one relationship between a student and a nominated member of the academic staff or a person specifically appointed to the position. (See also *Advisor, Associate supervisor, Instrumental supervisor (teacher), Research supervisor.*)

Suppression of results

Results for a particular student can be suppressed by the University for the following reasons:

- the student has an outstanding debt to the University
- the student is facing disciplinary action.

Suspension

See *Course leave*.

Sydney Summer School

A program of accelerated, intensive study running for approximately 6 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 are full fee-paying and enrolled students are also liable for compulsory subscriptions. Some fee-waiver scholarships are available.

Teaching department

See *Department*.

Temporary address

Students may advise the University of a temporary address. Correspondence will be sent to this address between the dates specified by the student. (See also Addresses, Business address, Permanent home address, Semester address.)

Testamur

A certificate of award provided to a graduate usually at a graduation ceremony.

Thesis

A major work that is the product of an extended period of supervised independent research.† means the earliest date at which a research student can submit the thesis. 'means the latest date at which a research student can submit the thesis.

Timetable

Timetable refers to 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.

UAC

The Universities Admissions Centre (UAC) receives and processes applications for admission to undergraduate courses at recognised universities in NSW and the ACT. Most commencing undergraduate students at the University apply through UAC.

UAC admissions

Most local undergraduates (including local undergraduate fee payers) apply through the Universities Admission Centre (UAC).

The University Admissions Office coordinates the processing of UAC applicants with faculties and departments and decisions are recorded on the UAC system.

Applicants are notified by UAC and an electronic file of applicants who have been made offers of admission to courses at the University is loaded onto FlexSIS. (See also *Admission, Direct admissions*.)

UAI (Universities Admission Index)

A number between 0.00 and 100.00 with increments of 0.05. It provides 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.

Undergraduate

A term used to describe a course leading to a diploma or bachelor's degree. An 'undergraduate' is a student enrolled in such a course.

Unit of study

The smallest stand-alone component of a student's course that is recordable on a student's transcript. Units of study have an integer credit point value, normally in the range 3–24. Each approved unit of study is identified by a unique sequence of eight characters, consisting of a four character alphabetical code which usually identifies the department or subject area, and a four character numeric code which identifies the particular unit of study. Units of study can be grouped by subject and level. (See also *Core unit of study, Course, Major.*)

Unit of study enrolment status

The enrolment status indicates whether the student is still actively attending the unit of study (ie, currently enrolled) or is no longer enrolled (withdrawn, discontinued or cancelled).

Unit of study group

A grouping of units of study within a course. The units of study which make up the groups are defined within FlexSIS.

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 Medal

A faculty may recommend the award of a University Medal to students qualified for the award of an undergraduate Honours degree or some master's degrees whose academic performance is judged to be outstanding.

UPA

University Postgraduate Award.

Upgrade

Where a student is enrolled in a Master's by research course and where the research they are undertaking is 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. There would be no interval between the candidature for the Master's degree and the PhD unless the interval was covered by a period of suspension.

With an upgrade, the research undertaken by the student while enrolled for the Master's by research degree would either be continued in the PhD or modified to meet the requirements for a PhD program.

USYDnet

The University of Sydney's intranet system. In addition to the customised MyUni service, it provides access to other services such as directories (maps, staff and student, organisations), a calendar of events (to which staff and students can submit entries), and a software download area. (See also MyUni.)

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.

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*.)

WAM (Weighted Average Mark)

This mark uses the unit of study credit point value in conjunction with an agreed 'weight'. The formula for this calculation is:

$$WAM = \frac{\sum(marks \times creditPointValue \times levelWeight)}{\sum(creditPointValue \times levelWeight)}$$

The 'marks' used in this formula are the actual marks obtained by the student in each unit of study, as recorded on the student's record, including any marks of less than 50, and in the case of a failing grade with no mark, the mark defaults to 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.

Faculty resolutions may also include specific formulae for the purpose of calculating progression between years, or for calculating entrance into an honours year. If such a formula is not specified in the faculty resolutions, the formula outlined above is used. (Effective from 1 January 2004.)

YAM (Yearly Average Mark)

This term has been renamed AAM (Annual Average Mark). See AAM in this Glossary.

YFE (Year of First Enrolment)

The year in which a student first enrols at the University.

Youth Allowance

Youth Allowance is payable to a full-time student or trainee aged 16–24 years of age; and 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. Youth Allowance replaces AUSTUDY.

