

The University of Sydney



Faculty of Science

Handbook

1997

Editor
Anthony F. Masters

The Editor gratefully acknowledges the substantial inputs to the preparation of the Handbook by Ms Deirdre McKay and Ms Charlene Griffiths from the Faculty of Science. The Editor also thanks all Departmental and School Faculty Handbook Liaison Officers for their assistance.

The University of Sydney
 N.S.W. 2006
 Telephone (02) 9351 2222
 Faculty of Science Telephone (02) 9351 3021
 Faculty of Science Facsimile (02) 9351 4846

Semester and vacation dates 1997

Semester	Day	1997
First		
Semester and lectures begin	Monday	3 March
Easter recess		
Last day of lectures	Thursday	• 27 March
Lectures resume	Monday	7 April
Study vacation -1 week beginning	Monday	16 June
Examinations commence	Monday	23 June
Second		
Semester and lectures begin	Monday	28 July
Mid-semester recess		
Last day of lectures	Friday	26 September
Lectures resume	Tuesday	7 October
Study vacation -1 week beginning	Monday	10 November
Examinations commence	Monday	17 November

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Latest dates for Withdrawals and Discontinuations 1997

	Day	1997
Semester 1 courses		
Last day for Withdrawal	Sunday	30 March
Last day to Discontinue with Permission	Sunday	20 April
Last day to Discontinue	Friday	20 June
Semester 2 courses		
Last day for Withdrawal	Saturday	30 August
Last day to Discontinue with Permission	Sunday	14 September
Last day to Discontinue	Friday	14 November
Full Year courses		
Last day for Withdrawal	Saturday	30 March
Last day to Discontinue with Permission	Friday	1 August
Last day to Discontinue	Friday	14 November

Please note: No discontinuations can be made after 14 November 1997.

At the time of going to press, the details of Government policies with respect to higher education had not been finalised and the relevant legislation had yet to be enacted. The information in this Handbook is subject to approval and/or change by the Faculty or the University.

Introduction

This is the Faculty of Science Handbook. In it you will find a store of information about things you are likely to need to know about the Faculty.

In particular, it will help you to find out who the people in your Faculty are; the requirements for degrees in the Faculty and the ways that these can be satisfied; what courses are offered and the books required to do these courses; where to turn for more information, advice and help.

When making up your mind about your course of study, look at Chapter 3, dealing with how to get a degree, and also read the Resolutions of the Senate that apply to the degree. If you would like help in deciding on the best course for you to take, talk to a Faculty or Departmental adviser.

Once you have selected the Departments you will be studying in, you will then enrol. The Faculty requires

all enrolments to be approved by Faculty Advisers before the completion of the enrolment process. Any further particular requirements of Departments you enrol in are given at the beginning of the Department's entry in Chapter 5 on courses of study.

Information and advice

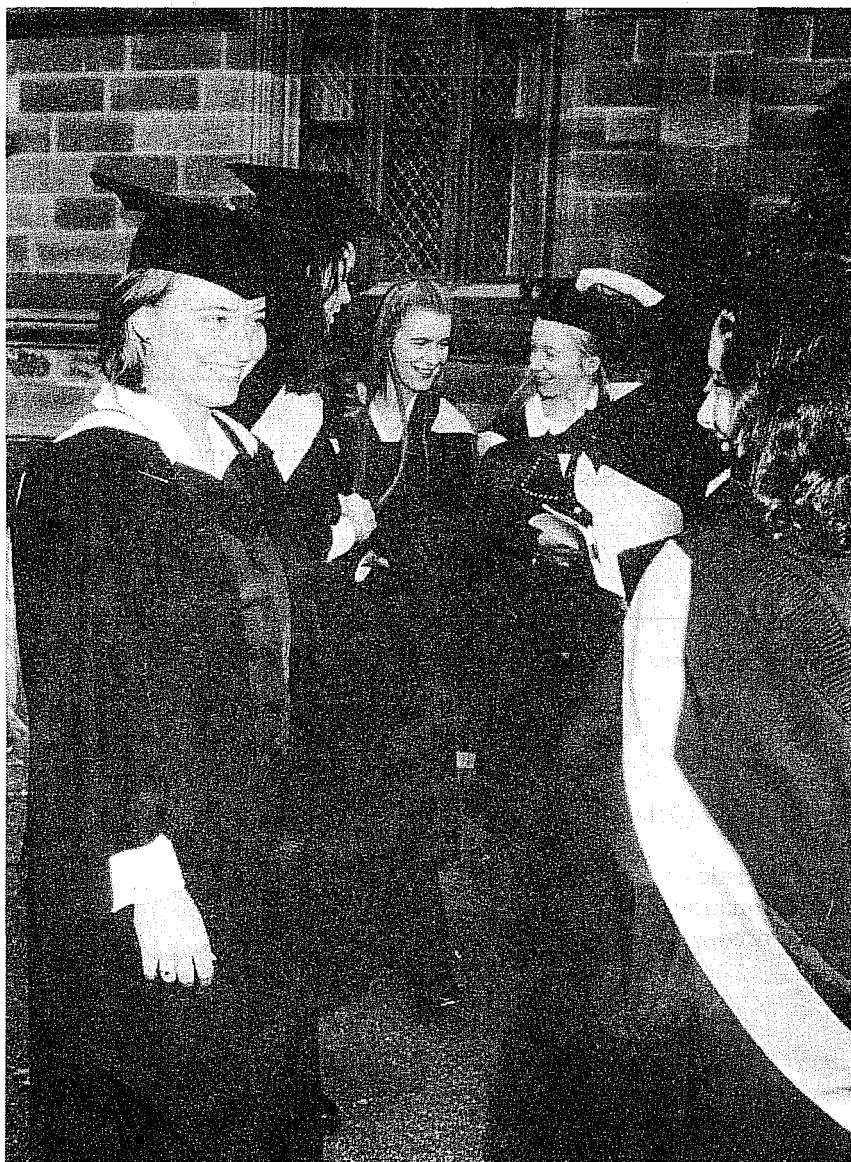
Faculty Office

The offices of the Dean and the Faculty Manager are in the Carslaw Building. The Dean is located on level 4 in Room 435 and the Faculty Manager is in the Faculty Office, level 2.

Departmental advisers or Head of Department or section

Any special advisers for Departments are set out in Chapter 2.

For questions about particular courses or subjects consult the above.



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Message from the Dean



Pictured are Professor Helen C Beh and 1995's top third year student Meri Peach. Meri is currently completing her Honours degree in Marine Biology.

On behalf of the Faculty of Science, I extend a warm welcome to all students enrolling in Science in 1997, particularly those commencing their studies this year. We hope that your stay at the University will be both enjoyable and productive.

The Faculty has now been in existence for over a hundred years and its graduates have brought us considerable distinction during that time. Many of them have occupied high profile public positions in diverse areas both here and abroad. For example, our current alumni include an astronaut, the Chief Scientist for the British Government and the head of one of Australia's largest companies.

Because of its size and extensive links with other Faculties in the University, the Faculty of Science is able to offer courses which cater for the widest possible range of student interests and abilities. Our courses provide preparation for professional careers in many scientific fields, including medical science, pharmacy, psychology, environmental science, computer science and molecular biology. The degree programmes also offer combinations which provide a broad general education in science which opens the way for a variety of careers in both the public and private sector.

As well as catering for different interests of students, our courses provide for differences in ability in the various areas of science. Most courses are available at an advanced level for students wishing for a special challenge in their studies. In addition, our Talented Student Program provides enormous flexibility in study for students with exceptional ability.

In 1997, the flexibility for which the Faculty is renowned will increase with the introduction of

semesterisation. Students will have a much wider choice of subject options and be able to 'customise' their courses to a much greater extent.

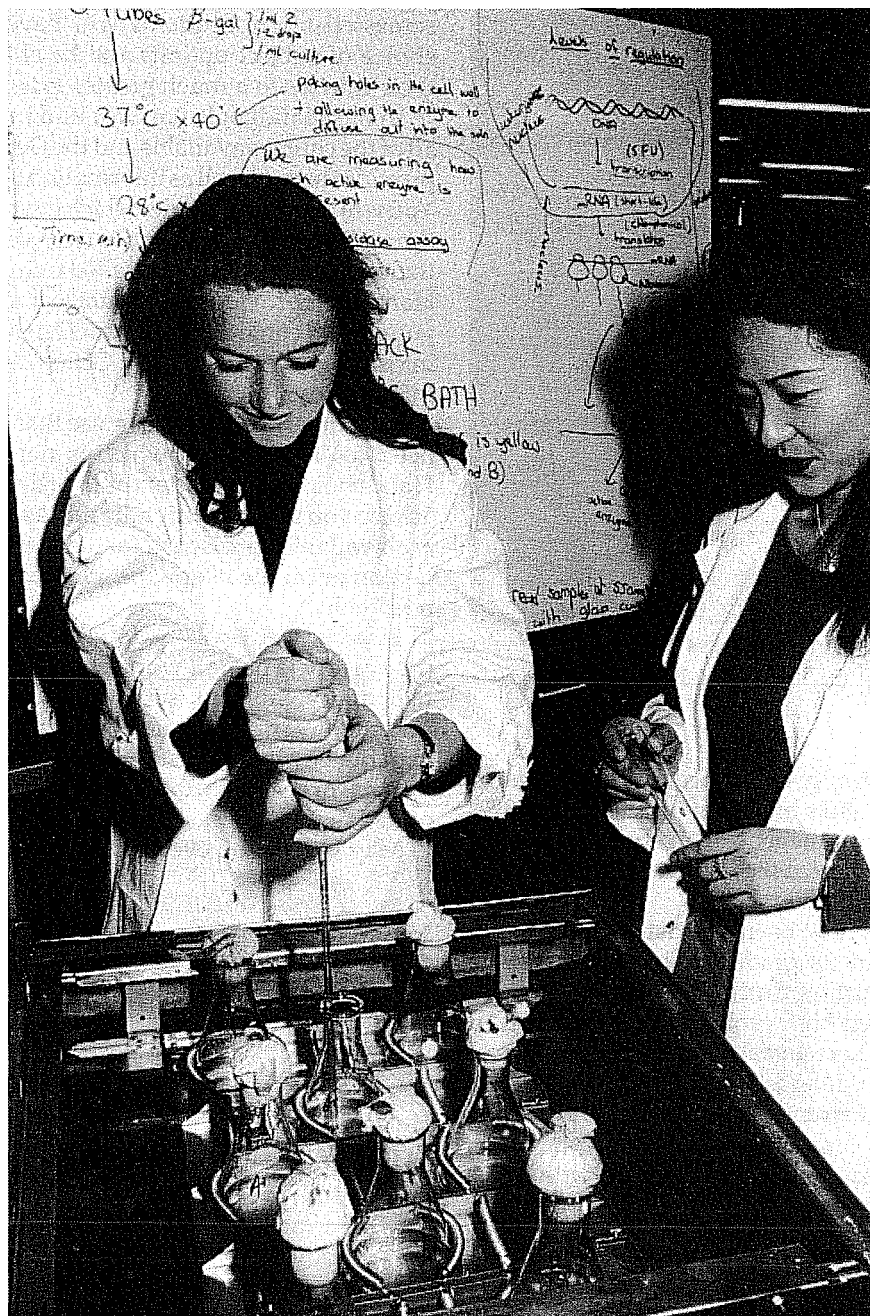
In this Handbook, you will find information about all of the courses available and the Departments which provide them as well as information about the Faculty. You will also find the rules which govern your progress through your degree setout so that you can understand them. If you want more detailed information than this Handbook provides, or are unclear about something, you should contact the relevant Department for course information or the Faculty Office for administrative information.

Staff in our Faculty recognise that there is often the need for information which is not available in the Handbook and will attempt to provide you with any advice you need in a friendly and helpful fashion. We are available to discuss matters with you either in person or on the telephone. Please seek us out if you need help.

Finally, you should try to ensure that your period in the Faculty is not 'all work and no play'. The Faculty has many student societies which you should investigate so that you obtain the full University experience which, in summary, can be expressed as lots of work, lots of fun and a quality degree at the end of it.

May I wish you every Success in your studies.

Helen C. Beh
Acting Dean



Students performing a laboratory experiment.

1 The Faculty of Science¹

THE FACULTY OF SCIENCE

Carslaw Building F07
The University of Sydney
NSW 2006
Telephone +61 (02) 9351 3021
Facsimile +61 (02) 9351 4846
e-mail facsci@scifac.su.oz.au
URL <http://www.scifac.usyd.edu.au>

Acting Dean

Associate Professor Helen C. Beh

Pro-Deans

Associate Professor Christopher B. Gillies
Associate Professor Anthony F. Masters

Associate Deans

Associate Professor Gerald M. Holder
Associate Professor Brian W. James
Dr Mary Peat
Associate Professor Cedric D. Shorey
Dr Ian Spence
Associate Professor Donald E. Taylor
Dr Michael A.W. Thomas

Executive Officer

Kim P. Schwieters

Resources Manager

Dorothea Sophia

Faculty Manager

Charlene Griffiths

Assistant to the Faculty Manager

Deirdre McKay

Postgraduate Adviser

Maria A. Marshall

Undergraduate Adviser

Thea Papageorgiou

Administrative Assistants

Ranee M. Boteju
Lisa N. Jones
Jennifer R. McCallister
Vladimir Y. Tretyakov
Elisabeth van de Wetering

Marketing Manager

Adrienne Jerram

Marketing Assistant

Alison Gall

Professional Development Course Coordinator

Anne M. Powell

DEPARTMENTS/SCHOOLS

Department of Agricultural Chemistry and Soil Science, A03

Telephone +61 (02) 9351 2439
Facsimile +61 (02) 9351 5108
e-mail hod.agchem@agcc.usyd.edu.au
URL <http://soils.agric.usyd.edu.au>
Head of Department Associate Professor L. Copeland

Department of Anatomy and Histology, F13

Telephone +61 (02) 9351 2520
Facsimile +61 (02) 9351 6556/2813
e-mail enquiries@anatomy.su.oz.au
URL <http://www.anatomy.su.oz.au/index.html>
Head of Department Associate Professor Cedric D. Shorey

Department of Biochemistry, G08

Telephone +61 (02) 9351 2597
Facsimile +61 (02) 9351 4726
e-mail mflz7m.miller@biochem.usyd.edu.au
URL <http://www.biochem.usyd.edu.au>
Head of Department Professor Robert Gerard Wake

School of Biological Sciences, A12

Telephone +61 (02) 9351 2848
Facsimile +61 (02) 9351 2558
e-mail djp@bio.usyd.edu.au
URL <http://www.bio.usyd.edu.au>
Head of School Professor David Joseph Patterson

School of Chemistry, F11

Telephone +61 (02) 9351 4504
Facsimile +61 (02) 9351 3329
e-mail hos@chem.usyd.edu.au
Head of School Professor Donald Harold Napper

Basser Department of Computer Science, F09

Telephone +61 (02) 9351 3423
Facsimile +61 (02) 9351 3838
e-mail admin@cs.usyd.edu.au
URL <http://www.cs.su.oz.au>
Head of Department Professor John Rosenberg

Department of Geography, H03

Telephone +61 (02) 9351 2886/2805
Facsimile +61 (02) 9351 3644
e-mail hod@geography.usyd.edu.au
Head of Department Associate Professor Robin F. Warner

Department of Geology and Geophysics, F05

Telephone +61 (02) 9351 2912
Facsimile +61 (02) 9351 0184
e-mail jock@ucc.su.oz.au
Head of Department Dr John B. Keene

School of Mathematics and Statistics, F07

Telephone +61 (02) 9351 4533
Facsimile +61 (02) 9351 4534
e-mail enq@maths.usyd.edu.au
LIRL <http://www.maths.usyd.edu.au:8000/>
Head of School Associate Professor Christopher J. Durrant

¹As of 31 August 1996

Department of Microbiology, G08*Telephone* +61 (02) 9351 2536*Facsimile* +61 (02) 9351 4571*e-mail* hod.micro@microbio.su.oz.au*Head of Department* Professor Peter Richard Reeves**Department of Pathology, D06***Telephone* +61 (02) 9351 2414/2600*Facsimile* +61 (02) 9351 3429*e-mail* fi@pathology.su.oz.au*Head of Department* Professor GIVE Harper**Department of Pharmacology, D06***Telephone* +61 (02) 9351 2408*Facsimile* +61 (02) 9351 3808*e-mail* mfli7virginia@pharmacol.su.oz.au*Head of Department* Professor J. Paul Seale**Department of Pharmacy, A15***Telephone* +61 (02) 9351 2320*Facsimile* +61 (02) 9351 4391*e-mail* rages@pharmacy.pharm.su.oz.au*URL* <http://www.usyd.edu.au/su/pharmacy/pharm.html>*Head of School* Professor Shalom Isaac Benrimoj**School of Physics, A28***Telephone* +61 (02) 9351 2537*Facsimile* +61 (02) 9351 2903*e-mail* physics@physics.usyd.edu.au*URL* <http://www.physics.usyd.edu.au>*Head of School* Professor Ross C. McPhedran**Department of Physiology, F13***Telephone* +61 (02) 9351 2509*Facsimile* +61 (02) 9351 2058*e-mail* enquiries@physiol.usyd.edu.au*URL* <http://www.physiol.usyd.edu.au>*Head of Department* Associate Professor David Davey**Department of Psychology, A19***Telephone* +61 (02) 9351 2865*Facsimile* +61 (02) 9351 2603*e-mail* hod@psych.su.oz.au*URL* <http://www.psych.su.oz.au>*Head of Department* Dr David J. Kavanagh**Coastal Studies Unit, H03***Telephone* +61 (02) 93513625/6444*Facsimile* +61 (02) 9351 3644*e-mail* ashort@extro.ucc.su.oz.au*Director* Associate Professor Andrew D. Short**History and Philosophy of Science, F07***Telephone* +61 (02) 93514226*Facsimile* +61 (02) 9351 4124*e-mail* shari@scifac.su.oz.au*Director* Associate Professor Alan F. Chalmers**Human Nutrition Unit, G08***Telephone* +61 (02) 9351 3757*Facsimile* +61 (02) 9351 6022*e-mail* mfli7m.alexander@biochem.usyd.edu.au*Boden Professor of Human Nutrition from 1997* Professor Ian Douglas Caterson**Institute of Marine Ecology, A11***Telephone* +61 (02) 9351 2590*Facsimile* +61 (02) 9351 6713*e-mail* jwinzar@bio.usyd.edu.au*Director* Professor Antony J. Underwood**Marine Studies Centre, F05***Telephone* +61 (02) 9351 2699*Facsimile* +61 (02) 9351 6713*e-mail* jwinzar@bio.usyd.edu.au*Director* Professor Antony J. Underwood**Ocean Studies Institute, H34***Telephone* +61 (02) 9351 2279*Facsimile* +61 (02) 9351 4067*Director* Professor Peter J. Davies**Mathematics Learning Centre, F07***Telephone* +61 (02) 9351 4061*Facsimile* +61 (02) 93515797*e-mail* maz7jackien@extro.ucc.su.oz.au*Director* Dr Jacqueline M. Nicholas

2 Study in the Faculty of Science

This handbook is intended to give you a comprehensive view of the courses that the Faculty of Science offers, and to help you select those best suited to your capacity, present needs and intended career.

The Faculty of Science offers a wide range of training intended, on the one hand, to prepare you to become a professional scientist in one or other of the several branches of science (including Pharmacy) and, on the other, to prepare you for careers in non-specialised fields requiring a scientific background.

Courses available

The Faculty offers courses in the following subjects:

Agricultural Chemistry
Anatomy
Biochemistry
Biology
Cell Pathology
Chemical Engineering Science
Chemistry
Civil Engineering Science
Computer Science
Geography
Geology
Geophysics
Histology
History and Philosophy of Science
Marine Sciences
Applied Mathematics
Pure Mathematics
Mathematical Statistics
Mechanical and Aeronautical Engineering Science
Microbiology
Pharmacology
Physics
Physiology
Psychology
Soil Science

In addition to the above, courses are available for the degrees of Bachelor of Medical Science, Bachelor of Pharmacy, Bachelor of Psychology, Bachelor of Computer Science and Technology and the specially designated BSc (Advanced), BSc (Environmental) and BSc (Molecular Biology and Genetics) degree programs. Combined degree programs are also available with the Faculties of Arts, Economics, Engineering, Law and Medicine.

Information about these courses is given in Chapters 3 and 5. The Faculty also offers a Talented Student Program, which is discussed in Chapter 4. Postgraduate study is discussed in Chapter 7.

Science disciplines and subject areas available in the Faculty of Science

Acoustics see Physics
Algebra see Mathematics and Statistics

Analysis

Animal Physiology

Analytical Chemistry

Applied Mathematics

Applied Physics
Artificial Intelligence
Astronomy
Astrophysics
Atomic Physics
Bacteriology

Beach Dynamics

Biodegradation

Biological Chemistry

Bioremediation

Biotechnology

Behavioural Science
Biophysical Chemistry

Botany
Carbohydrate Chemistry

Catalysis

Category Theory

Cancer

see Mathematics and Statistics
see Biological Sciences
see BMedSc
see Physiology
see Agricultural Chemistry and Soil Science
see Chemistry
see Mathematics and Statistics
see Physics
see Computer Science
see Physics
see Physics
see Physics
see Biochemistry
see Biological Sciences
see BMedSc
see Microbiology
see Marine Studies
see Geography
see Microbiology
see Agricultural Chemistry and Soil Science
see Agricultural Chemistry and Soil Science
see Biochemistry
see Chemistry
see Microbiology
see Agricultural Chemistry and Soil Science
see Biochemistry
see Biological Sciences
see Chemistry
see Microbiology
see Physiology
see Psychology
see Biochemistry
see Chemistry
see Biological Sciences
see Agricultural Chemistry and Soil Science
see Biochemistry
see Chemistry
see Biochemistry
see Chemistry
see Mathematics and Statistics
see Biochemistry
see BMedSc
see Cell Pathology

Cell Biology	see Biochemistry see Biological Sciences see BMedSc see Cell Pathology see Histology see Microbiology see Physiology	Disease	see Biochemistry see BMedSc see Cell Pathology see Microbiology see Biochemistry see BMedSc see Chemistry see Pharmacology see Pharmacy
Chaos	see Physics	Drugs	see Biochemistry see Biological Sciences see BMedSc see Physiology see Geology and Geophysics
Chemotherapy	see Biochemistry see Chemistry see Microbiology see Pharmacology	DNA Technology	see Geography see Biological Sciences see Microbiology see Geology and Geophysics
Clay Mineralogy	see Agricultural Chemistry and Soil Science	Earth Evolution	see Chemistry see Physics see Histology see Physics see Histology see Biochemistry see BMedSc see Physiology see Physics see Physics see Biological Sciences see Agricultural Chemistry and Soil Science see BSc (Environmental) see Chemistry see Geography see Marine Sciences see Microbiology see Agricultural Chemistry and Soil Science see Biological Sciences see Chemistry see Geography see Geology and Geophysics see Microbiology see Physics see Psychology see Agricultural Chemistry and Soil Science see Biochemistry see Mathematics and Statistics see Microbiology see Physiology see Biological Sciences see Geology and Geophysics see Computer Science see Expert Systems see Fish Biology
Coastal Morphodynamics	see Marine Studies	Ecology	
Coastal Zone Management	see Geography see Marine Studies see Geography	Economic Geology	
Cognitive Science	see Psychology	Electrochemistry	
Colloid Science	see Chemistry	Electromagnetism	
Communicating Science	see History and Philosophy of Science	Electron Microscopy	
Communications Technology	see Computer Science	Embryology	
Computer-aided Drug Design	see Biochemistry see BMedSc see Chemistry see Pharmacology	Endocrinology	
Computational Algebra	see Mathematics and Statistics	Energy Conservation	
Computational Chemistry	see Chemistry	Energy Science	
Computational Physics	see Physics	Entomology	
Computer Design	see Computer Science	Environmental Pollution	
Computer Graphics	see Computer Science		
Computer Cartography	see Geography		
Computer Networks	see Computer Science		
Computer Programming	see Computer Science		
Condensed Matter Physics	see Physics		
Conservation	see Biological " Sciences see Geography see Geology and Geophysics	Environmental Science	
Cosmology	see Physics		
Crystallography	see Biochemistry see Chemistry see Geology and Geophysics		
Data Analysis	see Mathematics and Statistics see Physics	Enzymes	
Databases	see Computer Science		
Developmental Biology	see Biological Sciences see BMedSc see Histology	Epidemiology	
Dietetics	see Biochemistry see BMedSc see Postgraduate study MNutrSc and MNutrDiet	Ergonomics	
		Evolution	
		Expert Systems	
		Fish Biology	

Fisheries Biology	see Marine Sciences	Human Nutrition	see Biochemistry
Fluvial Systems	see Geography	Hydrology	see Agricultural Chemistry and Soil Science
Food Science	see Agricultural Chemistry and Soil Science		see BSc (Environmental)
	see Biochemistry		see Geography
	see Chemistry	Image Processing	see Physics
	see Microbiology	Immunology	see Biochemistry
	see Postgraduate study		see Biological Sciences
	MNutrSc and		see BMedSc
	MNutrDiet		see Cell Pathology
Forensic Science	see Biochemistry	Industrial Chemistry	see Chemistry
	see BMedSc	Infectious Diseases	see BMedSc
Fungal Biology	see Chemistry		see Cell Pathology
	see Biological Sciences		see Microbiology
General Relativity	see Physics	Information Technology	see Computer Science
Genetics	see Biochemistry	Instrumentation	see Physics
	see Biological Sciences	Inorganic Chemistry	see Chemistry
	see BMedSc	Intertidal Ecology	see Marine Sciences
	see BSc (Molecular Biology and Genetics)	Invertebrate Zoology	see Biological Sciences
	see Microbiology	Land Resources	see Agricultural Chemistry and Soil Science
Genetic Engineering	see Biochemistry		see Geography
	see Biological Sciences	Lasers	see Physics
	see BMedSc	Macromolecular Structure	see Biochemistry
	see BSc (Molecular Biology and Genetics)	Magnetic Resonance Imaging	see Chemistry
	see Microbiology		see Biochemistry
Geochemistry	see Chemistry	Mammalian Biology	see BMedSc
	see Geography	Marine Biology	see Biological Sciences
	see Geology and Geophysics	Marine Ecology	see Biological Sciences
Geographical Information Systems (GIS)	see Agricultural Chemistry and Soil Science	Marine Geology	see Marine Studies
	see Geography	Marine Geophysics	see Biological Sciences
Geometry	see Mathematics and Statistics	Marine Science	see Marine Sciences
Geomorphology	see Geography		see Geology and Geophysics
Geostatistics	see Agricultural Chemistry and Soil Science		see Geology and Geophysics
	see Mathematics and Statistics		see Biological Sciences
Geophysics	see Geology and Geophysics	Materials Science	see Chemistry
Haematology	see Histology	Mathematical Modelling	see Physics
	see BMedSc		see Mathematics and Statistics
Histochemistry	see Histology	Mathematical Statistics	see Physics
	see BMedSc	Measurement Science	see Mathematics and Statistics
History of Science	see BMedSc	Medicinal Chemistry	see Physics
	see History and Philosophy of Science	Medical Biochemistry	see Chemistry
Human Life Sciences	see Anatomy		see Pharmacology
	see Biochemistry		see Pharmacy
	see BMedSc		see Biochemistry
	see Cell Pathology		see BMedSc
	see Histology		see BSc (Molecular Biology and Genetics)
	see Physiology		

Medical Microbiology	see BMedSc	Neural Networks	see Mathematics and Statistics
Medical Molecular Biology	see Microbiology		see Physiology
	see Biochemistry	Neuroanatomy	see BMedSc
	see Microbiology	Neurochemistry	see BMedSc
	see BMedSc	Neurophysiology	see Pharmacology
	see BSc (Molecular Biology and Genetics)		see BMedSc
Membrane Biology	see Biological Sciences	Neuroscience	see Physiology
Metabolism	see Agricultural Chemistry and Soil Science		see Anatomy
	see Biochemistry	Nitrogen Fixation	see Anatomy
	see Biological Sciences		see BMedSc
	see BMedSc	Nonlinear Analysis	see Physiology
	see Microbiology		see Physiology
Microanalysis	see Physics	Nuclear Magnetic Resonance (NMR)	see Agricultural Chemistry and Soil Science
Microscopy	see Agricultural Chemistry and Soil Science	Nuclear Physics	see Microbiology „
	see Biological Sciences	Nutrition	see Mathematics and Statistics
	see BMedSc		see Chemistry
	see Histology		see Biochemistry
	see Microbiology		see Physics
	see Physics		see Biochemistry
Microtechniques	see Histology		see BMedSc
	see BMedSc		see Postgraduate study
Mineralogy	see Geology and Geophysics	Oceanography	MNutrSc and MNutrDiet
Mineral Physics	see Geology and Geophysics		see Geology and Geophysics
Molecular Biology	see Biochemistry	Optical Fibre Technology	see Marine Studies
	see Biological Sciences	Optics	see Physics
	see BMedSc	Organic Chemistry	see Physics
	see BSc (Molecular Biology and Genetics)	Organometallic Chemistry	see Chemistry
	see Cell Pathology	Palaeontology	see Chemistry
	see Chemistry	Parasitology	see Geology and Geophysics
	see Microbiology	Particle Physics	see BMedSc
	see Physiology	Pathogenicity	see Physics
	see Chemistry	Pedogeomorphology	see Microbiology
Molecular Engineering	see Biochemistry	Pedology	see Geography
Molecular Genetics	see Biological Sciences	Pesticide Chemistry	see Agricultural Chemistry and Soil Science
	see BMedSc		see Agricultural Chemistry and Soil Science
	see BSc (Molecular Biology and Genetics)	Petrochemicals	see Chemistry
	see Chemistry	Petroleum Geology	see Chemistry
Molecular Modelling	see Pharmacology	Petrology	see Geology and Geophysics
Molecular Physics	see Physics	Pharmaceutical Chemistry	see Geology and Geophysics
Morphology	see BMedSc	Philosophy of Science	see Chemistry
Mycology	see Biological Sciences		see Pharmacy
	see BMedSc	Photonics	see History and Philosophy of Science
Natural Hazards	see Geography	Physical Chemistry	see Physics
	see Geology and Geophysics	Plant Management	see Chemistry
Natural Products Chemistry	see Agricultural Chemistry and Soil Science	Plant Metabolism	see Biological Sciences
	see Chemistry	Plant Molecular Biology	see Agricultural Chemistry and Soil Science
			see Biological Sciences

Plant Physiology	see Biological Sciences	Theoretical Physics	see Physics
Plant Science	see Biological Sciences	Thermal Physics	see Physics
Plasma Physics	see Physics	Toxicology	see Chemistry
Plate Tectonics	see Geology and Geophysics		see Pharmacology
Polymer Science	see Chemistry	Vertebrate Zoology	see Pharmacy
Programming	see Computer Science	Virology	see Biological Sciences
Proteins	see Biochemistry		see BMedSc
Protozoology	see Chemistry		see BSc (Molecular Biology and Genetics).
Public Health	see Biological Sciences		see Microbiology
Pure Mathematics	see BMedSc	Volcanology	see Geology and Geophysics
Quantum Mechanics	see Mathematics and Statistics	X-Ray Crystallography	see Chemistry
Recombinant DNA Technology	see Chemistry	Zoology	see Biological Sciences
	see Physics		
	see Biochemistry		
	see Biological Sciences		
	see BMedSc		
	see BSc (Molecular Biology and Genetics)		
	see Microbiology		
Relativity	see Physics		
Resource Management	see Geography		
River Systems	see BSc (Environmental)		
	see Geography		
Robotics	see Computer Science		
Scientific Revolution	see History and Philosophy of Science		
Sedimentology	see Geography		
	see Geology and Geophysics		
	see Marine Studies		
Social Relations of Science	see History and Philosophy of Science		
Software Engineering	see Computer Science		
Soil Chemistry	see Agricultural Chemistry and Soil Science		
Soil Physics	see Agricultural Chemistry and Soil Science		
Soil Science	see Agricultural Chemistry and Soil Science		
Solar Physics	see Physics		
Solid State Physics	see Physics		
Solid State Science	see Chemistry		
	see Physics		
Spectroscopy	see Chemistry		
	see Physics		
Statistics	see Mathematics and Statistics		
Structural Geology	see Geology and Geophysics		
Surface Science	see Chemistry		
	see Physics		
Systems Analysis	see Computer Science		
Therapeutics	see BMedSc		
	see Pharmacology		
Theoretical Chemistry	see Chemistry		

Departmental and Faculty advisers

The selection of courses is particularly important in the Faculty of Science because of the interdependence of the subjects studied. You should therefore consult one of the advisers before the beginning of Semester 1 (see list below).

All first year students will have the opportunity to discuss particular courses of study and any general academic problems with one of the Departmental advisers concerned. There will also be advisers available during the enrolment period.

You may seek advice from the advisers, the Associate Deans, Pro-Deans or Dean of the Faculty at any time in the academic year, should the need arise. Advisers should not, however, be regarded as coaches dealing with detailed instruction.

Degree Program Coordinators

BSc (Environmental) — Prof. Antony Underwood
BSc (Molecular Biology and Genetics) — Dr Peter Lay
BMedSc — Dr Ian Spence

Agricultural Chemistry

Associate Professor Les Copeland, Dr Edith M. Lees

Anatomy

Ms Anne Glucina, Dr J. Pro vis

Biochemistry

Intermediate year: Dr Gareth S. Denyer
Senior year: Dr Simon B. Easterbrook-Smith
4th year: Dr Ivan G. Darvey

Biological Sciences

Junior year: Dr Mary Peat
Intermediate year: Dr Jan Marc, Professor Tony Larkum, Dr Ben Oldroyd, Dr Michael Thompson
Senior year: Dr Ove Hoegh-Guldberg
4th year: Associate Professor Patsy Armati

Cell Pathology

Professor Nicholas Hunt, Dr Nicholas King

Chemistry

Junior year: Dr Ray Pierens
Intermediate and Senior years: Professor Leslie D. Field, Professor Robert G. Gilbert, Dr Tony F. Masters, Dr Scott H. Kable

Computer Science

Junior year: Dr Ian Parkin
Intermediate year: Dr Nitin Indurkha

Senior year: Dr Michael Wise
 4th year: Dr Wayne Wobke
 International Students: Dr Antonios Symvonis
 Research Committee (Research Students): Professor Ross Quinlan

Geography

Junior year: Associate Professor John Connell
 Intermediate year: Dr Peter Cowell
 Senior year: Dr Phil Hirsch
 4th year: Associate Professor Andrew Short

Geology and Geophysics

Junior year: Dr John B. Keene
 Intermediate year: Dr Eric A.K. Middlemost
 Intermediate year Environmental Geology: Dr Gavin Birch
 Senior year: Dr Roger Buick
 4th year: Dr Geoffrey L. Clarke
 Geophysics: Mr Jan Stienstra

Histology

Dr Christopher R. Murphy, Dr Lynette A. Moffat

History and Philosophy of Science

Associate Professor Alan F. Chalmers

Marine Sciences

Associate Professor Andrew D. Short

Mathematics and Statistics

Junior year: First-year Office
 Intermediate year: Dr David J. Ivers (Applied Mathematics), Dr Howard D'Abrera (Mathematical Statistics), Ms Sandra Britton and Dr Adrian Nelson (Pure Mathematics)
 Senior year: Dr David Galloway (Applied Mathematics), Dr Shelton Peiris (Mathematical Statistics Ms Jenny Henderson and Dr Laurentiu Paunescu (Pure Mathematics)
 4th year: Dr Hugh Luckock (Applied Mathematics), Professor John Robinson (Mathematical Statistics), Dr Jonathan Hillman (Pure Mathematics)

Microbiology

Intermediate year: Mrs Ilze Dalins
 Senior year: Dr Trevor Duxbury
 4th year: Dr Tom Ferenci
 BMedSc: Dr Ian Humphrey-Smith

Pharmacology

Intermediate Year: Dr Robin Allan
 Senior Year: Dr Ian Spence
 4th Year: Associate Professor Judith Black, Associate Professor Rosemarie Einstein

Pharmacy

Associate Professor Gerald M. Holder, Dr Ross A. Kennedy, Dr Ines Krass

Physics

Junior year: Mrs Rosemary M. Millar
 Intermediate year: Dr William J. Tango
 Senior year: Dr Neil Cramer
 4th year: Dr Peter Robinson

Physiology

Intermediate year: Dr Roger Dampney, Dr Miriam Frommer
 Senior year: Dr Joseph Hoh, Dr Paul Martin
 4th year: Associate Professor Dave Davey

Psychology

Junior year: Mr James Dalziel
 Intermediate year: Dr Cyril Latimer
 Senior year: Dr Soames Job
 Honours year: Dr Pauline Howie

Soil Science

Intermediate year: Associate Professor Anthony J. Koppi, Mr Harold G. Geering
 Senior and Honours year: Professor Alexander B. McBratney

Recommended combinations of courses in first year of attendance

Courses to be taken during the first year of attendance must be selected with subsequent years of candidature in mind. The list below shows how to find a first year combination which will lead to a desired field of specialisation.

Most students should have no reason to depart from these recommendations and no special consideration can be given to students in later years whose difficulties arise from such departures.

Students who are uncertain as to the field(s) of ultimate specialisation are strongly advised to take Junior courses in at least the three Science Discipline Areas: Mathematics, Physics and Chemistry, thus leaving the widest possible scope for progression in later years.

Students should note that certain Intermediate biomedical courses are offered only as part of the BMedSc degree.

Schools or Departments, and recommended Junior level combinations

Refer to Table 1 for specific qualifying and/or pre-and/or corequisite courses. Junior Computer Science courses must not be taken without the Mathematics courses specified in Table 1.

*Agricultural Chemistry*¹

12 units of Junior courses in each of Chemistry + Mathematics + 24 units from of Physics, Biology 101 or 191 + Biology 102 or 192, Geology or Geography

*Biochemistry*¹

12 units of Junior courses in each of Chemistry + Physics + Mathematics + Biology 101 or 191 + Biology 102 or 192

Biology

Biology 101 or 191 + Biology 102 or 192 + 12 units of Junior courses in each of Chemistry + Physics + Mathematics

*Cell Pathology*²

12 units of Junior courses in each of Chemistry + Physics + Mathematics + Biology 101 or 191 + Biology 102 or 103 or 192 or 193

Chemical Engineering Science

12 units of Junior courses in each of Chemistry + Physics + Mathematics + two courses selected in consultation with an adviser.

¹Major subject beginning as an Intermediate course

²Major subject beginning as a Senior course

Chemistry

12 units of Junior courses in each of Chemistry + Physics + Mathematics + two courses selected in consultation with an adviser

Civil Engineering Science

12 units of Junior courses in each of Chemistry + Physics + Mathematics + two courses selected in consultation with an adviser

Computer Science

COMP101 + COMP102 + MATH 101 + MATH 103 or MATH 104 + 24 units of other Junior courses. (Each of the above courses can be replaced by the corresponding Advanced course.)

Geography

12 units of Junior courses in each of Geography + Mathematics + Geology or Biology 101 or 191 + Biology 102 or 192 + either Chemistry or Physics

Geology

12 units of Junior courses in each of Geology + Chemistry or Physics + Mathematics + two courses selected in consultation with an adviser

Geophysics

12 units of Junior courses in each of Geology + Physics + Mathematics + two courses selected in consultation with an adviser

Marine Sciences²

Biology 101 or 191 + Biology 102 or 192 + 12 units of Junior courses in each of Geology + Chemistry or Physics + Mathematics

Mathematical Statistics¹

MATH 101 or 191 + MATH 102 or 192 + 36 other Junior units

Mathematics

MATH 101 or 191 + MATH 102 or 192 or MATH 101 or 191 + MATH 103 or 193 + 36 other Junior units

Mechanical and Aeronautical Engineering Science

12 units of Junior courses in each of Physics + Mathematics + two courses selected in consultation with an adviser

Microbiology¹

12 units of Junior Biology + 12 units of Junior Chemistry including 112 or 192 or 194 + 12 units of Junior Mathematics including 101 or 111 or 191 and one of 102 or 104 or 112 or 192 or 194

Pharmacology²

12 units of Junior courses in each of Chemistry + Physics + Mathematics + Biology 101 or 191 + Biology 102 or 103 or 192 or 193

Physics

12 units of Junior courses in each of Physics + Chemistry + MATH 101 or 191 + MATH 102 or 192 + 12 units of other Junior courses selected in consultation with an adviser

Preparation for Masters course in Nutrition and Dietetics

12 units of Junior courses in each of Chemistry + Physics + Mathematics + Biology 101 or 191 + Biology 102 or 103 or 192 or 193

Psychology

12 units of Junior courses in each of Psychology + Mathematics + Chemistry or Physics + Biology 101 or 191 + Biology 102 or 103 or 192 or 193 or Computer Science or two courses selected in consultation with an adviser

Soil Science¹

12 units of Junior courses in each of Chemistry + Physics or Mathematics or Computer Science

Selection of courses in second year of attendance

During Semester 2 of the first year of attendance you are advised to discuss your choice of courses for the following year with members of the academic staff in the Departments in which you propose to study.

¹Major subject beginning as an Intermediate course

²Major subject beginning as a Senior course

3 Undergraduate degree requirements

This chapter sets out the requirements for the degrees of Bachelor of Science, Bachelor of Pharmacy, Bachelor of Medical Science, Bachelor of Computer Science and Technology (BCST), Bachelor of Psychology (BPsych), the specially designated Bachelor of Science degree programs of Advanced, Environmental and Molecular Biology and Genetics, and the combined degrees of BSc/BCom, BSc/LLB, BA/BSc, BSc/BE and BSc/MBBS. The courses for the pass BSc (which includes the Advanced, Environmental and Molecular Biology and Genetics degree programs), BMedSc and BCST degrees extend over a minimum of three years. For the Honours BSc, BMedSc and BCST degrees a fourth year is taken and students must qualify to enter the Honours year. The courses for the BPharm and both the pass and the Honours BPsych degree extend over a minimum of four years. The combined degrees of BSc/LLB, BA/BSc and BSc/BE extend over five years, while the combined degrees of BSc/MBBS extend over seven or eight years depending on the major Science courses chosen. The BSc/MBBS is generally no longer available to school leavers.

Restrictions (general)

- (1) A candidate for a degree must satisfy the minimum eligibility requirements before commencing the degree courses. Courses taken before satisfying these requirements cannot normally be counted for degree purposes.
- (2) A candidate may not take a course in any subject without having previously completed the qualifying course or courses 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 courses available are those permitted by the timetable. A candidate may attend evening courses 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 then-degree within ten calendar years of admission to candidature. This rule applies to all students who first enrolled in their degree after 1995, and, from 1998, applies 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 enrolls in another course of tertiary study after having been granted a suspension of candidature.

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 course listed in the Tables may be given credit for that course providing that the course was completed not more than nine 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 course 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 courses in the Bachelor of Science, Bachelor of Pharmacy, Bachelor of Medical Science, Bachelor of Computer Science and Technology 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
CP	Concessional Pass	45-49*
X	Provisional Fail	40-49**
XX	Fail	Below 45 or below 50
AXX	Absent Fail	

*Student to contact Department about additional assessment.
A Concessional Pass does not apply for courses in the Bachelor of Pharmacy degree.

**Valid for Junior courses only; student to contact Department.

For Final Year Honours courses, the following Honours grades apply:

HI	Honours Class I	80+
H21	Honours Class II (Division 1)	70+
H22	Honours Class II (Division 2)	60+
H3	Honours Class Tfl	50+
XX	Fail*	Below 50
AXX	Absent Fail*	

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

Boards of Examiners

Undergraduate results are formally determined by Boards of Examiners. The University's *Calendar 1996, Vol. I, Statutes and Regulations* contains the Resolutions of the Faculty relating to the composition of the Boards, and the *Manual for Examiners* (extracts from which may be obtained at the Faculty Office) details the guidelines under which the Boards operate.

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 maybe 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 counselling assistance should discuss the matter with a Departmental or Faculty adviser, as appropriate.

Discontinuation and re-enrolment

Regulations about discontinuation and about restrictions imposed on re-enrolment are published in the University's *Calendar 1996, Vol. I, Statutes and Regulations*. Attention is drawn in particular to Regulations 18 and 19 specifically concerned with the Faculty of Science, and to those headed 'Students in all Faculties and Boards of Studies'.

The Resolutions of the Senate which relate to students enrolled in the Faculty of Science appear below.

Discontinuation of enrolment and re-enrolment after discontinuation — undergraduate

All Faculties¹ and Boards of Studies

1. A candidate for a degree of Bachelor who ceases attendance at classes must apply to the Faculty or Board of Studies concerned and will be presumed to have discontinued enrolment from the date of application, unless evidence is produced (i) that the discontinuation occurred at an earlier date and (ii) that there was good reason why the application could not be made at the earlier time.

2. A candidate for a degree of Bachelor who at any time during the first year of attendance discontinues enrolment in all courses shall not be entitled to re-enrol for that degree unless the Faculty or Board of Studies concerned has granted prior permission to re-enrol or the person is re-selected for admission to candidature for that degree.

3. Subject to paragraphs (i) and (ii) of section 1, no candidate for a degree of Bachelor may discontinue enrolment in a course or year after the end of lectures in that course or year.

4. The Dean, Pro-Dean or a Sub-Dean of a Faculty, or the Chairperson of a Board of Studies, may act on behalf of that Faculty or Board of Studies in the administration of these Resolutions unless the Faculty or Board of Studies concerned decides otherwise.

Withdrawal from full-year and First Semester courses

5. A candidate for a degree of Bachelor who discontinues enrolment in a full-year or First Semester course on or before 30 March in that year shall be recorded as having withdrawn from that course.

Withdrawal from Second Semester courses

6. A candidate for a degree of Bachelor who discontinues enrolment in a Second Semester course on or before 30 August in that year shall be recorded as having withdrawn from that course.

All Faculties¹ and Boards of Studies except the Faculty of Engineering

Discontinuation

7. (1) A discontinuation of enrolment in a course shall be recorded as 'Discontinued with Permission' when the discontinuation occurs after the relevant withdrawal period and:

- (a) on or before the Friday of the first week of Second Semester for a full-year course; or
- (b) up to the last day of the seventh week of teaching in a one semester course.

(2) A discontinuation of enrolment in a course shall be recorded as 'Discontinued' when the discontinuation occurs:

- (a) after the Friday of the first week of Second Semester for a full-year course; or

¹Note that 'Faculty' includes for these purposes a 'College Board'.

- (b) after the last day of the seventh week of teaching in a one semester course.
- (3) Notwithstanding paragraph (2) the Dean, Pro-Dean or Sub-Dean of the Faculty or Chairperson of the Board of Studies concerned may determine that a discontinuation of enrolment should be recorded as 'Discontinued with Permission' on the grounds of serious ill-health or misadventure.

Restriction upon re-enrolment¹

The following are extracts from the Resolutions of the Senate concerning 'Restriction upon Re-enrolment of Certain Students who fail in Annual Examinations':

1. The Senate authorises any Faculty or Board of Studies to require a student who comes within the provisions of sections 8 to 24 below to show good cause why he or she should be allowed to re-enrol or to repeat a year of candidature or a course in that Faculty or Board of Studies.
2. Subject to section 5, the Faculty or Board of Studies may exclude a student who fails to show good cause from (a) the degree course or year of candidature concerned and/or (b) the course or courses concerned both in the Faculty or Board of Studies and in any other Faculty or Board of Studies in which that course or those courses may be taken.
3. Subject to section 5—
 - (a) Any student who has been excluded from a year of candidature or from a course or courses by a Faculty or Board of Studies in accordance with section 2 and who wishes to re-enrol in that year of candidature or that course or those courses may apply for such re-enrolment after at least two academic years and that Faculty or Board of Studies may permit him or her to re-enrol in the year or the course or courses from which he or she was previously excluded.
 - (b) Any student who has been excluded from a course or courses by one Faculty or Board of Studies in accordance with section 2 and who wishes to enrol in that course or courses in another Faculty or another Board of Studies may apply for such enrolment after at least two academic years and that other Faculty or Board of Studies may permit him or her to enrol in the course or courses from which he or she was previously excluded.
4. Except with the express approval of the Faculty concerned a student excluded from a year or course who is re-admitted shall not be given credit for any work completed in another Faculty or Board of Studies or another university during the period of exclusion.
5. Before exercising its powers under section 2 or 3 in relation to an individual course, a Faculty or Board of Studies shall consult the Head of the Department or School responsible for the course.

6. The Senate authorises the Faculty or Board of Studies as a whole or a Faculty Committee or Board of Studies Committee representing the main teaching Departments in each Faculty or Board of Studies, to carry out all duties arising out of sections 1,2,3,4 and 5.

7. (1) Subject to section 7(2), a student who, having been excluded in accordance with these Resolutions, has been refused enrolment or re-enrolment in any year or course by any Faculty or Board of Studies, or any Faculty Committee or Board of Studies Committee, may appeal to the Senate.
- (2) A second or subsequent appeal to the Senate shall only be heard by leave of the Chancellor or the Deputy Chancellor.

A. Students in all Faculties and Boards of Studies

8. The Senate authorises any Faculty or Board of Studies to require a student to show good cause why he or she should be allowed to repeat in that Faculty or Board of Studies (a) a year of candidature in which he or she has failed or discontinued more than once or (b) any course in which he or she has failed or discontinued more than once whether that course was failed or discontinued when he or she was enrolled for a degree supervised by the Faculty or Board of Studies or by another Faculty or Board of Studies.
9. The Senate authorises the several Faculties or Boards of Studies to require a student who, because of failure or discontinuation has been excluded from a Faculty or course, either in the University of Sydney or in another tertiary institution, but who has subsequently been admitted or re-admitted to the University of Sydney to show good cause why he or she should be allowed to repeat either (a) the first year of attendance in which after such admission or readmission he or she fails or discontinues, or (b) any course in which in the first year after admission or readmission he or she fails or discontinues.

J. Faculty of Science

18. (1) The Senate authorises the Faculty of Science to require a student to show good cause why he or she should be allowed to re-enrol in the degree of Bachelor of Science, Bachelor of Medical Science, Bachelor of Computer Science and Technology or Bachelor of Psychology if in the opinion of the Faculty he or she has not made satisfactory progress towards fulfilling the requirements for the degree.
- (2) Satisfactory progress cannot be defined in all cases in advance, but a student who has not gained credit for 116 or more units should be asked to show good cause why he or she should be allowed to re-enrol as a candidate for the degree of Bachelor of Science, Bachelor of Medical Science, Bachelor of Computer Science and Technology or Bachelor of Psychology if in any two successive years of attendance he or she fails to gain credit for half the unit value of courses attempted, unless in one of these two years he or she successfully completes all courses attempted in that year.

¹Note that 'Faculty' includes for these purposes a 'College Board'.

(3) In cases where the Faculty permits the re-enrolment of a student whose progress has been deemed unsatisfactory, the Faculty may require the completion of specified courses in a specified time, and if the student does not comply with these conditions, the student may again be called upon to show good cause why he or she should be allowed to re-enrol in the degree of Bachelor of Science, Bachelor of Medical Science, Bachelor of Computer Science and Technology or Bachelor of Psychology.

19. (1) The Senate authorises the Faculty of Science to require a student to show good cause why he or she should be allowed to re-enrol in the degree of Bachelor of Pharmacy if in the opinion of the Faculty he or she has not made satisfactory progress towards fulfilling the requirements for the degree.

(2) Satisfactory progress cannot be defined in all cases in advance, but a student who has not gained credit for 116 or more units shall be asked to show good cause why he or she should be allowed to re-enrol as a candidate for the degree of Bachelor of Pharmacy, if in any two successive years of attendance he or she fails in the first of these years to gain credit for 28 units and then fails to gain a total of 44 units in the two years of attendance, unless in one of these two years he or she successfully completes all courses attempted in that year.

(3) In cases where the Faculty permits the re-enrolment of a student whose progress has been deemed unsatisfactory, the Faculty may require the completion of specified courses in a specified time, and if the student does not comply with these conditions the student may again be called upon to show good cause why he or she should be allowed to re-enrol in the degree of Bachelor of Pharmacy.

study will comply with the basic requirements for the degree contained in sections 4, 5 and 8. For your information, important aspects to consider while enrolling are summarised in the enrolment guide below.

To complete your degree you must gain credit for at least 144 units. The 144 units required for the degree must include:

- at least 12 units from Mathematics or Statistics courses.
- at least 36 units from Junior courses in Science Discipline Areas (defined in Resolution 1(l)(v), below).
- a total of 72 units from Senior and Intermediate courses in Science Discipline Areas.
- at least 24 units from Senior courses in a single Science Discipline Area other than History and Philosophy of Science and 16 units from Intermediate courses in a second Science Discipline Area.

You should also note the following:

- you can take only courses which do not have timetable clashes.
- most full-time students enrol in 4 (6 unit) Junior courses in each semester of their first year.
- you may not enrol in more than 28 units in any one semester.
- before being permitted to enrol in a course, you have to meet any prerequisites and corequisites for that course.
- you may not enrol in more than 48 units of Senior courses in a single Science Discipline Area.
- if you wish to major in History and Philosophy of Science, you must have another major in a Science Discipline Area.
- you may not enrol in more than 32 units of Intermediate courses in a single Science Discipline Area.
- you may not enrol in more than 16 units of Intermediate courses and no more than 24 units of Senior courses in the Science Discipline Areas of Anatomy and Histology, Cell Pathology, Pharmacology and Physiology. This means that no more than 40 units from courses in these areas may be counted towards your degree.
- you may not enrol in more than 16 units of Intermediate courses in Engineering Science.
- you may not enrol in more than 28 units of courses not in Science Discipline Areas unless you are enrolled in a specially designated degree program (e.g., BSc (Environmental)).
- Advanced courses are indicated by a 9 (or 8) as the second digit of the course number. Entry to these courses is limited (details can be obtained from Departments).

Plans of study

It is important when choosing courses at any stage of your University career that you consider your overall degree program. *Consultation with a Faculty adviser before enrolment is always recommended.*

Studying part-time

Most students study full-time. If you wish to study part-time you will have to indicate this when enrolling.

Degree of Bachelor of Science

Summary of requirements

The requirements for the degree are set out in the Senate Resolutions which should be read by all intending candidates (see below). In particular it is important to ensure that any proposed course of study will comply with the basic requirements for the degree contained in sections 4, 5 and 8. Important aspects of the Resolutions are summarised below. The Resolutions should be consulted for any clarification of the summary points. The Resolutions in force prior to 1997 are contained in the Faculty of Science Handbook 1996, which can be inspected at the Faculty Office or on the Faculty of Science website homepage <http://www.scifac.usyd.edu.au>.

Enrolment guide

The requirements for the Bachelor of Science degree are set out in the Senate Resolutions (see below) which you should read before enrolment. In particular it is important to ensure that your proposed course of

Day-time attendance at lectures and laboratory classes is required for most science courses.

Discontinuation

If you wish to discontinue it is important to talk to staff in the Faculty Office. In some circumstances discontinuation can affect your access to courses, prizes and scholarships.

HSC aggregate

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

A quota will apply for entry into the BMedSc degree (at second year level), following regular enrolment for the BSc degree (at first year level). A quota will also apply for entry into the BMedSc degree at first year level.

Alternative structure of courses

It is possible to enrol in some courses without completing the usual prerequisites. In all cases permission must be obtained from the Head of the Department concerned.

Senior Agricultural Chemistry courses

If you have not taken Intermediate courses in Agricultural Chemistry, but have completed 16 units of each of Intermediate Chemistry and Biochemistry, you may be permitted to enrol in Senior courses in Agricultural Chemistry.

Biology Honours

If you have majored in Physics, Chemistry or Biochemistry and wish to study Biophysics or Plant Physiology you may be permitted to enrol in Biology Honours without having completed Intermediate or Senior courses in Biology.

Intermediate Computer Science courses

If you have not completed Mathematics 1 or Mathematics 1 (Advanced), but have completed Mathematics 1 (Life Sciences) at credit standard, you may apply for permission to enrol in Intermediate courses in Computer Science if you have satisfied the remaining requirements.

Intermediate Geography courses

If you have completed a Junior Mathematics course and 12 Junior units of either Chemistry or Physics, you may enrol in Intermediate Geography courses without completing Junior courses in Geography, with the permission of the Head of Department.

Intermediate Geology courses

If you have completed 12 units of Junior courses in each of Chemistry and Physics you may apply to the Head of Department for permission to enrol in Intermediate Geology courses without completing Junior Geology courses.

Special permission

You should note that the Faculty can, in certain instances, 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 the staff in the Faculty Office.

Part-time candidature

It is expected that the majority of candidates will proceed as full-time students. If, however, you are unable to proceed on a full-time basis you may enrol as a part-time candidate and will be required to indicate this when enrolling. Day-time attendance at lectures and laboratory classes is required for most science courses.

Discontinuation

For Regulations relating to discontinuation, see the University's *Calendar 1996, Vol. I, Statutes and Regulations*. Students should read these Regulations carefully as a discontinuation can affect the Weighted Average Mark (WAM). For further information about the WAM, see under 'Honours courses' below.

Regulations

Resolutions of the Senate¹

The following Resolutions governing candidature for the degree of Bachelor of Science have been prescribed by the Senate.

Definitions

1. For the purposes of the Resolutions:
 - (1) (i) A *course* shall consist of such lectures, tutorial instruction, essays, exercises, or practical and field work as may be prescribed.
 - (ii) Each course shall be designated as a *Junior, Intermediate, Senior* or *Honours* level course. In addition certain courses may be designated as *Advanced* or *Special Studies Program* courses.
 - (iii) Junior, Intermediate, Senior and Honours courses are indicated by course level designations 100-199, 200-299, 300-399 and 400-499 respectively, placed immediately after the name of the course.
 - (iv) Except for Honours courses, each course shall be confined to one semester in duration, with assessment being completed during that semester.
 - (v) Except as provided in sections 4(1)(xi) and 4(1)(xii), 12 and 13, each course shall be designated as belonging to one or more *Science Discipline Areas*, as determined by the Faculty. The approved Science Discipline Areas are:
 - Agricultural Chemistry

¹Subject to the approval of the Senate.

From 1994 the course General Pure Mathematics 1 has been renamed Mathematics 1 (Life Sciences). Any reference to Mathematics 1 (Life Sciences) in these Resolutions shall be deemed to apply equally to General Pure Mathematics 1.

- Anatomy and Histology
- Biochemistry
- Biology
- Cell Pathology
- Chemistry
- Computer Science
- Engineering Science
- Geography
- Geology
- Geophysics
- History and Philosophy of Science
- Marine Sciences
- Mathematics
- Microbiology
- Pharmacology
- Physics
- Physiology
- Psychology
- Soil Science
- Statistics

(vi) Except as provided in sections 7(1), 12 and 13, candidates who have completed a course shall have units credited towards the completion of a degree in accordance with the following:

each course shall be of 4,6,8, or 12 units value;

a course may be comprised of modules of smaller unit value which shall be taken in various combinations as determined by the Head of the Department concerned.

(2) To 'complete a course' and derivative expressions mean:

- (i) to attend the lectures and the meetings for tutorial instructions, if any;
- (ii) to complete satisfactorily the essays, exercises and the practical and field work, if any; and
- (iii) to pass the examinations of the course.

(3) A *qualifying course* means a course which, except with the permission of the Faculty, must be completed with a result of Pass or better [not Concessional Pass — see sections 9(2) and 9(7)] before enrolment in the course for which it qualifies.

(4) A *prerequisite course* means a course other than a qualifying course which, except with the permission of the Head of the Department concerned, must have been completed with a result of Concessional Pass or better [see sections 9(2) and 9(7)] prior to a candidate enrolling in a course for which it is a prerequisite.

(5) A *corequisite course* means a course which, unless previously completed or except with the permission of the Head of the Department concerned, must be taken concurrently with the course for which it is a corequisite.

Grades of Award

2. The degree shall be awarded in two grades, namely the Pass degree and the Honours degree.

Courses for Pass degree

3. Courses for the degree shall, except as provided in sections 4(1)(xi), 6, 12 and 13:

- (1) have such names,
- (2) be in such subjects,
- (3) be in such Science Discipline Areas,
- (4) have such unit values, and
- (5) have such qualifying, prerequisite and corequisite courses as are determined from time to time by the Faculty, and are set out in Table I associated with this section.

Requirements for Pass degree

4. (1) To qualify for the Pass degree, candidates must complete courses giving credit for a total of at least 144 units, where:
 - (i) at least 12 units are from courses in the Science Discipline Areas of Mathematics and Statistics;
 - (ii) at least 36 units are from Junior courses in Science Discipline Areas;
 - (iii) except as provided in section 13, at least 72 units are from Intermediate and Senior courses in Science Discipline Areas;
 - (iv) except as provided in section 12, at least 24 units are from Senior courses in a single Science Discipline Area other than History & Philosophy of Science;
 - (v) at least 16 units are from Intermediate or Senior courses in a single Science Discipline Area other than that used to satisfy the requirement in section 4(1)(iv);
 - (vi) no more than 32 units are from Intermediate courses which belong to a single Science Discipline Area;
 - (vii) no more than 48 units are from Senior courses which belong to a single Science Discipline Area;
 - (viii) no more than 16 units are from Intermediate courses and no more than 24 units are from Senior courses which belong to the Science Discipline Areas of Anatomy and Histology, Cell Pathology, Pharmacology, and Physiology;
 - (ix) no more than 16 units are from Intermediate courses which belong to the Science Discipline Area of Engineering Science;
 - (x) no more than 28 units are from courses in which the grade of Concessional Pass was awarded;
 - (xi) no more than 28 units are from courses not in Science Discipline

Areas, including all first year courses offered by the Faculties of Arts and Economics but excluding those courses which the Faculty has deemed to be mutually exclusive with courses offered for the Bachelor of Science degree;

- (xii) except as provided in section 12, no more than 12 units are from courses in the Faculty of Arts designated B101 or AB101.

(2) No course may be credited more than once for the degree.

(3) No units may be credited for the degree from more than one of such courses as the Faculty may deem to be mutually exclusive (listed in column (e) of Table I associated with section 3), except that where a candidate enrolls in a course which has substantial content in common with another course which was previously completed, that candidate shall undertake alternative assessed work as determined by the Head of the Department concerned; alternatively the Head of Department may give permission for the candidate to perform only the work that is not common to a course previously completed, in which case the candidate shall receive credit only for the number of units appropriate to the work performed.

(4) Where a candidate enrolls in a course which is the same as, or has substantial content in common with, a course which was previously attempted but was not completed satisfactorily, the Head of the Department concerned may exempt the candidate from certain of the course requirements, on receipt of evidence that the candidate has previously demonstrated competence to perform those requirements.

Restrictions on enrolment

5. (1) Except with the permission of the Faculty, candidates may not take in any one semester courses with a total number of units in excess of 28.
- (2) The choice of courses made by a candidate shall be limited by the exigencies of the timetable provided that candidates who have completed at least 36 units of Junior courses and who seek to enrol in two courses which are given wholly or partly at the same time may be granted, by the Heads of the Departments concerned, permission to attend equivalent courses or parts of courses given at another time.

Enrolment in courses not in Table I

6. (1) A candidate of merit may, under special circumstances and with the permission of the Faculty, enrol in a course other than those specified in Table I associated with section 3. Units will be counted from such a course towards the maximum of 28 units specified under section 4 (1) (xi).

(2). A candidate of exceptional merit may, under special circumstances and with the permission of the Dean, undertake studies within the Faculty other than those courses specified in Table I accompanying section 3, and upon completion of those studies have them counted towards the degree. The candidate may be given credit for these studies of up to 40 units, which will be designated by the Dean "as Junior, Intermediate or Senior. Such units shall count towards the number of units required for the degree in accordance with section 4(1).

Upgrade of courses

7. (1) A candidate may not enrol in a course which was previously completed with a grade of Pass or better.
- (2) Candidates who have been awarded a Concessional Pass in any course may enrol in that course again. On completion of that course such candidates will not be credited with any further units for that course unless the course is completed at least at Pass level and the units had not previously been credited in accordance with section 4(1)(x).

Time limits, suspension, part-time study

8. (1) Except with the permission of the Faculty a candidate must complete the requirements for award of the degree within ten calendar years of admission to candidature. This section applies to all candidates first enrolling in the degree after 1995, and applies from 1998 to candidates who first enrolled in the degree before 1996.
- (2) A candidate must re-enrol each calendar year unless the Faculty has approved suspension of candidature. Candidature lapses if a candidate has not obtained approval for suspension and does not re-enrol. Candidates whose candidature has lapsed must be selected for admission again before they can re-enrol.
- (3) Except with the prior permission of the Faculty a candidate shall not be granted a suspension of candidature in order to enrol in another course of tertiary study. Candidature shall lapse if a candidate without prior permission of Faculty enrolls in another course of tertiary study after having been granted a suspension of candidature.
- (4) Candidates who in any semester intend to proceed towards the degree of Bachelor of Science by part-time study shall indicate this intention when enrolling.
- (5) Candidates proceeding by part-time study shall not in any one semester take courses with a total unit value of more than 17 units.

Course assessment

9. (1) Candidates may be tested by written and oral class examinations, exercises, essays or practical work or any combination of these, and the results of such tests may be taken into

account by the Faculty Board of Examiners in determining the final results for a course.

(2) In all courses passes may be graded into High Distinction, Distinction, Credit, Pass and Concessional Pass. The grades High Distinction, Distinction or Credit indicate work of a standard higher than that required for a Pass.

(3) Where a Department offers a course at two levels the performance of candidates in the two levels in terms of comparability of quality of work will be matched by that Department so that a grade obtained at one level indicates a quality of work comparable with that required for the same grade obtained at the other level.

(4) Candidates who have been prevented by duly certified illness or misadventure from sitting for the whole or part of a course assessment may be tested at such times and in such way as the Head of the Department concerned or the Faculty Board of Examiners shall determine.

(5) Candidates who do not pass in a course shall, unless exempted by the Faculty, again attend lectures and other classes and complete the prescribed written and other work in all such courses in which they are permitted to re-enrol.

(6) Candidates who repeat any course shall not be eligible for any prize or scholarship awarded in connection with the examination for such a course.

(7) Subject to the provisions of section 4(1)(x), the award of a Concessional Pass in a course entitles the candidate to be credited with the full number of units for that course.

Credit for other courses

10. (1) Subject to the limitations on total credit given in section 10(2), candidates may be given credit for a course which they have completed in another recognised program provided that:

- (i) the course was completed not more than nine years before admission to candidature in the Faculty;
- (ii) the course was completed with a result equivalent to Pass or better (not Concessional Pass);
- (iii) if the course was completed at another university or recognised institution after admission to candidature in the Faculty, then permission had been obtained in advance from the Faculty, and either
 - (a) the course content was material not taught in any corresponding course at the University of Sydney, or
 - (b) the candidate was unable for good reason to attend a corresponding course at the University of Sydney;
- (iv) where the course is considered by

the Faculty to be equivalent to a course listed in the Tables associated with section 3, section 12 or section 13, then credit shall be given for that equivalent course, and the candidate shall be regarded as having completed that equivalent course for the purposes of these Resolutions;

- (v) where the course is considered by the Faculty as appropriate, but no course listed in the Tables associated with section 3, section 12 or section 13 is considered equivalent, then the candidate shall be given credit for such number of units and with such a result as the Faculty may determine in order to provide fair comparison with courses listed in Table I. Units credited under this section shall be designated as being in such Science Discipline Areas, and either Junior, Intermediate or Senior, as the Faculty may determine.

(2) Except as provided in section 13, section 14 and section 15 award of credit for courses shall be limited such that:

- (i) the total unit value which is credited to a candidate in accordance with section 10(1) from courses in another recognised program, including those for which credit has been abandoned, may not exceed 96;
- (ii) the total unit value which is credited to a candidate in accordance with section 10(1), from courses for which either the candidate maintains credit in some other recognised program, or a degree has been conferred, may not exceed 48;
- (iii) in satisfying the requirements of section 4, a candidate must have been credited with at least 48 units, of which at least 24 are Senior units, from courses which are listed in Table I and taken at the University of Sydney.

BSc Advanced Program

11. (1) Notwithstanding sections 4, 5 and 8 of these Resolutions, a candidate may be accepted into the Advanced Degree Program.

(2) To qualify for the award of the BSc degree in the Advanced Degree Program, candidates shall pass all courses at the first attempt and, except with the permission of the Faculty, shall:

- (i) complete courses to a value of at least 48 units in each year of enrolment;
- (ii) include, in the Junior courses

taken, at least 24 units from courses designated as Advanced and/or from units obtained at Junior level from studies taken under the Faculty's Talented Student Program, as approved from time to time by the Dean under Resolution 6(2);

- (hi) complete at least 96 units from Intermediate and Senior Courses;
- (iv) include, in the Intermediate courses taken, at least 16 units from courses designated as Advanced and/or units obtained at Intermediate level from studies taken under the Faculty's Talented Student Program, as approved from time to time by the Dean under Resolution 6(2);
- (v) complete at least 48 units from Senior Courses, including at least 24 units from courses designated as Advanced and/or units obtained at Senior level from studies taken under the Faculty's Talented Student Program, as approved from time to time by the Dean under Resolution 6(2); and
- (vi) qualify for admission to an Honours course under section 16.

Specially designated BSc degree programs

12. Notwithstanding sections 4, 5 and 8 of these Resolutions, candidates wishing to graduate in specially designated degree programs, which may also be taken in the Advanced degree program, shall, except with the permission of the Faculty, complete the courses as set out in the Tables associated with this section as follows:

- (1) Environmental: Table II
- (2) Molecular Biology & Genetics: Table HI

Science/Law

13. (1) Notwithstanding the Resolutions of the Senate relating to degrees in more than one Faculty and subject to section 4 of these Resolutions, a candidate may proceed concurrently for the degrees of Bachelor of Science and Bachelor of Laws and may receive credit for up to 52 units in respect of the courses set out in Table *TV* associated with this section for the Bachelor of Science degree¹, provided that:

- (i) such a candidate may not, except with the express permission of the Deans of the Faculties of Science and Law, enrol in courses of a total unit value exceeding that specified in section 5(1);
- (ii) with the exception of courses in Table IV, only courses from Science Discipline Areas may be credited towards the BSc degree;
- (in) in addition to the 52 units of courses set out in Table *TV*, such a

candidate shall complete at least 56 units from Intermediate and Senior courses in Science Discipline Areas in Table I, in accordance with section 4.

- (2) Except with the permission of the Faculty of Law, a candidate may not take any of the Intermediate or Senior courses in Table IV until they have completed the courses Legal Institutions I and H

Science/Engineering

- 14. (1) Notwithstanding the Resolutions of the Senate relating to degrees in more than one Faculty or any other of these Resolutions, candidates who have completed studies in the Faculty of Engineering may be admitted by the Faculty of Science to candidature for the degree.
- (2) Such candidates shall comply with such requirements for the degree as may be prescribed by the Resolutions of the Senate and by Resolution of the Faculty¹.

Science/Medicine, Arts/Science, Science/Commerce

- 15. (1) Notwithstanding the Resolutions of the Senate relating to degrees in more than one Faculty or any other of these Resolutions, a candidate may proceed concurrently for the degrees of
 - (i) -Bachelor of Science, Bachelor of Medicine and Bachelor of Surgery²;
 - (ii) Bachelor of Arts and Bachelor of Science;
 - (iii) Bachelor of Science and Bachelor of Commerce
- (2) Such candidates shall comply with such requirements for each degree as may be prescribed by the Resolutions of the Senate and by Resolution of the Faculties¹.

Admission to Honours courses

- 16. (1) In order to qualify for admission to an Honours course candidates shall have qualified for the award of a Pass degree and be considered by the Faculty and the Head of the Department concerned to have the requisite knowledge and aptitude for an Honours course.
- (2) With the permission of the appropriate Head of Department and provided the requirements in section 16(1) have been satisfied the following may also be admitted to Honours courses:
 - (i) Pass graduates in Science of the Faculty of Science.
 - (ii) Pass graduates holding Bachelor of Science degrees or equivalent

¹See the sections 'Combined Science/Law degrees', 'Combined Science/Engineering', 'Combined Science/Medicine degrees', 'Combined Science/Commerce degree' and 'Combined Arts/Science degrees' later in this chapter of the handbook.

²This combined program relates to the MB BS old Resolutions only.

from such other institutions as the Faculty may from time to time determine.

(3) Candidates may not take more than one Honours course in any one academic year.

(4) Candidates who have qualified for the Honours degree may take/in the next year or at such later times as the Faculty permits, an additional Honours course which they are qualified to enter.

Honours courses

17. (1) Candidates for the Honours degree shall complete an Honours course, full-time over one calendar year.

(2) On the recommendation of the Head of Department concerned the Faculty may permit a candidate to undertake an Honours course half-time over two consecutive calendar years. This permission will be granted only if the Faculty is satisfied that the candidate is unable to attempt the course on a full-time basis.

(3) There shall be an Honours course in the following subjects: Agricultural Chemistry, Anatomy, Applied Mathematics, Biochemistry, Biology, Cell Pathology, Computer Science, Geography, Geology, Geomorphology-with Geography, Geophysics, Histology, History and Philosophy of Science, Inorganic Chemistry, Marine Sciences, Mathematical Statistics, Microbiology, Organic Chemistry, Pharmacology, Physical Chemistry, Physics, Physiology, Psychology, Pure Mathematics, Soil Science/Theoretical Chemistry;

Classes of Honours and Medal:

18. (1) There shall be three Classes of Honours, namely Class I, Class II and Class III, and within Class II there shall be two Divisions, namely Division 1 and Division 2.

(2) A candidate with an outstanding performance in the subject of an Honours course shall, if deemed to be of sufficient merit by the Faculty, receive a bronze medal.

(3) There shall be no re-examination for Honours.

Transitional provisions

19. (1) These Resolutions apply to all candidates for the degree enrolling in courses after 1 January 1997.

(2) With the permission of the Faculty candidates who first enrolled for the degree prior to 1997 and have not had a period of suspension or exclusion may until 31 March 2000 choose to qualify for the degree under the old Resolutions.

(3) With the permission of the Faculty candidates who have enrolled for the degree as part-time candidates prior to 1997 may until 31 March 2002 choose to qualify for the degree under the old Resolutions.

(4) With the permission of the Faculty and subject to the restrictions in section 8; candidates

who first enrolled for the degree prior to 1997 may qualify for the degree by completing 140 units.

Honours courses

The Regulations governing Honours courses in the Faculty of Science are sections 16-18 (BSc), 10-12 (BPharm) and 11-13 (BMedSc) of the Senate Resolutions. Candidates should note particularly section 16 (BSc), 10 (BPharm) or 11 (BMedSc) and that approval both from Faculty, and the Head of the Department concerned is required. To obtain permission from the Faculty, applicants must: (i) have gained credit grades in 24 units of Senior courses relating to the intended Honours subject or have a WAM of at least 58 (applications for advice of WAM may be lodged at the Faculty Office; see below for WAM calculation); and (ii) be of not more than four years' standing, or in the case of part-time candidates, of not more than five years' standing as candidates in the Faculty at the time requirements for the Pass degree are completed. Exceptions are granted only on the grounds of documented illness or misadventure. Note also that Heads of Department¹ may apply additional guidelines. The Head of Department will determine the availability of half-time Honours courses in the Department concerned.

In the case of candidates applying under section 16(2)(ii) of the Senate Resolutions for the degree of Bachelor of Science or section 12(5)(i)(ii) of the Senate Resolutions for the degree of Bachelor of Pharmacy, the Dean, on behalf of the Faculty, shall be responsible for determining whether candidates may be admitted to an Honours course by assessing whether the overall performance of each applicant is comparable to pass graduates of the Faculty of Science eligible for admission to an Honours course.

It is usual for candidates to take the same subject in Honours that they have taken at the Senior level. Permission can, however, be given by the Faculty for taking an Honours course without having taken the Senior course when previous training is suitable. For example, it is permissible to study Biophysics in Biology Honours without having taken Intermediate and Senior Biology courses if Physics or Physical Chemistry have been taken instead. Similarly Honours in Geophysics may be taken in certain circumstances without having taken Senior Geophysics courses.

Where an Honours course differs from the previous specialisation, the Head of the appropriate Department and the Faculty of Science must be satisfied that previous training is adequate.

Award of Honours and ranking for postgraduate scholarships

The Faculty has adopted a system of Weighted Average Marks (WAM) in relation to the award of Honours and ranking for postgraduate scholarships. The WAM is an integer between 45 and 100 which is an overall measure of performance in the pre-Honours years. It is calculated by summing the products of the marks achieved and the weighted unit values of the courses taken in the pre-Honours years and then dividing by the sum of the weighted unit values. Note that all

attempts at courses are included in the calculation except where courses are discontinued with permission.

The formula used is as follows:

$$WAM = \frac{\sum W_c M_c}{\sum W_c}$$

where W_c is the weighted unit value—i.e. unit value x level weighting of 1 (Junior), 2 (Intermediate) or 3 (Senior)—and M_c is the greater of 45 or the mark out of 100 for the course.

The Faculty is aware that, because the Honours year, in some Departments is 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 pre-Honours years 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 stipulates that a candidate with a WAM of less than 80 or an Honours year mark of less than 95 would not normally receive a medal. A candidate with a WAM of 77 to 79 inclusive may be considered for the award of a medal only if it can be demonstrated that the WAM was affected by sickness, misadventure, unusual workload or choice of courses. The Faculty recognises, however, that the Senate Resolutions concerning medals relate the award of a medal to the Honours courses only.

The Faculty also stipulates that a candidate with a WAM of less than 68 or an Honours year mark of less than 80 would receive First Class Honours only in exceptional circumstances. Candidates who have a WAM within the range of 65 to 67 and who obtain a combined mark of 148 or greater (WAM plus fourth year mark) may be considered for the award of First Class Honours only if it can be demonstrated that their WAM was affected by sickness/ misadventure, unusual work load or choice of courses, and/or they can demonstrate exceptional performance in their Honours year.

Candidates who have a WAM of 77 to 79 inclusive or 65 to 67 inclusive and who consider that their WAM was affected by exceptional circumstances are advised to discuss their case with the Dean, or the Dean's nominee, early in their Honours year and in any event before the beginning of Semester 2.

The award of Second and Third Class Honours is made on the basis of the Honours year mark only. A candidate who fails the Honours year is recorded 'Fail' in that year and is awarded a Pass, degree.

Ranking for postgraduate scholarships is determined by the sum of the WAM and the Honours year mark.

Table I: [see section 3] [Bachelor of Science]

<i>(a)</i>	<i>(b)</i>	<i>(c)</i>	<i>(d)</i>	<i>(e)</i>	<i>(f)</i>
Science Discipline Area/Course number*	Course name	Unit value	Assumed standard of knowledge (Akn)t Qualifying Courses (Q) Prerequisites (P) Corequisites (C)	Faculty of Science Resolutions and additional information about courses	Antecedent course (1996)
A. Junior courses					
Biology					
BIOL 101F	Concepts in Biology	6	Akn: Biology section of the HSC 3-unit Science course	See prerequisites for second semester courses in Biology. May not be counted with Biology 191	Biology 1
BIOL 102S	Living Systems	6	P: Biology 101 or 191	This course is a prerequisite for all Intermediate courses in Biology. May not be counted with Biology 192	Biology 1
BIOL 103S	Human Biology	6	P: Biology 101 or 191	Not a prerequisite for all Intermediate courses in Biology. See prerequisites listed under Intermediate courses. May not be counted with Biology 193	Biology 1
BIOL 191F	Concepts in Biology (Advanced)	6	Akn: Biology section of the HSC 3-unit Science course; by invitation	Students must first enrol in Biology 101. Subsequently, selected students may be invited to enrol in this course where they will participate in a more demanding alternative component. May not be counted with Biology 101	Biology 1 (Advanced)
BIOL192S	Living Systems (Advanced)	6	P: Biology 101 or 191; by invitation	Students must first enrol in Biology 102. Subsequently, selected students may be invited to enrol in this course where they will participate in a more demanding alternative component. May not be counted with Biology 102	Biology 1 (Advanced)
BIOL 193S	Human Biology (Advanced)	6	P: Biology 101 or 191; by invitation	Students must first enrol in Biology 103. Subsequently, selected students may be invited to enrol in this course where they will participate in a more demanding alternative component. May not be counted with Biology 103	Biology 1 (Advanced)
Chemistry					
CHEM 101F	Introductory Chemistry 1A	6	No previous Chemistry assumed	May not be counted with Chemistry 111 or 191 or 193	NEW

*Courses abcF and abcS are delivered in Semesters 1 and 2 respectively. The course numbers a8c and a9c denote Advanced level courses.

t Candidates who have not achieved this assumed standard will be required to undertake supplementary work, details of which can be obtained from the School/Department concerned

<i>(a)</i>	<i>(b)</i>	<i>(c)</i>	<i>(d)</i>	<i>(e)</i>	<i>(f)</i>
Science Discipline Area/Course number*	Course name	Unit value	Assumed standard of knowledge (Akn)t Qualifying Courses (Q) Prerequisites (P) Corequisites (C)	Faculty of Science Resolutions and additional information about courses	Antecedent course (1996)
CHEM 102S	Introductory Chemistry IB	6	P: Chemistry 101	May not be counted with Chemistry 112 or 192 or 194	NEW
CHEM 111F	Chemistry 1A	6	Akn: HSC Mathematics 2-unit course; and the Chemistry section of the HSC Science 3-unit or 4-unit course, or 2-unit Chemistry	See prerequisites for Intermediate Chemistry. Recommended concurrent course: Preferred: Mathematics 101 or 191 Otherwise: Mathematics 111 May not be counted with Chemistry 101, 191 or 193	Chemistry 1
CHEM 112S	Chemistry IB	6	P: Chemistry 111 or Distinction in Chemistry 101 or equivalent	Recommended concurrent course: Preferred: Mathematics 102 or 103 or 192 or 193 Otherwise: Mathematics 104 or 112 May not be counted with Chemistry 102 or 192 or 194	Chemistry 1
CHEM 191F	Chemistry 1A (Advanced)	6	P: TER of at least 88 and at least 75% in HSC 2-unit Chemistry or equivalent	See prerequisites for Intermediate Chemistry. Recommended concurrent course: Preferred: Mathematics 101 or 191 Otherwise: Mathematics 111 May not be counted with Chemistry 101 or 111 or 193	Chemistry 1 (Advanced)
CHEM 192S	Chemistry IB (Advanced)	6	Q: Chemistry 191 or 193 or Distinction in Chemistry 111 or equivalent	Recommended concurrent course: Preferred: Mathematics 102 or 103 or 192 or 193 Otherwise: Mathematics 104 or 112 May not be counted with Chemistry 102 or 112 or 194	Chemistry 1 (Advanced)
CHEM 193F	Chemistry 1A (Special Studies Program)	6	P: TER of at least 98 and at least 85% in HSC 2-unit Chemistry or equivalent. By invitation	See prerequisites for Intermediate Chemistry. Recommended concurrent course: Preferred: Mathematics 101 or 191. Otherwise: Mathematics 111 May not be counted with Chemistry 101, 111 or 191 Students in the Faculty of Science Talented Students Program are automatically eligible	Chemistry 1 (Special Studies Program)
CHEM 194S	Chemistry IB (Special Studies Program)	6	P: Chemistry 193	Recommended concurrent course: Preferred: Mathematics 102 or 103 or 192 or 193	Chemistry 1 (Special Studies Program)

Otherwise: Mathematics 104 or 112
May not be counted with Chemistry 102 or 112 or 192

Computer Science					
COMP100F/S	Information Technology Tools	6		This course may be taken in first or second semester	NEW
COMP101F	Introductory Programming	6	Akn: HSC 3-unit Mathematics	Students intending to major in Computer Science are advised to enrol in Mathematics 103 or 104 or 193 or 194 in their first year May not be counted with Computer Science 191	Computer Science 1
COMP 102S	Introductory Computer Science	6	P: Computer Science 101 or 191	May not be counted with Computer Science 192	Computer Science 1
COMP 191F	Introductory Programming (Advanced)	6	Akn: HSC 3-unit Mathematics	May not be counted with Computer Science 101	Computer Science 1 (Advanced)
COMP 192S	Introductory Computer Science (Advanced)	6	P: Computer Science 191 (or 101 with sufficient merit)	May not be counted with Computer Science 102	Computer Science 1 (Advanced)
Geography					
GEOG 101F	Physical Geography	6			Geography 1
GEOG 102S	Environmental and Human Geography	6			Geography 1
Geology					
GEOL101F	Earth and Its Environment	6	No previous knowledge of Geology assumed	See prerequisites for Intermediate Geology	Geology 1
GEOL102S	Earth Processes and Resources	6	No previous knowledge of Geology assumed	See prerequisites for Intermediate Geology	Geology 1
Mathematics					
MATH 101F	Differential Calculus and Linear Algebra	6	Akn: HSC 3-unit Mathematics	May not be counted with Mathematics 111 or 191	Mathematics 1
MATH 102S	Integral Calculus and Statistics	6	P: Mathematics 101 or 191 or Distinction in 111	May not be counted with Mathematics 103 or 104 or 112 or 192 or 193 or 194	Mathematics 1
MATH 103S	Integral Calculus and Discrete Mathematics	6	P: Mathematics 101 or 191 or Distinction in 111	May not be counted with Mathematics 102 or 104 or 112 or 192 or 193 or 194	Mathematics 1
MATH 104S	Statistics and Discrete Mathematics	6	Akn: HSC 3-unit Mathematics	May not be counted with Mathematics 102 or 103 or 112 or 192 or 193 or 194	Mathematics 1
MATH111F	Life Science Mathematics A	6	Akn: HSC 2-unit Mathematics	May not be counted with Mathematics 101 or 191 May not be counted by students enrolled in the BSc/BCom combined degree program ¹	Mathematics 1 (Life Sciences)

¹Subject to Senate approval of the combined BSc/BCom program.

<i>(a)</i>	<i>(b)</i>	<i>(c)</i>	<i>(d)</i>	<i>(e)</i>	<i>(f)</i>
Science Discipline Area/Course number*	Course name	Unit value	Assumed standard of knowledge (Akn)t Qualifying Courses (Q) Prerequisites (P) Corequisites (C)	Faculty of Science Resolutions and additional information about courses	Antecedent course (1996)
MATH 112S	Life Science Mathematics B	6	Akn: HSC 2-unit Mathematics	May not be counted with Mathematics 102 or 103 or 104 or 192 or 193 or 194 May not be counted by students enrolled in the BSc/BCom combined degree program ¹	Mathematics 1 (Life Sciences)
MATH 191F	Differential Calculus and Linear Algebra (Advanced)	6	Akn: HSC 4-unit or top decile 3-unit Mathematics	May not be counted with Mathematics 101 or 111	Mathematics 1 (Advanced)
MATH 192S	Integral Calculus and Statistics (Advanced)	6	P: Credit in Mathematics 101 or 191	May not be counted with Mathematics 102 or 103 or 104 or 112 or 193 or 194	Mathematics 1 (Advanced)
MATH193S	Integral Calculus and Discrete Mathematics (Advanced)	6	P: Credit in Mathematics 101 or 191	May not be counted with Mathematics 102 or 103 or 104 or 112 or 192 or 194	Mathematics 1 (Advanced)
MATH 194S	Statistics and Discrete Mathematics (Advanced)	6	Akn: HSC 4-unit or top decile 3-unit Mathematics	May not be counted with Mathematics 102 or 103 or 104 or 112 or 192 or 193	Mathematics 1 (Advanced)
Physics					
PHYS 101F	Physics (Regular)	6	Akn: HSC Physics or HSC 4-unit Science	See prerequisites for Intermediate Physics courses. May not be counted with Physics 102 or 191 Recommended concurrent course: Mathematics 101 or 191	Physics 1
PHYS 102F	Physics (Fundamentals)	6	No previous Physics assumed	See prerequisites for Intermediate Physics courses. May not be counted with Physics 101 or 191 Recommended concurrent course: Mathematics 101 or 191	Physics 1
PHYS 103S	Physics (Technological)	6	P: Physics 101 or 102 or 191	See prerequisites for Intermediate Physics courses. May not be counted with Physics 104 or 192 Recommended concurrent course: Mathematics 102 or 192	Physics 1
PHYS 104S	Physics (Environmental and Life Sciences)	6	P: Physics 101 or 102 or 191	See prerequisites for Intermediate Physics courses. May not be counted with Physics 103 or 192 Recommended concurrent course: Mathematics 102 or 192	Physics 1
PHYS191F	Physics (Advanced) A	6	P: TER at least that for acceptance to BSc (Advanced) degree program or at least 90 in HSC	See prerequisites for Intermediate Physics courses.	Physics 1 (Advanced)

			2-unit Physics or at least 180 in HSC 4-unit Science	May not be counted with Physics 101 or 102 Recommended concurrent course: Mathematics 101 or 191	
PHYS 192S	Physics (Advanced) B	6	P: Physics 191 or Distinction or better in Physics 101 or 102	See prerequisites for Intermediate Physics courses. May not be counted with Physics 103 or 104 Recommended concurrent course: Mathematics 102 or 192	Physics 1 (Advanced)
Psychology					
PSYC 101F	Psychology 101	6			Psychology 1
PSYC 102S	Psychology 102	6	P: Psychology 101		Psychology 1
Courses in the Faculties of Arts and Economics					
	A total of 28 units of courses in non-Science Discipline Areas may be counted towards the BSc degree including courses from the Faculties of Arts and Economics		<	Students should consult the Handbooks for the Faculties of Arts and Economics to determine any prerequisites, corequisites or other requirements relating to enrolment in courses offered by departments in these faculties. Students may not enrol in Econometrics 1, General Statistical Methods 101, or any other course deemed to be mutually exclusive with courses listed in this Table. Students enrolled in the combined BSc/BCom program may enrol in Econometrics 1 but they may not enrol in Mathematics 111 or 112	
B. Intermediate courses					
Agricultural Chemistry					
AGCH 201F	Molecular Processes in Ecosystems	8	Q: Chemistry 102 or equivalent P: Biology 102 or 192	May not be counted with any Intermediate course in Biochemistry Students who have not satisfied the prerequisites in Biology may enrol in Agricultural Chemistry 201 with Soil Science 201 as a corequisite	Agricultural Chemistry 2
Anatomy and Histology					
ANAT201F	Comparative Histology and Embryology	4	P: 12 units of Junior Biology or 12 units of Junior Psychology courses		Anatomy and Histology 2: Comparative
ANAT 202S	Comparative Primate Anatomy	4	Q: Anatomy and Histology 201		Anatomy and Histology 2: Comparative

¹Subject to Senate approval of the combined BSc/BCom program.