Science subject area index

Abnormal Psychology *see* Psychology
Acoustics *see* Physics
Algebra *see* Mathematics and Statistics
Analysis *see* Mathematics and Statistics
Animal Physiology *see* Biological Sciences, BMedSc, Physiology
Analytical Chemistry *see* Agricultural Chemistry and Soil Science, Chemistry
Anatomy *see* Anatomy and Histology
Applied Mathematics *see* Mathematics and Statistics
Applied Physics *see* Physics
Artificial Intelligence *see* Computer Science
Astronomy *see* Physics
Astrophysics *see* Physics
Atomic Physics *see* Physics
Bacteriology *see* Biochemistry, Biological Sciences, BMedSc, BSc (Molecular Biotechnology), Microbiology
Beach Dynamics *see* Marine Studies, Geography
Biodegradation *see* Microbiology, Agricultural Chemistry and Soil Science, BSc (Molecular Biotechnology)
Biological Chemistry *see* Agricultural Chemistry and Soil Science, Biochemistry, BSc (Molecular Biotechnology), Chemistry
Bioinformatics *see* Biological Science, Computer Science, Microbiology, BSc (Bioinformatics), BSc (Molecular Biotechnology)
Biomaterials *see* BSc (Molecular Biotechnology)
Bioremediation *see* Biological Sciences, Microbiology, Agricultural Chemistry and Soil Science, BSc (Molecular Biotechnology)
Biotechnology *see* Biochemistry, Biological Sciences, BSc (Molecular Biotechnology), Chemistry, Microbiology, Physiology
Behavioural Genetics *see* Biological Sciences
Behavioural Science *see* Psychology
Biomathematics *see* Mathematics and Statistics
Biophysical Chemistry *see* Biochemistry, BSc (Molecular Biotechnology), Chemistry
Biophysics *see* Physics
Botany *see* Biological Sciences
Carbohydrate Chemistry *see* Agricultural Chemistry and Soil Science, Biochemistry, BSc (Molecular Biotechnology), Chemistry
Catalysis *see* Biochemistry, Chemistry
Category Theory *see* Mathematics and Statistics
Cancer *see* Biochemistry, BMedSc, Cell Pathology, Immunology, Physiology
Cardiovascular disease *see* Cell Pathology
Cardiovascular therapeutics *see* Pharmacology, BMedSc
Cell Biology *see* Biochemistry, Biological Sciences, BMedSc, Cell Pathology, Histology, Immunology, Microbiology, Physiology
Chaos *see* Physics, Mathematics and Statistics
Chemotherapy *see* Biochemistry, Chemistry, Microbiology, Pharmacology
Clay Mineralogy *see* Agricultural Chemistry and Soil Science
Coastal Morphodynamics *see* Marine Studies, Geography
Coastal Zone Management *see* Marine Studies, Geography
Cognitive Science *see* Psychology
Colloid Science *see* Chemistry, Key Centre for Polymer Colloids, BSc (Molecular Biotechnology)
Communicating Science *see* History and Philosophy of Science
Communication *see* Psychology
Communications Technology *see* Computer Science
Computational Algebra *see* Mathematics and Statistics
Computational Biology *see* BSc (Bioinformatics), BSc (Molecular Biotechnology)
Computational Chemistry *see* Chemistry
Computational Physics *see* Physics
Computational Science *see* Physics
Computer-aided Drug Design *see* Biochemistry, BMedSc, BSc (Molecular Biotechnology), Chemistry, Pharmacology
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Computer Graphics *see* Computer Science
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Data Analysis *see* Mathematics and Statistics, Physics
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Developmental Biology *see* Biological Sciences, BMedSc, Anatomy and Histology
Developmental Psychology *see* Psychology
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Disease *see* Biochemistry, BMedSc, BSc (Molecular Biotechnology), Cell Pathology, Immunology, Microbiology
Drugs *see* Biochemistry, BMedSc, BSc (Molecular Biotechnology), Chemistry, Pharmacology
DNA Technology *see* Biochemistry, Biological Sciences, BMedSc, BSc (Molecular Biotechnology), Physiology
Earth Evolution *see* Geology and Geophysics, Geography
Ecology *see* Biological Sciences, Microbiology
Economic Geology *see* Geology and Geophysics
Electrochemistry *see* Chemistry
Electromagnetism *see* Physics
Electron Microscopy *see* Australian Key Centre for Microscopy and Microanalysis, Anatomy and Histology, GradDipAppSc (Microscopy and Microanalysis), MAppSc (Microscopy and Microanalysis), Physics
Embryology *see* Anatomy and Histology
Endocrinology *see* Biochemistry, BMedSc, Physiology
Energy Conservation *see* Chemistry, Physics
Energy Science *see* Chemistry, Physics
Entomology *see* Biological Sciences
Environmental Pollution *see* Agricultural Chemistry and Soil Science, BSc(Environmental), BSc (Molecular Biotechnology), Chemistry, Geography, Marine Sciences, Microbiology
Environmental Science *see* Agricultural Chemistry and Soil Science, Biological Sciences, BSc (Environmental), Graduate Applied Science (Environmental), , Master of Environmental Science and Law, MSc (Environmental), Chemistry, Geography, Geology and Geophysics, Microbiology, Physics
Enzymes *see* Agricultural Chemistry and Soil Science, Biochemistry
Epidemiology *see* Mathematics and Statistics, Microbiology
Ethics and Science *see* HPS.
Evolution *see* Biological Sciences, Geology and Geophysics
Expert Systems *see* Computer Science
Fibre Optics *see* Physics
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Geometry *see* Mathematics and Statistics
Geomorphology *see* Geography, Marine Sciences
Geostatistics *see* Agricultural Chemistry and Soil Science, Mathematics and Statistics
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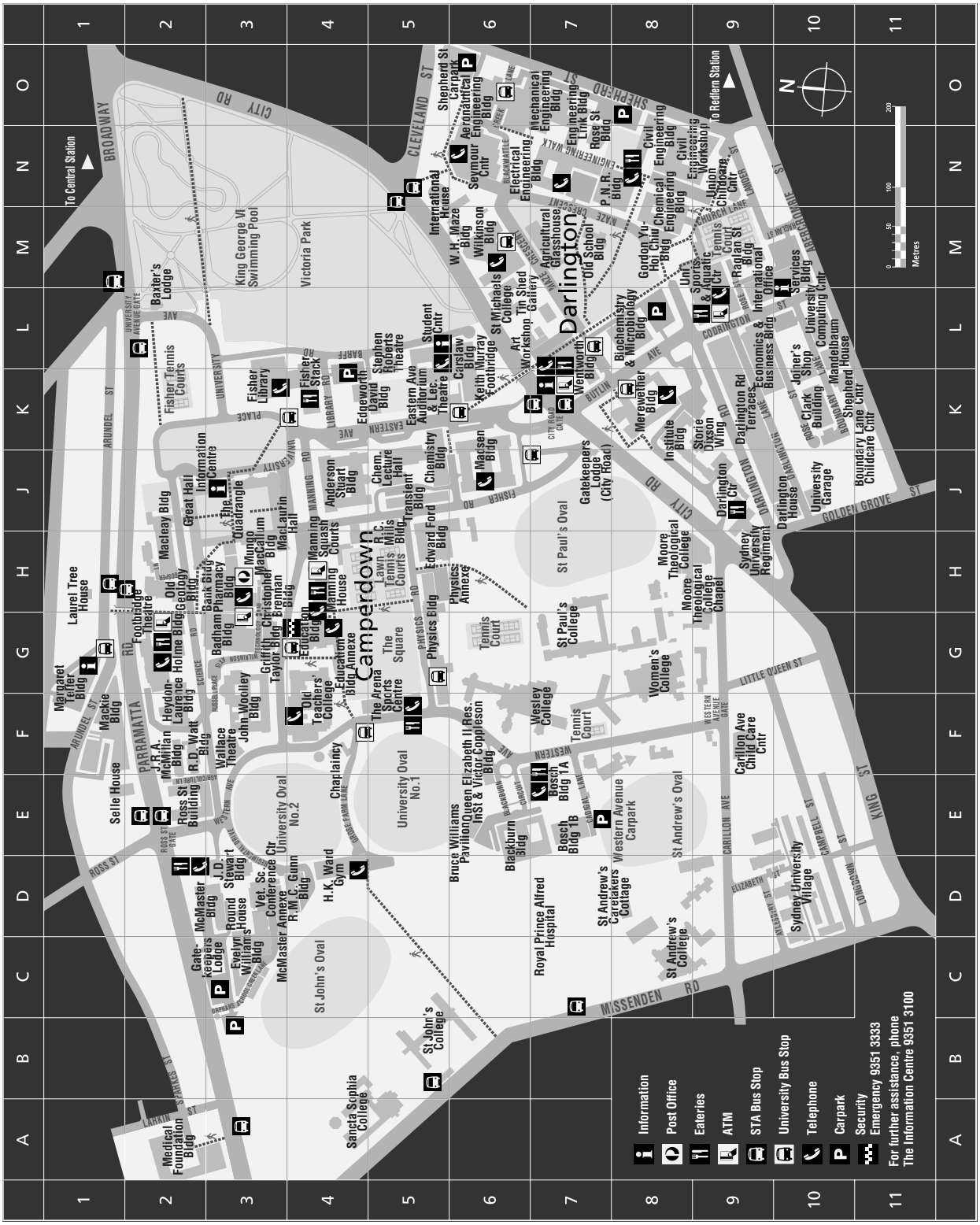