<i>(a)</i>	<i>(b)</i>	<i>(c)</i>	<i>(d)</i>	<i>(e)</i>	<i><f></i>
Science Discipline Area/Course number*	Course name	Unit value	Assumed standard of knowledge (Akn)t Qualifying Courses (Q) Prerequisites (P) Corequisites (C)	Faculty of Science Resolutions and additional information about courses	Antecedent course (1996)
Biochemistry					
BCHM 201F	Genes and Proteins	8	Q: 12 units of Junior Chemistry which must include Chemistry 112 or 192 or 194 P: 12 units of Junior Biology or 12 units of Junior Physics	May not be counted with Agricultural Chemistry 201 or Biochemistry 211 or 291	Biochemistry 2
BCHM 202S	Molecules, Metabolism and Cells	8	Q: Biochemistry 201 or 291	May not be counted with Agricultural Chemistry 201 or Biochemistry 212 or 292	Biochemistry 2
BCHM 211F	Genes and Proteins Theory	4	Q: 12 units of Junior Chemistry which must include Chemistry 112 or 192 or 194 P: 12 units of Junior Biology or 12 units of Junior Physics	May not be counted with Agricultural Chemistry 201 or Biochemistry 201 or 291	Biochemistry 2 Auxiliary
BCHM212S	Molecules, Metabolism and Cells Theory	4	Q: Biochemistry 201,211 or 291	May not be counted with Agricultural Chemistry 201 or Biochemistry 202 or 292	Biochemistry 2 Auxiliary
BCHM 291F	Genes and Proteins (Advanced)	8	Q: 12 units of Junior Chemistry which must include Chemistry 112 or 192 or 194 P: 12 units of Junior Biology or 12 units of Junior Physics	May not be counted with Agricultural Chemistry 201 or Biochemistry 201 or 211	Biochemistry 2 (Advanced)
BCHM 292S	Molecules, Metabolism and Cells (Advanced)	8	Q: Biochemistry 201 or 291	May not be counted with Agricultural Chemistry 201 or Biochemistry 202 or 212	Biochemistry 2 (Advanced)
Biology					
BIOL201F	Animals A	8	Q: 12 units of Junior Biology including Biology 102 or 192 P: Chemistry 112 or 192 or 194 or (with the permission of the Head of the School) exceptional performance in Chemistry 102	May not be counted with Biology 211 or 291 See prerequisites for Senior courses in Biology	Biology 2 (Animals)
BIOL202S	Animals B	8	P: Biology 201 or 291	May not be counted with Biology 292 See prerequisites for Senior courses in Biology	Biology 2 (Animals)
BIOL203F	Plant Anatomy and Physiology	8	Q: 12 units of Junior Biology including Biology 102 or 192	May not be counted with Biology 293 See prerequisites for Senior courses in Biology	Biology 2 (Plant Anatomy and Physiology) Auxiliary
BIOL 204S	Plant Ecology and Diversity	8	Q: 12 units of Junior Biology including Biology 102 or 192	May not be counted with Biology 294 See prerequisites for Senior courses in Biology	Biology 2 (Plant Ecology and Diversity) Auxiliary
BIOL205S	Molecular and General Genetics	8	Q: 12 units of Junior Biology P: Chemistry 112 or 192 or 194 or (with the permission of the Head of the School) exceptional	May not be counted with Biology 215 or 295 See prerequisites for Senior courses in Biology	Biology 2 (Molecular and General Genetics) Auxiliary

			performance in Chemistry 102. Biochemistry 201 or 291 and Biology 206 or 296 are highly recommended		
BIOL 206F	Cell Biology	8	Q: 12 units of Junior Biology P: Chemistry 112 or 192 or 194 or (with the permission of the Head of the School) exceptional performance in Chemistry 102	May not be counted with Biology 216 or 296 See prerequisites for Senior courses in Biology	Biology 2 (Cellular and Developmental) Auxiliary
BIOL 211F	Animals A — Theory	4	Q: 12 units of Junior Biology including Biology 102 or 192	May not be counted with Biology 201 or 291 Not a prerequisite for Senior courses in Biology	Biology 2 (Animals — Theory) Auxiliary
BIOL212S	Animals B — Theory	4	P: Biology 211	May not be counted with Biology 202 or 292 Not a prerequisite for Senior courses in Biology	Biology 2 (Animals — Theory) Auxiliary
BIOL 215S	Molecular and General Genetics — Theory	4	Q: 12 units of Junior Biology P: Chemistry 112 or 192 or 194 or (with the permission of the Head of the School) exceptional performance in Chemistry 102	May not be counted with Biology 205 or 295 Not a prerequisite for Senior courses in Biology	Biology 2 (Generics, Cellular and Developmental) Auxiliary
BIOL216F	Cell Biology — Theory	4	Q: 12 units of Junior Biology P: Chemistry 112 or 192 or 194 or (with the permission of the Head of the School) exceptional performance in Chemistry 102	May not be counted with Biology 206 or 296 Not a prerequisite for Senior courses in Biology	Biology 2 (Genetics, Cellular and Developmental) Auxiliary
BIOL 291F	Animals A (Advanced)	8	Q: 12 units of Junior Biology including Biology 102 or 192 P: Chemistry 112 or 192 or 194 or (with the permission of the Head of the School) exceptional performance in Chemistry 102; by invitation	Students must first enrol in Biology 201 Subsequently, students may be invited to enrol in this course where they will participate in a more demanding alternative component May not be counted with Biology 201 or 211 See prerequisites for Senior courses in Biology	Biology 2 (Animals) (Advanced)
BIOL 292S	Animals B (Advanced)	8	P: Biology 201 or 291; by invitation	Students must first enrol in Biology 202 Subsequently, students may be invited to enrol in this course where they will participate in a more demanding alternative component May not be counted with Biology 202 or 212 See prerequisites for Senior courses in Biology	Biology 2 (Animals) (Advanced)
BIOL 293F	Plant Anatomy and Physiology (Advanced)	8	Q: 12 units of Junior Biology including Biology 102 or 192; by invitation	Students must first enrol in Biology 203 Subsequently, students may be invited to enrol in this course where they will participate in a more demanding alternative component May not be counted with Biology 203 See prerequisites for Senior courses in Biology	Biology 2 (Plant Anatomy and Physiology) Auxiliary (Advanced)

<i>(a)</i>	<i>(b)</i>	<i>(c)</i>	<i>(d)</i>	<i>(e)</i>	<i>(f)</i>
Science Discipline Area/Course number*	Course name	Unit value	Assumed standard of knowledge (Akn)t Qualifying Courses (Q) Prerequisites (P) Corequisites (C)	Faculty of Science Resolutions and additional information about courses	Antecedent course (1996)
BIOL294S	Plant Ecology and Diversity (Advanced)	8	Q: 12 units of Junior Biology including Biology 102 or 192; by invitation	Students must first enrol in Biology 204 Subsequently, students may be invited to enrol in this course where they will participate in a more demanding alternative component May not be counted with Biology 204 See prerequisites for Senior courses in Biology	Biology 2 (Plant Ecology and Diversity) Auxiliary (Advanced)
BIOL 295S	Molecular and General Genetics (Advanced)	8	Q: 12 units of Junior Biology P: Chemistry 112 or 192 or 194 or (with the permission of the Head of the School) exceptional performance in Chemistry 102. Biochemistry 201 or 291 and Biology 206 or 296 are highly recommended. By invitation	Students must first enrol in Biology 205 Subsequently, students may be invited to enrol in this course where they will participate in a more demanding alternative component May not be counted with Biology 205 or 215 See prerequisites for Senior courses in Biology	Biology 2 (Molecular and General Genetics) Auxiliary (Advanced)
BIOL 296F	Cell Biology (Advanced)	8	Q: 12 units of Junior Biology P: Chemistry 112 or 192 or 194 or (with the permission of the Head of the School) exceptional performance in Chemistry 102; by invitation	Students must first enrol in Biology 206 Subsequently, selected students may be invited to enrol in this course where they will participate in a more demanding alternative component May not be counted with Biology 206 See prerequisites for Senior courses in Biology	Biology 2 (Cellular and Developmental) Auxiliary (Advanced)
Chemistry					
CHEM 201F	Chemistry 2 (Life Sciences)	8	P: Chemistry 112 or 192 or 194 P: 12 units of Junior Mathematics	May not be counted with Chemistry 211 or 221 or 231 or 252 or 291	NEW
CHEM 211F	Chemistry 2 (Environmental)	8	P: Chemistry 112 or 192 or 194 P: 12 units of Junior Mathematics	May not be counted with Chemistry 201 or 221 or 231 or 252 or 291	NEW
CHEM 221F	Chemistry 2 (Materials)	8	P: Chemistry 112 or 192 or 194 P: 12 units of Junior Mathematics	May not be counted with Chemistry 201 or 211 or 231 or 252 or 291	NEW
CHEM 222S	Chemistry 2 (Principles)	8	P: Chemistry 201 or 211 or 221 or 231 or 252	May not be counted with Chemistry 232 or 292	Chemistry 2
CHEM 231F	Chemistry 2A	8	P: Chemistry 112 or 192 or 194 P: 12 units of Junior Mathematics	May not be counted with Chemistry 201 or 211 or 221 or 252 or 291	Chemistry 2
CHEM 232S	Chemistry 2B	8	P: Chemistry 201 or 211 or 221 or 231 or 252	May not be counted with Chemistry 222 or 292	Chemistry 2
CHEM 252S	Chemistry 2 (Forensic)	8	P: Chemistry 112 or 192 or 194	May not be counted with Chemistry 201 or 211 or 221 or 231 or 291	NEW

CHEM 291F	Chemistry 2A(Advanced)	8	P: WAM greater than 80 and Distinction average in Chemistry (111 or 191 or 193) and Chemistry (112 or 192 or 194) P: 12 units of Junior Mathematics By invitation	May not be counted with Chemistry 201 or 211 or 221 or 231 or 252 The number of places in this course is limited, and entry is by invitation. Students in the Faculty of Science Talented Students Program are automatically eligible	NEW
CHEM 292S	Chemistry 2B (Advanced)	8	P: Chemistry 291	May not be counted with Chemistry 222 or 232	NEW
Computer Science					
COMP 201F	Computer Systems	4	Q: Computer Science 102 or 192	See prerequisites for Senior Computer Science courses. Consult Departmental Handbook May not be counted with Computer Science 291	Computer Science 2
COMP 202F	Design and Data Structures	4	Q: Computer Science 102 or 192	See prerequisites for Senior Computer Science courses. Consult Departmental Handbook. May not be counted with Computer Science 292	Computer Science 2
COMP 203S	Languages and Logic	4	Q: Computer Science 102 or 192 P: Computer Science 202 or 292 P: Mathematics 103 or 104 or 193 or 194	See prerequisites for Senior Computer Science courses. Consult Departmental Handbook. May not be counted with Computer Science 293	Computer Science 2
COMP 204S	Programming Practice	4	Q: Computer Science 102 or 192 P: Computer Science 202 or 292	See prerequisites for Senior Computer Science courses. Consult Departmental Handbook. May not be counted with Computer Science 294	Computer Science 2
COMP 291F	Computer Systems (Advanced)	4	Q: Computer Science 192 (or 102 with sufficient merit)	May not be counted with Computer Science 201	Computer Science 2
COMP 292F	Design and Data Structures (Advanced)	4	Q: Computer Science 192 (or 102 with sufficient merit)	May not be counted with Computer Science 202	Computer Science 2
COMP293S	Languages and Logic (Advanced)	4	Q: Computer Science 192 (or 102 with sufficient merit) P: Computer Science 292 (or 202 with sufficient merit) P: Mathematics 103 or 104 or 193 or 194	May not be counted with Computer Science 203	Computer Science 2
COMP 294S	Programming Practice (Advanced)	4	Q: Computer Science 192 (or 102 with sufficient merit) P: Computer Science 292 (or 202 with sufficient merit)	May not be counted with Computer Science 204	Computer Science 2
Engineering Science					
ENGS 221Y	Civil Engineering Science 2	16	P: Chemistry 112 or 192 or 12 units of Junior Physics or 12 units of Junior Mathematics	No more than 16 units of Engineering Science may be counted in the BSc	Civil Engineering Science 2
ENGS 241F	Engineering Thermo-fluids	6	P: 12 units of Junior Mathematics P: 12 units of Junior Physics	Mutually exclusive with U2.410 Mechanical Engineering	Mechanical and Aeronautical Engineering Science 2

<i>(a)</i>	<i>(b)</i>	<i>(c)</i>	<i>(d)</i>	<i>(e)</i>	<i>(f)</i>
Science Discipline Area/Course number*	Course name	Unit value	Assumed standard of knowledge (Akn)t Qualifying Courses (Q) Prerequisites (P) Corequisites (C)	Faculty of Science Resolutions and additional information about courses	Antecedent course (1996)
ENGS 242S	Engineering Dynamics	4	P: 12 units of Junior Mathematics P: 12 units of Junior Physics	Mutually exclusive with U2.410 Mechanical Engineering	Mechanical and Aeronautical Engineering Science 2
ENGS 243S	Mechanical Design for Engineers	6	P: 12 units of Junior Mathematics P: 12 units of Junior Physics	Mutually exclusive with Mechanical Design 1	Mechanical and Aeronautical Engineering Science 2
ENGS 261Y	Chemical Engineering Science 2	16	P: Chemistry 112 or 192 or 194 or 12 units of Junior Physics or 12 units of Junior Mathematics C: Chemistry 222 or 292	May not be counted with Engineering Science 262	Chemical Engineering Science 2 Auxiliary
ENGS 262Y	Chemical Engineering Science 2 Auxiliary	8	P: Chemistry 112 or 192 or 194 or 12 units of Junior Physics or 12 units of Junior Mathematics	May not be counted with Engineering Science 261	Chemical Engineering Science 2 Auxiliary
Geography					
GEOG 201F	Megascale Physical Environments	8	P: Geography 101 or Environmental Science 102	A candidate who has completed 12 units of Junior Mathematics and 12 Junior units of at least one of Physics or Chemistry and who has not taken Geography 101 or 102 may apply under section 1(4) for permission to enrol in any Intermediate Geography course. The Department of Geography is not normally prepared to support applications under section 1(4) to enrol in Intermediate Geography courses from persons other than those who, in their first year of studies, have completed four Junior courses above the concessional pass grade and have not subsequently failed in any Intermediate course	Geography 2 (Principles of Geomorphology)
GEOG 202S	Geomorphology of Fluvial and Coastal Environments	8	P: Geography 101 or Environmental Science 102	As for Geography 201	Geography 2 (Principles of Geomorphology)
GEOG 211F	Environmental Change and Human Response	8	P: Geography 101 or 102, or Environmental Science 102	As for Geography 201	Geography 2 (Environmental Geography and Resource Management)
GEOG 212S	Environmental Management	8	P: Geography 101 or 102, or Environmental Science 102	As for Geography 201	Geography 2 (Environmental Geography and Resource Management)
GEOG 221F	Social and Cultural Geography	8	P: Geography 102 or Environmental Science 102	As for Geography 201	Geography 2 (Principles of Human Geography)

GEOG 222S	Geography of Restructuring	8	P: Geography 102 or Environmental Science 102	As for Geography 201	Geography 2 (Principles of Human Geography)
Geology					
GEOL 201F	Plate Tectonics and Materials	8	P: Geology 102 or Environmental Science 101	A candidate who has completed 24 units of Junior courses in Physics and Chemistry and who has not taken Junior Geology or Environmental Science 101, may apply under section 1(4) for permission to enrol in Geology 201	Geology 2
GEOL 202S	Resource Exploration	4	P: Geology 201		Geology 2
GEOL203S	Fossils and Time	4	P: 24 units of Science courses		Geology 2
GEOL 204F	Environmental Geology: Hazards	4	P: 24 units of Science courses	See prerequisites for Senior Geology	Environmental Geology 2 Auxiliary
GEOL 205S	Environmental Geology: Resources	4	P: 24 units of Science courses	See prerequisites for Senior Geology	Environmental Geology 2. Auxiliary
History and Philosophy of Science					
HPSC 201S	Introductory Philosophy of Science	4	P: 24 units of Junior courses from Science Discipline Areas	This is a qualifying course for Senior courses in History and Philosophy of Science	History and Philosophy of Science 2 Introductory
HPSC202F	Introductory History of Science	4	P: 24 units of Junior courses from Science Discipline Areas	This is a qualifying course for Senior courses in History and Philosophy of Science	History and Philosophy of Science 2 Introductory
Marine Science					
MARS 201F	Introductory Marine Science A	4	P: 24 units of Junior courses from Science Discipline Areas	This is a qualifying course for Marine Science 301 and 302. Some options in Senior Marine Science have additional prerequisites	Marine Science 2 Introductory
MARS202S	Introductory Marine Science B	4	P: Marine Science 201	As for Marine Science 201	Marine Science 2 Introductory
Mathematics					
MATH 201F	Vector Calculus and Complex Variables	4	Q: Mathematics 102 or 103 or 192 or 193	May not be counted with Mathematics 291	Pure Mathematics 2
MATH 202F	Matrix Applications	4	Q: Mathematics 101 or 191 or Distinction in 111	May not be counted with Mathematics 292	Pure Mathematics 2
MATH 203F	Introduction to Mathematical Computing	4	Q: Mathematics 102 or 103 or 192 or 193	May not be counted with Mathematics 293	Applied Mathematics 2
MATH 204F	Dynamical Systems	4	Q: Mathematics 102 or 103 or 192 or 193	May not be counted with Mathematics 294	Applied Mathematics 2
MATH205S	Fourier Series and Differential Equations	4	P: Mathematics 201 or 291	May not be counted with Mathematics 295	Applied Mathematics 2
MATH 206S	Mechanics of Deformable	4	P: Mathematics 201 or 291	May not be counted with Mathematics 296	Applied Mathematics 2
MATH 207S	Analysis	4	Q: Mathematics 102 or 103 or 192 or 193	May not be counted with Mathematics 297	Pure Mathematics 2
MATH 208S	Inner Products and Group - Theory	4	P: Mathematics 202 or 292	May not be counted with Mathematics 298	Pure Mathematics 2
MATH 209F	Graph Theory	4	P: 6 units of Junior Mathematics other than Mathematics 112, but Distinction necessary in Mathematics 111		Pure Mathematics 2

<i>(a)</i>	<i>(b)</i>	<i>(c)</i>	<i>(d)</i>	<i>(e)</i>	<i>(f)</i>
Science Discipline Area/Course number*	Course name	Unit value	Assumed standard of knowledge (Akn)t Qualifying Courses (Q) Prerequisites (P) Corequisites (C)	Faculty of Science Resolutions and additional information about courses	Antecedent course (1996)
MATH 210S	Optimisation	4	Q: Mathematics 102 or 103 or 192 or 193.	May not be counted with Econometrics 351 Operations Research A1 The combination of this course with Mathematics 202 or 292 is highly recommended	Applied Mathematics 2
MATH 291F	Vector Calculus and Complex Variables (Advanced)	4	Q: Mathematics 192 or 193 or Credit in either Mathematics 102 or 103	May not be counted with Mathematics 201	Pure Mathematics 2
MATH.292F	Linear Algebra (Advanced)	4	Q: Mathematics 191 or Credit in Mathematics 101 Q: Mathematics 192 or 193 or 194 or Credit in one of Mathematics 102 or 103 or 104	May not be counted with Mathematics 202	Pure Mathematics 2
MATH 293F	Introduction to Mathematical Computing (Advanced)	4	Q: Mathematics 192 or 193 or Credit in either Mathematics 102 or 103	May not be counted with Mathematics 203	Applied Mathematics 2
MATH 294F	Lagrangian Dynamics (Advanced)	4	Q: Mathematics 192 or 193 or Credit in either Mathematics 102 or 103	May not be counted with Mathematics 204 or 311	Applied Mathematics 2
MATH 295S	Mathematical Methods (Advanced)	4	P: Mathematics 291 or Credit in Mathematics 201	May not be counted with Mathematics 205	Applied Mathematics 2
MATH 296S	Deformable Media and Waves (Advanced)	4	P: Mathematics 291 or Credit in Mathematics 201	May not be counted with Mathematics 206 The combination of this course with Mathematics 202 or 292 is highly recommended	Applied Mathematics 2
MATH.297S	Analysis (Advanced)	4	P: Mathematics 291 or Credit in Mathematics 201	May not be counted with Mathematics 207	Pure Mathematics 2
MATH 298S	Differential Equations and Group Theory (Advanced)	4	P: Mathematics 292	May not be counted with Mathematics 208	Pure Mathematics 2
Microbiology					
MICR201F	Introductory Microbiology	8	Q: 12 units of Junior Biology P: Chemistry 112 or 192 or 194 P: Mathematics 101 or 111 or 191 P: Mathematics 102 or 104 or 112 or 192 or 194	May not be counted with Microbiology 203 or 291	Microbiology 2
MICR202S	Applied Microbiology	8	P: Microbiology 201 or 291	May not be counted with Microbiology 204 or 292	Microbiology 2

¹Subject to Senate approval of the combined BSc/BCom program

MICR203F	Theoretical Microbiology A	4	Q: 12 units of Junior Biology P: Chemistry 112 or 192 or 194 P: Mathematics 101 or 111 or 191 P: Mathematics 102 or 104 or 112 or 192 or 194	May not be counted with Microbiology 201 or 291	Microbiology 2 (Theory) Auxiliary
MICR 204S	Theoretical Microbiology B	4	P: Microbiology 201 or 203 or 291	May not be counted with Microbiology 202 or 292	Microbiology 2 (Theory) Auxiliary
MICR291F	Introductory Microbiology (Advanced)	8	Q: Biology 102 or 103 or 192 or 193 Q: Chemistry 112 or 192 or 194 P: Mathematics 101 or 111 or 191 P: Mathematics 102 or 104 or 112 or 192 or 194	Credit average or better is required in Junior courses in either Biology or Chemistry May not be counted with Microbiology 201 or 203	Microbiology 2 (Advanced)
MICR292S	Applied Microbiology (Advanced)	8	Q: Credit or better in Microbiology 201 or equivalent course components in Microbiology 291	May not be counted with Microbiology 202 or 204	Microbiology 2 (Advanced)
Pharmacology					
PCOL 201F	Pharmacology Fundamentals	4	P: 12 units of Junior Chemistry which must include Chemistry 112 or 192 P: 24 units of courses from other Science Discipline Areas	This is a qualifying course for Pharmacology 301 or 302. Students are strongly advised to complete Junior courses in Biology before enrolling in Pharmacology 201	Pharmacology 2 Introductory
PCOL202S	Pharmacology Drugs and People	4	P: 12 units of Junior Chemistry which must include Chemistry 112 or 192 P: 24 units of courses from other Science Discipline Areas	This is a qualifying course for Pharmacology 301 or 302. Students are strongly advised to complete Junior courses in Biology before enrolling in Pharmacology 202	Pharmacology 2 Introductory
Physics					
PHYS 201F	Physics (Technological) A	8	Q: Physics 103,104 or 192 P: 12 units of Junior Mathematics other than Mathematics 111 and 112, or Credit or better in Mathematics 111 and 112	This is a qualifying course for Physics 301 and 302 May not be counted with Physics 211 or 213 or 291	Physics 2
PHYS 202S	Physics (Technological) B	8	Q: Physics 103,104 or 192 P: 12 units of Junior Mathematics other than Mathematics 111 and 112, or Credit or better in Mathematics 111 and 112	This is a qualifying course for Physics 301 and 302 May not be counted with Physics 212 or 214 or 292	Physics 2
PHYS 211F	Physics (Environmental) A	8	Q: Physics 103,104 or 192 P: 12 units of Junior Mathematics other than Mathematics 111 and 112, or Credit or better in Mathematics 111 and 112	This is a qualifying course for Physics 301 and 302 May not be counted with Physics 201 or 213 or 291	Physics 2
PHYS 212S	Physics (Environmental) B	8	Q: Physics 103,104 or 192 P: 12 units of Junior Mathematics other than Mathematics 111 and 112, or Credit or better in Mathematics 111 and 112	This is a qualifying course for Physics 301 and 302 May not be counted with Physics 202 or 214 or 292	Physics 2
PHYS 213F	Introduction to Environmental Physics	4	Q: Physics 103,104 or 192 P: 12 units of Junior Mathematics other than Mathematics 111 and 112, or Credit or better in Mathematics 111 and 112	This is not a qualifying course for Senior Physics May not be counted with Physics 201 or 211 or 291	Physics 2 (Environmental) Auxiliary

<i>(a)</i>	<i>(b)</i>	<i>(c)</i>	<i>(d)</i>	<i>(e)</i>	<i>(f)</i>
Science Discipline •Area/Course number*	Course name	Unit value	Assumed standard of knowledge (Akn)t Qualifying Courses (Q) Prerequisites (P) Corequisites (C)	Faculty of Science Resolutions and additional information about courses	Antecedent course (1996)
PHYS 214S	Applications of Environmental Physics	4	Q: Physics 103,104 or 192 P: 12 units of Junior Mathematics other than Mathematics 111 and 112, or Credit or better in Mathematics 111 and 112	This is not a qualifying course for Senior Physics May not be counted with Physics 202 or 212 or 292	Physics 2 (Environmental) Auxiliary
PHYS 291F	Physics (Advanced) A	8	Q: Physics 192 or Credit or better in Physics 103 or 104 P: 12 units of Junior Mathematics other than Mathematics 111 and 112, or Credit or better in Mathematics 111 and 112	This is a qualifying course for Physics 301, 302,391 and 392 May not be counted with Physics 201 or 211 or 213	Physics 2
PHYS292S	Physics (Advanced) B	8	Q: Physics 192 or Credit or better in Physics 103 or 104 P: 12 units of Junior Mathematics other than Mathematics 111 and 112, or Credit or better in Mathematics 111 and 112	This is a qualifying course for Physics 301, 302,391 and 392 A candidate with Credit or better in Physics 201 or 211 may enrol in Physics 292 May not be counted with Physics 202,212 or 214	Physics 2
Physiology					
PHSI201F	Introductory Physiology A	4	P: 12 units each of Junior Chemistry and Junior Mathematics P: 12 units of two of Junior Biology, Computer Science, Physics or Psychology	This is a qualifying course for Senior Physiology courses	Physiology 2 Introductory
PHSI 202S	Introductory Physiology B	4	P: Physiology 201	As for Physiology 201	Physiology 2 Introductory
Psychology					
PSYC 201F	Psychology 201	8	Q: Psychology 102		Psychology 2
PSYC 202S	Psychology 202	8	P: Psychology 201		Psychology 2
Soil Science					
SOIL 201F	Soil Properties and Processes	8	P: Chemistry 102 or equivalent P: 12 units of Junior Mathematics or Physics 103 or 104		Soil Science 2
SOIL 202S	Soil Resources and Conservation	8	P: 12 units of Junior Mathematics	May not be counted with Geography 302	Soil Science 2
Statistics					
The following courses are available in 1997 only					
STAT 21 IF	Mathematical Statistics 2(1)	8 .	P: Mathematics 1 or Mathematics 1 (Advanced) or Credit in Mathematics 1 (Life Sciences)	May not be counted with Statistics 212 or 291	Mathematical Statistics 2

STAT212F	Statistical Methods	8	P: 18 units of Junior Science courses	May not be counted with Mathematical Statistics 2 or Statistics 211 or 213 or 291 or 293 If Mathematical Statistics 2 has not been passed, this course [with one of Mathematics 1 or Mathematics 1 (Advanced) or Mathematics 1 (Life Sciences)] is a prerequisite for Applied Statistics 2	Statistical Methods 2
STAT 213S	Mathematical Statistics 2(2)	8	P: Statistics 211 or 291	May not be counted with Statistics 293	Mathematical Statistics 2
STAT 214S	Applied Statistics	8	P: Statistics 212 or Mathematical Statistics 2 P: 12 units of Junior Mathematics	May not be counted with Statistics 317 or 318 or 397 or 398	Applied Statistics 2
STAT 291F	Mathematical Statistics * 2(1) (Advanced)	8	P: Mathematics 1 or Mathematics 1 (Advanced)	May not be counted with Statistics 211 or 212 See prerequisites for Senior Statistics courses	Mathematical Statistics 2 (Advanced)
STAT 293S	Mathematical Statistics 2(2) (Advanced)	8	P: Statistics 211 or 291	May not be counted with Statistics 213	Mathematical Statistics 2 (Advanced)
The following courses will be offered from 1998					
STAT 215F	Probability and Distribution Theory	4	P: Mathematics 102 or 192 or (Mathematics 112 and a Credit in Mathematics 111)	May not be counted with Statistics 295	Mathematical Statistics 2
STAT 216F	Data Analysis	4	P: Mathematics 102 or 104 or 112 or 192 or 194		Mathematical Statistics 2/ Statistical Methods 2
STAT 217S	Estimation Theory	4	P: Statistics 215 or 295	May not be counted with Statistics 297	Mathematical Statistics 2
STAT218S	Hypothesis Testing	4	P: Statistics 216		Mathematical Statistics 2/ Statistical Methods 2
STAT 295F	Introduction to Probability (Advanced)	4	P: Mathematics 192 or Credit in Mathematics 102	May not be counted with Statistics 215	Mathematical Statistics 2 (Advanced)
STAT 297S	Estimation Theory (Advanced)	4	P: Statistics 295 or Credit in Statistics 215	May not be counted with Statistics 217	Mathematical Statistics 2 (Advanced)
Courses in the Faculties of Arts and Economics					
A total of 28 units of courses in non-Science Discipline Areas may be counted towards the BSc degree including courses from the Faculties of Arts and Economics				Students should consult the Handbooks for the Faculties of Arts and Economics to determine any prerequisites, corequisites or other requirements relating to enrolment in courses offered by departments in these faculties. Students may not enrol in Econometrics 1, General Statistical Methods 101, or any other course deemed to be mutually exclusive with courses listed in this Table. Students enrolled in the combined BSc/BCom program may enrol in Econometrics 1 but they may not enrol in Mathematics 111 or 112	!

<i>(a)</i>	<i>(b)</i>	<i>(c)</i>	<i>(d)</i>	<i>(e)</i>	<i>(f)</i>
Science Discipline Area/Course number*	Course name	Unit value	Assumed standard of knowledge (Akn)t Qualifying Courses (Q) Prerequisites (P) Corequisites (C)	Faculty of Science Resolutions and additional information about courses	Antecedent course (1996)
C. Senior courses					
Agricultural Chemistry					
AGCH 301F	Chemistry and Biochemistry of Ecosystems	12	P: Agricultural Chemistry 201, or Chemistry 201 or 211 or 222 or 231 or 232 or 292 or Biochemistry 202 or 292	May not be counted with Agricultural Chemistry 302	Agricultural Chemistry 3
AGCH 302F	Environmental Plant and Soil Chemistry	12	Q: Agricultural Chemistry 201> or Chemistry 201 or 211 or 222 or 231 or 232 or 292 or Biochemistry 202 or 292	May not be counted with Agricultural Chemistry 301	Environmental Plant and Soil Chemistry 3
AGCH 303S	Agricultural Biochemistry	12	Q: Agricultural Chemistry 201 or Biochemistry 202 or 292		Agricultural Chemistry 3
Anatomy and Histology					
ANAT301F	Microscopy and Histochemistry	12	Q: Anatomy and Histology 201		Anatomy and Histology 3
ANAT302S	Cells and Development	12	Q: Anatomy and Histology 201 P: Minimum of 8 units of Intermediate Biochemistry	May not be taken with Anatomy and Histology 303	Anatomy and Histology 3
ANAT 303S	Transmission and Scanning Electron Microscopy	12	Q: Anatomy and Histology 201	May not be taken with Anatomy and Histology 302	NEW
ANAT304S	Cranial and Cervical Anatomy	6	Q: Anatomy and Histology 202		NEW
Biochemistry					
BCHM 301F	Molecular Biology and Structural Biochemistry	12	Q: Biochemistry 202 or 292 (or, with permission of Head of Department — Biology 205 or 295, or good performance in Biochemistry 201 or 291 with suitable Intermediate Chemistry course)	May not be counted with Biochemistry 391	Biochemistry 3
BCHM 302S	Metabolic and Medical Biochemistry	12	Q: Biochemistry 202 or 292	May not be counted with Biochemistry 392	Biochemistry 3
BCHM 391F	Molecular Biology and Structural Biochemistry (Advanced)	12	Q: Biochemistry 202 or 292 (or, with permission of Head of Department — Biology 205 or 295, or good performance in Biochemistry 201 or 291 with suitable Intermediate Chemistry course)	May not be counted with Biochemistry 301	Biochemistry 3
BCHM 392S	Metabolic and Medical Biochemistry (Advanced)	12	Q: Biochemistry 202 or 292	May not be counted with Biochemistry 302	Biochemistry 3

Biology					
BIOL 311F	Ecophysiology	12	Q: 16 units of Intermediate Biology including Biology 202 or 203 or 206 or 292 or 293 or 296	Some modules have specific prerequisites; consult list of modules: students are advised to consult the School	Biology 3 option 110
BIOL 312F	Evolution and Diversity of the Australian Biota	12	Q: 16 units of Intermediate Biology including Biology 202 or 203 or 204 or 292 or 293 or 294	Some modules have specific prerequisites; consult list of modules; students are advised to consult the School Marine Science 301 students may take Evolution Core without taking a module, or Marine Biology module without Core	Biology 3 option 120
BIOL 313F	Molecular Genetics and Recombinant DNA Technology	12	Q: 16 units of Intermediate Biology including Biology 205 or 295	May not be counted with Biology 393	Biology 3 option 130
BIOL 321S	Cellular and Systems Physiology	12	Q: 16 units of Intermediate Biology including Biology 202 or 203 or 206 or 292 or 293 or 296	Some modules have specific prerequisites; consult list of modules; students are advised to consult the School	Biology 3 option 210
BIOL 322S	Ecology	12	Q: 16 units of Intermediate Biology including Biology 202 or 204 or 292 or 294	Some modules have specific prerequisites; consult list of modules; students are advised to contact the School	Biology 3 option 220
BIOL 323S	Eukaryotic Genetics and Development	12	Q: 16 units of Intermediate Biology including Biology 205 or 295	May not be counted with Biology 394	Biology 3 option 230
BIOL393F	Molecular Genetics and Recombinant DNA Technology (Advanced)	12	Q: 16 units of Intermediate Biology including Biology 205 or 295; by invitation	Students must first enrol in Biology 313 Subsequently, students may be invited to enrol in this course where they will participate in a more demanding alternative component. May not be counted with Biology 313	Biology 3 option 130 (Advanced)
BIOL 394S	Eukaryotic Genetics and Development (Advanced)	12	Q: 16 units of Intermediate Biology including Biology 205 or 295; by invitation	Students must first enrol in Biology 323 Subsequently, students may be invited to enrol in this course where they will participate in a more demanding alternative component. May not be counted with Biology 323	Biology 3 option 230 (Advanced)
Cell Pathology					
CPAT 301F	Cell Pathology A	12	P: Anatomy and Histology 202 or Biochemistry 202 or 292, or Biology 205 or 206 or 295 or 296, or both Pharmacology 201 and 202, or Physiology 202	Students must consult the Department before enrolling. Only a small number of students can be accommodated in the laboratory facilities.	Cell Pathology 3
CPAT 302S	Cell Pathology B	12	Q: Cell Pathology 301		Cell Pathology 3
Chemistry					
CHEM311F	Chemistry 3A	12	P: Chemistry 222 or 232 or 292	May not be counted with Chemistry 391	Chemistry 3
CHEM312S	Chemistry 3B	12	P: Chemistry 311	May not be counted with Chemistry 392	Chemistry 3

<i>(a)</i>	<i>(b)</i>	<i>(c)</i>	<i>(d)</i>	<i>(e)</i>	<i>(f)</i>
Science Discipline Area/Course number*	Course name	Unit value	■ Assumed standard of knowledge (Akn)t Qualifying Courses (Q) Prerequisites (P) Corequisites (C)	Faculty of Science Resolutions and additional information about courses	Antecedent course (1996)
CHEM 321F	Chemistry 3A Additional	12	P: Chemistry 222 or 232 or 292 P/C: Chemistry 311 or 391		Chemistry 3 Additional
CHEM 322S	Chemistry 3B Additional	12	P: Chemistry 321 P/C: Chemistry 312 or 392		Chemistry 3 Additional
CHEM 391F	Chemistry 3A (Advanced)	12	P: Distinction average in Chemistry (201 or 211 or 221 or 231 or 291) and Chemistry (222 or 232 or 292) By invitation	May not be counted with Chemistry 311, but may be counted with Chemistry 321. The number of places in this course is limited, and entry is by invitation. Students in the Faculty of Science Talented Student Program are automatically eligible	Chemistry 3 (Advanced)
CHEM 392S	Chemistry 3B (Advanced)	12	P: Chemistry 391	May not be counted with Chemistry I312	Chemistry 3 (Advanced)
Computer Science					
COMP 301F	Algorithms	4	Q: Computer Science 202 or 292 P: Mathematics 103 or 104 or 193 or 194 P: 8 units of Intermediate Mathematics and/or Statistics	Consult Departmental Handbook	Computer Science 3
COMP302F	Artificial Intelligence	4	Q: Computer Science 204 or 294 P: Computer Science 202 or 292 P: Computer Science 203 or 293 P: 8 units of Intermediate Mathematics and/or Statistics	Consult Departmental Handbook	Computer Science 3
COMP 303S	Computer Architecture	4	Q: Computer Science 201 or 291 P: Computer Science 202 or 292 P: Computer Science 203 or 293	Consult Departmental Handbook	Computer Science 3
COMP304S	Computer Graphics	4	Q: Computer Science 204 or 294 P: Computer Science 202 or 292 P: Mathematics 101 or 191 P: 8 units of Intermediate Mathematics and/or Statistics	Consult Departmental Handbook	Computer Science 3
COMP305S	Database Systems	4	Q: Computer Science 202 or 292	Consult Departmental Handbook	Computer Science 3
COMP 306F	Logic Programming	4	Q: Computer Science 203 or 293 P: Computer Science 202 or 292 P: 8 units of Intermediate Mathematics and/or Statistics	Consult Departmental Handbook	Computer Science 3
COMP 307F	Networked Systems	4	Q: Computer Science 204 or 294 P: Computer Science 201 or 291 P: Computer Science 202 or 292	Consult Departmental Handbook	Computer Science 3

COMP 308F	Object-Oriented Systems	4	Q: Computer Science 204 or 294 P: Computer Science 202 or 292	Consult Departmental Handbook	Computer Science 3
COMP309F	Operating Systems	4	Q: Computer Science 204 or 294 P: Computer Science 201 or 291 P: Computer Science 202 or 292	Consult Departmental Handbook	Computer Science 3
COMP310F	Software Engineering	4	Q: Computer Science 202 or 292 P: Computer Science 204 or 294	Consult Departmental Handbook	Computer Science 3
COMP311S	Theory of Computation	4	Q: Computer Science 203 or 293 P: 8 units of Intermediate Mathematics and/or Statistics	Consult Departmental Handbook	Computer Science 3
COMP312S	User Interfaces	4	Q: Computer Science 204 or 294 P: Computer Science 202 or 292 P: Computer Science 203 or 293	Consult Departmental Handbook	Computer Science 3
COMP321S	Algorithmic Systems Project	4	P: Computer Science 301	Students intending to major in Computer Science are advised to enrol in one of Computer Science 321,322,323,324 or 325	Computer Science 3
COMP322S	Computer Systems Project	4	P: Computer Science 309	Students intending to major in Computer Science are advised to enrol in one of Computer Science 321,322,323,324 or 325	Computer Science 3
COMP323S	Intelligent Systems Project	4	P: Computer Science 302	Students intending to major in Computer Science are advised to enrol in one of Computer Science 321,322,323,324 or 325	Computer Science 3
COMP324S	Large-Scale Software Project	4	P: Computer Science 310	Students intending to major in Computer Science are advised to enrol in one of Computer Science 321,322,323,324 or 325	Computer Science 3
COMP325S	Product Development Project	4	P: Computer Science 308	Students intending to major in Computer Science are advised to enrol in one of Computer Science 321, 322,323,324 or 325	Computer Science 3
Geography					
GEOG 301F	Coastal Environments and Dynamics	12	P: Geography 201 or 202 or 211 or Marine Science 201		Geography 3 (Geomorphology)
GEOG 302S	Environmental Geomorphology	12	P: Geography 201 or 202 or 211		Geography 3 (Geomorphology)
GEOG 31 IF	Fluvial Environments	12	P: Geography 201 or 202 or 211		Geography 3 (Environmental)
GEOG 312S	Coastal Environmental Management and GIS	12	P: Geography 201 or 202 or 211 or Marine Science 201		Geography 3 (Environmental)
GEOG 321F	Socio-Economic Development in the Asia-Pacific Rim	12	P: Geography 212 or 221 or 222		Geography 3 (Human)
GEOG 322S	Urban and Regional Change in Australasia	12	P: Geography 212 or 221 or 222		Geography 3 (Human)

<i>(a)</i>	<i>(b)</i>	<i>(c)</i>	<i>(d)</i>	<i>(e)</i>	<i>(f)</i>
Science Discipline Area/Course number*	Course name	Unit value	Assumed standard of knowledge (Akn)t Qualifying Courses (Q) Prerequisites (P) Corequisites (C)	Faculty of Science Resolutions and additional information about courses	Antecedent course (1996)
Geology					
GEOL 301F	Petrology, Basins and Structure	12	P: Geology 202 P: Geology 203		Geology 3
GEOL 302S	Exploration for Resources	8	P: Geology 301		Geology 3
GEOL303F	Engineering and Exploration Methods	8	C: Geology 301		Geology 3 Additional
GEOL304F	Palaeobiology	4	P: Geology 203 or 8 units of Intermediate Biology		Geology 3
GEOL 305S	Geochemistry and Structure	12	P: Geology 301		Geology 3 Additional
GEOL306S	Petroleum Exploration	4	P: Geology 301 C: Geophysics 304		Geology 3 Additional
Geophysics					
GEOP 301F	Geophysical Signal Processing	4	P: 6 units of Physics P: 16 units of Intermediate Science courses		Geophysics 3
GEOP 302F	Geodynamics	4	P: 6 units of Physics P: 16 units of Intermediate Science courses		Geophysics 3
GEOP 303F	Geophysical Exploration A	4	P: 6 units of Physics P: 16 units of Intermediate Science courses		Geophysics 3
GEOP304S	Petroleum Geophysics	4	P: Geology 301 C: Geology 306		Geophysics 3
GEOP 305S	Environmental Geophysics	4	P: 6 units of Physics P: 16 units of Intermediate Science courses		Geophysics 3
GEOP 306S	Geophysical Exploration B	4	P: Geophysics 303		Geophysics 3
History and Philosophy of Science					
HPSC 301F	History of Physical Sciences	6	Q: History and Philosophy of Science 201 Q: History and Philosophy of Science 202	Candidates taking this course must complete at least 24 units at Senior level in another Science Discipline Area in order to satisfy the requirements for the BSc degree	History and Philosophy of Science 3
HPSC 302F	History of Biological Sciences	6	Q: History and Philosophy of Science 201 Q: History and Philosophy of Science 202	As for 301	History and Philosophy of Science 3
HPSC303F	Social Relations of Science A	4	Q: History and Philosophy of Science 201 Q: History and Philosophy of Science 202	As for 301	History and Philosophy of Science 3
HPSC 304S	Social Relations of Science B	4	Q: History and Philosophy of Science 201 Q: History and Philosophy of Science 202 P: History and Philosophy of Science 303	As for 301	History and Philosophy of Science 3

HPSC 305F	History and Philosophy of Medicinal Science	4	Q: History and Philosophy of Science 201 Q: History and Philosophy of Science 202	As for 301	History and Philosophy of Science 3
HPSC 306F	Scientific Controversies	4	Q: History and Philosophy of Science 201 Q: History and Philosophy of Science 202	As for 301	History and Philosophy of Science 3
HPSC 307S	Science and Ethics	4	Q: History and Philosophy of Science 201 Q: History and Philosophy of Science 202	As for 301	History and Philosophy of Science 3
HPSC 308S	The Nature of Experiment	4	Q: History and Philosophy of Science 201 Q: History and Philosophy of Science 202	As for 301	History and Philosophy of Science 3
HPSC 309S	Visualisation Techniques in Contemporary Science	4	Q: History and Philosophy of Science 201 Q: History and Philosophy of Science 202	As for 301	History and Philosophy of Science 3
HPSC310F	Contemporary Issues A	6	Q: History and Philosophy of Science 201 Q: History and Philosophy of Science 202 C: History and Philosophy of Science 301 or 302 or C: History and Philosophy of Science 303 and 304	As for 301 May not be taken with History and Philosophy of Science 305 or 306 if there is significant overlap; consult Departmental Handbook	History and Philosophy of Science 3
HPSC 311S	Contemporary Issues B	6	Q: History and Philosophy of Science 201 Q: History and Philosophy of Science 202 C: History and Philosophy of Science 301 or 302 or C: History and Philosophy of Science 303 and 304	As for 301 May not be taken with History and Philosophy of Science 307 or 308 or 309 if there is significant overlap; consult Departmental Handbook	History and Philosophy of Science 3
Marine Science					
MARS 301F	Marine Science A	12	Q: Marine Science 202	All selections of options must be approved by the Director of the Marine Studies Centre. Students should read the prerequisites for each of the component course options listed in the Faculty Handbook entry for Senior Marine Science Courses	Marine Science 3
MARS 302S	Marine Science B	12	Q: Marine Science 202	As for Marine Science 301	Marine Science 3
Mathematics					
MATH 301F	Topology	4	Q: 8 units of Intermediate Mathematics	May not be counted with Mathematics 391	Pure Mathematics 3
MATH 302F	Rings and Fields	4	Q: 8 units of Intermediate Mathematics	May not be counted with Mathematics 392 The combination of this course with Mathematics 202 or 292, and Mathematics 208 or 298 is highly recommended	Pure Mathematics 3
MATH 303F	Ordinary Differential Equations	4	Q: 8 units of Intermediate Mathematics	The combination of this course with Mathematics 202 or 292, and Mathematics 201 or 291 is highly recommended	Pure Mathematics 3
MATH 304F	History of Mathematical ideas	4	Q: 8 units of Intermediate Mathematics		Pure Mathematics 3
MATH 305F	Logic	4	Q: 8 units of Intermediate Mathematics BCST students may enrol with P: 8 units Intermediate Mathematics or 12 units of Junior Mathematics at Advanced level		Pure Mathematics 3

<i>(a)</i>	<i>(b)</i>	<i>(c)</i>	<i>(d)</i>	<i>(e)</i>	<i>(f)</i>
Science Discipline Area/Course number*	Course name	Unit value	Assumed standard of knowledge (Akn)t Qualifying Courses (Q) Prerequisites (P) Corequisites (C)	Faculty of Science Resolutions and additional information about courses	Antecedent course (1996)
MATH 306S	Geometry	4	Q: 8 units of Intermediate Mathematics	The combination of this course with Mathematics 101 is highly recommended	Pure Mathematics 3
MATH 307S	Coding Theory	4	Q: 8 units of Intermediate Mathematics	The combination of this course with Mathematics 202 or 292 is highly recommended	Pure Mathematics 3
MATH 308S	Real Variables	4	Q: 8 units of Intermediate Mathematics	The combination of this course with Mathematics 201 or 207 or 291 or 297 is highly recommended	Pure Mathematics 3
MATH 309S	Number Theory	4	Q: 8 units of Intermediate Mathematics		Pure Mathematics 3
MATH 310S	Information Theory	4	Q: 8 units of Intermediate Mathematics	The combination of this course with Mathematics 201 or 291 and some probability theory is highly recommended	Pure Mathematics 3
MATH311F	Lagrangian Dynamics	4	Q: Mathematics 205 or 295	May not be counted with Mathematics 294	Applied Mathematics 3
MATH 312F	Mathematical Computing I	4	Q: Mathematics 102 or 103 or 192 or 193 Q: 8 units of Intermediate Mathematics		Applied Mathematics 3
MATH 313F	Signal Processing	4	Q: Mathematics 205 or 295		Applied Mathematics 3
MATH 314S	Partial Differential Equations and Waves	4	Q: Mathematics 205 or 295		Applied Mathematics 3
MATH 315S	Financial Mathematics	4	Q: Mathematics 102 or 103 or 192 or 193 Q: 8 units of Intermediate Mathematics	The combination of this course with Mathematics 210 and some probability theory is highly recommended	Applied Mathematics 3
MATH 316S	Nonlinear Systems and Biomathematics	4	Q: Mathematics 102 or 103 or 192 or 193 Q: 8 units of Intermediate Mathematics	The combination of this course with Mathematics 298 or 303 is highly recommended	Applied Mathematics 3
MATH 381S	Differential Analysis (Advanced)	4	Q: 12 units of Intermediate Mathematics	The combination of this course with Mathematics 392 and 291 is highly recommended Not offered every year	Pure Mathematics 3
MATH 382S	Combinatorics (Advanced)	4	Q: 12 units of Intermediate Mathematics		Pure Mathematics 3
MATH 383S	Computational Algebra (Advanced)	4	Q: 12 units of Intermediate Mathematics	The combination of this course with Mathematics 302 or 392 is highly recommended	Pure Mathematics 3
MATH 384F	Fluid Dynamics (Advanced)	4	Q: Mathematics 295 or Credit in Mathematics 205	The combination of this course with Mathematics 296 is highly recommended	Applied Mathematics 3