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O6 Aeronautical Engineering Building
J4 Anderson Stuart Building
L7 Art Workshop
G3 Badham Building
H3 Bank Building
L2 Baxter's Lodge
L8 Biochemistry and Microbiology Building
E6 Blackburn Building
E7 Bosch Building 1A
E7 Bosch Building 1B
E6 Bruce Williams Pavilion
L6 Carslaw Building
F4 Chaplaincy
M8 Chemical Engineering Building
J5 Chemistry Building
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N8 Civil Engineering Building
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J9 Darlington Centre
J10 Darlington House
K9 Darlington Road Terraces
K5 Eastern Avenue Auditorium & Lecture Theatre Complex
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K4 Edgeworth David Building
G4 Education Building
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H5 Edward Ford Building
N7 Electrical Engineering Building
N7 Engineering Link Building
C3 Evelyn Williams Building
K3 Fisher Library
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C3 Gatekeeper's Lodge
J7 Gatekeeper's Lodge (City Road)
M8 Gordon Yu-Hoi Chui Building
J2 Great Hall
G3 Griffith Taylor Building
D4 HK Ward Gymnasium
F2 Heydon-Laurence Building
G2 Holme Building
K8 Institute Building
N5 International House
F2 JRA McMillan Building
D3 JD Stewart 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
H3 Mungo MacCallum Building
H2 Old Geology Building
M7 Old School Building
F4 Old Teachers' College
H3 Pharmacy Building
H6 Physics Annexe
G5 Physics Building
N8 PNR Building
E6 Queen Elizabeth II Research Institute
H5 RC Mills Building
F2 RD Watt Building
D4 RMC Gunn Building
M9 Raglan Street Building
N7 Rose Street Building
E2 Ross Street Building
F2 Science Road Cottage
E1 Selle House
M10 Services Building
N6 Seymour Centre
K10 Shepherd Centre
O6 Shepherd Street Carpark
L5 Stephen Roberts Theatre
K9 Storie Dixson Wing
F5 The Arena Sports Centre
J3 The Quadrangle
J5 Transient Building
L10 University Computing Centre
J10 University Garage
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 WH Maze Building
M6 Wilkinson Building