MATH 385F	Mathematical Methods (Advanced)	4	Q: Mathematics 295 or Credit in Mathematics 205		Applied Mathematics 3
MATH 386S	Mathematical Computing II (Advanced)	4	P: Mathematics 312 (or Engineering 2N2)		Applied Mathematics 3
MATH 387S	Hamiltonian Dynamics (Advanced)	4	Q: Mathematics 294		Applied Mathematics 3
MATH 388F	Mathematical Computing I (Advanced)	4	Q: Mathematics 192 or 193 or Credit in Mathematics 102 or 103 Q: 8 units of Intermediate Mathematics	See footnote ¹ May not be counted with Mathematics 312	Applied Mathematics 3
MATH 389F	Signal Processing (Advanced)	4	Q: Mathematics 295 or Credit in Mathematics 205	See footnote ¹ May not be counted with Mathematics 313	Applied Mathematics 3
MATH 390S	Nonlinear Systems and Biomathematics (Advanced)	4	Q: Mathematics 192 or 193 or Credit in Mathematics 102 or 103 Q: 8 units of Intermediate Mathematics	See footnote ¹ May not be counted with Mathematics 316 The combination of this course with Mathematics 298 or 303 is highly recommended	Applied Mathematics 3
MATH 391F	Metric Spaces (Advanced)	4	Q: 12 units of Intermediate Mathematics	May not be counted with Mathematics 301 The combination of this course with Mathematics 297 is highly recommended	Pure Mathematics 3
MATH 392F	Algebra I (Advanced)	4	Q: 12 units of Intermediate Mathematics	May not be counted with Mathematics 302 The combination of this course with Mathematics 292 is highly recommended	Pure Mathematics 3
MATH 393F	Differential Geometry (Advanced)	4	Q: 12 units of Intermediate Mathematics	The combination of this course with Mathematics 201 or 291, and Mathematics 301 or 391 is highly recommended	Pure Mathematics 3
MATH 394F	Complex Variable (Advanced)	4	Q: 12 units of Intermediate Mathematics	The combination of this course with Mathematics 201 or 291, and Mathematics 301 or 391 is highly recommended	Pure Mathematics 3
MATH 395F	Categories and Computer Science (Advanced)	4	Q: 12 units of Intermediate Mathematics		Pure Mathematics 3
MATH396S	Group Representation Theory (Advanced)	4	Q: 12 units of Intermediate Mathematics	The combination of this course with Mathematics 392 is highly recommended Offered only in odd years	Pure Mathematics 3
MATH 397S	Algebra II (Advanced)	4	Q: 12 units of Intermediate Mathematics	The combination of this course with Mathematics 302 or 392 is highly recommended Offered only in even years	Pure Mathematics 3
MATH 398S	Nonlinear Analysis (Advanced)	4	Q: 12 units of Intermediate Mathematics	The combination of this course with Mathematics 391 is highly recommended	Pure Mathematics 3
MATH399S	Lebesgue Integration and Fourier Analysis (Advanced)	4	Q: 12 units of Intermediate Mathematics	The combination of this course with Mathematics 297 and 391 is highly recommended	Pure Mathematics 3

¹Available subject to Senate and Faculty approval

<i>(a)</i>	<i>(b)</i>	<i>(c)</i>	<i>(d)</i>	<i>(e)</i>	<i>(f)</i>
Science Discipline Area/Course number*	Course name	Unit value	Assumed standard of knowledge (Akn)t Qualifying Courses (Q) Prerequisites (P) Corequisites (C)	Faculty of Science Resolutions and additional information about courses	Antecedent course (1996)
Microbiology					
MICR301F	General and Medical Microbiology	12	Q: Microbiology 202 or 292 or both Microbiology 201 and 204 or both Microbiology 204 and 291 P: Biochemistry 201 or 211 or 291, or Biology 205 or 295, or Agricultural Chemistry 201	May not be counted with Microbiology 391	Microbiology 3
MICR302S	Molecular and Environmental Microbiology	12	Q: Microbiology 202 or 292 or both Microbiology 201 and 204 or both Microbiology 204 and 291 P: Biochemistry 201 or 211 or 291, or Biology 205 or 295, or Agricultural Chemistry 201	May not be counted with Microbiology 392	Microbiology 3
MICR391F	General and Medical Microbiology (Advanced)	12	Q: Microbiology 202 or 292 or both Microbiology 201 and 204 or both Microbiology 204 and 291 P: Biochemistry 201 or 211 or 291, or Biology 205 or 295, or Agricultural Chemistry 201	Credit or better required in Microbiology 201 or 202 or 204 or the equivalent course components of Microbiology 291 or 292 May not be counted with Microbiology 301	Microbiology 3 (Advanced)
MICR 392S	Molecular and Environmental Microbiology (Advanced)	12	Q: Microbiology 202 or 292 or both Microbiology 201 and 204 or both Microbiology 204 and 291 P: Biochemistry 201 or 211 or 291, or Biology 205 or 295, or Agricultural Chemistry 201	Credit or better required in Microbiology 201 or 202 or 204 or the equivalent course components of Microbiology 291 or 292 May not be counted with Microbiology 302	Microbiology 3 (Advanced)
Pharmacology					
PCOL 301F	Molecular Pharmacology and Toxicology	12	Q: Pharmacology 201 and 202	Students are strongly advised to consider Intermediate courses in Biochemistry and/or Chemistry together with Physiology 201 and 202 if they wish to undertake Pharmacology 301	Pharmacology 3
PCOL 302S	Neuro- and Cardiovascular Pharmacology	12	Q: Pharmacology 201 and 202	Students are strongly advised to consider Intermediate courses in Biochemistry and/or Chemistry together with Physiology 201 and 202 if they wish to undertake Pharmacology 302	Pharmacology 3
PCOL 31 IF	Toxicology and Computer aided drug design	12	Q: Pharmacology 201 and 202 C: Pharmacology 301		Pharmacology 3 Additional
PCOL 312S	Advanced Pharmacodynamics	12	Q: Pharmacology 201 and 202 C: Pharmacology 302		Pharmacology 3 Additional

Physics					
PHYS 301F	Physics (Technological) A	12	Q: 16 units of Intermediate Physics P: 8 units of Intermediate Mathematics	May not be counted with Physics 391	Physics 3
PHYS 302S	Physics (Technological) B	12	Q: 16 units of Intermediate Physics P: 8 units of Intermediate Mathematics	May not be counted with Physics 392	Physics 3
PHYS321F	Scientific Computing	12	Q: Credit or better in Mathematics 203 or 293 P: 16 units from Intermediate courses in Chemistry, Computer Science, Mathematics, Physics or Statistics	This course will be offered from 1998	Scientific Visualisation 3
PHYS 322S	Scientific Visualisation	12	P: Physics 321	This course will be offered from 1998	Scientific Visualisation 3
PHYS 391F	Physics (Advanced) A	12	Q: Physics 291 and 292, or Credit or better in Physics (201 or 211) and Physics (202 or 212) P: 16 units of Intermediate Mathematics	May not be counted with Physics 301	Physics 3
PHYS 392S	Physics (Advanced) B	12	Q: Physics 291 and 292, or Credit or better in Physics (201 or 211) and Physics (202 or 212) P: 16 units of Intermediate Mathematics	Candidates with Credit or better in Physics 301 may enrol in Physics 392 May not be counted with Physics 302	Physics. 3
Physiology					
PHSI301F	Neuroscience	12	Q: Physiology 202 or Anatomy and Histology 202 P: Biochemistry (201 and 202) or (211 and 212) P: An additional 8 or more units from any Intermediate course(s) in the following subjects: Anatomy and Histology, Biology, Chemistry, Computer Science, Mathematics, Statistics, Microbiology, Pharmacology, Physics, Physiology and Psychology	Students in the Faculty of Engineering who have completed Physiology 202 plus at least one other Intermediate course similar to one of the above prerequisites may be permitted to enrol by the Course Supervisor	Physiology 3
PHSI 302S	Neuroscience — Cellular and Integrative	12	Q: Physiology 301		Physiology 3
PHSI303S	Heart and Circulation	12	Q: Physiology 202 P: Biochemistry (201 and 202) or (211 and 212) P: An additional 8 or more units from any Intermediate course(s) in the following subjects: Anatomy and Histology, Biology, Chemistry, Computer Science, Mathematics, Statistics, Microbiology, Pharmacology, Physics, Physiology and Psychology	As for Physiology 301	Physiology 3
Psychology					
PSYC 301F	Psychology 301	12	Q: Psychology 202		Psychology 3
PSYC 302S	Psychology 302	12	Q: Psychology 202, but History and Philosophy option has additional prerequisite		Psychology 3
Soil Science					
SOIL 301F	Environmental Soil Science'A	12	Q: Soil Science 201 P: Agricultural Chemistry 201, or Chemistry 201 or 211 or 222 or 231 or 232 or 292, or Biochemistry 202 or 292		Soil Science 3

(a)	(b)	(c)	(d)	(e)	(f)
Science Discipline Area/Course number*	Course name	Unit value	Assumed standard of knowledge (Akn)t Qualifying Courses (Q) Prerequisites (P) Corequisites (C)	Faculty of Science Resolutions and additional information about courses	Antecedent course (1996)
SOIL 302S	Environmental Soil Science B	12	Q: Soil Science 201 P: Agricultural Chemistry 201, or Chemistry 201 or 211 or 222 or 231 or 232, or Biochemistry 202 or 292		Soil Science 3
Statistics					
The following; courses are available in 1997 only					
STAT 317F	Mathematical Statistics 3(1)	12	Q: Mathematical Statistics 2 or Mathematical Statistics 2 (Advanced) P: Pure Mathematics 2 or Applied Mathematics 2 or Combined Mathematics 2	May not be counted with Applied Statistics 2 or Statistics 397	Mathematical Statistics 3
STAT 318S	Mathematical Statistics 3(2)	12	P: Statistics 317 or 397	May not be counted with Statistics 398	Mathematical Statistics 3
STAT 397F	Mathematical Statistics 3(1) (Advanced)	12	Q: Mathematical Statistics 2 (Advanced) or Credit in Mathematical Statistics 2 P: Pure Mathematics 2 or Applied Mathematics 2 or Combined Mathematics 2	May not be counted with Applied Statistics 2 or Statistics 317	Mathematical Statistics 3 (Advanced)
STAT 398S	Mathematical Statistics 3(2) (Advanced)	12	P: Statistics 397	May not be counted with Statistics 318	Mathematical Statistics 3 (Advanced)
The following; courses will be offered from 1998					
STAT 319F	Distribution Theory and Inference	4	Q: Statistics 213 or 217 or 293 or 297 P: Mathematics 201 or 291	May not be counted with Statistics 399	Mathematical Statistics 3
STAT 320F	Applied Linear Models	4	Q: Statistics 212 or 213 or 218 or 293	May not be counted with Statistics 214 or 390 or 395	Mathematical Statistics 3/ Applied Statistics 2
STAT 321F	Time Series Analysis	4	Q: Statistics 213 or 217 or 293 or 297 Q: Statistics 213 or 218 or 293	May not be counted with Econometrics 303 Forecasting for Economics and Business ¹	Mathematical Statistics 3/ Mathematical Statistics 3 (Advanced)
STAT 323S	Design of Experiments	4	P: Statistics 320 or 390	May not be counted with Statistics 214	Mathematical Statistics 3/ Applied Statistics 2/ Mathematical Statistics 3 (Advanced)
STAT 390F	Linear Models (Advanced)	4	Q: Statistics 217 or 293 or 297 or Credit in Statistics 213 Q: Statistics 213 or 218 or 293 P: Mathematics 202 or 292	May not be counted with Statistics 214 or Statistics 320	Mathematical Statistics 3 (Advanced)

STAT392S	Markov Processes (Advanced)	4	Q: Statistics 293 or 295 P: Mathematics 201 or 291 P: Mathematics 202 or 292	May not be counted with Statistics 322	Mathematical Statistics 3 (Advanced)
STAT395S	Multivariate Analysis (Advanced)	4	P: Statistics 319 or 399 P: Statistics 390	May not be counted with Statistics 320	Mathematical Statistics 3 (Advanced)
STAT 399F	Statistical Theory (Advanced)	4	Q: Statistics 293 or 297 P: Mathematics 201 or 291	May not be counted with Statistics 319	Mathematical Statistics 3 (Advanced)

Courses in the Faculties of Arts and Economics

A total of 28 units of
courses in non-Science
Discipline Areas may be
counted towards the BSc
degree including courses
from the Faculties of Arts
and Economics

Students should consult the Handbooks for
the Faculties of Arts and Economics to
determine any prerequisites, corequisites
or other requirements relating to enrolment
in courses offered by departments in these
faculties. Students may not enrol in
Econometrics 1, General Statistical Methods
101, or any other course deemed to be
mutually exclusive with courses listed in this
Table. Students enrolled in the combined
BSc/BCom program may enrol in
Econometrics 1 but they may not enrol in
Mathematics 111 or 112

¹Subject to Senate approval of the Combined BSc/BCom program

Bachelor of Science (Advanced) degree program

Summary of requirements

The Bachelor of Science (Advanced) degree program requires three years of full-time study. An Honours program is available and requires a further year of full-time study. Progression towards the Bachelor of Science (Advanced) degree program is by accumulation of credit points gained by completing courses. A total of 144 units is required for the degree. These must include:

- 48 units from Senior courses
- 48 units from Intermediate courses

Students will also be required to perform at a standard which will allow them to be admitted into an Honours course.

Courses taken must include 12 units of Mathematics.

All students in the Bachelor of Science (Advanced) must complete at least 24 units of Junior courses, at least 16 units of Intermediate courses and at least 24 units of Senior courses, these 64 units being designated as Advanced or taken under the Faculty's Talented Student Program.

A minimum requirement for progression in the BSc (Advanced) will be set annually and will be based on WAM.

The Resolutions of the Senate governing candidature for the degree of Bachelor of Science listed in this chapter also govern the BSc (Advanced) degree program. Students should refer to the Table of courses for the BSc.

HSC Aggregate

A quota exists for admission into the degree of Bachelor of Science (Advanced).

Transferring into the BSc (Advanced) degree program

Students are permitted to transfer from other degrees offered by the Faculty of Science into the BSc (Advanced). In order to transfer into the BSc (Advanced) students must achieve a WAM of at least 75. They must also meet Departmental course entrance requirements.

Bachelor of Science (Environmental) degree program

Summary of requirements

The Bachelor of Science (Environmental) degree program requires three years of full-time study. An Honours program is available and requires a further year of full-time study. Progression in the Bachelor of Science (Environmental) program is by accumulation of credit points gained by completing courses. A total of 144 units is required for the degree.

All students must study:

First Year 12 units of Junior Biology
 12 units of Junior Chemistry
 12 units of Junior Mathematics⁺
 Environmental Earth Science A & B

The study of Biology, Chemistry or Mathematics courses at the Advanced level is highly recommended.

⁺The combination MATH103/193 is not recommended in this degree program. Students wishing to study Statistics/Calculus are advised to select MATH (102/192) or 112.

Second Year Choice of at least 16 Intermediate units*
 Environmental Science A1 & A2
 Environmental Science B1 & B2

*Choices must be in a relevant discipline, defined to be Agricultural Chemistry, Biology, Chemistry, Geography, Geology, Microbiology and Soil Science. Special arrangements may be made with the Dean of Science to enrol in a Physics major with this degree program.

Third Year Choice of 24 Senior units**
 Environmental Science A & B

**Choices must be in a relevant discipline, defined to be Biology, Chemistry, Geography, Geology.

The Resolutions of the Senate governing candidature for the degree of Bachelor of Science also govern the BSc (Environmental) degree program. Table II (below) is the Table of courses for the BSc (Environmental) degree program.

HSC Aggregate

A quota exists for admission into the degree of Bachelor of Science (Environmental).

Transferring into the BSc (Environmental)

After 1996 students will be permitted to transfer from other degrees offered by the Faculty of Science into the BSc (Environmental) degree program.

Table II: [see section 12] [Bachelor of Science (Environmental)]

(a)	(b)	(c)	(d)	(e)	(f)
Course designation*	Course name	Unit value	Assumed standard of knowledge (Akn) Qualifying Courses (Q) Prerequisites (P) Corequisites (C)	Faculty of Science Resolutions and additional information about courses	Antecedent course (1996)
For details of course content, assumed knowledge, prerequisite, corequisite and qualifying courses see also Table I [Bachelor of Science].					
A. Junior courses					
Candidates are required to enrol in and complete:					
(i) Environmental Science 101 and Environmental Science 102					
(ii) (Biology 101 or Biology 191) <i>and either</i> (Biology 102 or Biology 192)					
(iii) (Chemistry 111 or Chemistry 191 or Chemistry 193) <i>and either</i> (Chemistry 112 or Chemistry 192 or Chemistry 194)					
(iv) 12 units in the Science Discipline Area of Mathematics					
ENVI101F	Environmental Earth Science A	6	C: Biology 101 or 191 C: Chemistry 111 or 191 or 193 C: Mathematics 101 or 111 or 191		Environmental Earth Science 1
ENVI102S	Environmental Earth Science B	6	P: Environmental Science 101 C: Biology 102 or 192 C: Chemistry 112 or 192 or 194 C: Mathematics 102 or 103 or 104 or 112 or 192 or 193 or 194		Environmental Earth Science 1
B. Intermediate courses					
Candidates are required to enrol in and complete:					
(i) Environmental Science 201 <i>and</i> Environmental Science 211					
(ii) Environmental Science 202 <i>and</i> Environmental Science 212					
(iii) 16 Intermediate units from the following courses: AGCH 201, BIOL 201, BIOL 202, BIOL 203, BIOL 204, BIOL 291, BIOL 292, BIOL 293, BIOL 294, CHEM 201, CHEM 211, CHEM 222, CHEM 231, CHEM 232, CHEM 252, CHEM 291, CHEM 292, GEOG 201, GEOG 202, GEOG 211, GEOG 212, GEOG 221, GEOG 222, GEOL 201, GEOL 202, GEOL 203, GEOL 204, GEOL 205, MICR 201, MICR 291, SOIL 201, SOIL 202.					
Note that when choosing these courses, candidates should carefully consider the relevant requisites and corequisites of units, options in senior courses in Environmental Science and their choice of the other major discipline.					
ENVI 201F	Environmental Science A1	8	P: Environmental Science 101 and 102 P: Biology 102 or 192 P: Chemistry 112 or 192 or 194 P: Mathematics (102 or 103 or 104 or (111 and 112) or 192 or 193 or 194) C: Environmental Science 211 C: 8 units from the approved list of courses in B(iii) above		Environmental Science 2A
ENVI 21 IF	Environmental Science B1	8	P: As for Environmental Science 201 C: Environmental Science 201	Environmental Science 201	Environmental Science 2B

(a) Course designation*	(b) Course name	(c) Unit value	(d) Assumed standard of knowledge (Akn) Qualifying Courses (Q) Prerequisites (P) Corequisites (C)	(e) Faculty of Science Resolutions and additional information about courses	(f) Antecedent course (1996)
ENVI202S	Environmental Science A2	8	P: Environmental Science 201 and 211 C: Environmental Science 212 C: 8 units from the approved list of courses in B(iii) above		Environmental Science 2A
ENVI212S	Environmental Science B2	8	P: Environmental Science 201 and 211 C: Environmental Science 202		Environmental Science 2B

C. Senior courses

Candidates are required to enrol in and complete:

(i) **Environmental Science 301 and Environmental Science 302. (Details of relevant options should be obtained before enrolment from Professor A.J. Underwood, Marine Ecology Laboratories, All)**

(ii) **24 Senior units from the following Science Discipline Areas: Biology, Chemistry, Geography, Geology.**

ENVI301F	Environmental Science A	12	P: Environmental Science 201 and 202 and 211 and 212 . P: 16 Units of Intermediate subjects from the list in B(iii) above C: 12 Senior units from the Science Discipline Areas listed above	See * below Note: Many other options and modules in different Science Discipline Areas have specific pre- and corequisites	Environmental Science 3
ENVI 302S	Environmental Science B	12	P: Environmental Science 301 C: 12 Senior units from the Science Discipline Areas listed above	See * below Note: Many other options and modules in different Science Discipline Areas have specific pre- and corequisites	Environmental Science 3

***No option can be simultaneously counted towards ENVI 301 or ENVI 302 and any other discipline.**

*Courses available only in the Bachelor of Science (Environment) are designated by ENVI rather than a Science Discipline: Area code.

Bachelor of Science (Molecular Biology and Genetics) degree program

The course offers an integrated and comprehensive coverage of all aspects of modern molecular biology and genetics. This is an Advanced program. Students will have the opportunity to develop an understanding (at the chemical and physical levels) of the structure, information content and replication of the genetic material (DNA, RNA), the organisational expression of the encoding genes, and the structure and reactivity of the gene products (proteins). This will provide a background for the introduction of advanced topics including genetic and protein engineering, macromolecular interactions and recognition, the molecular mechanisms of cellular differentiation and organism development, the molecular basis of inherited disease and pathogenesis, biotechnology, and medical diagnostic molecular biology. All students will also participate as a group in a three-year program of seminars and discussions to give abroad perspective of the field. Graduates with the Honours degree would be highly sought after in a wide variety of biological and medical research laboratories and in hospitals and industry. In addition, the course will prepare the graduate for PhD training in many of the cutting-edge biological and medical research areas.

Summary of requirements

The Bachelor of Science (Molecular Biology and Genetics) degree program requires three years of full-time study. An Honours program is available and requires a further year of full-time study. Progression towards the Bachelor of Science (Molecular Biology and Genetics) is by accumulation of credit points gained by completing courses. A total of 144 units is required for the degree. These must include:

- 48 units from Senior courses
- 48 units from Intermediate courses

Students will also be required to perform at a standard which will allow them to be admitted into an Honours course.

Courses taken must include 12 units of Junior Mathematics, and 12 Junior units of each of Biology and Chemistry.

All students in the Bachelor of Science (Molecular Biology and Genetics) must complete at least 24 units of Junior courses, at least 16 units of Intermediate courses and at least 24 units of Senior courses, these 64 units being designated as Advanced or taken under the Faculty's Talented Student Program.

A minimum requirement for progression in the BSc (Molecular Biology and Genetics) will be set annually and will be based on WAM.

The Resolutions of the Senate governing candidature for the degree of Bachelor of Science also govern the BSc (Molecular Biology and Genetics) degree program. Students should refer to Table III (below) and to the Table of courses for the BSc.

Sequence of study

First Year

BIOL 191 and (192 or 193)

CHEM (191 and 192) or (193 and 194)

12 units of Mathematics (excluding MATH 111 and 112)*

12 units of other Junior courses from the BSc Table of courses

It is recommended that the extra 12 units be selected from Junior courses in Physics or in Computer Science.

The combination MATH 103/193 is not recommended in this degree program. Students wishing to study Statistics/Calculus are advised to select MATH(102/192) or MATH 112.

Second Year

BCHM 291 and 292

BIOL 295 and 296

CHEM 293

MICR 205 and 206

Third Year

Core (S1):

BCHM 301 or 391

BIOL 393

Option (S2): Two of—

BIOL 323 or 394

BCHM 302 or 392

MICR 302

Fourth Year

Any appropriate Honours program in a Department or School in the Faculty of Science

NOTE: Students wishing to major in Molecular Biology or Genetics in their Senior year should have completed both Biochemistry 202/292 and Biology 205/295.

HSC Aggregate

A quota exists for admission into the degree of Bachelor of Science (Molecular Biology and Genetics).

Transferring into the BSc(Molecular Biology and Genetics)

After 1996 students will be permitted to transfer from other degrees offered by the Faculty of Science into the BSc (Molecular Biology and Genetics),

Table III: [see section 12] [Bachelor of Science (Molecular Biology and Genetics)]

(a)	(b)	(c)	(d)	(e)	(f)
Science Discipline Area/Course number	Course name	Unit value	Assumed standard of knowledge (Akn) Qualifying Courses (Q) Prerequisites (P) Corequisites (C)	Faculty of Science Resolutions and additional information about courses	Antecedent course (1996)
For details of course content, assumed knowledge, prerequisite, corequisite and qualifying courses see Table I [Bachelor of Science].					
A. Junior courses					
Candidates are required to enrol in and complete:					
(i) Biology 191 <i>and either</i> (Biology 192 or Biology 193)					
(ii) (Chemistry 191 and Chemistry 192) <i>or</i> (Chemistry 193 and Chemistry 194)					
(iii) 12 units in the Science Discipline Area of Mathematics, excluding Mathematics 111 and Mathematics 112					
(iv) Any other 12 units of Junior courses. It is recommended that these courses include Physics or Computer Science.					
B. Intermediate courses					
Candidates are required to enrol in and complete:					
(i) Biochemistry 291 and Biochemistry 292					
(ii) Biology 295 and Biology 296					
(iii) Chemistry 293 and Microbiology 205 and 206					
Chemistry					
CHEM 293F	(Life Sciences) Advanced	8	Q: Chemistry 192 or 194 P: 12 units of Junior Mathematics	May not be counted with Chemistry 201, 211, 221, 231, 291 or 252	NEW
Microbiology					
MICR 205F	Fundamental Microbiology	4	Q: Biology 191 and (192 or 193) Q: Chemistry 192 or 194		NEW
MICR 206S	Microbiological Applications and Biotechnology	4	Q: Biology 191 and (192 or 193) Q: Chemistry 192 or 194 Q: Microbiology 205		NEW
C. Senior courses					
At least 24 units must be completed from Senior Advanced courses.					
Candidates are required to enrol in and complete:					
(i) S1 Core Courses					
(a) Biochemistry 301 or 391					
(b) Biology 393					
(ii) S2 Elective Option Courses					
Select two options from (a), (b) and (c) below:					
(a) Biochemistry 302 or 392					
(b) Biology 323 or 394					
(c) Microbiology 303 (For details of course content, assumed knowledge, prerequisite, corequisite and qualifying courses, see Table VI [Bachelor of Medical Science].)					
D. Honours courses					
Candidates for the Honours degree shall complete an appropriate Honours program in a Department or School in the Faculty of Science.					

Combined degrees

Combined Science/Law degrees

BSc/LLB¹

The University offers a combined Science/Law course similar to the combined courses of Arts/Law and Economics/Law. The purpose of the course is to meet a demand for science graduates with legal training.

A student who is selected for enrolment in the Science/Law course may proceed to the LLB degree at the same time as being a candidate for the BSc degree, and may count up to 52 units of Law subjects, comprising Legal Institutions I and II (6 units each) and five 8 unit courses as specified below towards the Science degree. No other courses offered by other Faculties may be credited towards the BSc degree. On completion of the remaining requirements for the Science degree, as specified in section 13 of the Resolutions of the Senate relating to the degree of Bachelor of Science, this degree is awarded and the student can then proceed to complete the requirements for the degree of Bachelor of Laws.

The order in which Law courses are taken is specified in the Resolutions of the Senate governing the degree of Bachelor of Laws as follows:

- (i) in the first year of attendance the student will take 36 units of Science Junior courses and the courses Legal Institutions I and II.
- (ii) in the second year of attendance the student will take 32 units of Science Intermediate courses, from at least 2 Science Discipline Areas and Constitutional Law (8 units), Torts (8 units) and Criminal Law (8 units); **note that Criminal Law can be taken in either the second or third year.**
- (iii) in the third year of attendance the student will take Administrative Law (8 units) Contracts (8 units) and, if not taken in second year, Criminal Law (8 units). In addition the student will take Science courses which will include at least 24 units of Senior courses from a single Science Discipline Area and any other courses required to give the student a minimum of 56 units of Science courses at Intermediate and Senior level, and at least the minimum of 144 units required for the BSc degree.
- (iv) A course in Legal Research and Writing must also be completed.

In the combined Science/Law course students will spend the first three years in the main University grounds during which time the Science degree is 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 during a period of two years. Full details of the courses to be completed during this time are included in the Faculty of Law Handbook.

General enquires about the combined Science/Law course should be addressed to the Manager, Faculty of Science.

Honours courses

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

1. Students taking the combined Science/Law course who wish to take an Honours course in Science and whose examination results in their early years qualify them to do so, may elect to spend an additional year in Science after the third year. Note, however that the Faculty of Law generally permits only one year of suspension of candidature from the Bachelor of Laws degree (including the combined Science/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.

2. There is no separate Honours course for the degree of Bachelor of Laws. Graduation with Honours in Law requires a high standard of performance in all courses for the LLB degree. Some of these courses are taken during the first three years of the combined course while the student is completing the Science segment of the course.

¹Subject to approval of the Senate.

Table IV: [see section 13] Law courses¹

(Available to students enrolled concurrently for the degrees of Bachelor of Science and Bachelor of Laws)

<i>(a)</i>	<i>(b)</i>	<i>(c)</i>	<i>(d)</i>	<i>(e)</i>	<i>(f)</i>
Course code	Course name	Unit value	Assumed standard of knowledge (Akn) Qualifying Courses (Q) Prerequisites (P) Corequisites (C)	Faculty of Science Resolutions and additional information about courses	Antecedent course (1996)
A. Junior courses					
F	Legal Institutions I	6	This course offered in Semester 1 only		
S.	Legal Institutions II	6	P: Legal Institutions I	This course offered in Semester 2 only	
B. Intermediate and Senior courses					
23649 F/S	Constitutional Law	8	P: Legal Institutions I and II	Must be taken in the second year of attendance. See entry under Courses of Study	
22670 F/S	Torts	8	P: Legal Institutions I and II	Must be taken in the second year of attendance. See entry under Courses of Study	
25153 F/S	Criminal Law	8	P: Legal Institutions I and II	May be taken in either the second or third year of attendance. See entry under Courses of Study	
38359F/S	Administrative Law	8	P: Legal Institutions I and II	Must be taken in the third year of attendance. See entry under Courses of Study	
38245 F/S	Contracts	8	P: Legal Institutions I and II	Must be taken in the third year of attendance. See entry under Courses of Study	

¹A course in Legal Research and Writing must also be completed.

Combined Arts/Science degrees

BA/BSc Resolutions of the Faculty¹

These Resolutions should be read in conjunction with the Resolutions of Senate governing candidature for the degrees of Bachelor of Arts and Bachelor of Science.

1. Candidature for the combined program is full-time.
2. Candidates qualify for the combined degrees by completing 240 units including:
 - (i) at least 12 units from the Science Discipline Areas of Mathematics and Statistics;
 - (ii) 24 units from Junior courses in Science Discipline Areas;
 - (iii) (a) at least 72 Senior units from Part A of the Table of Courses for the BA including a major; and
(b) at least 72 units from Senior and Intermediate courses in Science Discipline Areas taken in accordance with the Resolutions of the BSc.
3. Candidates will be under the general supervision of one of the Faculties until they complete at least 144 units (normally the first three years) and they will complete the combined program under the general supervision of the other Faculty. General supervision covers all areas of policy and procedure affecting candidates such as degree rules, course nomenclature, enrolment procedures and the Dean to whom reference is to be made at any given time.
4. Candidates who are qualified for one or both of the degrees and otherwise qualified to do so may complete an Honours year. In cases where the Honours year may be completed in either Faculty, it shall be completed in the Faculty in which the candidate has completed the final qualifying course for the Honours year.
5. Candidates may abandon the combined program and elect to complete either a BSc or a BA in accordance with the Resolutions of the Senate governing those degrees.
6. The Deans of Arts and Science shall jointly exercise authority in any matter concerning the combined degree program not otherwise dealt with in the Resolutions of the Senate or these Resolutions.

Combined Science/Engineering degrees

BSc/BE Resolutions of the Faculty¹

1. Pursuant to section 14 of the Resolutions of the Senate governing the degree of Bachelor of Science, students who are of two or three years' standing in the Faculty of Engineering may be admitted to candidature for the degree.
2. To be eligible for admission, such students:
 - (1) must have gained credit in the Faculty of Engineering for not less than 96 units if of two years' standing in that Faculty, or not less than 108 units if of three years' standing in that Faculty; and

(2) except with the permission of the Dean of the Faculty of Science, must have completed, at full Pass level or better, all courses attempted in the Faculty of Engineering at their first examination, including at least 32 units of Intermediate courses which are equivalent to courses available to candidates in the BSc, of which at least 16 units must be offered by Departments of the Faculty of Science, and

(3) must have completed courses which meet the prerequisites for at least 24 Senior units in a single Science Discipline Area under the BSc Regulations.

3. To qualify for the award of the Pass degree, candidates (after admission under section 14 of the Resolutions of the Senate governing the degree of Bachelor of Science) shall complete, in one year of full-time study or in two consecutive years of part-time study, courses listed in Table I of the BSc Resolutions totalling at least 48 units subject to the provisos:
 - (1) that at least 40 units shall be for Intermediate or Senior courses, and at least 24 units shall be for Senior courses in a single Science Discipline Area other than Engineering Science; and
 - (2) that, except with the permission of the Dean, the 48 units shall not include any units:
 - (i) for courses taught by Departments in the Faculties of Arts or Economics or Engineering
 - (ii) for courses regarded by the Faculty as equivalent to those already completed within the Faculty of Engineering.

Permission will be given to include in these 48 units courses taught in the Faculty of Engineering only if the total number of Engineering Science units counted toward the BSc, including those counted as units in satisfying section 2(2) above, does not exceed 16.

4. Candidates admitted under section 14 shall comply with section 5 of the Resolutions of the Senate governing the degree of Bachelor of Science.
5. To qualify for admission to Honours courses, such candidates shall comply with section 16 of the Resolutions of the Senate.

There is no provision for students admitted under section 14 to continue in the Faculty of Science after one full-time or two part-time years of study except to complete an Honours course. Candidates who fail to complete the required 48 units may only be re-admitted to the Faculty of Science if a successful application is made at the appropriate time through the Universities Admissions Centre. Successful applicants will be given credit for courses completed in accordance with section 10 of the Resolutions of the Senate governing the degree of Bachelor of Science.

Progression into the Faculty of Engineering

Graduands/graduates in the Faculty of Science at this University, who wish to transfer to the Bachelor of Engineering degree course, must make application through the Universities Admissions Centre by the

¹Subject to approval of the Senate.

appropriate closing date in the year prior to proposed entry into the Faculty of Engineering.

Applications will be considered on the basis of academic merit. Consideration will be given to HSC examination results and examination results in the Faculty of Science (and to results in any other tertiary courses completed). The offer of a place in the Faculty of Engineering is NOT automatic and the competition for entry is keen.

Graduands /graduates in the Faculty of Science who are offered a place in the Faculty of Engineering may be able to complete the BE degree requirements in two further years of full-time study. It would be necessary to have completed appropriate courses in the Faculty of Science so that credit for/exemption from all or most of the Junior and Intermediate core course prescribed for that branch of Engineering in which candidates wish to proceed could be given.

The Departments in the Faculty of Engineering have indicated that they would recommend that a Science graduand/graduate be given sufficient credit/exemption to enable him/her to complete the BE degree requirements in two years if he/she has completed appropriate Science courses.

The BSc degree requirements would need to have been completed in the minimum time and in some Engineering Departments minimum standards of performance in Science courses are required. Prospective candidates are advised to consult the relevant Engineering Department about the Science courses required and the standards of performance necessary.

Combined Science/Medicine degrees BSc/MB BS Resolutions of the Faculty (old Resolutions)

1. Pursuant to section 15 of the Resolutions of Senate governing candidature for the degree of Bachelor of Science, students may enrol concurrently in the BSc, MB and BS degrees. Such candidates may satisfy the requirements for the BSc degree by completing at least 92 units including at least 72 units at Intermediate or Senior level, at least 24 units of which shall be at Senior level, in courses as prescribed in sections 2 and 4. On completion of these 92 units, candidates will be credited with the equivalent of 48 units towards the BSc degree from courses completed in the first year of the MB and BS degrees.

2. Candidates admitted in accordance with section 1 may credit only Junior, Intermediate and Senior courses in the Science Discipline Areas of Chemistry, Computer Science, Mathematics, Physics and Statistics towards the additional 92 units required for the BSc degree.

3. Except with the permission of the Faculty of Science, candidates may not enrol in a course unless they have completed those courses specified as prerequisites in section 3 of the Resolutions of the Senate governing the degree of Bachelor of Science. The course Chemistry, available to first year students in the Faculty of Medicine, is an alternative qualifying course for Intermediate Chemistry courses.

4. Except with the permission of the Faculties of Medicine and Science,

(a) a candidate in years 1 to 4 of the course shall:

- (i) enrol in the courses prescribed for years 1, 2, 3 and 4 of the MB BS degrees;
- (ii) complete 12 units of courses from the Science Discipline Area of Mathematics;
- (iii) complete 32 units of Intermediate courses from Science Discipline Areas listed in section 2, at least 16 of which are in a single Science Discipline Area.

(b) a candidate in year 5 shall enrol as a full-time student in the Faculty of Science and complete 24 units of Senior courses from one Science Discipline Area in section 2, and at least a further 12 units of Intermediate or Senior courses from Science Discipline Areas in section 2.

5. Except with the permission of the Faculties of Medicine and Science, candidates may not enrol in courses other than those prescribed in sections 2 and 4.

6. To qualify for admission to Honours courses in the Faculty of Science, candidates shall comply with section 16 of the Resolutions of the Senate governing the degree of Bachelor of Science.

7. There is no provision for students admitted in accordance with section 1 to continue in the Faculty of Science after completion of their full-time year in that Faculty (as prescribed in section 4) except to complete an Honours course.

8. Candidates who fail to complete the requirements for the award of the degree of Bachelor of Science at the end of their full-time year in the Faculty of Science may only be readmitted to that Faculty if a successful application is made at the appropriate time through the Universities Admissions Centre. Successful applicants will be given credit for courses completed in accordance with section 10 of the Resolutions of Senate governing the degree of Bachelor of Science.

Combined Science/Commerce degree BSc/BCom joint Resolutions of the Faculties of Science and Economics¹

These Resolutions should be read in conjunction with the Resolutions of Senate governing candidature for the degrees of Bachelor of Science and Bachelor of Commerce.

1. Candidature for the combined program is full-time.

2. Candidates qualify for the combined degrees by completing 240 units including:

- (i) in the first three years of enrolment, 12 Junior units in each of Accounting, Econometrics and Economics and 12 units from the Science Discipline Areas of Mathematics and Statistics;

¹Subject to approval of the Senate.

- (ii) "at least 72 Senior and Intermediate units from courses in the BSc taken in accordance with the Regulations for the degree of Bachelor of Science;
 - (iii) at least 72 Senior units from the subject areas specified in the BCom Regulations including two majors.
3. Candidates may not enrol in any course which is substantially the same as one they have already passed or in which they are concurrently enrolled¹.
 4. Candidates will be under the general supervision of the Faculty of Science until the end of the year in which they complete 144 units. After that they will be under the general supervision of the Faculty of Economics. General supervision covers all areas of policy and procedure affecting candidates such as degree rules, course nomenclature, enrolment procedures and the Dean to whom reference is to be made at any given time.
 5. Candidates will, in each of the first three years of enrolment, enrol in at least 36 units of courses from the Table of courses associated with section 3 of the Resolutions of the Senate for the Bachelor of Science degree.
 6. Candidates who are qualified to do so may complete an Honours year.
 7. Candidates may abandon the combined program and elect to complete either a BSc or a BCom in accordance with the Regulations governing these degrees.
 8. The Deans of Economics and Science shall jointly exercise authority in any matter concerning the combined degree program not otherwise dealt with in the Resolutions of the Senate or these Resolutions.

Degree of Bachelor of Computer Science and Technology

The Bachelor of Computer Science and Technology degree includes substantial coverage of Computer Science and related subjects, to prepare you for a professional career in Information Technology; however it is also very flexible, and you have a wide choice of electives as well, depending on your interests. In particular, you can enrol in any course offered in the BSc, BA, or BEc degrees. The BCST degree takes three years full-time, or four years to obtain Honours.

Summary of requirements

General requirements

The requirements for the degree are set out in the Senate Resolutions which should be read by all intending candidates (see below). In particular it is important to ensure that any proposed course of study will comply with the basic requirements for the degree contained in sections 4, 5, 6, and 9.

¹For details of courses which cannot be counted, see the notes in column (e) of the Table of courses associated with section 3 of the BSc Resolutions.

Overview of degree structure.

A full-time student usually takes courses worth 24 units each semester; however you may choose to do a few more or less at various times during your course. Graduation requires 140 units.

In first year, students take subjects in the two core subject areas: Computer Science (take either COMP 101 or 191 in first semester, and either COMP 102 or 192 in second semester; these cover programming in an object-oriented language, and an introduction to central ideas of the field including data structures, computer organisation, and reasoning about code) and Mathematics (take either MATH 101 or 111 or 191 in first semester, and either MATH 103 or 104 or 193 or 194 in second semester; these cover Discrete Mathematics and some other topics such as either Calculus or Statistics). You must also choose 12 units of elective subjects each semester depending on your career goal as described below.

In second year, all students study a core of Computer Science (COMP (201 or 291) and (202 or 292) and (203 or 293) and (204 or 294); these cover complex data structures like trees and graphs, effective programming in the industrial-strength language C++, the use of Unix tools such as shell scripts, assembly language and system software, and mathematical models for computer languages and programs). Second year also contains some mathematics, chosen from a wide selection, and some electives, which may be additional subjects taken at introductory level or perhaps you prefer further study in the electives you began studying in first year.

In third year there is a wide choice of modules covering many topics; courses related to computing will usually occupy at least 75% of your time, and at least 50% of the year must actually be spent studying courses in Computer Science itself. To get an Honours degree, you spend the fourth year studying a mixture of advanced topics in Computer Science, and also carry out a supervised research project.

HSC Tertiary Entrance Rank

A quota will apply for entry into the BCST degree.

Transfer into the BCST degree after Junior year

With permission of the Dean, a student enrolled in the BSc, BSc (Advanced), BSc (Molecular Biology and Genetics), BMedSc, or BPsych degree who has completed a minimum of 48 units of Junior courses, including 12 units of Computer Science courses from COMP 101, 102, 191, 192 with an average grade of Credit (65%) or better, and 12 units of Mathematics courses from MATH 101, 103, 104, 111, 191, 193, 194 with an average grade of Pass (50%) or better, may apply for transfer into the Intermediate year of the BCST degree. Applications should be made through UAC. Selection is on academic merit and subject to a quota determined by the Dean.

Plans of courses

It is important when choosing courses 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 the first two years, and the possibility of a double major, combining computer science with another computationally based discipline.

Below are described some common possible patterns of study, suitable for students with varying career goals. Many other subjects are available (ranging from Music to History to Geology). Entry to Advanced courses (those described with a second digit of 8 or 9) is usually limited to students who did well in previous courses. A student's talents and interests and the prerequisites for any later courses should be considered when selecting courses. In general, career opportunities are better for students who can combine expertise in computing with skill in another area. The course structures presented below are all intended for students who have background equivalent to at least 3 units of HSC mathematics; if you have only 2 unit mathematics you can still complete a BCST in some (but not all) of the streams, but you should consult the Department of Computer Science when planning your course choices. *In all cases, the Core of COMP 101/191 and 102/192 (Junior year) 201/291 and 202/292 and 203/293 and 204/294 (Intermediate year) is assumed.*

Network Manager, System Administrator or Programmer for Embedded Systems

NOTE: a background equivalent to at least 3 units of HSC mathematics, and 2 unit HSC physics (or 4 unit science including physics) is expected.

Incorporates Computer Science courses emphasising hardware and system software as well as courses taught by the Electrical Engineering Department. Here is a sensible pattern of courses.

Junior year MATH (101/191, 103/193), ENGS 151, PHYS (101/191, 103/192).

Intermediate year MATH (201/291, 202/292, 203/293, 205/295, 207/297), ENGS (251, 252).

Senior year COMP (303, 307, 308, 309, 312, 322). At least 12 of the extra 24 units from 300-level courses in Computer Science and/or related topics.

Programmer for Commercial Applications

Involves Computer Science courses emphasising work with large-scale software systems and databases, as well as electives related to business. Here are two sensible patterns of courses.

The first suits students interested in Accounting, who have a TER exceeding the BCom degree cutoff.

Junior year MATH (101/191, 103/193), Econometrics 1, Accounting IA, Accounting IB.

Intermediate year COMP 305, MATH (202/292, 209, 210), Accounting (201, 202) Management Accounting A, Financial Accounting A.

Senior year COMP (307, 308, 310, 312, 324), MATH 315. At least 12 of the extra 24 units from 300-level courses in Computer Science and/or related topics.

The second pattern provides a broad introduction to business topics rather than deep study of Accounting.

Junior year MATH (111/101/191, 104/194), Econometrics 1, Economics 1.

Intermediate year COMP 305, MATH 209, STAT (216, 218) Financial Accounting Concepts/Accounting IA, Management Accounting Concepts/Accounting IB; COMP 100 would be useful as extra units if desired or as a substitute for Management Accounting Concepts/Accounting IB.

Senior year COMP (307, 308, 310, 312, 324), STAT 320. At least 12 of the necessary additional 24 units from 300-level courses in Computer Science and/or related topics (perhaps also include Finance 201).

Programmer for Scientific Applications

NOTE: requires background equivalent to at least 3 units of HSC mathematics.

Involves Computer Science courses emphasising graphics and user interfaces and Scientific Visualisation. Here is a sensible pattern of courses.

Junior year MATH (101/191, 103/193), PHYS (101/102/191, 103/104/192), CHEM (111/191/193, 112/192/194).

Intermediate year MATH (202/292, 203/293, 205/295, 210), either PHYS (201/211/291, 202/212/292) or CHEM (201/211/221/231/291, 222/232/292).

Senior year COMP (301, 302, 304, 308, 312, 325), PHYS (321, 322).

Programmer for Bioinformatics

Involves Computer Science courses emphasising data storage and analysis and courses in Biochemistry or Genetics. Here is a sensible pattern of courses.

Junior year MATH (101/191, 104/194), CHEM (111/191/193, 112/192/194), BIOL (101/191, 102/192).

Intermediate year COMP 305, MATH 209, STAT (216, 218), BCHM 201/291, and BCHM 202/292 or BIOL 205/295.

Senior year COMP (301, 304, 308, 312, 325), STAT 320, BCHM 301, and 12 more units in second semester (such as BIOL 323/394/313/393).

Programmer for Geographic Information Systems

Involves Computer Science courses emphasising data storage and analysis as well as courses in Geography. Here is a sensible pattern of courses.