Academic Colleges (offices)

H5 Health Sciences
F4 Humanities and Social Sciences
N8 Sciences and Technology

Childcare Centres

K11 Boundary Lane
F9 Carillon Avenue
H1 Laurel Tree House
N9 Union

Colleges & Residential Accommodation

J10 Darlington House
K9 Darlington Road Terraces
N5 International House
K10 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 (ITS)

L6 Carslaw
G4 Education
K3 Fisher
N7 PNR

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G2 Footbridge Theatre
H2 Macleay Museum
H3 Nicholson Museum
N6 Seymour Centre
K7 Sir Hermann Black Gallery
L6 Tin Sheds Gallery
H2 War Memorial Art Gallery

Faculties (offices)

E2 Agriculture
L6 Architecture
H3 Arts
J8 Economics & Business
G4 Education
N7 Engineering
H5 Medicine
G3 Pharmacy
K6 Science
D3 Veterinary Science

Libraries

L6 Architecture
G3 Badham
K8 Biochemistry
H5 Burkitt-Ford
J5 Chemistry
F4 Curriculum Resources
M7 Engineering
K3 Fisher
K4 Geosciences
K6 Mathematics
D7 Medical
N6 Music
H3 Pharmacy
H6 Physics
H5 Schaeffer Fine Arts

Retail

H3 Australia Post Office
H3 Bank Building
J9 Darlington Centre
G2 Holme 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
D3 Veterinary Hospital & Clinic
K7 Wentworth Building

Security

G3 Emergency Services
G3 Lost Property
G3 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 No1
E3 University Oval No2
M9 University Sports & Aquatic Centre

Unions and Associations (Offices)

K7 Students ' Representative Council (SRC)
M9 Sydney University Postgraduate

Representative Association (SUPRA)

M9 Sydney University Sports Union
G2 University of Sydney Union
F5 Sydney University Women's Sports Association

University Administration & Services

H3 Alumni Relations
F3 Business Liaison Office
F1 Careers Centre
G1 Cashier
F1 Centre for Continuing Education
H3 Chancellor
L10 Computing Centre
H2 Development Office
H2 Executive Offices
J3 Information Centre
L10 Information Technology Services
L9 International Office
G1 Personnel
M10 Printing Services (UPS)
H3 Publications Office
H3 Research Office
M10 Room Bookings & Venue Management
F1 Scholarships Unit
L5 Student Centre
F1 Student Housing
G4 Student Services Unit
J7 Summer School
D3 Veterinary Hospital & Clinic
H2 Vice-Chancellor

Course planner

	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 credit points
Year 1	1							
	2							
Year 2	Summer							
	1							
	2							
Year 3	Summer							
	1							
	2							
Year 4	Summer							
	1							
	2							
Year 5	Summer							
	1							
	2							
							Total credit points:	