Junior year COMP 100 (in second semester), MATH (101/191, 103/193), GEOG (101, 102), and 6 units of electives in first semester (GEOL 101 is suggested).

Intermediate year MATH (202/292, 203/293, 205/295, 210), GEOG (211, 212).

Senior year COMP (301, 302, 305, 308, 312, 325), GEOG 312, and 12 more units in first semester.

Computer Scientist with interest in Mathematics

NOTE: requires at least 3 units of HSC mathematics or equivalent.

Involves Computer Science courses emphasising theoretical aspects as well as courses in Mathematics.

Junior year MATH 101/191, MATH (103/193/104/194) and 18 or 24 units of electives in other fields. COMP 100 would be useful as extra units if desired or as a substitute for one semester of an elective.

Intermediate year MATH (201/291,202/292,203/293,205/295,207/297,208/298,209, 210).

Senior year COMP (301,302,304,306,311,321), and 24 units from 300-level courses in Computer Science and Mathematics (including some of the following: MATH (305,307,310,312,313,315,382,383,386,395).

Computer Software Specialist

Appropriate for gaining an exceptionally broad knowledge of all aspects of computers, without concentrating on any other subjects. Includes as many courses as allowed on computing and related topics. Here are two patterns of courses.

The first spreads the electives more evenly among the semesters.

Junior year COMP 100, MATH 101/191, MATH 103/193, and 18 units of electives.

Intermediate year COMP 305, MATH 202/292, MATH 203/293, MATH 209, MATH 210, and either between 8 and 12 units of electives.

Senior year 48 units of 300-level COMP courses, including two of the project modules (COMP 321, COMP 322, COMP 323, COMP 324, COMP 325).

The second pattern concentrates the electives in the first 3 semesters. It minimises the mathematics content.

Junior year MATH 111/101, MATH 104, and 24 units of electives.

Intermediate year COMP 100 (in second semester), COMP 305, MATH 209, STAT 216, STAT 218, and either 6 or 8 units of electives in first semester.

Senior year 44 units of 300-level Computer Science courses including two of the project modules (COMP 321, COMP 322, COMP 323, COMP 324, COMP 325), and also STAT 320.

Special permission

You should note that the Faculty can, in certain instances, permit exceptions to the normal requirements for a degree. Applications for special permission should be made in writing to the Faculty after discussion with staff in the Faculty Office.

Part-time candidature

It is expected that the majority of candidates will proceed as full-time students. If, however, you are unable to proceed on a full-time basis you may enrol as a part-time candidate and will be required to indicate this when enrolling. Day-time attendance at lectures and laboratory classes is required for most science courses.

Discontinuation

For Regulations relating to discontinuation, see the University's *Calendar 1996, Vol. I, Statutes and Regulations*. Students should read these Regulations

carefully as a discontinuation can affect the Weighted Average Mark (WAM). For further information about the WAM, see under 'Honours courses' below.

Regulations¹

Definitions

1. For the purposes of the Resolutions:
 - (1) (i) A *course* shall consist of such lectures, tutorial instruction, essays, exercises, or practical and field work as may be prescribed.
 - (ii) Each course shall be designated as a *Junior, Intermediate, Senior* or *Honours* level course. In addition certain courses may be designated as *Advanced* or *Special Studies Program* courses.
 - (iii) Junior, Intermediate, Senior and Honours courses are indicated by course level designations 100-199, 200-299, 300-399 and 400-499 respectively, placed immediately after the name of the course.
 - (iv) Candidates who have completed a course shall have units credited towards the completion of a degree in accordance with the value of the course as described in the Resolutions governing the degree.
- (2) To '*complete a course*' and derivative expressions mean:
 - (i) to attend the lectures and the meetings for tutorial instructions, if any;
 - (ii) to complete satisfactorily the essays, exercises and the practical and field work, if any; and
 - (iii) to pass the examinations of the course.
- (3) A *qualifying course* means a course which, except with the permission of the Faculty, must be completed with a result of Pass or better [not Concessional Pass; see sections 9(2) and 9(7)] before enrolment in the course for which it qualifies.
- (4) A *prerequisite course* means a course other than a qualifying course which, except with the permission of the Head of the Department concerned, must have been completed with a result of Concessional Pass or better [see sections 9(2) and 9(7)] prior to a candidate enrolling in a course for which it is a prerequisite.
- (5) A *corequisite course* means a course which, unless previously completed or except with the permission of the Head of the Department concerned, must be taken concurrently with the course for which it is a corequisite.

Grades of Award

2. The degree shall be awarded in two grades, namely the Pass degree and the Honours degree.

¹Subject to approval of the Senate.

Courses for Pass degree

3. Courses for the degree shall include all courses available for the degrees of BSc, BA, BEc, as well as those courses listed in Table V(i) associated with this section. Each course will

- (1) have such names,
- (2) be in such subjects,
- (3) be in such Discipline Areas,
- (4) have such unit values, and
- (5) have such qualifying, prerequisite and corequisite courses as are determined in the Resolutions of the corresponding degree or listed in Table V(i). Note that for a course available in the BA or BEc degree, the Discipline Area is called the 'subject area' in the corresponding Resolutions of that degree, while for a course available in the BSc degree the Discipline Area is called the 'Science Discipline Area' in the corresponding Resolutions.

Requirements for Pass degree

4. (1) To qualify for the Pass degree, candidates must complete courses giving credit for a total of at least 144 units, where:
- (i) at least 12 units are from Junior courses which are offered in the BSc in the Discipline Area of Computer Science;
 - (ii) at least 16 units are from Intermediate courses which are offered in the BSc in the Discipline Area of Computer Science;
 - (iii) at least 24 units are from Senior courses which are offered in the BSc in the Discipline Area of Computer Science, including at least 4 units which are from the courses listed in Table V(ii) associated with these Resolutions;
 - (iv) at least 26 units are from courses which are offered in the BSc in the Discipline Areas of Mathematics and/or Statistics of which at least 12 units must be at Intermediate or Senior level;
 - (v) either
 - (a) at least 12 units, in addition to those used to satisfy the requirement of section 4(1)(iii), are from Senior courses each of which is either offered in the BSc in the Discipline Area of Computer Science, or is listed in Table V(iii) associated with this section, or
 - (b) at least 12 units are from Senior courses all of which are offered in the BSc in a single Discipline Area other than Computer Science;
 - (vi) at least 72 units are from Intermediate and Senior courses;
 - (vii) no more than 40 units are from courses which are offered in the BSc in the Discipline Areas of

Anatomy and Histology, Cell Pathology, Pharmacology, and Physiology;

- (viii) no more than 28 units are from courses in which the grade of Concessional Pass was awarded;
- (2) No course may be credited more than once for the degree.
- (3) No units may be credited for the degree from more than one of such courses as the Faculty may deem to be mutually exclusive (listed in the Resolutions of the degrees involved), except that where a candidate enrolls in a course which has substantial content in common with another course which was previously completed or is concurrently taken, that candidate shall undertake alternative assessed work as determined by the Head of the Department concerned; alternatively the Head of Department may give permission for the candidate to perform only the work that is not common to a course previously completed or concurrently taken, in which case the candidate on completing the course shall receive credit only for the number of units appropriate to the work performed.
- (4) Where a candidate enrolls in a course which is the same as, or has substantial content in common with, a course which was previously attempted but was not completed satisfactorily, the Head of the Department concerned may exempt the candidate from certain of the course requirements, on receipt of evidence that the candidate has previously demonstrated competence to perform those requirements.

Restrictions on enrolment

5. (1) Except with the permission of the Faculty, candidates may not take in any one semester courses with a total number of units in excess of 28.
- (2) The choice of courses made by a candidate shall be limited by the exigencies of the timetable provided that candidates who have completed at least 36 units of Junior courses and who seek to enrol in two courses which are given wholly or partly at the same time may be granted, by the Heads of the Departments concerned, permission to attend equivalent courses or parts of courses given at another time.

Enrolment in courses not described in section 3

6. (1) A candidate of merit may, under special circumstances and with the permission of the Faculty, enrol in a course offered in the University of Sydney other than those specified in section 3.
- (2) A candidate of exceptional merit may, under special circumstances and with the permission of the Dean, undertake studies other than those courses specified in the Table accompanying section 3, and upon completion of those studies have them counted towards

the degree. The candidate may be given credit for these studies of up to 40 units, which will be designated by the Dean as Junior, Intermediate or Senior. Such units shall count towards the number of units required for the degree in accordance with section 4(1).

Upgrade of courses

7. (1) A candidate may not enrol in a course which was previously completed with a grade of Pass or better.
- (2) Candidates who have been awarded a Concessional Pass in any course may enrol in that course again. On completion of that course such candidates will not be credited with any further units for that course unless the course is completed at least at Pass level and the units had not previously been credited in accordance with section 4(1)(viii).

Time limits, Suspension, Part-time study

8. (1) Except with the permission of the Faculty a candidate must complete the requirements for award of the degree within ten calendar years of admission to candidature. This section applies to all candidates first enrolling in the degree after 1995, and applies from 1998 to candidates who first enrolled in the degree before 1996.
- (2) A candidate must re-enrol each calendar year unless the Faculty has approved suspension of candidature. Candidature lapses if a candidate has not obtained approval for suspension and does not re-enrol. Candidates whose candidature has lapsed must be selected for admission again before they can re-enrol.
- (3) Except with the prior permission of the Faculty a candidate shall not be granted a suspension of candidature in order to enrol in another course of tertiary study. Candidature shall lapse if a candidate without prior permission of Faculty enrolls in another course of tertiary study after having been granted a suspension of candidature.
- (4) Candidates who in any semester intend to proceed towards the degree of Bachelor of Computer Science and Technology as part-time candidates shall indicate this intention when enrolling.
- (5) Candidates proceeding as part-time candidates shall not in any one semester take courses with a total unit value of more than 17 units.

Course assessment

9. (1) Candidates may be tested by written and oral class examinations, exercises, essays or practical work or any combination of these, and the results of such tests may be taken into account by the Faculty Board of Examiners in determining the final results for a course.
- (2) In all courses passes may be graded into High Distinction, Distinction, Credit and Pass, and Concessional Pass. The grades High

Distinction, Distinction or Credit indicate work of a standard higher than that required for a Pass.

- (3) Where a Department offers a course at two levels the performance of candidates in the two levels in terms of comparability of quality of work will be matched by that Department so that a grade obtained at one level indicates a quality of work comparable with that required for the same grade obtained at the other level.
- (4) Candidates who have been prevented by duly certified illness or misadventure from sitting for the whole or part of a course assessment may be tested at such times and in such way as the Faculty Board of Examiners or the Head of the Department concerned shall determine.
- (5) Candidates who do not pass in a course shall, unless exempted by the Faculty, again attend lectures and other classes and complete the prescribed written and other work in all such courses in which they are permitted to re-enrol.
- (6) Candidates who repeat any course shall not be eligible for any prize or scholarship awarded in connection with the examination for such a course.
- (7) Subject to the provisions of section 4(1)(viii), the award of a Concessional Pass in a course entitles the candidate to be credited with the full number of units for that course.

Credit for other courses

10. (1) Subject to the limitations on total credit given in section 10(2), candidates may be given credit for a course which they have completed in another recognised program provided that:
 - (i) the course was completed not more than nine years before admission to candidature in the Faculty;
 - (ii) the course was completed with a result equivalent to Pass or better (not Concessional Pass);
 - (iii) if the course was completed at another university or recognised institution after admission to candidature in the Faculty, then permission had been obtained in advance from the Faculty, and either
 - (a) the course content was material not taught in any corresponding course at the University of Sydney, or
 - (b) the candidate was unable for good reason to attend a corresponding course at the University of Sydney;
 - (iv) where the course is considered by the Faculty to be equivalent to a course described in section 3, then credit shall be given for that equivalent course, and the

candidate shall be regarded as having completed that equivalent course for the purposes of these Resolutions;

- (v) where the course is considered by the Faculty as appropriate, but no course described in section 3 is considered equivalent, then the candidate shall be given credit for such number of units and with such a result as the Faculty may determine in order to provide fair comparison with courses described in section 3. Units credited under this section shall be designated as being in such Discipline Areas, and either Junior, Intermediate or Senior, as the Faculty may determine.
- (2) Award of credit for courses shall be limited such that:
- (i) the total unit value which is credited to a candidate in accordance with section 10(1) from courses in another recognised program, including those for which credit has been abandoned, may not exceed 96;
 - (ii) the total unit value which is credited to a candidate in accordance with section 10(1), from courses for which either the candidate maintains credit in some other recognised program, or a degree has been conferred, may not exceed 48;
 - (iii) in satisfying the requirements of section 4, a candidate must have been credited with at least 48 units, of which at least 24 are Senior units which are in the Discipline Area of Computer Science or are listed in Table V(ii) associated with section 4, from courses which are taken at the University of Sydney.

Admission to Honours courses

11. (1) In order to qualify for admission to an Honours course candidates shall have qualified for the award of a Pass degree and be considered by the Faculty and the Head of the Department concerned to have the requisite knowledge and aptitude for an Honours course.
- (2) With the permission of the appropriate Head of Department and provided the requirements in section 11 (1) have been satisfied the following may also be admitted to Honours courses:
- (i) Pass graduates of the University of Sydney
 - (ii) Pass graduates holding Bachelor degrees or equivalent from such other institutions as the Faculty may from time to time determine.

- (3) Candidates may not take more than one Honours course in any one academic year.
- (4) Candidates who have qualified for the Honours degree may take, in the next year or at such later times as the Faculty permits, an additional Honours course which they are qualified to enter.

Honours courses

12. (1) Candidates for the Honours degree shall complete an Honours course, full-time over one calendar year or half-time over two consecutive calendar years.
- (2) There shall be an Honours course in Computer Science. With permission of the Faculty, 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.

Classes of Honours and Medal

13. (1) There shall be three Classes of Honours, namely Class I, Class II and Class III, and within Class II there shall be two Divisions, namely Division 1 and Division 2.
- (2) A candidate with an outstanding performance in the subject of an Honours course shall, if deemed to be of sufficient merit by the Faculty, receive a bronze medal.
- (3) There shall be no re-examination for Honours.

Transitional provisions

14. (1) These Resolutions apply to all candidates for the degree enrolling in courses after 1 January 1997.
- (2) With the permission of the Faculty candidates who first enrolled for the degree prior to 1997 and have not had a period of suspension or exclusion may until 31 March 2000 choose to qualify for the degree under the old Resolutions.
- (3) With the permission of the Faculty candidates who have enrolled for the degree as part-time candidates prior to 1997 may until 31 March 2002 choose to qualify for the degree under the old Resolutions.
- (4) With the permission of the Faculty and subject to the restrictions in section 8, candidates who first enrolled for the degree prior to 1997 may qualify for the degree by completing 140 units.

Table V: [see section 3] [Bachelor of Computer Science and Technology]

<i>(a)</i>	<i>(b)</i>	<i>(c)</i>	<i>(d)</i>	<i>(e)</i>	<i>(f)</i>
Science Discipline Area/Course number	Course name	Unit value	Assumed standard of knowledge (Akn) Qualifying Courses (Q) Prerequisites (P) Corequisites (C)	Faculty of Science Resolutions and additional information about courses	Antecedent course (1996)
Table V(i)					
A. Junior courses					
Engineering Science					
ENGS151Y	Digital and Electronics Technology 1	12	C: Mathematics 101 or 191 C: Mathematics 103 or 193 C: Computer Science 101 or 191 C: Computer Science 102 or 192		Digital and Electronics Technology 1
B. Intermediate courses					
Engineering Science					
ENGS 251F	Electrical and Digital Systems		P: Engineering Science 151 P: Computer Science 102 or 192	Consult the Department of Electrical Engineering about recommended Mathematics courses	NEW
ENGS 252S	Electronics and Signals		P: Engineering Science 151	As for Engineering Science 251	NEW
Table V(ii)					
Senior courses					
Computer Science					
COMP 321S	Algorithmic Systems Project	4	Refer to Table I [Bachelor of Science] for further information about this course		
COMP 322S	Computer Systems Project	4	As for Computer Science 321		
COMP 323S	Intelligent Systems Project	4	As for Computer Science 321		
COMP 324S	Large-Scale Software Project	4	As for Computer Science 321		
COMP 325S	Product Development Project	4	As for Computer Science 321		
Table V(iii)					
Senior courses					
Econometrics					
351F	Operations Research A	8	Refer to Table A of the Bachelor of Economics resolutions for further information about this course		
352S	Operations Research B	8	As for Econometrics 351		

<i>(a)</i> Science Discipline Area/Course number	<i>(b)</i> Course name	<i>(c)</i> Unit value	<i>(d)</i> Assumed standard of knowledge (Akn) Qualifying Courses (Q) Prerequisites (P) Corequisites (C)	<i>(e)</i> Faculty of Science Resolutions and additional information about courses	<i>(f)</i> Antecedent course (1996)
Geography					
GEOG 312S	Coastal Environmental Management and GIS	12	Refer to Table I [Bachelor of Science] for further information about this course		
Mathematics					
MATH 305F	Logic	4	Refer to Table I [Bachelor of Science] for further information about this course		
MATH 307S	Coding Theory	4	As for Mathematics 305		
MATH 310S	Information Theory	4	As for Mathematics 305		
MATH 312F	Mathematical Computing I	4	As for Mathematics 305		
MATH 313F	Signal Processing	4	As for Mathematics 305		
MATH 382S	Combinatorics (Advanced)	4	As for Mathematics 305		
MATH 383S	Computational Algebra (Advanced)	4	As for Mathematics 305		
MATH 386S	Mathematical Computing II (Advanced)	4	As for Mathematics 305		
MATH 395F	Categories and Computer Science (Advanced)	4	As for Mathematics 305		
Physics					
PHYS 321F	Scientific Computing	12	Refer to Table I [Bachelor of Science] for further information about this course		
PHYS 322S	Scientific Visualisation	12	As for Physics 321		
Statistics					
STAT 323S	Design of Experiments	4	Refer to Table I [Bachelor of Science] for further information about this course		

Degree of Bachelor of Medical Science

Summary of requirements

The Bachelor of Medical Science degree program requires three years of full-time study. An Honours program is available and requires a further year of full-time study. Progression towards the degree is by accumulation of credit points gained by completing courses. A total of 144 units is required for the degree. This must include:

- 48 units from Junior courses, comprising 12 units each from Biology, Chemistry, Mathematics and Physics; with the permission of the Faculty 12 units of Biology may be replaced with Junior courses in Computer Science or Psychology;
- 48 units from Intermediate courses, comprising a core of 40 units plus 8 units of electives;
- 48 units from Senior courses, comprising a core of 12 units plus 36 units of electives.

Students are required to pass all components of the core courses in order to progress in the degree. It is possible for students to 'carry' their 8 unit elective from the Intermediate year into the Senior year, provided that it is not a prerequisite for an elective they may wish to undertake in the Senior Year. In choosing Intermediate Biochemistry courses, students should note that the courses BCHM 211 and 212 have no laboratory components. Students selecting these courses must choose another 8 units from Biology or History and Philosophy of Science courses.

The combination MATH 103/193 is not recommended in this degree. Students wishing to study Statistics/Calculus are advised to select MATH 102/192 or 112.

Entry to first year

A quota will apply for entry into the BMedSc degree in first year. The minimum TER in 1996 was 93.

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 courses or courses deemed equivalent by the Faculty. Selection is based solely on performance in the first year subjects. Applicants should anticipate a WAM of at least 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.

Transferring to other degrees offered by the Faculty of Science

Students who wish to discontinue enrolment in the BMedSc course may apply for admission to other degrees offered by the Faculty through the Universities Admission Centre. For admission to the BSc (Advanced) and BSc (Molecular Biology and Genetics)

students must achieve a WAM of at least 75 and meet the appropriate Departmental course entrance requirements. Students who wish to transfer to the BSc degree after completing the Intermediate year should be aware that in the BSc degree a student is permitted to complete only 40 units from subjects taught by Departments in the Faculty of Medicine devolved unit. Such students may find it necessary to complete additional Intermediate courses in the Faculty of Science before undertaking Senior courses.

Regulations¹

Resolutions of the Senate

The following Resolutions governing candidature for the degree of Bachelor of Medical Science have been prescribed by the Senate.

Definitions

1. (1) (i) A *course* shall consist of such lectures, tutorial instruction, essays, exercises, or practical and field work as may be prescribed.
(ii) Each course shall be designated as a *Junior, Intermediate, Senior* or *Honours* level course. In addition certain courses may be designated as *Advanced* or *Special Studies Program* courses.
(iii) Junior, Intermediate, Senior and Honours courses are indicated by course level designations 100-199, 200-299, 300-399 and 400-499 respectively, placed immediately after the name of the course.
(iv) Except as provided in section 7, candidates who have completed a course shall have units credited towards the completion of a degree in accordance with the unit value of the course as described in section 3 of these Resolutions.
- (2) To '*complete a course*' and derivative expressions mean:
 - (i) to attend the lectures and the meetings for tutorial instructions, if any;
 - (ii) to complete satisfactorily the essays, exercises and the practical and field work, if any; and
 - (iii) to pass the examination of the course.
- (3) *Qualifying course* means a course which must be completed with a result of Pass or better [not a Concessional Pass — see sections 7(2) and 9(7)].
- (4) *Prerequisite course* means a course other than a qualifying course in a subject which, except with the permission of the Head of the Department concerned, must have been completed prior to a candidate taking a course for which it is a prerequisite.

¹Subject to approval of the Senate.

(5) *Corequisite course* means a course which unless previously completed or except with the permission of the Head of Department concerned, must be taken concurrently with the course for which it is a corequisite.

Grades of award

2. The degree shall be awarded in two grades, namely the Pass degree and the Honours degree.

Courses for Pass degree

3. Courses for the degree shall—
- (1) have such names,
 - (2) be in such subjects,
 - (3) have such unit values, and
 - (4) have such qualifying, prerequisite and corequisite courses as are set out in Table VI associated with this section.

Requirements for Pass degree

4. To qualify for the Pass degree a candidate shall:
- (1) except as provided in section 10(3) complete 48 units from Junior courses, 48 units from Intermediate courses including 40 units of core courses and 8 units of elective courses, and 48 units from Senior courses including 12 units of core courses and 36 units of elective courses, as set out in Table VI in section 3;
 - (2) gain credit totalling at least 144 units, not more than 16 units of which shall be credited from courses in which Concessional Passes have been awarded; and
 - (3) not have any courses credited more than once for the degree.

Restrictions on enrolment

5. (1) Except with the permission of the Faculty, candidates may not take the Intermediate core course until they have completed all the Junior courses prescribed by the Faculty as qualifying courses as set out in section 3.
- (2) Except with the permission of the Faculty, candidates may not take a Senior course—
- (i) until they have gained credit for the 44 core units in the Intermediate program, and
 - (ii) until they have completed the Intermediate courses, if any, prescribed as prerequisites for the Senior course, as set out in section 3.
- (3) The enrolment by candidates in the degree will be subject to a quota. The enrolment by candidates in some Senior elective courses may be limited by the exigencies of the timetable and some Senior elective courses may also be subject to a quota.
- (4) No units may be credited for the degree from more than one of such courses as the Faculty may deem to be mutually exclusive (listed in column (e) of Table VI associated with section 3), except that where a candidate enrolls in a course which has substantial content in common with another course which was

previously completed, that candidate shall undertake alternative assessed work as determined by the Head of the Department concerned; alternatively the Head of Department may give permission for the candidate to perform only the work that is not common to a course previously completed, in which case the candidate shall receive credit only for the number of units appropriate to the work performed.

(5) Where a candidate enrolls in a course which is the same as, or has substantial content in common with, a course which was previously attempted but was not completed satisfactorily, the Head of the Department concerned may exempt the candidate from certain of the course requirements, on receipt of evidence that the student has previously demonstrated competence to perform those requirements.

Enrolment in courses not in the Table

6. A candidate of exceptional merit may, under special circumstances and with the permission of the Dean, undertake studies within the Faculty other than those courses specified in Table VI accompanying section 3, and upon completion of those studies have them counted towards the degree. The candidate may be given credit of up to 40 units for these studies which will be designated by the Dean as Junior, Intermediate or Senior. Such units shall count towards the number of units required for the degree in accordance with section 3.

Upgrade of courses

7. (1) A candidate may not enrol in a course which was previously completed with a grade of Pass or better.
- (2) Candidates who have been awarded a Concessional Pass in any course may enrol in that course again. On completion of that course such candidates will not be credited with any further units for that course unless the course is completed at least at Pass level and the units had not previously been credited in accordance with section 4(2).

Time limits, Suspension

8. (1) Except with the permission of the Faculty a candidate must complete the requirements for award of the degree within ten calendar years of admission to candidature. This section applies to all candidates first enrolling in the degree after 1995, and applies from 1998 to candidates who first enrolled in the degree before 1996.
- (2) A candidate must re-enrol each calendar year unless the Faculty has approved suspension of candidature. Candidature lapses if a candidate has not obtained approval for suspension and does not re-enrol. Candidates whose candidature has lapsed must be selected for admission again before they can re-enrol.
- (3) Except with the prior permission of the

Faculty a candidate shall not be granted a suspension of candidature in order to enrol in another course of tertiary study. Candidature shall lapse if a candidate enrolls in another course of tertiary study after having been granted a suspension of candidature.

Course assessment

9. (1) Candidates shall be tested by written or oral examinations, exercises, essays or practical work or any combination of these, and the results of such tests may be taken into account by the Faculty Board of Examiners in determining the final results for a course.
- (2) In all courses, passes may be graded into High Distinction, Distinction, Credit, Pass and Concessional Pass. The grades High Distinction, Distinction or Credit indicate work of a standard higher than that required for a Pass.
- (3) Where a Department offers a course at two levels the performance of students in the two levels in terms of comparability of quality of work will be matched by that Department so that a grade obtained at one level indicates a quality of work comparable with that required for the same grade obtained at the other level.
- (4) Candidates who have been prevented by duly certified illness or misadventure from sitting for the whole or part of a course assessment may be tested at such times and in such way as the Head of the Department concerned or the Faculty Board of Examiners shall determine.
- (5) Candidates who do not pass in a course shall, unless exempted by the Faculty, again attend lectures and other classes and complete the prescribed written and other work in all such courses in which they are permitted to re-enrol.
- (6) Candidates who repeat any course shall not be eligible for any prize or scholarship awarded in connection with the examination for such a course.
- (7) Subject to the provisions of section 4(2), the award of a Concessional Pass in a course entitles the candidate to be credited with the full number of units for that course.

Credit for other courses

10. (1) Subject to the limitations on total credit given in section 10(2), candidates may be given credit for a course which they have completed in another recognised program provided that:
- (i) the course was completed not more than nine years before admission to candidature in the Faculty;
 - (ii) the course was completed with a result equivalent to Pass or better (not Concessional Pass);
 - (iii) if the course was completed at another university or recognised institution after admission to candidature in the Faculty, then

permission had been obtained in advance from the Faculty, and the candidate was unable for good reason to attend a corresponding course at the University of Sydney; where the course is considered by the Faculty to be equivalent to a course listed in the Tables associated with section 3, then credit shall be given for that equivalent course, and the candidate shall be regarded as having completed that equivalent course for the purposes of these Resolutions.

- (iv) (2) Award of credit for courses shall be limited such that:
- (i) the total unit value which is credited to a candidate in accordance with section 10(1) from courses in another recognised program, including those for which credit has been abandoned, may not exceed 96;
 - (ii) the total unit value which is credited to a candidate in accordance with section 10(1), from courses for which either the candidate maintains credit in some other recognised program, or a degree has been conferred, may not exceed 48;
 - (iii) in satisfying the requirements of section 4, a candidate must have been credited with at least 48 units, of which at least 24 are Senior units, from courses which are listed in Table VI and taken at the University of Sydney.
- (3) Candidates who have previously completed studies which are considered by the Faculty to be acceptable alternatives to any Junior courses listed in Table VI associated with section 3 may be given unspecified credit and shall be regarded as having completed such Junior courses in the Table for the purposes of these Resolutions.

Admission to Honours courses

11. (1) In order to qualify for admission to an Honours course candidates shall have qualified for the award of a Pass degree and be considered by the Faculty and the Head of the Department concerned to have the requisite knowledge and aptitude for an Honours course.
- (2) With the permission of the appropriate Head of Department and provided the requirements in section 11(1) have been satisfied, the following may also be admitted to Honours courses:
- (i) Pass graduates in Medical Science of the Faculty of Science;
 - (ii) Pass graduates holding Bachelor of

Medical Science degrees or equivalent from other such institutions as the Faculty may from time to time determine.

- (3) Candidates may not take more than one Honours course in any one academic year.
- (4) Candidates who have qualified for the Honours degree may take, in the next year or at such later times as the Faculty permits, an additional Honours course which they are qualified to enter.

Honours courses

12. (1) Candidates for the Honours degree shall complete an Honours course, full-time over one calendar year.
- (2) On the recommendation of the Head of Department concerned the Faculty may permit a candidate to undertake an Honours course half-time over two consecutive calendar years. This permission will be granted only if the Faculty is satisfied that the candidate is unable to attempt the course on a full-time basis.
- (3) There shall be an Honours course in the following subjects: Anatomy, Biochemistry (Molecular Biology), Biology (Genetics), Cell Pathology, Histology and Embryology, History and Philosophy of Science, Immunology, Infectious Diseases, Microbiology, Pharmacology, Physiology.

Classes of Honours and Medal

13. (1) There shall be three classes of Honours, namely Class I, Class II, and Class III, and within Class II there shall be two Divisions, namely Division 1 and Division 2.
- (2) A candidate with an outstanding performance in the subject of an Honours course shall, if deemed to be of sufficient merit by the Faculty, receive a bronze medal.
- (3) There shall be no re-examination for Honours.

Table VI: [see section 3] [Bachelor of Medical Science]

(a)	(b)	(c)	(d) 't	(e)	(f)
Science Discipline Area/Course number*	Course name	Unit value	Assumed standard of knowledge (Akn)t Qualifying Courses (Q) Prerequisites (P) Corequisites (C)	Faculty of Science Resolutions and additional information about courses	Antecedent course (1996)
A. Junior courses					
Biology					
BIOL 101F	Concepts in Biology	6	Akn: Biology section of the HSC 3-unit Science course	See prerequisites for second semester courses in Biology May not be counted with Biology 191	Biology 1
BIOL 102S	Living Systems	6	P: Biology 101 or 191	This course is a prerequisite for all Intermediate courses in Biology May not be counted with Biology 192	Biology 1
BIOL 103S	Human Biology	6	P: Biology 101 or 191	Not a prerequisite for all Intermediate courses in Biology. See prerequisites listed under Intermediate courses May not be counted with Biology 193	Biology 1
BIOL 191F	Concepts in Biology (Advanced)	6	Akn: Biology section of the HSC 3-unit Science course; by invitation	Students must first enrol in Biology 101 Subsequently, selected students may be invited to enrol in this course where they will participate in a more demanding alternative component May not be counted with Biology 101	Biology 1 (Advanced))
BIOL 192S	Living Systems (Advanced)	6	P: Biology 101 or 191; by invitation	Students must first enrol in Biology 102 Subsequently, selected students may be invited to enrol in this course where they will participate in a more demanding alternative component May not be counted with Biology 102	Biology 1 (Advanced)
BIOL 193S	Human Biology (Advanced)	6	P: Biology 101 or 191; by invitation	Students must first enrol in Biology 103 Subsequently, selected students may be invited to enrol in this course where they will participate in a more demanding alternative component May not be counted with Biology 103	Biology 1 (Advanced)
Chemistry					
CHEM 111F	Chemistry 1A	6	Akn: HSC Mathematics 2-unit course; and the Chemistry section of the HSC Science 3-unit or 4-unit course, or 2-unit Chemistry	Recommended concurrent course: Preferred: Mathematics 101 or 191 Otherwise: Mathematics 111 May not be counted with Chemistry 191 or 193	Chemistry 1

Multidisciplinary courses available only in the Bachelor of Medical Science are designated by BMED rather than a Science Discipline Area code

†Candidates who have not achieved this assumed standard will be required to undertake supplementary work, details of which can be obtained from the School/Department concerned

<i>(a)</i>	<i>(b)</i>	<i>(c)</i>	<i>(d)</i>	<i>(e)</i>	<i>(f)</i>
Science Discipline Area/Course number*	Course name	Unit value	Assumed standard of knowledge (Akn)t Qualifying Courses (Q) Prerequisites (P) Corequisites (C)	Faculty of Science Resolutions and additional information about courses	Antecedent course (1996)
CHEM 112S	Chemistry IB	6	P: Chemistry 111 or Distinction in Chemistry 101 or equivalent	Recommended concurrent course: Preferred: Mathematics 102 or 103 or 192 or 193 Otherwise: Mathematics 104 or 112 May not be counted with Chemistry 192 or 194	Chemistry 1
CHEM 191F	Chemistry 1A (Advanced)	6	P: TER of at least 88 and at least 75% in HSC 2-unit Chemistry or equivalent	Recommended concurrent course: Preferred: Mathematics 101 or 191 Otherwise: Mathematics 111 May not be counted with Chemistry 111 or 193	Chemistry 1 (Advanced)
CHEM 192S	Chemistry IB (Advanced)	6	Q: Chemistry 191 or 193 or Distinction in Chemistry 111 or equivalent	Recommended concurrent course: Preferred: Mathematics 102 or 103 or 192 or 193 Otherwise: Mathematics 104 or 112 May not be counted with Chemistry 112 or 194	Chemistry 1 (Advanced)
CHEM 193F	Chemistry 1A (Special Studies Program)	6	P: TER of at least 98 and at least 85% in HSC 2-unit Chemistry or equivalent. By invitation	Recommended concurrent course: Mathematics 101 or 191 Otherwise: Mathematics 111 May not be counted with Chemistry 111 or 191 Students in the Faculty of Science Talented Students Program are automatically eligible	Chemistry 1 (Special Studies Program)
CHEM 194S	Chemistry IB (Special Studies Program)	6	P: Chemistry 193	Recommended concurrent course: Preferred: Mathematics 102 or 103 or 192 or 193 Otherwise: Mathematics 104 or 112 May not be counted with Chemistry 112 or 192	Chemistry 1 (Special Studies Program)
Computer Science				Junior courses in Computer Science can only be substituted for Junior courses in . Biology with the permission of the Faculty	
COMP 101F	Introductory Programming	6	Akn: HSC 3-unit Mathematics	May not be counted with Computer Science 191	Computer Science 1
COMP102S	Introductory Computer Science	6	P: Computer Science 101 or 191	May not be counted With Computer Science 192	Computer Science 1

COMP 191F	Introductory Programming (Advanced)	6	Akn: HSC 3-unit Mathematics	May not be counted with Computer Science 101	Computer Science 1 (Advanced)
COMP 192S	Introductory Computer Science (Advanced)	6	P: Computer Science 191 (or 101 with sufficient merit)	May not be counted with Computer Science 102	Computer Science 1 (Advanced)
Mathematics					
MATH101F	Differential Calculus and Linear Algebra	6	Akn: HSC 3-unit Mathematics	May not be counted with Mathematics 111 or 191	Mathematics 1
MATH 102S	Integral Calculus and Statistics	6	P: Mathematics 101 or 191 or Distinction in 111	May not be counted with Mathematics 103 or 104 or 112 or 192 or 193 or 194	Mathematics 1
MATH 103S	Integral Calculus and Discrete Mathematics	6	P: Mathematics 101 or 191 or Distinction in 111	May not be counted with Mathematics 102 or 104 or 112 or 192 or 193 or 194	Mathematics 1
MATH 104S	Statistics and Discrete Mathematics	6	Akn: HSC 3-unit Mathematics	May not be counted with Mathematics 102 or 103 or 112 or 192 or 193 or 194	Mathematics 1
MATH 111F	Life Science Mathematics A	6	Akn: HSC 2-unit Mathematics	May not be counted with Mathematics 101 or 191	Mathematics 1 (Life Sciences)
MATH 112S	Life Science Mathematics B	6	Akn: HSC 2-unit Mathematics	May not be counted with Mathematics 102 or 103 or 104 or 192 or 193 or 194	Mathematics 1 (Life Sciences)
MATH 191F	Advanced Differential Calculus and Linear Algebra	6	Akn: HSC 4-unit or top decile 3-unit Mathematics	May not be counted with Mathematics 101 or 111	Mathematics 1 (Advanced)
MATH 192S	Advanced Integral Calculus and Statistics	6	P: Credit in Mathematics 101 or 191	May not be counted with Mathematics 102 or 103 or 104 or 112 or 193 or 194	Mathematics 1 (Advanced)
MATH 193S	Advanced Integral Calculus and Discrete Mathematics	6	P: Credit in Mathematics 101 or 191	May not be counted with Mathematics 102 or 103 or 104 or 112 or 192 or 194	Mathematics 1 (Advanced)
MATH 194S	Advanced Statistics and Discrete Mathematics	6	Akn: HSC 4-unit or top decile 3-unit Mathematics	May not be counted with Mathematics 102 or 103 or 104 or 112 or 192 or 193	Mathematics 1 (Advanced)
Physics					
PHYS 101F	Physics (Regular)	6	Akn: HSC Physics or HSC 4-unit Science	May not be counted with Physics 102 or 191 Recommended concurrent course: Mathematics 101 or 191	Physics 1
PHYS 102F	Physics (Fundamentals)	6	No previous Physics assumed	May not be counted with Physics 101 or 191 Recommended concurrent course: Mathematics 101 or 191	Physics 1
PHYS 103S	Physics (Technological)	6	P: Physics 101 or 102 or 191	May not be counted with Physics 104 or 192 Recommended concurrent course: Mathematics 102 or 192	Physics 1
PHYS 104S	Physics (Environmental and Life Sciences)	6	P: Physics 101 or 102 or 191	May not be counted with Physics 103 or 192 Recommended concurrent course: Mathematics 102 or 192	Physics 1
PHYS 191F	Physics (Advanced) A	6	P: TER at least that for acceptance to BSc (Advanced) degree program or at least 90 in HSC 2-unit Physics or at least 180 in HSC 4-unit Physics	May not be counted with Physics 101 or 102 Recommended concurrent course: Mathematics 101 or 191	Physics 1 (Advanced)

<i>(a)</i>	<i>(b)</i>	<i>(c)</i>	<i>(d)</i>	<i>to</i>	<i>(fi)</i>
Science Discipline Area/Course number*	Course name	Unit value	Assumed standard of knowledge (Akn)t Qualifying Courses (Q) Prerequisites (P) Corequisites (C)	Faculty of Science Resolutions and additional information about courses	Antecedent course (1996)
PHYS 192S	Physics (Advanced) B	6	P: Physics 191 or Distinction or better in Physics 101 or 102	May not be counted with Physics 103 or 104 Recommended concurrent course: Mathematics 102 or 192	Physics 1 (Advanced)
Psychology				Junior courses in Psychology can only be substituted for Junior courses in Biology with the permission of the Faculty	
PSYC 101F	Psychology 101	6			Psychology 1
PSYC 102S	Psychology 102	6	P: Psychology 101		Psychology 1
B. Intermediate courses					
(i) Core Courses			Q: 12 units of Junior Mathematics; 12 units of Junior Chemistry; 12 units of Junior Physics; 12 units of Junior Biology or 12 units of Junior Computer Science or 12 units of Junior Psychology		
BMED 201Y	Human Life Sciences	24		This course is offered over the full year only	Human Life Sciences 2
Biochemistry					
BCHM211F	Genes and Proteins Theory	4		May not be counted with Biochemistry 201 or 291 Does not provide entry to Senior Biochemistry electives	Biochemistry 2 Auxiliary
BCHM 212S	Molecules, Metabolism and Cells Theory	4		May not be counted with Biochemistry 202 or 29Z Does not provide entry to Senior Biochemistry electives	Biochemistry 2 Auxiliary
Pharmacology					
PCOL 201F	Pharmacology Fundamentals	4			Pharmacology 2 Introductory
PCOL 202S	Pharmacology — Drugs and People	4			Pharmacology 2 Introductory
(ii) Electives.(Select one subject) < Biochemistry ¹					
BCHM 201F	Genes and Proteins	8		May not be counted with Biochemistry 211 or 291	Biochemistry 2
BCHM 202S	Molecules, Metabolism and Cells	8	Q: Biochemistry 201 or 291	May not be counted with Biochemistry 212 or 292	Biochemistry 2

BCHM291F	Genes and Proteins (Advanced)	8		May not be counted with Biochemistry 201 or 211	Biochemistry 2 (Advanced)
BCHM 292S	Molecules, Metabolism and Cells (Advanced)	8	Q: Biochemistry 201 or 291	May not be counted with Biochemistry 202 or 212	Biochemistry 2 (Advanced)
Biology					
BIOL 205S	Molecular and General Generics	8	Q: 12 units of Junior Biology	May not be counted with Biology 295	Biology 2 (Molecular and General Genetics) Auxiliary
BIOL 295S	Molecular and General Genetics (Advanced)	8	Q: 12 units of Junior Biology By invitation	Students must first enrol in Biology 205. Subsequently, students may be invited to enrol in this course where they will participate in a more demanding alternative component. May not be counted with Biology 205. See prerequisites for Senior courses in Biology	Biology 2 (Molecular and General Genetics) Auxiliary (Advanced)
History and Philosophy of Science					
HPSC 201S	Introductory Philosophy of Science	4		Together with History and Philosophy of Science 202, this is a qualifying course for History and Philosophy of Science 312	History and Philosophy of Science 2 Introductory
HPSC 202F	Introductory History of Science	4		Together with History and Philosophy of Science 201, this is a qualifying course for History and Philosophy of Science 312	History and Philosophy of Science 2 Introductory
C. Senior courses					
(i) SI Core Courses			Q: Human Life Sciences 201 P: Biochemistry 211 and 212 or P: Biochemistry 201 and 202 or P: Biochemistry 291 and 292 P: Pharmacology 201 and 202		
BMED 301F	Human Life Sciences	4			Human Life Sciences 3 (Cellular and Molecular)
BMED 302F	Microbiology and Immunology	8			Microbiology and Immunology 3
(ii) SI Electives			Q: Human Life Sciences 201 P: Biochemistry 211 and 212 or P: Biochemistry 201 and 202 or P: Biochemistry 291 and 292 P: Pharmacology 201 and 202		
Anatomy and Histology					
ANAT301F	Microscopy and Histochemistry	12			Histology 3 (Techniques)

¹Students will choose any combination of first and second semester Biochemistry courses listed herein (total units 16) in place of the Core biochemistry courses.

<i>(a)</i>	<i>(b)</i>	<i>(c)</i>	<i>(d)</i>	<i>(e)</i>	<i>(f)</i>
Science Discipline Area/Course number*	Course name	Unit value	Assumed standard of knowledge (Akn)t Qualifying Courses (Q) Prerequisites (P) Corequisites (C)	Faculty of Science Resolutions and additional information about courses	Antecedent course (1996)
Biochemistry					
BCHM 301F	Molecular Biology and Structural Biochemistry	12	Q: Biochemistry 202 or 292		Biochemistry 3
BCHM 391F	Molecular Biology and Structural Biochemistry (Advanced)	12	Q: Biochemistry 202 or 292		Biochemistry 3
Biology					
BIOL313F	Molecular Genetics and Recombinant DNA Technology	12	Q: Biology 205 or 295		Biology 3 option 130
BIOL393F	Molecular Genetics and Recombinant DNA Technology (Advanced)	12	Q: Biology 205 or 295; by invitation	Students must first enrol in Biology 313. Subsequently, students may be invited to enrol in this course where they will participate in a more demanding alternative component. May not be counted with Biology 313	Biology 3 option 130 (Advanced)
Cell Pathology					
CPAT 301F	Cell Pathology A	12		Students must consult the Department before enrolling. Only a small number of students can be accommodated in the laboratory facilities	Cell Pathology 3
History and Philosophy of Science					
HPSC 312F	History of the Biomedical Sciences	12	Q: History and Philosophy of Science 201 and 202		NEW
Pharmacology					
PCOL 301F	Molecular Pharmacology and Toxicology	12			Pharmacology 3
Physiology					
PHSI301F	Neuroscience	12			Neuroscience 3
(iii) S2 Electives			Q: Human Life Sciences 201 P: Biochemistry 211 and 212 or P: Biochemistry 201 and 202 or P: Biochemistry 291 and 292 P: Pharmacology 201 and 202		

BMED 303S	Immunology	12	C: Microbiology 303			Immunology 3
BMED 304S	Infectious Diseases	12				Infectious Diseases 3 (Infection and Diagnosis)
Anatomy and Histology						
ANAT302S	Cells and Development	12				Histology 3 (Developmental Biology)
ANAT 305S	Topographical Anatomy	12				Anatomy 3 (Topographical)
Biochemistry						
BCHM302S	Metabolic and Medical Biochemistry	12	Q: Biochemistry 202 or 292	May not be counted with Biochemistry 392		Biochemistry 3
BCHM392S	Metabolic and Medical Biochemistry (Advanced)	12	Q: Biochemistry 202 or 292	May not be counted with Biochemistry 302		Biochemistry 3
Biology						
BIOL 323S	Eukaryotic Genetics and Development	12	Q: Biology 205 or 295	May not be counted with Biology 394		Biology 3 option 230
BIOL 394S	Eukaryotic Genetics and Development (Advanced)	12	Q: Biology 205 or 295; by invitation	Students must first enrol in Biology 323. Subsequently, students may be invited to enrol in this course where they will participate in a more demanding alternative component. May not be counted with Biology 323		Biology 3 option 230 (Advanced)
Cell Pathology						
CPAT 302S	Cell Pathology B	12	Q: Cell Pathology 301			Cell Pathology 3
Microbiology						
MICR303S	Molecular Biology of Pathogens	12		Students are advised not to attempt this course if they have not performed well in BMED 302		Microbiology 3 (Molecular Biology of Pathogens)
Pharmacology						
PCOL 302S	Neuro- and Cardiovascular Pharmacology	12				Pharmacology 3
Physiology						
PHSI302S	Neuroscience — Cellular and Integrative	12				Neuroscience 3 (Cellular and Integrative)
PHSI303S	Heart and Circulation	12				Physiology 3 (Heart and Circulation)

Degree of Bachelor of Pharmacy

NOTE: The Senate has approved new Resolutions for the Bachelor of Pharmacy. These Resolutions will take effect for new enrolments from 1997¹. The candidatures of students first enrolled before 1997 will continue to be governed by the pre-1997 Resolutions. The pre-1997 Resolutions are contained in the 1996 *Faculty of Science Handbook* and can be consulted at the Faculty-Office or via the Faculty of Science website home page (<http://www.scifac.usyd.edu.au>).

Candidates should note that section 15 of the new Resolutions requires that, except with the permission of the Dean, candidatures under the pre-1997 Resolutions must be completed by 31 December 2001.

Summary of requirements

The degree of Bachelor of Pharmacy is a full-time four year course. Progression towards the degree is by the accumulation of unit points. The requirements for the degree are set out in the Senate Resolutions, which should be read by all intending candidates (see below). The degree is offered at the Pass and Honours level.

To satisfy the requirement for the Pass degree candidates must gain a total of 192 units by completing the courses prescribed for the degree (see section 3 of the following Resolutions).

The basic requirements are contained in sections 4, 5 and 6.

To satisfy the requirement for the Honours degree, candidates must gain a total of 214 units by completing the courses prescribed for the degree (see section 11 of the following Resolutions).

During the first year of attendance candidates enrol in First Year courses as follows:

Biology (Pharmacy), Chemistry (Pharmacy), Introductory Pharmacy, Mathematics/Statistics (Pharmacy) and Psychology (Pharmacy).

Assumed knowledge: It should be noted that most of the above First Year courses will be taught on the assumption that students have reached the standard specified in Part A of Table VII below at the Higher School Certificate examination or equivalent level.

Prerequisites and corequisites: To be eligible to enrol in most Second Year, Third Year and Fourth Year courses, students must have completed the qualifying course, if any, and the prerequisite course(s), if any. Any corequisite course(s) not previously completed must be taken concurrently (see section 1).

Registration requirements for pharmacists

A student who intends to qualify to be registered as a pharmacist under the Pharmacy Act 1964 is first required to qualify for the degree of Bachelor of Pharmacy. In addition he or she is required to serve not less than 2000 hours as an assistant to a registered pharmacist in a pharmacy within the Commonwealth of Australia. This period must be served after the BPharm (Pass) or BPharm (Honours) course has been completed.

Further details concerning the requirements for registration can be obtained from the Pharmacy Board

of New South Wales, 3rd Floor, 28 Foveaux Street, Surry Hills, N.S.W. 2010, fed. (02) 9281 7736, fax (02) 9281 2924. Postal Address: Locked Bag 2, Haymarket, N.S.W. 2000.

Resolutions of Senate¹

The following Resolutions governing candidature for the degree of Bachelor of Pharmacy have been prescribed by the Senate.

Definitions

1. For the purposes of these Resolutions:
 - (1) (i) A *course* shall consist of lectures together with such tutorial instruction, essays, exercises, or practical work as may be prescribed.
 - (ii) Each course shall be designated as a First Year course, a Second Year course, a Third Year course or a Fourth Year course.
 - (iii) First Year, Second Year, Third Year or Fourth Year courses are indicated by the three digit Arabic numeral starting, 1, 2, 3 or 4 respectively placed immediately after the name of a subject.
- (2) To '*complete a course*' and derivative expressions mean:
 - (i) to attend the lectures and the meetings, if any, for tutorial instructions;
 - (ii) to complete satisfactorily the essays, exercises and the practical work, if any; and
 - (iii) to pass the examinations of the course.
- (3) A *prerequisite course* means a course which, except with the permission of the Head of the Department concerned, must have been completed prior to a candidate taking a course for which the Faculty has declared it to be a prerequisite.
- (4) A *corequisite course* means a course which unless previously completed must, except with the permission of the Head of Department concerned, be taken concurrently with the course for which the Faculty has declared it to be a corequisite.

Grades of award

2. The degree shall be awarded in two grades, namely, the Pass degree and the Honours degree.

Courses for Pass degree

3. Courses for the degree shall—
 - (1) be in such subjects,
 - (2) have such unit values, and
 - (3) have such prerequisite and corequisite courses as are set out in Table VII associated with these Resolutions.

¹Subject to approval of the Senate.

Qualification for Pass degree

4. To complete the requirements for the Pass degree a candidate shall gain 192 units by completing the First Year, Second Year, Third Year and Fourth Year courses set out in Table VI.

Enrolment in courses

5. (1) In the first year of attendance candidates, unless granted credit in accordance with section 8, shall enrol in all the First Year courses listed in Table VII associated with section 3.
- (2) Except with the permission of the Faculty and subject to the exigencies of the timetable, candidates in subsequent years of attendance shall enrol in the maximum number of prescribed courses for which they are qualified, provided that they may not take courses totalling in excess of 52 units.

Restrictions on enrolment

6. (1) Except with the permission of the Faculty, candidates may not take a Second Year course—
- (i) until they have gained credit for at least 32 units in First Year courses, and
 - (ii) until they have completed the First Year courses, if any, prescribed by the Faculty as prerequisites for the Second Year course, as set out in section 3.
- (2) Except with the permission of the Faculty candidates may not take a Third Year course—
- (i) until they have gained credit for at least 32 units derived from Second Year courses, and
 - (ii) until they have completed all the First Year and Second Year courses, if any, prescribed as prerequisites for the Third Year course as set out in section 3.
- (3) Except with the permission of the Faculty candidates may not take a Fourth Year course—
- (i) until they have gained credit for at least 32 units derived from Third Year courses, and
 - (ii) until they have completed all the Second Year and Third Year courses, if any, prescribed as prerequisites for the Third Year courses as set out in section 3.
- (4) Candidates may not take a higher course in any subject without having previously completed the lower course, if any, in the same subject.
- (5) The enrolment by candidates in courses shall be limited by the exigencies of the timetable.

Time limits, Suspension

7. (1) Except with the permission of the Faculty a candidate must complete the requirements for award of the degree within ten calendar years of admission to candidature.

(2) A candidate must re-enrol each calendar year unless the Faculty has approved suspension of candidature. Candidature lapses if a candidate has not obtained approval for suspension and does not re-enrol. Candidates whose candidature has lapsed must be selected for admission again before they can re-enrol.

(3) Except with the prior permission of the Faculty a candidate shall not be granted a suspension of candidature in order to enrol in another course of tertiary study. Candidature shall lapse if a candidate enrolls in another course of tertiary study after having been granted a suspension of candidature.

Course assessment

8. (1) Candidates may be tested by written and oral class examinations, exercises, essays or practical work or any combination of these, and the results of such tests may be taken into account by the Faculty Board of Examiners in determining the final results for a course.
- (2) In all courses work of a standard higher than that required for an ordinary Pass may be recognised by the award of High Distinction, Distinction or Credit.
- (3) Candidates who have been prevented by duly certified illness or misadventure from sitting for the whole or part of a course assessment may be tested at such times and in such way as the Faculty Board of Examiners shall determine.
- (4) Candidates who do not pass in a course shall, unless exempted by the Dean, again attend lectures and other classes and complete the prescribed written and other work in all such courses in which they are permitted to re-enrol.
- (5) Candidates who present themselves for re-examination in any course shall not be eligible for any prize or scholarship awarded in connection with such examination.

Credit for courses

9. (1) Candidates who have previously completed studies which are considered by the Faculty to be equivalent to any course listed in the Tables associated with section 3 may be given credit for that course providing that:
- (i) in the case of graduates, the total unit value of the courses so credited may not exceed 68;
 - (ii) in the case of students who have completed courses in another tertiary program without graduating and who have abandoned credit in that program for the courses on the basis of which credit is sought, any number of courses may be credited;
 - (iii) the courses were completed not more than nine years before admission to candidature in the Faculty.

- (2) Candidates who have been given credit for courses listed in the Tables, in accordance with section 9(1), shall be regarded as having completed such courses for the purposes of these Resolutions.

Courses for Honours degree

10. (1) Courses for the degree shall—
- (i) be in such subjects,
 - (ii) have such unit values, and
 - (iii) have such prerequisite and corequisite courses as are set out in the Tables associated with these Resolutions.
- (2) There shall be an Honours degree in the following subjects: Pharmacy Practice, Pharmaceutics, Pharmaceutical Chemistry, Pharmacology.

Qualification for the Honours degree

11. To complete the requirements for the Honours degree a candidate shall gain 214 units by completing courses set out in the Tables associated with this Resolution.

Admission to the Honours degree

12. (1) Except with permission of the Faculty on the recommendation of the Head of Department, in order to qualify for admission to the Honours degree candidates shall have completed all the requirements of First Year and Second Year in no more than 2 years, shall have a Science Weighted Average Mark greater than or equal to 65 and be considered by the Faculty and the Head of the Department concerned to have the requisite knowledge and aptitude for an Honours course.
- (2) Candidates may not take Honours courses in any one academic year in more than one subject listed in Resolution 10(2).
- (3) Candidates for the Honours degree shall enrol full-time.
- (4) Candidates who have qualified for the award of the Honours degree may take, in the next year or at such later times as the Faculty permits, an additional Honours course for which they are qualified.
- (5) (1) With permission of the appropriate Head of Department, and provided that the candidates are considered by Faculty and the Head of Department concerned to have the requisite knowledge and aptitude for an Honours course the following may be admitted:
- (i) Pass graduates in Pharmacy of the Faculty of Science
 - (ii) Pass graduates holding Bachelor of Pharmacy degrees from such other institutions as the Faculty may from time to time determine.
- (2) Such candidates must enrol full time and must complete the requirements for the degree in one year by completing

such Honours courses listed in Table VIIB and other courses as are prescribed from time to time by the Head of the Department concerned.

- (6) Except with permission of the Faculty on the recommendation of the Head of Department, candidates for the Honours degree who do not complete all the third year requirements in a single year will enrol in the Pass degree in the following year.

- (7) Except with permission of the Faculty on the recommendation of the Head of Department, candidates for the Honours degree who have a Science Weighted Average Mark at the end of Third Year of less than 65 will enrol for the Pass degree in the following year.

Award of the Honours Degree

13. (1) Except with the permission of the Faculty, the requirements for the Honours degree shall be completed in no more than 4 years.
- (2) A candidate for the Honours degree who has failed to be placed in any Honours classification may be awarded a Pass degree.

Classes of Honours and Medal

14. (1) There shall be three Classes of Honours, namely Class I, Class II and Class III, and within Class II there shall be two Divisions, namely Division 1 and Division 2.
- (2) A candidate with an outstanding performance in the subject of an Honours course shall, if deemed to be of sufficient merit by the Faculty, receive a bronze medal.
- (3) There shall be no re-examination for Honours.

Candidates enrolled before 1997

15. (1) A person who has enrolled as a candidate for the degree of Bachelor of Pharmacy before 1 January 1997 may complete the requirements for the degree in accordance with the Resolutions in force at the time the candidate commenced that degree provided that the candidate completes the requirements for the degree by 31 December 2001 or such later date as the Faculty may approve in special cases; and that if a course specified in those Resolutions is discontinued the Faculty may permit the candidate to substitute a course or courses deemed by the Faculty to be equivalent to the discontinued course.
- (2) Where a candidate proceeding pursuant to subsection (1) fails to complete the requirements for the degree before 31 December 2001 the candidate shall complete the requirements for the degree under such conditions as may be determined from time to time by the Dean.

Table VII: A: Courses for Pharmacy (Pass Degree) —1997 Resolutions [see section 3]

Course	Course No	Unit value	- Prerequisites (P) Corequisites (C) Assumed knowledge (Akn)
First Year courses			
Biology (Pharmacy)	161Y	12	Akn: See footnote ¹
Chemistry (Pharmacy)	162Y	12	Akn: See footnote ¹
Introductory Pharmacy	163S	6	Akn: See footnote ¹
Mathematics/Statistics (Pharmacy)	164F	6	Akn: Mathematics 2 unit course
Psychology (Pharmacy)	165Y	12	Akn: See footnote ¹
Second Year courses			
Biochemistry (Pharmacy)	261Y	6	P: Chemistry (Pharmacy) 162Y
Pharmacology (Pharmacy)	262Y	4	P: Chemistry (Pharmacy) 162Y C: Physiology (Pharmacy) 263Y
Physiology (Pharmacy)	263Y	6	P: Biology (Pharmacy) 161Y
Medicinal Chemistry	264Y	10	P: Chemistry (Pharmacy) 162Y P: Introductory Pharmacy 163S C: Biochemistry (Pharmacy) 261Y C: Pharmacology (Pharmacy) 262Y
Microbiology (Pharmacy)	265F	3	P: Biology (Pharmacy) 161Y
Pharmaceutical Microbiology	267S	4	P: Introductory Pharmacy 163S C: Microbiology (Pharmacy) 265F
Pharmacy Practice	266Y	5	P: Psychology (Pharmacy) 165Y P: Introductory Pharmacy 163S C: Pharmacology (Pharmacy) 262Y
Physical Pharmaceutics	268Y	10	P: Chemistry (Pharmacy) 162Y P: Introductory Pharmacy 163S
Third Year courses			
Dispensing	361S	4	P: Physical Pharmaceutics 268Y P: Microbiology (Pharmacy) 265F P: Pharmaceutical Microbiology 267S C: Formulation 363Y
Formulation	363Y	5	P: Pharmaceutical Microbiology 267S P: Physical Pharmaceutics 268Y C: Dispensing 361S
Medicinal Chemistry	364Y	12	P: Biochemistry (Pharmacy) 261Y C: Pharmacology (Pharmacy) 362Y C: Pharmacy Practice 366Y
Pharmacokinetics	365Y	6	P: Physical Pharmaceutics 268Y
Pharmacology (Pharmacy)	362Y	8	P: Physiology (Pharmacy) 263Y C: Medicinal Chemistry 364Y C: Pharmacy Practice 366Y
Pharmacy Practice	366Y	13	C: Pharmacokinetics 365Y C: Pharmacology (Pharmacy) 362Y
Fourth Year courses			
Integrated Dispensing	461F	4	P: Dispensing 361S P: Pharmacy Practice 366Y
New Drug Technologies	462F	4	P: Medicinal Chemistry 364Y
Pharmaceutics Workshop	463F	4	P: Formulation 363Y P: Pharmacokinetics 365Y
Pharmacotherapeutics.	464Y	12	P: Pharmacokinetics 365Y P: Pharmacology (Pharmacy) 362Y P: Pharmacy Practice 366Y C: Clinical Practice 465Y C: Integrated Dispensing 461F C: Clinical Information/Technology 466S C: Clinical Pathology 467S

¹HSC Chemistry (2-unit) and Mathematics (2-unit), or their equivalents, are considered essential preparation for Pharmacy. In addition it is highly desirable that students have completed either Biology or Physics as a second 2-unit HSC Science course. The 3- and 4-unit combined Science courses including the Biology component are acceptable alternatives.

Course	Course No	Unit value	Prerequisites (P) Corequisites (C) Assumed knowledge (Akn)	
Clinical Practice	465Y	12	P: Pharmacy Practice P: Pharmacokinetics P: Pharmacology (Pharmacy) C: Clinical Pathology C: Clinical Information/Technology C: Integrated Dispensing C: Pharmacotherapeutics	366Y 365Y 362Y 467S 466S 461F 464Y
Clinical Information/Technology	466S	2	P: Pharmacy Practice P: Pharmacokinetics P: Pharmacology (Pharmacy) C: Clinical Pathology C: Clinical Practice C: Integrated Dispensing C: Pharmacotherapeutics	366Y 365Y 362Y 467S 465S 461F 464Y
Clinical Pathology	467S	4	P: Pharmacy Practice P: Medicinal Chemistry C: Clinical Information/Technology C: CUnical Practice C: Integrated Dispensing C: New Drug Technology C: Pharmacotherapeutics	366Y 364Y 466S 465S 461F 462F 464Y
Ethics and History of Pharmacy	468S	2	C: Pharmaceutical Management	469S
Pharmaceutical Management	469S	4	C: Ethics and History of Pharmacy C: Pharmaceutics Workshop	468S 463F

Table VII: B: Courses for Pharmacy (Honours Degree) — 1997 Resolutions [see section 11]

Course	Course No	Unit value	Prerequisites (P) ¹ Corequisites (C) Assumed knowledge (Akn)
First Year courses			
All first year courses set out in Table A			
Second Year courses			
All second year courses set out in Table A			
Third Year courses			
All third year courses set out in Table A			
and			
Pharmacy (Honours)	371F	5	
and one of the following:			
Pharmaceutical Chemistry (Honours)	376S	5	
Pharmaceutics (Honours)	377S	5	
Pharmacology (Pharmacy Honours)	378S	5	
Pharmacy Practice (Honours)	379S	5	
Fourth Year courses			
Integrated Dispensing	461F	4	
New Drug Technologies	462F	4	
Pharmaceutics Workshop	463F	4	
Pharmacotherapeutics (Honours)	474Y	13	
Clinical Practice (Honours)	475F	6	
and one of the following:			
Pharmaceutical Chemistry (Honours)	476Y	29	
Pharmaceutics (Honours)	477Y	29	
Pharmacology (Pharmacy Honours)	478Y	29	
Pharmacy Practice (Honours)	479Y	29	

¹Candidates enrolled in the Honours Degree must normally complete all prescribed courses of each year in a single year.

Degree of Bachelor of Psychology

Summary of requirements

Candidature is by full-time study only.

The courses for the Bachelor of Psychology degree extend over four years. Progression towards the degree of Bachelor of Psychology is by the accumulation of Science Faculty unit points, and by achieving an average grade of Credit or better over all courses in the Science Discipline Area of Psychology (see section 3(3)) in each year of study. Candidates who fail to satisfy these requirements may be permitted to transfer to candidature in another program of study.

To graduate in the Bachelor of Psychology with Honours, candidates must be selected to enter the 4th year Honours course and obtain a grade of Honours in that year. Candidates who do not gain entry to the fourth year of the program may qualify for admission to the degree of BSc.

Candidates who have completed one year of full-time study towards the degrees of BSc, BA, BEc (Soc Sci) may apply to the Dean of the Faculty of Science for permission to transfer to the BPsych at the beginning of the second year, provided they have already met the subject and progression requirements for the BPsych, and have performed at a meritorious level in 12 units of Junior Psychology courses.

The requirements for the degree are set out in the Senate Resolutions, which should be read by all intending candidates (see below). The Resolutions in force prior to 1997 are contained in the Faculty of Science Handbook 1996, which can be inspected at the Faculty Office or the Faculty of Science website home page (<http://www.scifac.usyd.edu.au>).

There are the following constraints on enrolment in courses:

- Only those combinations of courses permitted by the timetable can be taken.
- Candidates will enrol in 48 units of Junior courses in the first year of attendance, as specified in the section 'Requirements for degree'.
- Except with the permission of the Faculty, candidates may not enrol in any one semester in courses with a total number of units in excess of 28.
- Candidates may not enrol in a Junior course unless they are enrolled in any corequisite course.
- Candidates may not enrol in any Intermediate courses before they have completed 48 units of Junior courses.
- Candidates may not enrol in a Senior course before they have completed 40 units of Intermediate courses.
- Candidates may not enrol in Intermediate or Senior courses unless they have completed the prerequisite courses and are enrolled in any corequisite courses.

Candidates may not enrol in Psychology 401 until the requirements for the completion of the third year have been met.

The combination MATH 103/193 is not recommended in this degree. Students wishing to study Statistics/Calculus are advised to select MATH (102/192) or 112.

HSC Aggregate

A quota will apply for entry into the Bachelor of Psychology.

Transfer into the BPsych degree after Junior year

With permission of the Dean, a student enrolled in the BSc, BSc (Advanced), BSc (Molecular Biology and Genetics), BMedSc, or BCSTdegree who has completed a minimum of 48 units of Junior courses with minimum grades of Pass, including 12 units of Psychology courses with an average grade of Credit (65%) or better, may apply for transfer into the Intermediate year of the BPsych degree. Applications should be made through UAC. Selection is on academic merit and subject to a quota determined by the Dean.

Regulations¹

Resolutions of the Senate

The following Resolutions governing candidature for the degree of Bachelor of Psychology have been prescribed by the Senate.

Definitions

1. For the purpose of the Resolutions:
 - (1) (i) A *course* shall consist of lectures together with such tutorial instruction, essays, exercises, or practical work as may be prescribed.
 - (ii) Each course shall be designated as a 'Junior' course, an 'Intermediate' course, a 'Senior' course or an 'Honours' course.
 - (iii) Candidates who have completed a course shall have units credited towards the completion of a degree in accordance with the following: each course shall be of 4, 6, 8, or 12 units value; a course may be comprised of modules of smaller unit value which shall be taken in various combinations as determined by the Head of the Department concerned.
 - (iv) Junior, Intermediate, Senior and Honours courses are indicated by course level designations 100-199, 200-299, 300-399 and 400-499, respectively, placed immediately after the name of the course.
 - (v) Except for Honours courses, each course shall be confined to one semester in duration, with assessment being completed during that semester.
- (2) To '*complete a course*' and derivative expressions mean:
 - (i) to attend the lectures and the meetings for tutorial instructions, if any;

¹Subject to approval of the Senate.

- (ii) to complete satisfactorily the essays, exercises and the practical work, if any; and
 - (iii) to pass the examinations of the course.
- (3) A *qualifying course* means a course which, except with the permission of the Faculty, must be completed with a result of Pass or better [not Concessional Pass—see sections 7(2) and 7(6)] before enrolment in the course for which it qualifies.
- (4) A *prerequisite course* means a course other than a qualifying course which, except with the permission of the Head of the Department concerned, must have been completed with a result of Concessional Pass or better [see sections 7(2) and 7(6)] prior to a candidate enrolling in a course for which it is a prerequisite.
- (5) A *corequisite course* means a course which, unless previously completed, or except with the permission of the Head of the Department concerned, must be taken concurrently with the course for which it is a corequisite.

Grades of Award

2. The degree shall be awarded at both the Pass and Honours levels.

Courses for degree

3. Courses for the degree shall, except as provided under section 4, 'Requirements for Degree' and section 6, 'Enrolment in Courses not in the Table':
- (1) have such names,
 - (2) be in such subjects,
 - (3) be in such Science Discipline Areas (as defined in the Resolutions governing candidature for the degree of Bachelor of Science),
 - (4) have such unit values, and
 - (5) have such qualifying, prerequisite and corequisite courses, as are determined from time to time by the Faculty, and are set out in Table VII associated with this section.

Requirements for degree

4. Candidates for the degree shall:
- (1) In their first year complete courses, to a total unit value of 48, in the following Science Discipline Areas:
 - (i) 12 units from Junior courses in Psychology
 - (ii) 12 units from Junior courses in Mathematics
 - (iii) At least 12 units from Junior courses in Biology, Chemistry, Computer Science or Physics.
 - (iv) 12 Junior units selected from courses listed within Table I of the BSc degree Regulations. For the purposes of this Resolution the courses selected shall be from a Single Science Discipline Area, or, in the case of courses offered by other Faculties, from a single

subject area as defined by the relevant degree Resolutions.

- (2) Achieve a minimum average grade of Credit in Junior courses in the Science Discipline Area of Psychology and a minimum grade of Pass in at least 30 units of other completed Junior courses in order to qualify for progression to second year.

- (3) In their second year, attempt 48 units, being:

- (i) 16 units of Intermediate courses in the Science Discipline Area of Psychology, and
- (ii) 16 units selected from Intermediate courses in the Science Discipline Areas of Anatomy and Histology, Biochemistry, Biology, Computer Science, History and Philosophy of Science, Mathematics, Pharmacology, Physiology, or Statistics, and
- (iii) 16 units selected from courses in (ii) above, not already selected, or from Intermediate courses in Sociology, Anthropology, Linguistics or Philosophy.

- (4) Achieve a minimum average grade of Credit in Intermediate courses in the Science Discipline Area of Psychology, and a minimum grade of Pass in at least 24 units of other Intermediate courses and to have an accumulated total of 88 units in order to qualify for progression to third year.

- (5) In their third year, complete 48 units being:

- (i) 24 Senior units in the Science Discipline Area of Psychology,
- (ii) either an additional 24 Senior units in the Science Discipline Area of Psychology or an additional 12 Senior units in the Science Discipline Area of Psychology plus 12 units in any Intermediate or Senior course in the Science Discipline Areas of Anatomy and Histology, Biochemistry, Biology, Computer Science, History and Philosophy of Science, Mathematics, Pharmacology, Physiology, or Statistics.

- (6) In order to qualify for progression to 4th year, normally be required to have achieved a minimum average grade of Credit in at least 24 units of Senior courses in the Science Discipline Area of Psychology, an accumulated total of at least 144 units and a SCIWAM of at least 65.

- (7) Not have any course credited more than once for the degree.

- (8) Not have credited for the degree units derived from more than one of such courses as the Faculty may deem to be mutually exclusive¹.

¹For details of courses which cannot be counted, see the notes in column (e) of the Table of courses associated with section 3 of the BSc Resolutions.

(9) When enrolled in a course, a non-optional part of which is similar in content to part of (i) a course previously completed or (ii) another course in which the candidate is currently enrolled, complete an equivalent amount of alternative work, as directed by the Head(s) of Department(s) concerned, in order to complete the course.

(10) Not take an option within a course which is similar in content to part of a course concurrently being taken or previously completed.

(11) Count towards the degree no more than 48 units from Junior courses, nor more than 16 units from courses in which the grade of Concessional Pass was awarded.

Restrictions on enrolment

5. (1) Except with the permission of the Faculty, candidates may not take an Intermediate course:
 - (i) until they have completed 48 units of Junior courses as specified in section 4, 'Requirements for Degree'.
 - (ii) until they have completed the Junior courses, prescribed by the Faculty as prerequisites for the Intermediate course.
- (2) Except with the permission of the Faculty, candidates may not take a Senior course:
 - (i) until they have completed Intermediate courses with a total unit value of at least 40.
 - (ii) until they have completed the Intermediate and Junior courses, if any, prescribed by the Faculty as prerequisites for the Senior course as set out in section 3, 'Courses for Degree'.
- (3) Except with the permission of the Faculty, candidates may not take, in any one semester, courses with a total number of units in excess of 28.
- (4) The choice of courses made by candidates shall be limited by the exigencies of the timetable. However, candidates who have completed at least 48 units may seek to enrol in two courses which are given wholly or partly at the same time. In such cases, candidates must, with the permission of the Heads of the Departments concerned, attend equivalent courses or parts of courses given at another time.

Enrolment in courses not in the Table

6. A candidate of exceptional merit may, under special circumstances and with the permission of the Dean, undertake studies within the Faculty other than those courses specified in Table I accompanying the BSc Resolutions, and upon completion of those studies have them counted towards the degree. The candidate may be given credit for these studies of up to 40 units,

which will be designated by the Dean as Junior, Intermediate, or Senior. Such units shall count towards the number of units required for the degree in accordance with section 4, 'Requirements for degree'.

Course assessment

7. (1) Candidates may be tested by written and oral class examinations, exercises, essays or practical work or any combination of these, and the results of such tests may be taken into account by the Faculty Board of Examiners in determining the final results for a course.
- (2) In all courses Passes may be graded into High Distinction, Distinction, Credit, Pass, and Concessional Pass. The grades High Distinction, Distinction or Credit indicate work of a standard higher than that required for a Pass.
- (3) Where a Department offers a course at two levels, the performance of candidates in the two levels in terms of comparability of quality of work will be matched by that Department so that a grade obtained at one level indicates a quality of work comparable with that required for the same grade obtained at the other level.
- (4) Candidates who have been prevented by duly certified illness or misadventure from sitting for the whole or part of a course assessment may be tested at such times and in such way as the Head of the Department concerned or the Faculty Board of Examiners shall determine.
- (5) Candidates who repeat any course shall not be eligible for any prize or scholarship awarded in connection with the examination for such a course.
- (6) Subject to the provisions of section 4(11), the award of a Concessional Pass in a course entitles a candidate to be credited with the full number of units for that course.

Credit for other courses

8. (1) Candidates who have previously completed studies which are considered by the Faculty to be equivalent to any course listed in the Tables associated with these or the BSc Resolutions may be given credit for that course providing that:
 - (i) the total unit-value of the courses so credited from studies which have resulted in the conferring of a degree or degrees may not exceed 52, and
 - (ii) in the case of students who have completed courses in another tertiary program without the degree being conferred and who have abandoned credit in that program for the courses on the basis of which credit is sought, any number of courses may be credited.
- (2) Candidates who have been given credit

for courses listed in the Tables in accordance with section 8(1), shall be regarded as having completed such courses for the purposes of these Resolutions.

(3) Candidates for the degree who have completed studies at tertiary level which are considered by the Faculty to be appropriate, but for which there is no equivalent course listed in the Tables associated with section 3 of these or with the BSc Resolutions, may be given credit for such number of units, to be designated by the Faculty as Junior, Intermediate or Senior, as the Faculty may determine. Such units shall count towards the number of units required for the degree in accordance with section 4, 'Requirements for degree'.

Admission to Honours courses

9. In order to qualify for admission to the Honours course, candidates shall have completed all specified requirements for Junior, Intermediate and Senior courses and be considered by the Faculty and the Head of the Department of Psychology to have the requisite knowledge and aptitude for an Honours course.

Classes of Honours and Medal

10. (1) There shall be three Classes of Honours, namely Class I, Class II and Class III, and within Class II there shall be two Divisions, namely Division 1 and Division 2.
- (2) A candidate with an outstanding performance in the Honours course shall, if deemed to be of sufficient merit by the Faculty, receive a bronze medal.
- (3) There shall be no re-examination for Honours.

Transitional Provisions

11. (1) These Resolutions apply to all candidates for the degree enrolling in courses after 1 January 1997.
- (2) With the permission of the Faculty, candidates who first enrolled for the degree in 1996 and have not had a period of suspension or exclusion may, until 31 March 1997, choose to qualify for the degree under the old Resolutions.

Honours courses

Approval both from Faculty and the Head of the Department of Psychology is required for entry to Honours.

To obtain permission from the Faculty, applicants must (i) have an accumulated total of at least 144 units and a SCIWAM of at least 65 (see below) and (ii) be of not more than three years' standing as students in the Faculty. Exceptions are granted only on the grounds of documented illness or misadventure.

To obtain permission from the Head of the Department of Psychology applicants must have gained at least an average minimum grade of Credit in Intermediate courses and an average minimum grade

of Credit in Senior courses in the Science Discipline Area of Psychology. Note that there is a quota on Psychology Honours and admission is on a competitive basis.

Award of Honours and ranking for postgraduate scholarships

The Faculty has adopted a system of Weighted Average Marks (WAM) in relation to the award of Honours and ranking for postgraduate scholarships. The WAM is an integer between 45 and 100 which is an overall measure of performance in the pre-Honours years. It is calculated by summing the products of the marks achieved and the weighted unit values of the courses taken in the pre-Honours years and then dividing by the sum of the weighted unit values. Note that *all* attempts at courses are included in the calculation *except where courses are discontinued with permission*.

The formula used is as follows:

$$WAM = \frac{\sum WcMc}{\sum Wc}$$

where Wc is the weighted unit value — i.e. unit value x year weighting of 1 (Junior), 2 (Intermediate) or 3 (Senior) — and Mc is the greater of 45 or the mark out of 100 for the course.

The Faculty is aware that, because the Honours year in some Departments is 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 pre-Honours years 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 stipulates that a candidate with a WAM of less than 80 or an Honours year mark of less than 95 would not normally receive a medal. A candidate with a WAM of 77 to 79 inclusive may be considered for the award of a medal only if it can be demonstrated that the WAM was affected by sickness, misadventure, unusual workload or choice of courses. The Faculty recognises, however, that the Senate Resolutions concerning medals relate the award of a medal to the Honours courses only.

The Faculty also stipulates that a student with a WAM of less than 68 or an Honours year mark of less than 80 would receive First Class Honours only in exceptional circumstances. Candidates who have a WAM within the range of 65 to 67 and who obtain a combined mark of 148 or greater (WAM plus fourth year mark) may be considered for the award of First Class Honours only if it can be demonstrated that their WAM was affected by sickness, misadventure, unusual work load or choice of courses, and/or they can demonstrate exceptional performance in their Honours year.

Candidates who have a WAM of 77 to 79 inclusive or 65 to 67 inclusive and who consider that their WAM was affected by exceptional circumstances are advised to discuss their case with the Dean, or the Dean's nominee, early in their Honours year and in any event before the beginning of Semester 2.

The award of second and third class Honours is made on the basis of the Honours year mark only. A student who fails the fourth year of the program may apply to the Dean of the Faculty of Science for admission to the degree of BSc.

Ranking for postgraduate scholarships is determined by the sum of the WAM and the Honours year mark.

Table VIII: [Bachelor of Psychology]

<i>(a)</i>	<i>(b)</i>	<i>(c)</i>	<i>(d)</i>	<i>(e)</i>	<i>(f)</i>
Science Discipline Area/Course number	Course name	Unit value	Assumed standard of knowledge (Akn) Qualifying Courses (Q) Prerequisites (P) Corequisites (C)	Faculty of Science Resolutions and additional information about courses	Antecedent course (1996)

Note: Details of Psychology courses only are listed. For details of course content, assumed knowledge, prerequisites, corequisites and qualifying courses for other courses see also Table I [Bachelor of Science].

A. Junior courses

Candidates are required to enrol in and complete 48 units in the following Science Discipline Areas:

- (i) 12 units from Junior courses in Psychology
- (ii) 12 units from Junior courses in Biology, Chemistry, Computer Science or Physics
- (iii) 12 units from Junior courses in the Science Discipline Area of Mathematics
- (iv) 12 units selected from Junior courses in a single Science Discipline Area listed within Table I [Bachelor of Science].

Psychology

PSYC101F	Psychology 101	6			Psychology 1
PSYC102S	Psychology 102	6	P: Psychology 101		Psychology 1

In order to proceed to the Intermediate year, candidates for the BPsych must achieve at least an average grade of Credit from courses in the Science Discipline area of Psychology and achieve a minimum grade of Pass in at least 30 units of other Junior courses.

B. Intermediate courses

Candidates are required to enrol in and complete:

- (i) 16 units from Intermediate courses in Psychology
- (ii) 16 units from Intermediate courses in Anatomy and Histology, Biochemistry, Biology, Computer Science, History and Philosophy of Science, Mathematics, Pharmacology, Physiology or Statistics
- (iii) 16 units of courses not selected from B(ii) (above) or from Intermediate courses in Sociology, Anthropology, Linguistics or Philosophy

Psychology

PSYC201F	Psychology 201	8	Q: Psychology 102		Psychology 2
PSYC202S	Psychology 202	8	P: Psychology 201		Psychology 2

In order to proceed to third year, candidates must achieve a minimum grade of Credit in Intermediate Psychology courses and achieve a minimum grade of Pass in at least 24 units of other Intermediate courses and have accumulated at least 88 units .

C. Senior courses

Candidates are required to enrol in and complete:

- (i) 24 Senior units of Psychology
- (ii) Either an additional 24 Senior units in Psychology OR
an additional 12 Senior units in Psychology plus 12 units in Intermediate or Senior courses in Anatomy and Histology, Biochemistry, Biology, Computer Science, History and Philosophy of Science, Mathematics, Pharmacology, Physiology, Statistics.

Psychology

PSYC301F	Psychology 301	12	Q: Psychology 202	Note that both Psychology 301 and Psychology 302 are required for Psychology 4 Honours	Psychology 3
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PSYC302S	Psychology 302	12	Q: Psychology 202, but History and Philosophy option has additional prerequisites	As for Psychology 301
PSYC303F	Psychology 303	12	C: Psychology 301	This course is available only to the BPsych degree
PSYC304S	Psychology 304	12	C: Psychology 302	This course is available only to the BPsych degree

In order to proceed to 4th year, candidates must have acquired a minimum grade of Credit in at least 24 units of Senior Psychology courses, a minimum of at least 65.

D. 4th Year (Psychology 4 Honours)

Candidates are required to enrol in and complete:

(i) The Psychology 4 (Honours) Program

PSYC 401Y	Psychology 4 Honours	48	Q: Psychology 301 and 302
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4 Talented Student Program

The Faculty offers a special program of study for exceptionally gifted students in the Talented Student Program (TSP) which operates mainly for those students in the BSc degree. The program is not available for the BMedSc or BPharm degrees, although if permission is granted by other Faculties, TSP options may be taken for science courses which 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. The following guidelines apply generally, although Departments may have additional (and more stringent) requirements for entry to the courses they offer in the program:

- to be considered for the program in their Junior year, students should normally have a TER (or equivalent) over 98 with marks of over 90 in science subject areas and over 95 in 4-unit Mathematics
- to be considered for the program in their second and third years, students should normally have SCIWAMs over 85 and a high distinction grade in the relevant subject area. Intermediate level entry to TSP is available only to students who have been enrolled full-time in courses totalling at least 48 units.

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.

Senate Resolution 6(2) for the BSc degree authorises the Dean to give approval for students of exceptional merit to enrol in courses or in combinations of courses not normally available within the degree. For example, a student who takes Psychology 301 and 302 and who wishes to take additional options in Psychology plus options in subjects related to biochemical aspects of behaviour may, following consultation with the Departments concerned (e.g. Departments of Biochemistry and Psychology), take a special course consisting of combinations of parts of existing courses.

In very exceptional cases, particularly for students who have excelled in Olympiad Programs, application of Resolution 6(2) may permit accelerated progress toward the completion of the BSc degree.

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.

Entry to the Talented Student Program is by invitation from the Dean.

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.

Examples of programs available for 1997

Senior Agricultural Chemistry

Coordinator: Associate Professor Les Copeland

Students may undertake, in addition to normal coursework, a special research project directly supervised by a member of the academic staff.

Biochemistry

Coordinator: Dr Anthony Weiss

A special program of study will be developed for individual students enrolled in Intermediate or Senior Biochemistry.

Biology

Coordinator: Associate Professor Bill Allaway

Students may undertake additional seminars and/or special project work.

Chemistry 193,194

Coordinator: Dr Raymond Pierens

The Chemistry School offers TSP students a challenging program under the title 'Chemistry 1: Special Studies Program'. The program comprises the Junior Chemistry (Advanced) lecture courses, special tutorials, and special project-based laboratory exercises. Admission to Chemistry I(SSP) is by invitation only, and is limited to 20 students each year. TSP students are automatically eligible.

Chemistry 291, 292

Coordinator: Dr Scott H. Kable

TSP students in Intermediate Chemistry take the Intermediate Chemistry (Advanced) courses. The courses comprise lectures, tutorials and special project-based laboratory exercises which complement the other Intermediate Chemistry courses. Admission to Intermediate Chemistry (Advanced) courses is by invitation only, and is limited to 20 students each year. TSP students are automatically eligible.

Chemistry 391, 392

Coordinator: Professor Hans Freeman

The Senior Chemistry TSP program consists of Chemistry 3A and 3B and four special 7-meeting modules (one per half-semester). In each module, students work as a group to solve a substantial real-life problem in contemporary Chemistry. In addition, the normal Senior Chemistry laboratory courses are modified to include special TSP experiments. The program is offered under the Senior Chemistry (Advanced) program, but admission is by invitation only and is limited to 10 students each year. TSP students are automatically eligible.

Computer Science

Coordinator: Dr Alan Fekete

The Department will make special arrangements for individual students throughout their studies. Interested students should contact the TSP coordinator as soon as possible.

Intermediate Geography

Coordinator: Dr David Chapman

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 Keith Klepeis

Students will be offered extra seminars and/or special project work.

Mathematics and Statistics

Coordinators: Dr Laurentiu Paunescu, Dr Vladislav Zheligovsky

Students admitted to the program have the following options available to them:

- additional options from courses in Mathematics and Statistics either in lieu of, or in addition to, other courses of study
- a combination of additional options from courses in Mathematics and Statistics combined with special studies in another discipline
- a special research project in lieu of, or in addition to, normal course components
- various combinations of the above options.

Microbiology

Coordinator: Dr T. Ferenci

A special program of study will be developed for individual students enrolled in Microbiology.

Pharmacology

Coordinator: Dr Ian Spence

The Department will make special arrangements for individual students throughout their studies.

Junior Physics

Coordinator: Dr David McKenzie

Students may take extra seminars and special laboratory project work in addition to, or in lieu of, parts of Physics (Advanced) courses.

Intermediate Physics

Coordinator: Dr David McKenzie

Students may take extra seminars and special laboratory project work in addition to, or in lieu of, parts of Intermediate Physics courses.

Senior Physics

Coordinator: Dr David McKenzie

Students may take extra seminars and special research

project work in addition to, or in lieu of, parts of Senior Physics courses.

Psychology

Coordinator: Associate Professor Helen Beh

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 addition to, other courses of study in Science (e.g. students may take an additional 4 options in Psychology 301 and 302 and receive 12 units credit in Psychology for these units in lieu of 12 units from another course or in addition to units in another course)
- a combination of additional Psychology options combined with special studies in another science discipline (e.g. 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: Professor Alex McBratney

Students may undertake, in addition to normal coursework, a special research project.

5 Courses of study

90

Note: Courses and arrangements for courses, including staff allocated, as stated in this or any other publication, announcement or advice of the University, are an expression of intent only and are not to be taken as a firm offer or undertaking. The University reserves the right to discontinue or vary such courses, arrangements or staff allocations at any time without notice.

Books

In this section of the handbook, books listed under the sub-heading *Textbooks* are those which students are expected to purchase, while all other books recommended for a course are listed under the sub-heading *Reference books*.

Changes sometimes occur in the selection of prescribed textbooks or reference books, owing to supply difficulties or the publication of new and more suitable works. Such changes will be announced by lecturers and it is prudent to check with the relevant lecturer before buying the books you expect to need.

Degree of Bachelor of Science

Department of Agricultural Chemistry and Soil Science

AGRICULTURAL CHEMISTRY

Courses in agricultural chemistry for science students consist of aspects of chemistry and biochemistry which are relevant in studies of basic and applied biological sciences including agriculture and the environment. Emphasis is placed on the chemistry of molecules of biological, agricultural and environmental significance both naturally occurring (e.g. cellular constituents, foods, natural fibres), and chemically synthesised (e.g. 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 courses available are Agricultural Chemistry 201 (8 unit Intermediate), Agricultural Chemistry 301, 302 and 303 (12 unit Senior), and Agricultural Chemistry Honours.

Location

The Departmental Office is on the ground floor of the Ross St Building (A03). The Soil Science teaching laboratories are on the ground floor of the eastern wing of the Ross St Building, and are approached by a ramp and footbridge lying between the Watt and Ross St Buildings. The Agricultural Chemistry teaching laboratories are on the first floor of the Ross St Building, at the top of the stairs from Science Rd entrance.

Noticeboards

Noticeboards are located at the foot of the stairs at the entrance to the teaching laboratories in the Ross St Building.

Registration

All students are required to register with the Department before the first day of Semester 1 to discuss their programs and timetables with the staff.

Advice on courses

Enquiries should initially be addressed to the Departmental Office, telephone 9351 2439 or extension 12439.

Intermediate Agricultural Chemistry course

AGCH 201F Molecular Processes in Ecosystems

8 units

Coordinator Dr Caldwell

Dr Lees, Dr Caldwell

Qual Chemistry 102 or equivalent

Prereq Biology 102 or 192. Students who have not satisfied the prerequisites in Biology may enrol with Soil Science 201 as a corequisite

Classes Sem 1: (3 lec & 5 prac)/wk

Assessment one 3hr exam, prac, assignments

This is an introductory course consisting of aspects of chemistry and biochemistry relevant in studies of basic and applied biological sciences including agriculture and the environment. The course 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 classes

Eight laboratory sessions cover aspects of analytical and biophysical chemistry including: volumetric analysis, spectrophotometry, chromatographic techniques, preparation of buffers, fundamentals of pH measurement; reaction kinetics; emulsions, foams and gels. An additional six 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.

Text/Reference books

To be advised at the commencement of the course.

Senior Agricultural Chemistry courses

AGCH 301F Chemistry and Biochemistry of Ecosystems 12 units

Coordinator Prof. Kennedy

Prof. Kennedy, Dr Caldwell, Dr Lees, Assoc. Prof. Copeland

Prereq Agricultural Chemistry 201 or Chemistry 201 or 211 or

222 or 231 or 232 or 292 or Biochemistry 202 or 292

Classes Sem 1: (3 lec, 1 tut & 8hr prac)/wk

Assessment one 3hr exam, prac, assignment

This is a course in environmental chemistry for students with interests in environmental aspects of agricultural science. It cannot be taken with Agricultural Chemistry 302. The specific objectives of the course are to (i) provide students with an understanding of chemical and biochemical processes in ecosystems, in particular the various elemental cycles, inclusive of environmental impacts arising from disturbances in natural processes and contamination from other human activity and (ii) teach students practical skills in chemical and biochemical methods of analysis used in environmental chemistry.

The lecture topics will include: the biological/environmental carbon cycle; bioenergetics of autotrophy and heterotrophy, photosynthesis, fermentation, eutrophication; the mineral nutrient cycles, uptake and utilisation by organisms, pH balancing; the biological/environmental nitrogen cycle; ammonification, nitrification of ammonia, denitrification of nitrate, nitrogen fixation, ammonia and nitrate assimilation; the biological/environmental sulfur cycle; sulfate assimilation, sulfate reduction and dissimilation in soil and water; the role of the nitrogen and sulfur cycles in the acidification of ecosystems; effects of acidification on plants and animals; pesticides and herbicides, chemistry, modes of action, metabolism and detoxification; environmental chemistry and fate of pesticides; design of new pesticides and means of pest control; heavy metals and plants, mechanisms of tolerance, hyperaccumulators, halophytes.

The laboratory exercises, will include sample preparation and analyses of environmental samples for organic and inorganic nutrients, products and contaminants including heavy metals and pesticides. Skills will be acquired in gas, liquid and ion chromatography, atomic adsorption spectroscopy, electrochemical methods and the use of immunoassay.

Text/Reference books

To be advised at the commencement of the course

AGCH 302F Environmental Plant and Soil Chemistry 12 units

Coordinator Prof. Kennedy

Prof. Kennedy, Dr Caldwell, Assoc. Prof. Copeland, Mr Geering, Assoc. Prof. Koppi, Dr Lees

Qual Agricultural Chemistry 201 or Chemistry 201 or 211 or

222 or 231 or 232 or 292 or Biochemistry 202 or 292

Classes Sem 1: (4 lec, 1 tut & 5hr prac)/week; field trips (28hr)

Assessment one 3hr exam, prac, assignments, field trip report

This interdisciplinary course has the objective of teaching the scientific principles important in understanding and sustaining our national plant-soil resources. It cannot be taken with Agricultural Chemistry 301. Its subject matter will include the chemistry and biochemistry of ecosystems, aspects of soil and water chemistry, analytical chemistry with environmental significance, and the impacts of human activities on soil and ecosystems. The course should prove attractive to students seeking a career in environmental protection in the public or the private sectors. The lecture topics will include:

Chemistry and Biochemistry of Ecosystems

The biological/environmental carbon cycle. Bioenergetics of autotrophy and heterotrophy, photosynthesis, fermentation, eutrophication; the mineral nutrient cycles, uptake and utilisation by organisms, pH balancing; the biological/environmental nitrogen cycle; ammonification, nitrification of ammonia, denitrification of nitrate, nitrogen fixation, ammonia and nitrate assimilation; the biological/environmental sulfur cycle; sulfate assimilation, sulfate reduction and dissimilation in soil and water; the role of the nitrogen and sulfur cycles in the acidification of ecosystems; effects of acidification on plants and animals; pesticides and herbicides, chemistry, modes of action, metabolism and detoxification; environmental chemistry and fate of pesticides; the design of new pesticides and means of pest control; heavy metals and plants, mechanisms of tolerance, hyperaccumulators, and halophytes.

Analytical Chemistry

Atomic absorption and atomic emission for measurement of metal cations; heavy metal analysis. Gas chromatography, liquid chromatography and mass spectrometry for analysis of organic contaminants and pesticide residues, immunoassays; electrochemical methods of analysis.

Introductory Soil Chemistry and Processes of Land Degradation

Soil pH and acidity; chemistry of major nutrients and micronutrients; structure and chemistry of clay minerals; soil acidification; soil salinisation; soil erosion by wind and water; soil structural decline; soil contamination.

Fieldwork

A one-week field trip to examine and assess rural landscapes for environmental impacts and methods of amelioration. Amongst the issues to be examined in field settings will be salinisation, acidification, soil erosion, the potential for transport of pesticides of farms to riverine ecosystems, soil properties and waste disposal. A range of portable instruments to monitor key chemical parameters of environmental health (e.g. pH, redox potential, salinity, ARA for nitrogen fixation, pesticide immunoassays) will be employed in this field work.

Laboratory exercises

These will illustrate the lectures, provide practical

skills in analytical chemistry (nutrients and contaminants) and the assessment of environmental health from chemical data, and teach field land laboratory sampling techniques and statistical analysis of field data. Instruments available for these laboratory exercises include ultraviolet/infra-red spectrophotometers, atomic adsorption spectrometers, high performance liquid chromatographs, gas chromatographs (FID, TC and ECD) and mass spectrophotometric identification of environmental contaminants.

The field work, assignments and associated tutorials will seek to develop interdisciplinary skills, building on the lecture and laboratory topics indicated above and using case studies of rural and urban landscapes to illustrate scientific concepts. There will be an emphasis on quantitative approaches.

Reference books

- S.E. Manahan *Environmental Chemistry* 5th edn (Lewis Publisher, 1991)
 I.R. Kennedy *Acid Soil and Acid Rain* (Wiley Research Studies Press, 1992)
 K.H. Tan *Environmental Soil Science* (Marcel Dekker, 1994)

AGCH 303S Agricultural Biochemistry 12 units

Coordinator Assoc. Prof. Copeland

Prof. Kennedy, Dr Lees, Assoc. Prof. Copeland, Dr Caldwell
Qual Agricultural Chemistry 201 or Biochemistry 202 or 292
Classes Sem 2: (3 lec, 1 tut & 8hr prac)/wk

Assessment one 3hr exam, prac, assignments

This is a course in agricultural biochemistry with emphasis on foods and fibres. The course covers the chemistry and biochemistry of agricultural and food products and aims to (i) develop in students an understanding at the molecular level of biosynthetic processes, including their regulation, particularly as they occur in plants, (ii) provide students with knowledge of the biochemistry of agricultural products and (hi) teach students practical skills in chemical and biochemical methods of analysis used in agricultural production, the processing of agricultural products, and in the food and beverage industries.

The lecture topics will cover principles of metabolic regulation, signal transduction mechanisms, membrane transport; biosynthetic processes including photosynthetic carbon assimilation, sucrose and other oligosaccharides, and starch and other storage and structural polysaccharides, amino acids, fatty acids and lipids; chemistry and biochemistry of nutritional and antinutritional constituents of cereal and legume grains and oil seeds; characteristics of constituents in relation to end use and quality of products; solution properties and methods of study of biological macromolecules; natural fibrous and gel-forming macromolecules, uses in foods and other commercial products.

The laboratory exercises will include sample preparation and analyses of foods and other biological materials using spectroscopic, enzymic, and chromatographic (including GC and HPLC) methods; analysis and structural studies of polysaccharides; techniques for separating and analysing biological

macromolecules (including chromatography and electrophoresis); experiments to illustrate aspects of plant metabolism.

Text/Reference books

To be advised at the commencement of the course

Agricultural Chemistry Honours

The fourth year course 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 courses are obtained. The course 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.

SOIL SCIENCE

The Soil Science courses offered by the Department of Agricultural Chemistry and Soil Science 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 course is particularly relevant for students interested in the environmental and geological sciences and in land-use management.

Location

The Departmental Office is on the ground floor of the Ross St Building (A03). The Soil Science teaching laboratories are on the ground floor of the eastern wing of the Ross St Building, and are approached by a ramp and footbridge lying between the Watt and Ross St Buildings.

Noticeboards

Noticeboards are at the foot of the stairs at the entrance to the teaching laboratories in the Ross St Building.

Registration

All students are required to register with the

Department before the first day of Semester 1 to discuss their programs and timetables with the Soil Science staff.

Advice on courses

Enquiries should initially be addressed to the Departmental Office.

Tutorials

All students will be allocated to tutorial groups, which will normally be held during times allocated to practical classes.

Intermediate Soil Science courses

SOIL 201F Soil Properties and Processes 8 units

Coordinator Assoc. Prof. Koppi

Assoc. Prof. Koppi, Prof. McBratney, Mr Geering

Prereq Chemistry 102 or equivalent and 12 units of Junior Mathematics or Physics 103 or 104

Classes Sem 1: (3 lec, 1 tut, 3hr prac)/wk and a 2 day excursion

Assessment one 3hr exam, coursework, and prac report

This course 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 course 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.

SOIL 202S Soil Resources and Conservation 8 units

Coordinator Mr Geering

Assoc. Prof. Koppi, Prof. McBratney, Mr Geering, staff from the Geography Department

Prereq 12 units of Junior Mathematics

Classes Sem 2: (4 lec & 3hr prac)/wk; 5 days in the field in the week prior to the commencement of Sem 2

Assessment one 3hr exam, reports on field and lab work

Lectures on classification of soil, soil survey, pedological processes, geomorphology and soil stratigraphy, aerial photography, 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 course.

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.

Senior Soil Science courses

SOIL 301F Environmental Soil Science A 12 units

Coordinator Prof. McBratney

Prof. McBratney, Assoc. Prof. Koppi

Qual Soil Science 201

Prereq Agricultural Chemistry 201 or Chemistry 201 or 211 or 222 or 231 or 232 or 292 or Biochemistry 202 or 292

Classes Sem 1: (3 lec, 1 tut & 6hr prac)/wk, 10 days in the field

Assessment two 2hr exams, field and prac reports, problem sets, essay

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 course 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 Semester 1, 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 course is a mini class project designed to investigate a problem in soil science involving the environment. 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 course 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. A field trip to study the variety of soil types in their environmental setting is made in the mid-semester break.

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

Reference books

- E.A. FitzPatrick Soils (Longman, 1980)
 E.A. FitzPatrick Micromorphology of Soils (Chapman & Hall, 1984)
 D. Kirkman and W.L. Powers Advanced Soil Physics (Wiley 1972)
 J. Loveday (ed.) Methods for Analysis of Irrigated Soils (C.A.B., 1974)
 J. Richler The Soil as a Reactor (Catena Verlag, 1987)
 Soil Survey Staff Soil Taxonomy: A Basic System of Soil Classification for Making and Interpreting Soil Surveys Agric. Handbook No. 436 (U.S. Department Agric, Washington D.C., 1975)

SOIL 302S Environmental Soil Science B

12 units

Coordinator Mr Geering

Prof. McBratney, Assoc. Prof. Koppi, Mr Geering, Prof. Kennedy, Assoc. Prof. Copeland

Qual Soil Science 201

Prereq Agricultural Chemistry 201 or Chemistry 201 or 211 or 222 or 231 or 232 or Biochemistry 202 or 292

Classes Sem 2: (3 lec, 1 tut & 8hr prac)/wk

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 course covers advanced soil chemistry and methods of soil analysis.

Soil Chemistry

Topics include clay mineralogy, cation exchange capacity and pH dependent charge, soil charge characteristics, soil chemical analyses and their interpretation, formation of acid soil — Al and Mn toxicities, chemistry and adsorption/desorption of K, P and S in soil, soil solution and speciation of ionic components, soil salinity, oxidation/reduction reactions in soil and chemistry of soil organic matter and nitrogen.

Methods

Particle Size Analysis (PSA) of clay fraction and fractionation by centrifugation techniques, specific surface area measurements by BET Thermocouple methods for field measurements of moisture. Thermal conductivity methods for soil moisture content, gamma and neutron probe methods for field measurements of moisture content and bulk density and time-domain reflectometry. Measurement of oxidation-reduction status, O₂ diffusion rate and O₂, CO₂ concentrations in soil, selective ion-electrodes for measurements of ion activities in soil solution. Mechanical measurements of soil properties including Atterberg limits, unconfined compression, penetrometer, Proctor and compaction, torsion shear box, dynamometer, rupture-test and drop shatter test, sampling and testing procedures for determining

physical properties of swelling soils. Soil structure and stability tests in relation to aggregate size and soil micro-aggregates. Fractionation of soil organic matter and determination of principal functional groups COOH, OH involved in CEC and complexation of heavy metals.

Reference books

- S.A. Barber Soil Nutrient Bioavailability (Wiley, 1984)
 E.A. FitzPatrick Soils (Longman, 1980)
 D.J. Greenland and M.H.B. Hayes The Chemistry of Soil Constituents (Wiley 1978)
 J. Loveday (ed.) Methods for Analysis of Irrigated Soils (C.A.B., 1974)
 P.H. Nye and P.B. Tinker Solute Movement in the Soil Root System (Blackwell Scientific, 1977)
 J. Richler The Soil as a Reactor (Catena Verlag, 1987)
 G. Sposito The Chemistry of Soils (Oxford, 1989)

Soil Science Honours

This course consists of several parts:

- (i) Supplementary lectures and seminars.
- (ii) Courses 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.
- (iv) A project in one branch of soil science.

Department of Anatomy and Histology

The Department teaches anatomy and histology to students in the Faculties of Science, Medicine and Dentistry and human embryology to students of Medicine and Dentistry.

Location

The Department is in the Anderson Stuart Building. The Department Office is on the ground floor, Room 219.

Noticeboards

The noticeboards are situated next to the Department Office, Room 219, and near Rooms 223 and 331. **Students are advised to consult the noticeboards regularly.** Timetables for lectures and practical classes will be posted/where possible, in the week before the beginning of each Semester.

Advice on courses and enrolment

Students wishing to enrol in courses in Anatomy and Histology must consult the Departmental advisers in the Enrolment Centre during re-enrolment week prior to enrolling in the courses. Information will be available at this time on the courses 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.**

Intermediate Anatomy and Histology courses

ANAT 201F Comparative Histology and Embryology 4 units

Dr Moffat

Prereq 12 units of Junior Biology or Junior Psychology

Classes Sem 1: 4hr/wk, usually 2 lec & 2 prac/tut

Assessment one 1hr exam, one 1hr prac exam, one 2000w essay

This course begins with the structure of cells (cytology), mainly at the ultrastructural level, followed by the histology of the main tissues of the mammalian body: epithelia, connective tissues including bone, blood, nervous and lymphoid tissues, muscle and blood vessels. In the last three weeks of semester the course continues with an introduction to the main events of mammalian embryogenesis that establish body form.

Textbooks

M.H. Ross, L.J. Romrell and G.I. Kaye *Histology: A Text and Atlas* 3rd edn (Williams & Wilkins, 1995)

Histology Practical Book (consult Departmental noticeboards)

W. Larsen *Human Embryology* (Churchill Livingstone, 1993) or

K.L. Moore and T.V.N. Persaud *The Developing Human — Clinically Oriented Embryology* 5th edn (W.B. Saunders, 1993)

or

K.L. Moore *The Developing Human — Clinically Oriented Embryology* 4th edn (W.B. Saunders, 1988)

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

ANAT 202S Comparative Primate Anatomy 4 units

Dr Donlon

Qual Anatomy and Histology 201

Classes Sem 2: 4hr/wk, usually 2 lec & 2 prac/tut

Assessment one 1hr theory exam (40%), one 1hr prac exam (40%), one 2000w essay (20%)

This course 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

L. Aiello and C. Dean *An Introduction to Human Evolutionary Anatomy* (Academic Press, 1990)

A.L. Zihlman *The Human Evolution Colouring Book* (Barnes & Noble Books, Sydney, 1982)

Senior Anatomy and Histology courses

ANAT 301F Microscopy and Histochemistry 12 units

Assoc. Prof. Murphy, Ms Arnold

Qual Anatomy and Histology 201

Classes Sem 1: (4hr lec & 8hr lab)/wk

Assessment 15hr theory exam, 2hr prac exam practical reports and/or essays

The aims of the course 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.

Textbook

J.A. Kiernan *Histological and Histochemical Methods* 2nd edn (Pergamon, 1990)

ANAT 302S Cells and Development 12 units

Dr McAvoy

AKn (i) an understanding of the basic structure of the vertebrates;

(ii) an understanding of elementary biochemistry and generics

Qual Anatomy and Histology 201

Prereq at least 8 units of Intermediate Biochemistry

Classes Sem 1: 12hr/wk

Assessment theory exam and practical assignments

The main emphasis of this course 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 course also covers the design of experimental procedures using appropriate molecular and cellular techniques to answer developmental questions.

Textbook

Scott F. Gilbert *Developmental Biology* (Sinauer Associates Inc., Sunderland, Mass.)

ANAT 303S Transmission and Scanning Electron Microscopy 12 units

Ms Arnold

Qual Anatomy and Histology 201

Classes Sem 2: (4hr lec & 8hr lab)/wk

Assessment exam, prac reports and/or project and/or essay

This course covers the theoretical basis of resolution, electron optics, image formation, vacuum systems and instrument design as applied to TEM and SEM. It includes the theory and practice of specimen preparation, the sectioning of plastic blocks for light microscopy as well as TEM, the operation of the instruments and the application of TEM and SEM to morphometry. The course also covers special methods in electron microscopy such as environmental SEM,

scanning transmission electron microscopy (STEM), ultrastructural cytochemistry, cryo-ultramicrotomy and electron diffraction.

Textbook

J.J. Bozzola and L.D. Russell *Electron Microscopy* (Jones & Bartlett, 1992)

Reference books

Royal Microscopical Society *Microscopy Handbooks* Numbers 03,08,11,17,20,21

ANAT 304S Cranial and Cervical Anatomy 6 units

DrProvis

Qual Anatomy and Histology 202

Classes Sem 2: 1 lec, 2hr dissection, 3hr prac/tut

Assessment one 1.5hr theory exam, one 1hr prac exam, one 2500 word essay, continuous assessment (10%)

This course focuses on the peripheral distribution of the cranial nerves in the head and neck regions of the body. Emphasis is placed on the functional components of the cranial nerves and their relationship to the special senses and special motor functions such as facial gesture and speech. 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 is encouraged and assessed in a major assignment.

Textbooks

Berkovitz and Moxham *A Textbook of Head and Neck Anatomy* (Wolfe Publishing, 1988)

McMinn and Hutchings *A Colour Atlas of Human Anatomy* (Wolfe Medical Publications, London)

or

Rohen and Yokochi *Colour Atlas of Anatomy* (Ikagu-Shoin)

Anatomy Honours and Graduate Diploma

This course 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 course the student must obtain an appropriate standard in Senior Anatomy 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 courses in Histology offered by the Department of Anatomy and Histology. Students who have taken only one of the semester courses may be restricted to particular Honours projects that are related to that course.

Higher Degrees

The degrees of Master of Science, Master of Medicine and Doctor of Philosophy by research are offered by the Department of Anatomy and Histology. There are no higher degrees by coursework.

Department of Biochemistry

The Department teaches biochemistry to Science students, as well as to students in Medicine, Veterinary Science, Dentistry, Pharmacy and Chemical Engineering.

Biochemistry 201 (8 units) and Biochemistry 202 (8 units), together provide a basic program for (a) students who wish to do only one year's study in the subject and (b) for students who wish to continue on to the Senior courses, Biochemistry 301 (12 units) and Biochemistry 302 (12 units). Advanced courses based on the four one-semester courses, Biochemistry 291, 292, 391 and 392 are available to selected students. An Honours course designed for those wishing to enter research or to undertake work leading to a higher degree is conducted in the fourth year.

Additional Intermediate courses in Biochemistry are Biochemistry 211 (4 units) and Biochemistry 212 (4 units).

Location

The Biochemistry Building (G08) is across City Road in the Darlington area behind the Wentworth Building. General enquiries should be directed to the Department Office on level 6 (Room 632).

Noticeboards

Noticeboards are in the foyer, level 3, and the practical laboratories relevant to each year of the course, viz:

Biochemistry 201 and 202	laboratory 380
(both 8 units)	
Biochemistry 291 and 292	laboratory 302
(both 8 units)	
Biochemistry 301 and 302	laboratory 400
(both 12 units)	

Registration

All Senior Year students (including those repeating a course, and irregular students) are required to register with the Department, during the orientation period. Students will then be allocated the two days of the week on which to attend practical classes.

Students who attempt to register after the orientation period may find that they cannot be allocated to a particular practical class.

Advice on courses

Students are strongly urged to discuss subject choices with members of staff present among faculty advisers during the enrolment period. This applies even to students enrolling in Junior courses and who are contemplating taking Biochemistry in a subsequent year. Certain Junior subjects are recommended depending upon the area of Biochemistry (or Molecular Biology) in which a student may wish to major in their Senior year. Students wishing to major in Molecular Biology and Genetics in their Senior year should have completed both Biochemistry 201/291 and Biology 205/295 in their Intermediate year. A major in Molecular Biology or Genetics would comprise two Senior (one semester) courses in these areas, of which one could be, for example, Biochemistry 301/391. Departmental advisers listed in the handbook are available in the Department during the period prior to enrolment and during orientation.

Intermediate Biochemistry courses

BCHM 201F Genes and Proteins 8 units

Dr Denyer, Mrs Loke, Biochemistry staff

Qual 12 units of Junior Chemistry which must include Chemistry 112 or 192 or 194

Prereq 12 units of Junior courses in either Biology or Physics

Classes Sem 1: (3 lec & 5 prac)/wk

Assessment one 3hr exam, one 2hr theory of prac exam, prac tasks

The lecture course introduces the main principles of biochemistry i.e. the molecular basis of life. In the beginning the course concentrates on proteins and, in particular, the mechanism of action of enzymes in the light of what we know of their structures. The second half of the course concentrates on nucleic acids (DNA and RNA) as the molecules of heredity and gene expression, and includes a section on DNA replication, transcription and translation. The processes of replication and transcription are highly controlled in multicellular organisms and these control mechanisms are discussed. The last section of the course will describe how these processes are put together in a whole organism in order to maintain life; the anabolism and catabolism of fuels under normal conditions and under conditions of starvation or exercise.

The practical course aims to teach basic biochemical skills. The emphasis is on obtaining quality data by individual and cooperative interactions within groups for problem solving.

Textbooks

To be advised

BCHM 202S Molecules, Metabolism and Cells 8 units

Dr Denyer, Mrs Loke, Biochemistry staff

Qual Biochemistry 201 or 291

Classes Sem 2: (3 lec & 5 prac)/wk

Assessment one 3hr exam, one 2hr theory of prac exam, prac tasks

This course aims to describe, at the molecular level, how cells work. 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 course, Molecular Aspects of Cell Biology. At every stage the course 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 extraction. 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 chemistry of life: 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.

The practical course builds on the skills acquired in Biochemistry 201. The work is more complicated and more structured.

Textbooks

To be advised

BCHM 211F Genes and Proteins Theory 4 units

Dr Denyer, Biochemistry staff

Qual 12 units of Junior Chemistry which must include Chemistry 112 or 192 or 194

Prereq 12 units of Junior Biology or 12 units of Junior Physics

Classes Sem 1: 3 lec /wk

Assessment one 3hr exam

This course comprises just the lecture course component of Biochemistry 201.

Textbooks

To be advised

BCHM 212S Molecules, Metabolism and Cells Theory 4 units

Dr Denyer, Biochemistry staff

Qual Biochemistry 201, 211 or 291

Classes Sem 2: 3 lec/wk

Assessment one 3hr exam

This course comprises just the lecture course component of Biochemistry 202.

Textbooks

To be advised

BCHM 291F Genes and Proteins Advanced 8 units

Dr Denyer, Mrs Loke, Biochemistry staff

Qual 12 units of Junior Chemistry which must include Chemistry 112 or 192 or 194 (selected students)

Prereq 12 Junior units of either Biology or Physics

Classes Sem 1: (3 lec & 5 prac)/wk

Assessment one 3hr & one 1hr theory exam, one 2hr theory of prac exam, prac tasks, assignments

The lecture and practical courses are the same as for Biochemistry 201. Selected students will be set special advanced assignments, and attend tutorials on these assignments during the practical class.

Textbooks

To be advised

BCHM 292S Molecules, Metabolism and Cells Advanced 8 units

Dr Denyer, Mrs Loke, Biochemistry staff
Qual Biochemistry 201 or 291 (selected students)
Classes Sem 2: (3 lec & 5 prac)/wk
Assessment one 3hr & one 1hr theory exam, one 2hr theory of prac exam, prac tasks, special assignments

The lecture and practical courses are the same as for Biochemistry 202. Selected students will be set special advanced assignments, and attend tutorials on these assignments during the practical classes.

Textbooks
 To be advised

Senior Biochemistry courses **BCHM 301F Molecular Biology and Structural Biochemistry 12 units**

Dr Easterbrook-Smith, Mrs Johnston, Biochemistry staff
Qual Biochemistry 202 or 292
Classes Sem 1: (4 lec & 8 prac)/wk
Assessment one 3hr & one 2hr theory exam, one 1.5hr theory of prac exam, prac work

The course is designed to build on the courses Biochemistry 201 and Biochemistry 202. It provides comprehensive training in molecular biology (with emphasis on eukaryotic systems) and structural biochemistry. The lecture component consists of core and option components. Students can choose from among the option components to enhance their knowledge of specialised topics. The practical component is designed to complement the lecture course and to provide students with experience in a wide range of techniques used in molecular biology and protein biochemistry laboratories.

Core lectures

The core lectures are divided evenly into two areas. The *Molecular Biology* section provides a thorough description of key areas of modern molecular biology, particularly hierarchies of gene regulation, mutations and disease, the cell cycle and programmed cell death, and shepherding proteins around the cell. The *Structural Biochemistry* section addresses the important areas of protein structure, ligand binding and drug design, macromolecular recognition, and molecular immunology.

Option lectures

The lecture course contains two 6-lecture option series. Options available in molecular biology include molecular biology of receptors and signal transduction, molecular cloning, the bacterial cell division cycle, medical molecular biology, applied medical molecular biology, and transcription. Options in the area of structural biochemistry include protein engineering and drug design, and macromolecular interactions.

Textbooks
 To be advised

BCHM 302S Metabolic and Medical Biochemistry 12 units

Dr Easterbrook-Smith, Mrs Johnston, Biochemistry staff
Qual Biochemistry 202 or 292
Classes Sem 2: (4 lec & 8 prac)/wk
Assessment one 3hr & one 2hr theory exam, one 1.5hr theory of prac exam, prac work

Normal cellular processes may become disturbed due to mutation or some external factor affecting an enzyme or mechanisms controlling cellular growth. Some of the disease outcomes of these changes, together with the way that external signals are transmitted to the interior of cells, form the basis of this course.

The *Metabolism and Disease* core lecture course concerns the problems arising when normal energy-yielding metabolic processes are unable to function correctly. Intolerance to carbohydrates and the inability to metabolise glucose, glycogen storage diseases, problems associated with the incorrect functioning of enzymes associated with the urea cycle and those of amino acid metabolism, together with mitochondrial malfunction, reinforce and extend the overall metabolic picture presented in Biochemistry 202.

Cell Growth and Cancer traces the problems that arise when cells lose control of their cycle of cell division due to mutations. The mechanisms involved in the causes of cancer are complemented by the techniques and targets available for its treatment. Signal Transduction deals with the mechanisms involved in transmitting signals across cell membranes. The role and function of receptors, hormones, second messengers and ion-channels is complemented by a discussion of the techniques available for probing signal transduction mechanisms.

Insulin and Diabetes is concerned with the normal role of insulin in metabolism and the problems that arise when insulin is not produced, is produced in a modified form, or when cells become resistant to it.

The series of option lectures include *The Macronutrients*, *The Vitamins*, *Xenobiotics*, *Receptors and Cellular Signalling*, *Inorganic Elements and Nutrition*, *The Biochemistry of Exercise*, *Lipoproteins* and *In vivo NMR spectroscopy*.

The practical course is designed to complement the lecture course and provide students with experience in sophisticated biochemical techniques.

Textbooks
 To be advised

BCHM 391F Molecular Biology and Structural Biochemistry Advanced 12 units

Dr Easterbrook-Smith, Mrs Johnston, Biochemistry staff
Qual Biochemistry 202 or 292 (selected students)
Classes Sem 1: (4 lec & 8 prac)/wk
Assessment one 3hr, one 2hr & one 1hr theory exam, one 1.5hr theory of prac exam, prac work

The lecture and practical courses are the same as for Biochemistry 301. Selected students will be set special advanced assignments related to the topics covered in the core lecture course, and attend tutorials on these assignments during the practical class.

Textbooks
 To be advised

BCHM 392S Metabolic and Medical Biochemistry Advanced 12 units

Dr Easterbrook-Smith, Mrs Johnston, Biochemistry staff
Qual Biochemistry 202 or 292 (selected students)
Classes Sem 2: (4 lec & 8 prac)/wk
Assessment one 3hr, one 2hr & one 1hr theory exam, one 1.5hr theory of prac exam, prac work

The lecture and practical courses are the same as for Biochemistry 302. Selected students will be set special advanced assignments related to the topics covered in the core lecture course, and attend tutorials on these assignments during the practical class.

Textbooks
To be advised

Biochemistry Honours

The course runs from about mid-February until mid-November. 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 courses students are invited to apply for permission to enrol in the Honours course 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
Kinetics of enzymic reactions
The cause of diabetes and/or obesity; fuel metabolism during exercise
Structure and function of clusterin, a molecule implicated in programmed cell death
X-ray crystallography of proteins which solve problems in molecular biology or are of potential clinical value
Metabolic pathways in boar spermatozoa
NMR studies of the solution structure of vasoactive peptides and DNA binding proteins
NMR studies of membrane transport and metabolism in cells
Protein interactions of the red cell cytoskeleton
Eukaryotic transcription factors
Thermodynamics of protein association reactions and analytical ultracentrifugation
Bioavailability of trace elements and biochemical indicators of their nutritional status
Cellulose digestion and nitrogen metabolism in termites
Studies on the collagens of marsupials
The effect of fibre on blood and urinary estrogens
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 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 minimum requirement for acceptance into the course is a pass at the Credit level in 12 units of Senior Biochemistry courses. However, it should be kept in mind that in determining the grade of Honours to be awarded at the end of the Honours year, the level of attainment in the first three years of the undergraduate course is taken into account. The Department is therefore reluctant to accept students into the Honours course where there is little evidence of merit in subjects other than Biochemistry. It should be noted that the number of students accepted into the Honours course may be limited because of resource restrictions (e.g. 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.

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School of Biological Sciences

Junior year

Location

Carslaw Building, F07, near the bridge over City Road. The Biology Office is in Room 512 on the 5th floor; the laboratories are on the 3rd floor.

Noticeboards

The noticeboards are located outside Laboratory 4 on the 3rd floor.

The noticeboards in the laboratories are in frequent use. Students should make a habit of looking at these each time they enter a laboratory.

Registration

All students are required to register with the Department during the first or second practical class of first semester.

Advice on courses

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.

Intermediate and Senior years, Honours

Location

Buildings A08, A1 1 and A1 2, Science Road.

Junior Biology courses

BIOL 101F Concepts in Biology 6 units

AKn Biology section of the HSC 3-unit Science course

Classes Sem 1: (3 lec & 3 prac)/wk

Assessment one 2hr 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, plants and animals. 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. This course is prerequisite for all second semester Biology courses.

Textbook

R.B. Knox *et al.* Biology (McGraw-Hill, 1995)

BIOL 191F Concepts in Biology (Advanced) **6 units**

AKn Biology section of the HSC 3-unit Science course

Classes Sem 1: (3 lec & 3 prac)/wk

Assessment one 2hr exam, assignments, classwork

Selected students may be invited to participate in a more demanding alternative component of the Concepts in Biology course. The content and nature of this component will be determined each year. Details and selection criteria are announced at the start of semester.

BIOL 102S Living Systems **6 units**

Prereq Biology 101 or 191

Classes Sem 2: (3 lec & 3 prac)/wk

Assessment one 2hr 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 course 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 medicine, agriculture and conservation are introduced. Enrolment may be restricted by the availability of places. This course provides entry to all Intermediate courses in biology in the School of Biological Sciences.

Textbook

R.B. Knox *et al.* Biology (McGraw-Hill, 1995)

BIOL 192S Living Systems (Advanced) **6 units**

Prereq Biology 101 or 191

Classes Sem 2: (3 lec & 3 prac)/wk

Assessment one 2hr exam, assignments, classwork

Selected students may be invited to participate in a more demanding alternative component of the Living Systems course. The content and nature of this component will be determined each year. Details and selection criteria are announced in the first semester.

BIOL 103S Human Biology **6 units**

Prereq Biology 101 or 191

Classes Sem 2: (3 lec & 3 prac)/wk

Assessment one 2hr exam, assignments, classwork

This course 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 course 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, the course concludes with some controversial aspects of human genetics. Enrolment may be restricted by the availability of places. This course provides entry to Intermediate courses in genetics and cell biology in the School of Biological Sciences, but not to the School's other Intermediate courses.

Textbook

S.S. Mader *Human Biology* 4th edn (Wm. C. Brown, 1995)

BIOL 193S Human Biology Advanced **6 units**

Dr R. Overall, Prof. I.D. Hume

Prereq Biology 101 or 191

Classes Sem 2: (3 lec & 3 prac)/wk

Assessment one 2hr exam, assignments, classwork

Selected students may be invited to participate in a more demanding alternative component of the Human Biology courses. The content and nature of this component will be determined each year. Details and selection criteria are announced in the first semester.

Intermediate Biology courses

Students who wish to take Intermediate Biology courses should obtain Information for Students Considering Intermediate Biology Courses from Carlsaw Lecture Room 3A during the Faculty of Science enrolment period or from the School Office (The Cottage, A10, Science Road) after the enrolment period. Students should discuss their preference of courses, together with the other subjects they propose to study, with a Biology staff member when enrolling.

The following Intermediate courses are offered:

Semester 1

Group 1

BIOL 201 Animals A

BIOL 211 Animals A — Theory

BIOL 291 Animals A (Advanced)

Group 2

BIOL 203 Plant Anatomy and Physiology

BIOL 293 Plant Anatomy and Physiology (Advanced)

Group 3

BIOL 206 Cell Biology

BIOL 216 Cell Biology — Theory

BIOL 296 Cell Biology (Advanced)

Semester 2

Group 4

BIOL 202 Animals B

BIOL 212 Animals B — Theory

BIOL 292 Animals B (Advanced)

Group 5

BIOL 204 Plant Ecology and Diversity

BIOL 294 Plant Ecology and Diversity (Advanced)

Group 6

BIOL 205 Molecular and General Genetics

BIOL 215 Molecular and General Genetics — Theory

BIOL 295 Molecular and General Genetics (Advanced)

Not more than one course may be taken from each group, and a maximum of 32 units of Intermediate Biology may be counted towards the degree. Qualifying courses for certain Senior Biology courses are defined as combinations of 8 unit Intermediate Biology courses (see the Senior course descriptions or *Information for Students* booklets).

BIOL 201F Animals A

8 units

Biological Sciences staff

Qual 12 units of Junior Biology including Biology 102 or 192
Prereq Chemistry 112 or 192 or 194 or (with the permission of the Head of School) exceptional performance in Chemistry 102

Classes Sem 1: (3 lec, 1 discussion group & 3 prac)/wk or (4 lec & 3 prac)/wk and one field trip/yr

Assessment one 3hr exam, 1 prac exam, 1 essay, quizzes

This course 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. This material is presented within the conceptual framework of evolution and the principles and use of phylogeny and classification. Discussion groups further explore concepts of evolution, phylogeny and animal function. The course is designed to be taken in conjunction with Biology 202 Animals B; the two courses together provide complete coverage of the diversity of animals at the level of phylum. This course may be taken alone, but when taken with Biology 202 Animals B provides entry into animal modules in Senior Biology courses.

BIOL 291F Animals A (Advanced)

8 units

Coordinator Biology 201 Course Executive Officer

Selected students may be invited to participate in alternative components of the Biology 201 Animals A course. The content and nature of these components may vary from year to year. Selection criteria and details are announced at/ or prior to enrolment by the Course Executive Officer.

BIOL 211F Animals A — Theory

4 units

Biological Sciences staff

Qual 12 units of Junior Biology including Biology 102 or 192

Classes Sem 1: (3 lec & 1 prac)/wk

Assessment one 3hr exam, quizzes

This course 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 course is designed to be taken with Biology 212S Animals B — Theory. The diversity, morphology and evolution of most invertebrate animals are presented.

BIOL 202S Animals B

8 units

Biological Sciences staff

Prereq Biology 201 or 291

Classes Sem 2: (3 lec, 1 discussion group & 3 prac)/wk or (4 lec & 3 prac)/wk and one field trip

Assessment one 3hr exam, 1 prac exam, field report, 1 exam, quizzes

This course completes the grounding in the diversity of animals at the level of phylum introduced in Biology 201 Animals A by lectures, laboratory classes, and in the field with an intensive 3.5 day field trip. It focuses on vertebrates and invertebrate phyla not covered in Biology 201 Animals A. Lectures and discussion groups further explore concepts of evolution, phylogeny and animal function. This course complements Biology 201 Animals A and cannot be taken without that course. It is a prerequisite for most animal modules in senior Biology courses.

BIOL 292S Animals B (Advanced)

8 units

Coordinator Biology 202 Course Executive Officer

Selected students may be invited to participate in alternative components of the Biology 202 Animals B course. The content and nature of these components may vary from year to year. Selection criteria and details are announced at or prior to enrolment by the Course Executive Officer.

BIOL 212S Animals B — Theory

4 units

Biological Sciences staff

Prereq Biology 211

Classes Sem 2: (3 lec & 1 prac)/wk

Assessment one 3hr exam, quizzes

This is a terminating course that provides an introduction to the diversity of animals at the level of phylum. The course 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 invertebrate phyla not covered in Biology 211 Animals A — Theory. The course is designed to be taken with Biology 211 Animals A — Theory and is suitable for students who are majoring in other areas of biology or other subjects but who wish to acquire a background in animal biology.

BIOL 203F Plant Anatomy and Physiology

8 units

Assoc. Prof. Allaway, Dr McGee, Dr Overall

Qual 12 units of Junior Biology including Biology 102 or 192

Classes Sem 1: (2 lec, 1 prac/audiovisual & 1 tut)/wk

Assessment one 2.5hr exam, one prac exam, project, classwork

The course 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. Lectures and self-instructional audiovisual study are augmented by group discussions and laboratory experiments. This course complements Biology 204 and leads up to advanced plant modules in Senior Biology.

BIOL 293F Plant Anatomy and Physiology (Advanced) 8 units

Coordinator Biology 203 Course Executive Officer

Selected students may be invited to participate in alternative components of Biology 203. The content and nature of these components may vary from year to year. Selection criteria and details are announced at or prior to enrolment by the Course Executive Officer.

BIOL 204S Plant Ecology and Diversity 8 units

Dr Henwood, Prof. Larkum, Dr McGee, Dr Marc, Dr Wardle
Qual 12 units of Junior Biology including Biology 102 or 192
Classes Sem 2: (2 lec, 1 prac/audiovisual & 1 tut)/wk
Assessment one 3hr exam, 1 prac exam, one 1000w essay, classwork

The course provides an integrated overview of plant ecology and plant diversity. It examines how plants 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 living in the sea, freshwater, and on the land 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 course complements Biology 203 and leads up to plant modules in Senior Biology courses.

BIOL 294S Plant Ecology and Diversity (Advanced) 8 units

Coordinator Biology 204 Course Executive Officer

Selected students may be invited to participate in alternative components of Biology 204. The content and nature of these components may vary from year to year. Selection criteria and details are announced at or prior to enrolment by the Course Executive Officer.

BIOL 205S Molecular and General Genetics 8 units

Biological Sciences staff

Qual 12 units of Junior Biology

Prereq Chemistry 112 or 192 or 194 or (with the permission of the Head of School) exceptional performance in Chemistry 102

Classes Sem 2: (3 lec, 1 tut & 4 prac)/wk

Assessment one 3hr exam, one 2hr theory of prac exam, assignments, pracs

A course which covers the fundamentals of genetics in lower and higher organisms, and the use of molecular genetics techniques. Topics including Mendelian genetics, linkage, gene and genome mapping, chromosome organisation and change, gene mutation, microbial and bacterial genetics, phage genetics, cloning vectors and application of recombinant DNA technology, developmental genetics, molecular evolution, and ecological and conservation genetics are covered in lectures, tutorials and laboratory classes. This course is the qualifying course for Biology 313 and Biology 323. The combination of this course with the 8 unit courses Biology 206 and Biochemistry 201 is recommended.

BIOL 295S Molecular and General Genetics (Advanced) 8 units

Coordinator Biology 205 Course Executive Officer

Selected students may be invited to participate in alternative components of the Biology 205 Molecular and General Genetics course. The content and nature of these components may vary from year to year. Selection criteria and details are announced at or prior to enrolment by the Course Executive Officer. This course is a core Intermediate course in the BSc (Molecular Biology and Genetics) program.

BIOL 215S Molecular and General Genetics — Theory 4 units

Biological Sciences staff

Qual 12 units of Junior Biology

Prereq Chemistry 112 or 192 or 194 or (with permission of the Head of School) exceptional performance in Chemistry 102

Classes Sem 2: (3 lec, 1 tut)/wk

Assessment one 3hr exam, assignments

This course provides a solid theoretical foundation in genetics. Topics include Mendelian genetics, chromosomes, linkage and mapping, mutation, microbial genetics, recombinant DNA technology, developmental, ecological and conservation genetics, and molecular evolution. The course is presented in the form of lectures and tutorials only; there are no practical classes. The course is not suitable for students continuing with genetics courses in third year, for which Biology 205 or Biology 295 are appropriate.

BIOL 206F Cell Biology 8 units

Biological Sciences staff

Qual 12 units of Junior Biology

Prereq Chemistry 112 or 192 or 194 or (with the permission of the Head of School) exceptional performance in Chemistry 102

Classes Sem 1: (3 lec, 1 tut & 3-4 prac hrs)/wk

Assessment one 3hr theory exam, one 2hr theory of prac exam, pracs & assignments

A course on cell biology and development in plants and animals, emphasizing the functioning of the cell and favouring the molecular perspective. Topics include cell and organelle structure and function, cellular development and differentiation, and embryonic development. The course is given by means

of lectures, tutorials, discussion groups and laboratory classes. The course leads into Cell Biology and Physiology modules in Senior Biology. The course is designed to complement Biology 205. Students intending to major in areas of genetics, cell biology or development are advised to take this combination.

BIOL 296F Cell Biology (Advanced) 8 units
Coordinator Biology 206 Course Executive Officer

Selected students may be invited to participate in alternative components of Biology 206. The content and nature of these components may vary from year to year. Selection criteria and details are announced at or prior to enrolment by the Course Executive Officer.

BIOL 216F Cell Biology — Theory 4 units
 Biological Sciences staff

Qual 12 units of Junior Biology

Prereq Chemistry 112 or 192 or 194 or (with the permission of the Head of School) exceptional performance in Chemistry 102

Classes Sem 1: (3 lec & 1 tut)/wk

Assessment one 3hr theory exams, assignments

This course provides a solid theoretical foundation in cellular and developmental biology. Topics include cell and organelle structure and function, cellular development and differentiation, and embryonic development. The course is presented in the form of lectures and tutorials only; there are no practical classes. The course is not suitable for students continuing with genetics, cell biology or development options in Senior year, for which Biology 206 or Biology 296 are appropriate.

Senior Biology courses

Students who intend to proceed from Intermediate to Senior Biology must:

- obtain *Information for Students Considering Senior Biology Courses* from the School Office (The Cottage, A10, Science Road). This booklet gives detailed synopses of all options in the course.
- discuss their choice of subjects with a Biology staff member when enrolling.
- register in Room 227 (Building A08) during the first week of first semester.

Six 12 unit courses are available. The courses are arranged in three compatible timetables.

Timetable 1

BIOL 311F Ecophysiology Sem 1

Ecophysiology core

Animal Ecophysiology module

Plant and Fungal Ecophysiology module

BIOL 321S Cellular and Systems Physiology Sem 2

Cellular and Systems Physiology core

Animal Physiology module

Plant Cells and Molecules module

Timetable 2

BIOL 312F Evolution and Diversity of the Australian Biota Sem 1 (MS)

Evolution and Diversity of the Australian Biota core (MS)

Plant Diversity and Biogeography module

Biology of Terrestrial Vertebrates module

Marine Biology module (MS)

Entomology

BIOL 322S Ecology Sem 2 (MS)

Ecology core (MS)

Marine Ecology module (MS)

Terrestrial Ecology module

Plant Ecology module

Timetable 3

BIOL 313F Molecular Genetics and Recombinant DNA Technology Sem 1

BIOL 393F Molecular Genetics and Recombinant DNA Technology (Advanced) Sem 1

BIOL 323S Eukaryotic Genetics and Development Sem 2

BIOL 394S Eukaryotic Genetics and Development (Advanced) Sem 2

Locations of lectures and practical classes are given in the booklet *Information for Students Considering Senior Biology Courses*.

A course may involve an obligatory core and one associated module. Any combination of courses may be chosen subject to timetable and prerequisite constraints. Modules in any option are only available if the core part of the course has been taken first, and cores cannot be taken without being followed by an associated module. An exception to this rule applies to those Marine Science students who have chosen to do only six units of Senior Biology in first semester: in this case, students may take either the Evolution and Diversity of the Australian Biota core or the Marine Biology module (first semester, starting in week 7) in isolation from the other.

Courses, modules, and places in modules, are offered subject to student numbers, availability of staff and resources. Quotas may be imposed on any Senior Biology module from time to time and in that event entry would normally be based on academic performance.

Marine Science students must do 24 units of Marine Science but are allowed to include from 6 to a maximum of 18 units of Biology (from those marked MS) as part of Marine Science. If these units are taken as part of Marine Science they may not be counted towards Senior Biology courses.

Selecting course options

Select your core and associated modules after (a) checking that you have passed the qualifying courses stated for each of the modules listed below, and (b) checking your timetable. You are strongly advised to check the most up-to-date information on options, including details of quotas, in the booklet *Information for Students Considering Senior Biology Courses*, available from the School Office in The Cottage, A10, Science Road.

Textbooks and reference books

A list of textbooks and reference books is provided in the booklet *Information for Students Considering Senior Biology Courses* obtainable from the School Office in Building A10

BIOL 311F Ecophysiology 12 units

Assoc. Prof. Allaway, Assoc. Prof. Armati, Prof. Hume, Prof. Larkum, Dr McGee, Dr Thompson and others
Qual 16 units of Intermediate Biology including Biology 202 or 203 or 206 or 292 or 293 or 296

Classes Sem 1: (4 lec and 8 prac)/wk, one 3-day field course.
Timetable 1

Assessment one 3hr exam, field trip exam, assignments

Ecophysiology core

The core covers general physiological interactions between organisms and their environments. The range of environments inhabited by organisms is outlined and the influences of important environmental parameters including temperature, water, salt, pH, and respiratory gases are investigated. Physiological interactions between animals, plants and fungi are discussed. The six-week core is followed by one of two modules, Animal Ecophysiology or Plant and Fungal Ecophysiology.

Animal Ecophysiology module

Assoc. Prof. Armati, Prof. Hume, Dr Thompson and others
Qual Biology 201 or 291 and 202 or 292

Classes Sem 1: (4 lec and 8 prac)/wk. Timetable 1

Assessment one 1.5hr exam, field trip exam, lab. assignments

Animal Physiology builds on the core to explore aspects of ecophysiology of animals in detail. Topics covered include endocrinology, reproductive physiology, digestive physiology, thermal biology, water and salt balance, scaling, metabolism and energetics of locomotion. The focus is on vertebrates, but invertebrate examples are used also. Laboratory classes form an important part of the course.

Plant and Fungal Ecophysiology module

Assoc. Prof. Allaway, Prof. Larkum, Dr McGee and others
Qual 16 units of Intermediate Biology including Biology 203 or 293 or 206 or 296

Classes Sem 1: (4 lec and 8 prac)/wk. Timetable 1

Assessment one 1.5hr exam, project

Plant and Fungal Ecophysiology is concerned with understanding mechanisms that determine the function of plants and/or fungi in their environment. In this module, we examine plants from different environments and, in particular, their interaction with fungi. We are concerned with the reaction of plants/fungi and plant/fungal associations to environmental stress and how we assess the importance of these factors on plant growth and development.

BIOL 312F Evolution and Diversity of the Australian Biota (MS) 12 units

Dr Henwood, Assoc. Prof. Hinde, Dr Hoegh-Guldberg, Dr Kingsford, Prof. Patterson, Prof. Shine, Dr Taylor and others

Qual 16 units of Intermediate Biology including Biology 202 or 203 or 204 or 292 or 293 or 294

Classes Sem 1: (4 lec and 8 prac)/wk. Timetable 2

Assessment one 3hr exam, assignments, projects

Evolution and Diversity of the Australian Biota (MS) Core 6 units

The core takes as its theme the 'uniqueness' of the Australian aquatic and terrestrial biota. Students are exposed to current concepts (and the theories upon which they are based) concerning the origin, evolution and recognition of various components of the Australian biota including protists, plants and animals. Evolution and diversity are major themes of the course. The lecture series is complemented by a series of discussion groups in which students will be given the opportunity to gain experience of Australian organisms and the analytical techniques employed to study them. The core prepares students for one of a number of modules that will permit the study of various aspects of the Australian biota at a deeper level.

Plant Diversity and Biogeography module

Dr Henwood, Dr Taylor and others

Qual 16 units of Intermediate Biology including Biology 204 or 294

This module deals with the reproductive biology, biogeography and evolution of flowering plants. Students are 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.

Biology of Terrestrial Vertebrates module

Prof. Shine, Dr Dickman and others

Qual Biology 201 and 202 or 291 and 292

Classes Sem 1: (4 lec and 8 prac)/wk, two 2-day field courses.
Timetable 2

Assessment core assessment plus one 1.5hr exam, assignments, projects

An evolutionary perspective on the radiation of terrestrial vertebrates, with special emphasis on the biogeography, phylogeny, morphology and ecology of representative taxa in the Australian fauna. The course includes at least one field trip to familiarise students with vertebrates of the Sydney region, and the techniques used to observe, capture, handle, identify and study them.

Marine Biology module (MS) 6 units

Assoc. Prof. Hinde, Dr Hoegh-Guldberg, Dr Kingsford, Prof. Patterson

Qual either Biology 201 or 291 and 202 or 292 or Biology 203 and 204 or 293 and 294

Marine biological diversity is discussed with particular attention to the major types of marine habitats represented along the Australian coastline. Emphasis is placed on exposing students to the key ideas, researchers and methodologies within selected fields of marine biology. Students will develop skills in areas such as the identification of marine algae and the techniques used to study marine animals and plants. Discussion sessions will review major marine biological themes, laboratory sessions will develop hands-on experience with marine organisms, and field trips include one to Jervis Bay. If there is sufficient

demand, classes on Protistology may be made available as alternatives to parts of this module.

Entomology 12 units

Staffing to be notified

Qual Biology 201 or 291 and 202 or 292

Classes Sem 1: (4 lec & 8 prac) / wk

Assessment one 3hr theory exam, 2 prac exams

This option occupies the whole semester and deals with the external and internal morphology of the major orders of insects. Lectures also cover the basic characteristics of each order of insects, their general life cycle and important pests or beneficial species. The biogeography and evolution of the insects are considered. Some basic aspects of taxonomic theory are also dealt with. Practical classes deal with the classification of the class Insecta and students will be expected to key out insects to family level in the major orders only.

BIOL 313F Molecular Genetics and Recombinant DNA Technology 12 units

Dr Lyon, Prof. Skurray and others

Qual 15 units of Intermediate Biology including Biology 205 or 295

Classes Sem 1: (4 lec & 8 prac)/wk, one 2-day excursion. Timetable 3

Assessment one 3hr exam, one 1.5hr prac exam, prac reports, seminars

A course of lectures, seminars, practicals and tutorials on molecular genetics and its application to the genetic manipulation of both prokaryotic and eukaryotic organisms. Lectures cover the molecular genetics of bacterial and animal viruses including HIV, prokaryotic and eukaryotic gene regulation and expression, whole genome analysis, plasmids, transposons and mobile DNA, yeast genetics, and the use of molecular techniques in systematics and ecology. The application of molecular genetics in biotechnology is covered in lectures on the cloning and expression of foreign genes in bacteria, yeast, animal and plant cells, novel human and animal therapeutics including human gene therapy, new diagnostic techniques for human and veterinary disease, the genetic engineering of animals and plants, and the release of genetically modified organisms into the environment. Practical work includes the use of molecular techniques for DNA isolation, digestion, electrophoresis, cloning and PCR amplification, labelling of DNA probes and DNA hybridisation, DNA sequencing and computer analysis of gene sequences, and immuno-detection of proteins.

BIOL 393F Molecular Genetics and Recombinant DNA Technology Advanced 12 units

Coordinator Biology 313 Course Executive Officer

Selected students may be invited to participate in alternative components of the Biology 313 Molecular Genetics and Recombinant DNA Technology course. The content and nature of these components may vary from year to year. Selection criteria and details are announced at or prior to enrolment by the Course Executive Officer.

BIOL 321S Cellular and Systems

Physiology 12 units

Assoc. Prof. Allaway, Assoc. Prof. Armati, Dr Hoegh-Guldberg, Prof. Larkum, Dr Marc, Dr Meats, Dr Morris, Dr Overall

Qual 16 units of Intermediate Biology including Biology 202 or 203 or 206 or 292 or 293 or 296

Classes Sem 2: (4 lec & 4 prac)/wk, excursion. Timetable 1

Assessment one 3hr exam, assignments, prac quiz

Cellular and Systems Physiology Core

The core occupies the lectures and laboratories for weeks 1-6 before students elect one of the modules below. The core covers aspects of physiology at the cellular level common to most organisms. The nature of cell membranes, permeability, active transport and the importance of these processes in producing electrical gradients are discussed and examples provided, relating these to both plant and animal models. The interactions between cells are an important theme in the cell physiology core which provides important background on cell signalling and the concepts of immunity. Recent ideas on the cytoskeleton and the control of the cell cycle are discussed. The core includes an introduction to molecular techniques as used in contemporary physiology.

Animal Physiology module

Dr Hoegh-Guldberg, Dr Meats, Dr Morris

Qual Biology 201 and 202 or 291 and 292

The course examines the basis of physiological responses by animals. Mechanisms in animal adaptation are covered at the level of cells, tissues, organs and whole organisms. They are related to the physiological ecology of the species. Both vertebrate and invertebrate examples are used. There is a large emphasis on the practical aspects of physiological experimentation and associated methodologies. The lecture series discusses a variety of homeostatic mechanisms, including maintenance of water and salt balance, acid-base state, regulation of respiration and blood function as well as muscle function and vision systems. Each topic is explored from the aspect of process and mechanism before relating these to the requirements of the animal. In this way the response to environmental changes, and the role of each system in the adaptation of animal to environment, can be outlined. The theory and practical exercises are complemented by a four-day field exercise in environmental physiology, adaptive biology and field monitoring.

Plant Cells and Molecules module

Assoc. Prof. Allaway, Dr Marc, Dr Overall

Prereq 16 units of Intermediate Biology including Biology 203 or 293 or 206 or 296

Current topics at the interface of plant molecular biology, plant cell biology and developmental physiology are explored. Subjects covered include the cytoskeleton, cell cycle control, recent ideas on gravitropism and photochrome, hormones, signal transduction apical meristems and flowering. Advances in the molecular understanding of plant physiology and development are discussed. Practical work, which uses a variety of plant material including

protoplasts, suspension cultures, *Arabidopsis* seedlings and mature plants, includes a range of molecular techniques, including immunocytochemistry, protein purification and characterisation and fluorescence and gas-exchange methods for photosynthetic analysis. The excursion takes the form of a workshop including seminars and discussion groups.

BIOL 322S Ecology (MS) 12 units

Dr Dickman, Dr Meats, Prof. Underwood, Dr Wardle and others

Qual 16 units of Intermediate Biology including Biology 202 or 204 or 292 or 294

Classes Sem 2: (4 lec & 8 prac)/wk, one 8-day field course in vacation before Sem 2. Timetable 2

Ecology Core (MS)

The core covers topics on theory, quantification and experimentation in ecology and analysis of patterns of distribution, abundance, dynamics, demography and life histories of natural populations. Multi-species interactions in animal communities are considered. An integrated part of the core is the application of ecological theory and methods to testing hypotheses and solving practical problems. The core is followed, after the first five weeks, by one of three modules: Marine Ecology, Terrestrial Ecology or Plant Ecology.

Marine Ecology module (MS)

Prof. Underwood, Dr Kingsford

Qual Biology 201 and 202 or 291 and 292

Marine Ecology provides practical experience with quantitative sampling and experimental analysis of populations. The emphasis is on the logical structure of ecological investigations and on the design and analysis of sampling and experimental studies. The module also explores the relationships between theories, practical evidence and the solution to problems of pollution, environmental disturbance, conservation and management of exploited resources.

Terrestrial Ecology module

Dr Dickman, Dr Hochuli, Dr Meats

Qual Biology 201 and 202 or 291 and 292 or 16 units of Intermediate Biology including Biology 204 or 294

Terrestrial ecology considers the biology of organisms in terrestrial ecosystems and analysis of their distribution and abundance. Practical experience in quantitatively sampling vertebrates and invertebrates in the field and analysing these data are an important component of the module, as are research projects designed and carried out by students. Topics covered in lectures include ecology at the population level, food chains and ecosystems, harvesting and management, habitat selection, niche theory, competition, predation and biodiversity, and conservation issues. The module will investigate the relationships between ecology and the management of populations and communities for conservation and the managed exploitation of resources.

Plant Ecology module

Dr Wardle

Qual 16 units of Intermediate Biology including Biology 204 or 294

Plant Ecology integrates experimental studies, quantitative sampling and theoretical models to examine the ecological processes that produce complex interactions in natural populations. Students will gain first hand experience in field systems and will have the opportunity to undertake an individual research project. The appropriate use of statistical methods for analysing data will be emphasised. The lectures will 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 will be given on the role of genetics, demography and population structure in the conservation and management of plants.

BIOL 323S Eukaryotic Genetics and Development 12 units

Assoc. Prof. Armati, Assoc. Prof. Gillies, Dr Oldroyd and others

Qual 16 units of Intermediate Biology including Biology 205 or 295

Classes Sem 2: (4 lec & 8 prac)/wk, one 2-day excursion. Timetable 3

Assessment one 3hr exam, one 1.5hr prac exam, prac reports, seminars

A course of lectures, seminars and practicals on molecular genetics and its application to the understanding of mammalian and human genetics, animal development and differentiation, and evolutionary biology. Lectures cover molecular and ultrastructural arrangement of DNA sequences and genes in eukaryotic genomes and chromosomes, mammalian gene organisation and expression, biochemical and molecular genetics of human disease, linkage and mapping, genetics of early animal development, nerve cell differentiation and growth, MHC function and recognition of self, sequence evolution, population and evolutionary genetics. Practical work provides experience with a range of molecular, cytological and genetical skills while illustrating theoretical principles.

BIOL 394S Eukaryotic Genetics and Development (Advanced) 12 units

Coordinator Biology 323 Course Executive Officer

Selected students may be invited to participate in alternative components of the Biology 323 Eukaryotic Genetics and Development course. The content and nature of these components may vary from year to year. Selection criteria and details are announced at or prior to enrolment by the Course Executive Officer.

Biology Honours

A single Honours program in Biology accommodates students who have completed 24 units of Senior Biology or equivalent. Information about qualifications for entry into Honours is available from the School Office (Building A10).

During the Honours year the principles established in the first three years of the undergraduate 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 the Honours course will be notified of acceptance shortly after the publication of the second semester Senior course examination results. Honours students are expected to start their academic year at the beginning of February.

With the permission of the Head of School and the Faculty of Science, students who have qualified to take an Honours course and passed 12 units of Junior Biology may take Biology Honours without having taken Intermediate or Senior Biology courses. 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 Dr R. L. Overall.

The Honours course 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) *a course in experimental design*, and other technical instruction.

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.

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 (see below), 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 Postgraduate Studies Handbook, which is available from the School Office (Building A10).

Graduate Diploma in Science

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 (Building 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 shortly after the publication of the second semester Senior course examination results. Graduate Diploma students are expected to start their academic year at the beginning of February.

The composition of the Graduate Diploma course is identical to that for the Honours course (see Biology Honours).

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Cell Pathology

Senior Cell Pathology courses

CPAT 301F Cell Pathology A 12 units

Prof. Hunt, Dr Gibbins, Dr Hambly, Dr King
Prereq Anatomy and Histology 202 or Biochemistry 202 or 292, or Biology 205 or 206 or 295 or 296, or both
 Pharmacology 201 and 202, or Physiology 202
Classes Sem 1: (1 tut & 11 prac)/wk
Assessment one 2hr exam, 7 prac reports

CPAT 302S Cell Pathology B 12 units

Prof. Hunt, Dr Gibbins, Dr Hambly, Dr King
Qual CeU Pathology 301
Classes Sem 1: (1 tut & 11 prac)/wk
Assessment one 2hr exam, 5 prac reports, one project report
 These courses are designed to be taken together. They are particularly suited to those interested in subsequently doing research in a challenging area of biology. The courses 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. The courses would not be useful for those wishing to pursue a career in diagnostic pathology.

Course structure

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 the subject will be used. These include flow cytometry, tissue culture, molecular biology and microscopy.

In Cell Pathology 302 each student will undertake a project designed to try to answer a question (preferably of their own asking) that has evolved in the earlier study of the subject. Performance in this project will be part of the assessment of the suitability of a student to proceed to Honours.

Enrolment requirements

Prerequisites for the courses are set out in Chapter 3. Students interested in the courses are expected to meet with Professor Hunt or Dr King before enrolling, preferably during the preceding year. The Department can cater only for a small number of students in this course and superior performance in Junior and Intermediate courses will be essential to ensure success in either Cell Pathology 301 or 302. The Department of Pathology is located on Level 5 of the Blackburn Building (tel. 9351 2414).

Civil Engineering Science

The School of Civil and Mining Engineering is part of the Faculty of Engineering. In addition to providing professional training in this branch of engineering, it provides a 16-unit course, Civil Engineering Science 2, in the Faculty of Science.

The course is available as an Intermediate course in a science degree for students majoring in Mathematics, Physics, Chemistry, Geology, Computer Science or Soil Science, and who are thinking of an applied science career in building or civil engineering or in related fields.

The course is 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.

Double degree

Some BSc graduates, who have passed the course Civil Engineering Science 2, may obtain a Bachelor of Engineering degree in Civil Engineering after an additional two years' study, following 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 Civil Engineering may be obtained from the Engineering Faculty Office in the Engineering Faculty Building.

Location

The School is in the south-east of the Engineering precinct and can be entered from Shepherd Street. However, most classes in this course are normally held in the theatres and tutorial rooms of the Engineering Faculty Building.

Noticeboards

Notices concerning this course and the component courses of which it is comprised will be displayed in the Junior Courses and Intermediate Courses noticeboards of the PNR Building, outside the lecture theatres on level 3, and in the Engineering Faculty Building (outside the Engineering Faculty Office).

Registration

All students are required to register with Mr N.L. Ings in Room 410 in the School of Civil and Mining Engineering on either the last day of Orientation or on the first day of lectures.

Timetable information on alternative lecture/tutorial/laboratory/practical classes is available in the General Office, School of Civil and Mining Engineering.

Advice on courses

Members of staff are available during enrolment and orientation periods to give advice about these courses. If you wish to see an adviser please apply to the School Office.

Tutorials and laboratories

All students are required to undertake the tutorial and laboratory work associated with these courses, details of which are set out in the timetables. The experimental and tutorial work is designed as an integral part of the course to complement the lecture material. It should be noted that the difficulties of timetabling are such that the majority of classes are in second semester.

Intermediate Civil Engineering Science courses

ENGS 221Y Civil Engineering Science 2

16 units

Prereq Chemistry 112 or 192 or 194 or 12 units of Junior Physics or 12 units of Junior Mathematics

Materials

Classes Sem 2: 3 lec/wk & four 3hr prac/sem

Assessment one 3hr exam, coursework

Materials classification. Abundance of elements. A consideration of the production of metals. The mechanical properties of materials. Elastic moduli; stress and strain. Yield and tensile strength, hardness. Fracture and toughness. Fatigue failure. Creep deformation and fracture. Friction and wear. Polymers; giant molecules and their configurations. Ceramic materials. Materials in hostile environments.

Textbooks

Ashby and Jones *Engineering Materials — an Introduction to their Properties and Applications* (Pergamon, 1981)
van Vlack *Materials for Engineering — Concepts and Applications* (Addison-Wesley, 1982)

Statics

Classes Sem 2: (1 lec & 2 tut)/wk

Assessment one 2hr exam

Basic concepts; scalars and vectors; units; the SI system. Statics of the rigid body: forces and moments; systems isolation; free body diagrams, and equilibrium criteria. Elementary principles of virtual work. Elementary kinematics and dynamics of the rigid body: angular and linear velocity; plane curvilinear motion of a particle; absolute and relative motion. Distributed force systems: beams with distributed loads; statically determinate, pinjointed structures.

Textbook

Meriam *Engineering Mechanics, Vol. I, Statics* (Wiley, 1980) SI version

Structural Mechanics

Classes Sem 1: (3 lec & one 2hr tut)/wk

Assessment one 3hr exam, class

Statics, shear, moment and axial force diagrams.

Elementary elasticity, stresses, strains, deformations, compatibility. Bending and shear stresses in beams. Deflection of beams. Analysis of triangulated frames. Torsion. Elementary instability.

Textbook

Megson *Strength of Materials for Civil Engineers* (Arnold, 1987)

Design

Classes Sem 2: (two 1hr lec & one 2hr prac)/wk

Assessment one 3hr exam, class

Philosophy of design. Loads. Design of simple elements of steel and concrete structures. Design project.

Textbooks

Buckle *Elements of Structure* 2nd edn (Pitman)

AS4100-SAA *Steel Structures*

AS3600-Concrete *Structures Code*

AS1170-SAA *Loading Code Parts I&II*

AS1511-SAA *High Strength Structural Bolting Code*

Chemical Engineering Science

The Department of Chemical Engineering is part of the Faculty of Engineering. In addition to providing professional training of this branch of engineering, it provides two courses in the Faculty of Science, namely Chemical Engineering Science 2, a 16 unit course and Chemical Engineering Science 2 Auxiliary, an 8 unit course.

These courses are available as Intermediate courses in a science degree for students majoring particularly in chemistry, but also in biochemistry, physics or mathematics, and who are thinking of a career in the chemical and process industries, or in applied industrial research.

The courses are intended to give a science student some insight into the principles which control the design and performance of large scale industrial processing plants.

Conversion course

The Department of Chemical Engineering also offers a two year course by which the holder of a Bachelor of Science degree may obtain a degree in Chemical Engineering provided that courses equivalent to 16 units of Intermediate Chemistry, 16 units of Intermediate Mathematics and Chemical Engineering Science 2 have been completed. 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 degree course may be obtained from the Engineering Faculty Office in the Engineering Faculty Building.

Structure of courses

Chemical Engineering Science 2 Auxiliary provides an introduction to the nature and analysis of large-scale chemical operations.

Chemical Engineering Science 2 incorporates the auxiliary course and, in addition, considers the basic principles of heat, momentum and mass transfer in large-scale operations.

Location

The Department is in the Engineering precinct, adjacent to the pedestrian way near the Shepherd Street entrance. Lectures are normally held in the Engineering precinct.

Noticeboards

All noticeboards are located in the foyer areas outside the lecture theatres on Levels 2 and 3. Notices relevant to these subjects will be displayed on the Level 3 noticeboard just inside the front entrance of the Department.

Registration

All students are required to register with the Secretary to the Head of the Department of Chemical Engineering in Room 402 on Level 4 in the Chemical Engineering Building on either the last day of Orientation or on the first day of lectures.

Timetable information on alternative lecture/tutorial/laboratory/practical classes is available in the General Office of Chemical Engineering.

Advice on courses

Members of staff are available during enrolment periods and Orientation Week to give advice concerning these courses. If you wish to see a Departmental adviser please apply to the Department Office.

Tutorials and laboratories

All students are required to undertake the tutorial and laboratory work associated with these courses, details of which are set out in the timetables. The experimental and tutorial work is designed as an integral part of the course to complement the lecture material.

Intermediate Chemical Engineering Science courses

ENGS 261Y Chemical Engineering Science 2 16 units

Prereq Chemistry 112 or 192 or 194 or 12 units of Junior Physics or 12 units of Junior Mathematics

Coreq Chemistry 222 or 292

Classes Sem 1: (4 lec, one 1hr tut & one 2hr tut)/wk; Sem 2: (4 lec, one 1hr tut, one 2hr tut & one 3hr prac)/wk

Assessment Sem 1 and 2: one 3hr exam; Yr. project and lab assessment

As for Chemical Engineering Science Auxiliary (below) with, in addition, the following:

An integrated introductory treatment of the transport of momentum, heat and mass.

Fluid statics: application to pressure measurement and forces on storage vessels. Inviscid flow theory: application to flow measurement. Conservation of momentum; forces on fittings. Laminar flow of Newtonian fluids in pipes: derivation of velocity profile, flow rate and frictional loss. Turbulent flow in pipes: application of dimensional analysis, friction factors; energy balances for pipe flow systems. Pumps: theory of reciprocating and centrifugal pumps; cavitation and NPSH.

Heat conduction: rectilinear and cylindrical geometry. Convection: concept and use of the heat transfer coefficient. Dimensional analysis and dimensionless

correlations for heat transfer in pipe flow. Natural convection. Simple heat exchangers.

Diffusion models and examples. Convection and dilute diffusion. Diffusion coefficients in gases, liquids and polymers. Mass transfer coefficients, interfacial conditions. Dimensional analysis, correlations. Heat and mass transfer analogies. Absorption of dilute and concentrated vapours. Heat and mass transfer, wet-bulb temperature.

Textbooks

As for Chemical Engineering Science Auxiliary and:
Hewitt, Shire and Bott *Process Heat Transfer* (CRC Press, Begel House, 1994)

Others as advised during classes

ENGS 262Y Chemical Engineering Science 2 Auxiliary 8 units

Prereq Chemistry 112 or 192 or 194 or 12 units of Junior Physics or 12 units of Junior Mathematics

Classes Yr: (2 lec & one 2hr tut)/wk

Assessment Sem 1: one 3hr exam; Sem 2: one 3hr exam, project assessment

Introduction to large-scale chemical processing; discussion of typical flowsheets for the manufacture of basic chemicals. The application of physicochemical principles to material and energy balance calculations.

A major assignment involving the computation of material and energy balances for a complete flowsheet, and a project on some aspect of the chemical industry.

Textbook

Felder and Rousseau *Elementary Principles of Chemical Processes* 2nd edn (Wiley, 1986)

School of Chemistry

Junior Chemistry courses

The School of Chemistry offers a number of 6 unit courses to cater for the differing needs of students. These courses are:

CHEM 101F Introductory Chemistry IA

CHEM 102S Introductory Chemistry IB

CHEM 111F Chemistry IA

CHEM 112S Chemistry IB

CHEM 191F Chemistry IA (Advanced)

CHEM 192S Chemistry IB (Advanced)

CHEM 193F Chemistry IA (Special Studies Program)

CHEM 194S Chemistry IB (Special Studies Program)

Fully detailed information about all courses, 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 courses.

CHEM 101F Introductory Chemistry 1A 6 units

Akn There is no assumed knowledge of chemistry for this course

May not be counted with Chemistry 111 or 191 or 193

Classes Sem 1: (3 lec & 3hr prac or tut workshop)/wk

The aim of the course 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 course.

Lectures

A course of about 42 lectures, three per week throughout the semester.

Practical work

A series of 10 three-hour laboratory sessions, one per week for 10 weeks of the semester.

Textbooks

A booklet is contained in the booklet *Information for Students* distributed at enrolment. Further information can be obtained from the School.

Examinations

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 course.

CHEM 102S Introductory Chemistry 1B 6 units

Prereq Chemistry 101 or equivalent

May not be counted with Chemistry 112 or 192 or 194

Classes Sem 2: (3 lec & 3hr prac or tut workshop)/wk

Chemistry 102 builds on Chemistry 101 to provide a sound coverage of inorganic and organic chemistry.

Lectures, Practical work, Examinations, Textbooks

As for Chemistry 101.

CHEM 111F Chemistry 1A 6 units

Akn HSC Mathematics 2 unit course; and the Chemistry component of the 4-unit or 3-unit HSC Science course, or 2-unit Chemistry

Recommended concurrent course Preferred — Mathematics 101 or 191; otherwise — Mathematics 111

May not be counted with Chemistry 101 or 191 or 193

Classes Sem 1: (3 lec & 3hr prac or tut workshop)/wk

Chemistry IA is built on a satisfactory prior knowledge of the chemistry component of the 4-unit or 3-unit HSC Science course or 2-unit Chemistry. A brief revision of basic concepts of the high school course is given. Chemistry IA covers chemical theory and physical chemistry.

Lectures, Practical work, Examinations, Textbooks

As for Chemistry 101.

CHEM 112S Chemistry 1B 6 units

Prereq Chemistry 111 or a Distinction in Chemistry 101 or equivalent

Coreq Chemistry 111 may be taken if available

Recommended concurrent course Preferred — Mathematics 102 or 103 or 192 or 193; otherwise — Mathematics 104 or 112

May not be counted with Chemistry 102 or 192 or 194

Classes Sem 2: (3 lec & 3hr prac or tut workshop)/wk

Chemistry 1B is built on a satisfactory prior knowledge of Chemistry IA and covers inorganic and organic

chemistry. Chemistry IB is an acceptable prerequisite for entry into Intermediate Chemistry courses.

Lectures, Practical work, Examinations, Textbooks
As for Chemistry 101.

CHEM 191F Chemistry 1A (Advanced) 6 units

Prereq TER of at least 88 and at least 75% in HSC 2-unit Chemistry or equivalent
Recommended concurrent course Preferred — Mathematics 101 or 191; otherwise — Mathematics 111
May not be counted with Chemistry 101 or 111 or 193
Classes Sem 1: (3 lec & 3hr prac or tut workshop)/wk

Chemistry IA (Advanced) is available to students with a very good HSC performance (typically a TER of 88+) as well as a very good school record in chemistry or science. Students in these categories are expected to do Chemistry IA (Advanced) rather than Chemistry IA.

The theory and practical work syllabuses for Chemistry IA and Chemistry IA (Advanced) are very similar, though the level of treatment in the latter course is more advanced, presupposing a very good grounding in the subject at secondary level. Chemistry IA (Advanced) covers chemical theory and physical chemistry.

Lectures, Practical work, Examinations, Textbooks
As for Chemistry 101.

CHEM 192S Chemistry 1B (Advanced) 6 units

Qual Chemistry 191 or 193 or Distinction in Chemistry 111 or equivalent
Recommended concurrent course Preferred — Mathematics 102 or 103 or 192 or 193, otherwise — Mathematics 112 or 104
May not be counted with Chemistry 102 or 112 or 194
Classes Sem 2: (3 lec & 3hr prac or tut workshop)/wk

Chemistry IB (Advanced) is built on a satisfactory prior knowledge of Chemistry IA (Advanced) and covers inorganic and organic chemistry. Chemistry IB (Advanced) is an acceptable prerequisite for entry into Intermediate Chemistry courses.

Lectures, Practical work, Examinations, Textbooks
As for Chemistry 101.

CHEM 193F Chemistry 1A (Special Studies Program) 6 units

Prereq TER of at least 98 and at least 85% in HSC 2-unit Chemistry or equivalent. Entry is by invitation
Recommended concurrent course Preferred — Mathematics 101 or 191; otherwise — Mathematics 111
May not be counted with Chemistry 101 or 111 or 191
Students in the Faculty of Science Talented Students Program are automatically eligible. For the purpose of Resolution 11 this course is deemed to be designated as an Advanced course
Classes Sem 1: (3 lec, 1 tut & 3hr prac)/wk

Entry to Chemistry IA (Special Studies Program) is restricted to students with a TER of 98+ and an excellent school record in chemistry or science. The program

comprises part of the Chemistry IA (Advanced) lecture course supplemented by more advanced lectures and tutorials. The practical work syllabus for Chemistry IA (Special Studies Program) is very different from that for Chemistry IA and Chemistry IA (Advanced) and consists of special project-based laboratory exercises. All other course details are the same as those for Chemistry IA (Advanced).

Chemistry IA (Special Studies Program) is an acceptable prerequisite for entry into Chemistry IB (Special Studies Program).

CHEM 194S Chemistry 1B Special Studies Program 6 units

Prereq Chemistry 193
Recommended concurrent course Preferred — Mathematics 102 or 103 or 192 or 193; otherwise — Mathematics 112 or 104
May not be counted with Chemistry 102 or 112 or 192
Classes Sem 2: (3 lec, 1 tut & 3hr prac)/wk

Entry to Chemistry IB (Special Studies Program) is restricted to students who have successfully completed Chemistry IA (Special Studies Program). The program comprises part of the Chemistry IB (Advanced) lecture course supplemented by more advanced lectures and tutorials. The practical work syllabus for Chemistry IB (Special Studies Program) is very different from that for Chemistry IB and Chemistry IB (Advanced) and consists of special project-based laboratory exercises. All other course details are the same as those for Chemistry IB (Advanced).

Chemistry IB (Special Studies Program) is an acceptable prerequisite for entry into Intermediate Chemistry courses.

Intermediate Chemistry courses

The School of Chemistry offers a number of courses to cater for the differing needs of students. The following courses are offered:

CHEM 201F Chemistry 2 (Life Sciences)	8 units
CHEM 21 IF Chemistry 2 (Environmental)	8 units
CHEM 221F Chemistry 2 (Materials)	8 units
CHEM 222S Chemistry 2 (Principles)	8 units
CHEM 231F Chemistry 2A	8 units
CHEM 232S Chemistry 2B	8 units
CHEM 252S Chemistry 2 (Forensic)	8 units
CHEM 291F Chemistry 2A (Advanced)	8 units
CHEM 292S Chemistry 2B (Advanced)	8 units

The courses Chemistry 201 (Life Sciences), 211 (Environmental); 221 (Materials) and 252 (Forensic) share a common core, which consists of approximately 36 lectures on: Principles of Modern Chemical Analysis, Chemical Speciation, Quantum Mechanics, Spectroscopy, Bonding and Organic Chemistry.

A fully detailed booklet on the courses including textbooks is available from the School of Chemistry. All students who intend to take Intermediate Chemistry must register with the School of Chemistry in addition to completing normal university enrolment procedures. This registration takes place in the first practical session.

CHEM 201F Chemistry 2 (Life Sciences) 8 units

Prereq Chemistry 112 or 192 or 194 and 12 units of Junior Mathematics courses
May not be counted with Chemistry 211 or 221 or 231 or 291 or 252

Classes Sem 1: (4 lec & 4hr prac)/wk
Assessment exam (67%), lab exercises (33%)

Lectures and tutorials

In addition to the core, the remaining 20 lectures are distinct for this course and apply the core knowledge to chemical problems in Life Sciences. Areas covered include: structure and thermodynamics of biomolecules and biomaterials, and biological organic chemistry. Non-compulsory tutorials will also be provided at a rate of one per week.

Practical work

Practical work entails 4 hours per week for 14 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.

Additional information

The aim of this course is to provide students interested in life sciences with the chemical knowledge required for an understanding of the subject.

Textbooks

To be advised

CHEM 211F Chemistry 2 (Environmental) 8 units

Prereq Chemistry 112 or 192 or 194 and 12 units of Junior Mathematics courses
May not be counted with Chemistry 201 or 221 or 231 or 291 or 252

Classes Sem 1: (4 lec & 4hr prac)/wk
Assessment exam (67%), lab exercises (33%)

Lectures

In addition to the core, the remaining 20 lectures are distinct for this course and apply the core knowledge to chemical problems in Environmental Science.

Practical work

As for Chemistry 201.

Additional information

The aim of this course is to provide students interested in environmental science with the chemical knowledge required for an understanding of the subject

Textbooks

To be advised

CHEM 221F Chemistry 2 (Materials) 8 units

Prereq Chemistry 112 or 192 or 194 and 12 units of Junior Mathematics courses
May not be counted with Chemistry 201 or 211 or 231 or 291 or 252

Classes Sem 1: (4 lec & 4hr prac)/wk
Assessment exam (67%), lab exercises (33%)

Lectures

In addition to the core, the remaining 20 lectures are distinct for this course and apply the core knowledge to chemical problems in Materials Science.

Practical work

As for Chemistry 201.

Additional information

The aim of this course is to provide students interested in materials science with the chemical knowledge required for an understanding of the subject.

Textbooks

To be advised

CHEM 222S Chemistry 2 (Principles) 8 units

Prereq Chemistry 201 or 111 or 221 or 231 or 252

May not be counted with Chemistry 232 or 292

Classes Sem 2: (4 lec & 4hr prac)/wk
Assessment exam (67%), lab exercises (33%)

Lectures

This course consists of: 18 lectures in which the structure, bonding and properties of inorganic compounds and complexes will be presented; 18 lectures of physical chemistry on statistical thermodynamics and thermodynamics; and 18 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.

Practical work

As for Chemistry 201.

Additional information

Chemistry Principles is designed for students who wish to continue to Senior chemistry courses after taking the more descriptive Intermediate courses in first semester.

CHEM 231F Chemistry 2A 8 units

Prereq Chemistry 112 or 192 or 194 and 12 units of Junior Mathematics courses

May not be counted with Chemistry 201 or 211 or 221 or 252 or 291

Classes Sem 1: (4 lec & 4hr prac)/wk
Assessment exam (67%), lab exercises (33%)

Lectures and tutorials

A course of 18 lectures in inorganic chemistry, 18 lectures in organic chemistry and 18 lectures in physical/theoretical chemistry. Non-compulsory tutorials will also be provided at a rate of one per week.

Practical work

As for Chemistry 201.

Additional information

This is the main chemistry course for students expecting to major in chemistry.

Textbooks

To be advised

CHEM 232S Chemistry 2B 8 units

Prereq Chemistry 201 or 211 or 221 or 231 or 252

May not be counted with Chemistry 222 or 292

Classes Sem 2: (4 lec & 4hr prac)/wk
Assessment exam (67%), lab exercises (33%)

Lectures

This course consists of: 18 lectures in which the structure, bonding and properties of inorganic compounds and complexes will be presented; 18 lectures of physical chemistry on statistical thermodynamics and thermodynamics; and 18 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.

Practical work

As for Chemistry 201.

Additional information

Main chemistry course for students expecting to major in chemistry.

Textbooks

To be advised

CHEM 252S Chemistry 2 (Forensic) 8 units

Prereq Chemistry 112 or 192 or 194

May not be counted with Chemistry 201 or 211 or 221 or 231 or 291

Classes Sem 2: (4 lec & 4hr prac)/wk

Assessment exam (67%), lab exercises (33%)

Lectures

In addition to the core, the remaining 20 lectures are distinct for this course and apply the core knowledge to chemical problems in Forensic Science.

Practical work

As for Chemistry 201.

Additional information

The aim of this course is to provide students interested in forensic science with the chemical knowledge required for an understanding of the subject.

Textbooks

To be advised

CHEM 291F Chemistry 2A (Advanced)

8 units

Prereq WAM greater than 80 and a Distinction average in Chemistry (111 or 191 or 193) and in (112 or 192 or 194); and

12 units of Junior Mathematics courses. Entry to this course is by invitation. Students in the Faculty of Science Talented Students Program are automatically eligible

May not be counted with Chemistry 201 or 211 or 221 or 231 or 252

Classes Sem 1: (5 lec & 3hr prac)/wk

Assessment exam (67%), lab exercises (33%)

Lectures and tutorials

Lectures and tutorials in Chemistry 291 (Advanced) comprise two sets: Four lectures per week in common with any other Intermediate Chemistry course and one lecture per week of advanced lectures on topics that are complementary to the other courses.

Practical work

Practical work entails 3 hours per week during the semester. For 8 weeks students take practical exercises in common with any other Intermediate Chemistry course; for 6 weeks special advanced project-oriented exercises are offered.

Additional information

The number of places in Chemistry 291 (Advanced) is limited. Applications are invited from students with a high WAM and an excellent record in a Junior Chemistry course. 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.

Textbooks

To be advised

CHEM 292S Chemistry 2B (Advanced)

8 units

Prereq Chemistry 291, but see *Additional information* below

May not be taken with Chemistry 222 or 232

Classes Sem 2: (5 lec & 3hr prac)/wk

Assessment exam (67%), lab exercises (33%)

Lectures and tutorials

Lectures and tutorials in Chemistry 292 (Advanced) comprise two sets: 4 lectures and 1 tutorial per week in common with any other Intermediate Chemistry course; and 1 lecture per week of advanced lectures on topics that are complementary to the other courses.

Practical work

Practical work entails 3 hours per week during the semester. For 10 weeks, students take practical exercises in common with any other Intermediate Chemistry course; for 4 weeks, special advanced project-oriented exercises are offered.

Additional information

The number of places in Chemistry 292 (Advanced) is limited. Normally entry to this course is restricted to those students enrolled in Chemistry 291. However, a student who has performed particularly well in another first semester Chemistry course may be invited by the Head of School to enrol in Chemistry 292S (Advanced). See the Intermediate Chemistry Course Coordinator for further information.

Textbooks

To be advised

Senior Chemistry courses

The School of Chemistry offers a number of courses to cater for the differing needs of students. The following courses are offered:

CHEM 311F Chemistry 3A	12 units
CHEM 312S Chemistry 3B	12 units
CHEM 391F Chemistry 3A (Advanced)	12 units
CHEM 392F Chemistry 3B (Advanced)	12 units
CHEM 321F Chemistry 3A Additional	12 units
CHEM 322S Chemistry 3B Additional	12 units

Advice on courses

A fully detailed information booklet on the courses and textbooks is available from the School of Chemistry. All students who intend to take Senior Chemistry courses must register in the School of Chemistry during either the Wednesday or Thursday

of the orientation period. Registration includes selection of Senior Chemistry modules from the list below, completion of a registration card and the taking of an I.D. photograph.

Textbooks

Inorganic Chemistry:

E.A.V. Ebsworth, D.W.H. Rankin and S. Craddock *Structural Methods in Inorganic Chemistry* (Blackwell, 1991)

Organic Chemistry:

R.M. Silverstein *et al. Spectrometric Identification of Organic Compounds* (Wiley, 1991)

S. Sternhell and J.R. Kalman *Structures from Spectra* (Wiley, 1986)

J. McMurry *Organic Chemistry* (Brooks/Cole, 1992)

Physical/Theoretical Chemistry:

P.W. Atkins *Physical Chemistry* (Oxford, 1994)

CHEM 311F Chemistry 3A 12 units

Prereq Chemistry 222 or 232 or 292

May not be counted with Chemistry 391 but may be counted with Chemistry 321

Classes Sem 1: (4 lec & 8hr prac)/wk

Assessment 45min exam per module and prac assessment

The lec hires will be presented in modules (each module runs for a half-semester and comprises 7 lectures). A full listing of the module titles available in Semester 1 is given below*. Each student must take 8 modules. Three modules (the first three listed under the *Common* heading in the list below) are compulsory for all Chemistry 311 students. The remaining 5 modules, of which one must be in each of the inorganic, organic and physical/theoretical chemistry areas, are to be chosen from the list below.

Common modules

Spectrometric identification of organic compounds

Symmetry

Kinetics

Chemical bonding

Inorganic chemistry modules

Vibrational spectroscopy of inorganic compounds

Instrumental methods in analytical chemistry

Electrochemical methods in inorganic chemistry

Main group chemistry and materials

Organometallic chemistry

Catalysis

Aquatic chemistry

Organic chemistry modules

Stereochemistry in organic chemistry

Natural products

Aromaticity

Organic reaction mechanisms

Free radical chemistry

Bioorganic chemistry 1: amino acids and polypeptides

Physical/Theoretical chemistry modules

Quantum chemistry — fundamentals

Molecular visualisation and simulation

Surface chemistry

Applications of symmetry

Intermolecular forces

Colloid chemistry

Spin in chemistry

This is the list of modules that were offered in Semester 1 in 1996. There may be some interchange of modules between Chemistry 311 and Chemistry 312 in 1997. As well, some modules may not be offered.

Practical work

Practical work (8 hours /week) comprises sessions in the inorganic, organic and physical chemistry laboratories, with an option that allows some of the time to be taken in the theoretical chemistry workshop. Details can be obtained from the School of Chemistry.

CHEM 312S Chemistry 3B 12 units

Prereq Chemistry 311

May not be counted with Chemistry 392 but may be counted with Chemistry 322

Classes Sem 2: (4 lec & 8hr prac)/wk

Assessment 45min exam per module and prac assessment

The lectures will be presented in modules (each module runs for a half-semester and comprises 7 lectures). A full listing of the module titles available in Semester 2 is given below*. Each student must take 9 modules. The common module *Chemistry Laboratory Practices* is compulsory for all Chemistry 312 students. The remaining 8 modules, of which one must be in each of the inorganic, organic and physical/theoretical chemistry areas, are to be chosen from the list below.

Common modules

Chemistry Laboratory Practices

Inorganic chemistry modules

Diffraction methods in inorganic chemistry

Electronic spectroscopy

Surface analysis

Transition metal chemistry

Inorganic reaction mechanisms

Biological and medical inorganic chemistry 1: metals in biomolecules

Biological and medical inorganic chemistry 2: chemotherapy and toxicology

Mineral chemistry

Marine chemistry

Organic chemistry modules

Heterocyclic chemistry 1

NMR spectroscopy in organic chemistry

Radicals and photochemistry in organic synthesis

Pericyclic reactions

Modern methods of organic synthesis

Heterocyclic chemistry 2

Advanced NMR spectroscopy

Organometallic reagents in organic synthesis

Bioorganic chemistry 2: the chemistry of DNA and carbohydrates

Supramolecular chemistry

Physical/Theoretical chemistry modules

Statistical mechanics

Molecular electronic structure theory

Molecular spectroscopy 1: electronic

High temperature chemistry

Polymer chemistry 1: chemistry of polymer formation

Polymer chemistry 2: physiochemical properties of polymers

Atmospheric photochemistry

This is the list of modules that were offered in Semester 2 in 1996. There may be some interchange of modules between Chemistry 311 and Chemistry 312 in 1997. As well, some modules may not be offered.

Practical work

As for Chemistry 311.

CHEM 391F Chemistry 3A (Advanced)

12 units

Prereq Distinction average in Chemistry (201 or 211 or 221 or 231 or 291) and in Chemistry (222 or 232 or 292). The number of places in this course is limited and entry is by invitation. Applications are invited from students with a high WAM and an excellent record in Intermediate Chemistry. Students in the Faculty of Science Talented Student Program are automatically eligible

May not be counted with Chemistry 311 but may be counted with Chemistry 321

Classes Sem 1: (4 lec & 8hr prac)/wk

Lectures

The requirements for Chemistry 391 are identical with those for Chemistry 311, with the addition of two special modules that are available only to Advanced students. These special modules involve an inquiry into a major problem in contemporary chemistry. A member of staff guides the discussion and acts as a consultant.

Assessment

As for Chemistry 311, plus a report on each Advanced module. Only the marks for the best 8 out of the total of 10 modules assessed contribute to a student's final mark.

Advanced modules offered in first semester 1996 were:

'Is there a risk to human health in the Sydney region from lead toxicity?'

The development of a research strategy in Chemistry

Practical work

As for Chemistry 311.

CHEM 392S Chemistry 3B (Advanced)

12 units

Prereq Chemistry 391. The number of places in this course is limited and entry is by invitation. Applications are invited from students with a high WAM and an excellent record in Intermediate Chemistry. Students in the Faculty of Science Talented Student Program are automatically eligible

May not be counted with Chemistry 312

Classes Sem 2: (4 lec & 8hr prac)/wk

Lectures

The requirements for Chemistry 3B (Advanced) are identical with those for Chemistry 3B, with the addition of two special modules that are available only to Advanced students. These special modules involve an inquiry into a major problem in contemporary chemistry. A member of staff guides the discussion and acts as a consultant.

Assessment

As for Chemistry 3B, plus a report on each Advanced module. Only the marks for the best 9 out of the total of 11 modules assessed contribute to a student's final mark.

Advanced modules offered in second semester 1996 were:

The disposal of waste materials

Creating a chemical industry

Practical work

As for Chemistry 311.

CHEM 321F Chemistry 3A Additional

12 units

Prereq Chemistry 222 or 232 or 292

Prereq or *Coreq* Chemistry 311 or 391

Classes Sem 1: (4 lec & 8hr prac)/wk

Assessment 45min exam per module and prac assessment

Students taking this course must be concurrently enrolled in or have previously completed either Chemistry 311 or Chemistry 391. The modules will be chosen from the modules listed for Chemistry 311 and the same selection rules as applicable to Chemistry 311 will apply to the selection of the additional 8 modules, except that those students who have not previously done so must undertake the Common module Chemical Bonding. Students cannot take modules already counted towards Chemistry 311 or 312.

Practical work

As for Chemistry 311.

CHEM 322S Chemistry 3B Additional

12 units

Prereq Chemistry 321

Prereq or *Coreq* Chemistry 312 or 392

Classes Sem 2: (4 lec & 8hr prac)/wk

Assessment 45min exam per module and prac assessment

Students taking this course must be concurrently enrolled in or have previously completed either Chemistry 312 or Chemistry 392. The modules will be chosen from the modules listed for Chemistry 312 and the same selection rules as applicable to Chemistry 312 will apply to the selection of the additional 8 modules. Students cannot take modules already counted towards Chemistry 311 or 312.

Practical work

As for Chemistry 311.

Chemistry Honours

Students of sufficient merit may be admitted to Honours courses and may then graduate with Honours in one of the following subject areas:

Inorganic Chemistry

Organic Chemistry

Physical Chemistry

Theoretical Chemistry

They are required to;

- carry out research work under the direction of a supervisor;

- (b) submit a report in the form of a thesis on this work;
- (c) attend such lectures, colloquia, etc., as directed; and
- (d) answer, satisfactorily, written examinations.

Further details are available from the Administrative Officer (Academic) who will direct enquiries to the Professors and other senior members of staff (in the above subject areas) from whom information about higher degree requirements (see below) can also be obtained.

Postgraduate study

MSc and PhD degrees and the Graduate Diploma in Science, all by research, are available in the School. The courses of study available to Graduate Diploma candidates are those listed above for BSc(Honours) candidature.

On completion of an Honours degree (at First Class or Second Class Division 1 level), Graduate Diploma in Science, or on satisfying the requirements of an MSc Qualifying course, students may pursue candidature for MSc or PhD degrees by research. The range of research fields offered and the fields of research for each member of academic staff are listed in the School's Postgraduate Studies Handbook, which is available from the School Office (Level 2, Chemistry Building, F11).

Basser Department of 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.

The diversity of the discipline is demonstrated by current research interests in the Department which include artificial intelligence, the design of computer hardware and networks, and the theory of parallel computation. The Department has a range of computers and specialised laboratories for its teaching and research.

Students who intend to major in Computer Science should pay particular attention to the prerequisites of each course. Students who complete 16 units of Intermediate courses (course numbers starting with the digit '2') and 24 units of Senior courses (course numbers starting with the digit '3'), including among them a 'project course' (course numbers starting with the digits '32'), are eligible to become Associate Members of the Australian Computer Society.

Intending Honours students are strongly urged to complete some Senior Mathematics prior to their entry into the Honours year. Students should note that entry to Honours requires **an average of Credit or better in the Senior Computer Science courses.**

The courses offered by the Department are described

briefly below, and more fully in the Department's Handbook which is available from the Department Office (Room G71) in the Madsen Building. Students should confirm details of courses, registration procedures, textbooks, etc., on the Departmental noticeboards. Those in doubt should seek advice from members of the Department's academic staff.

Junior Computer Science courses

COMP 100F/S Information Technology Tools 6 units

Classes Sem 1 and 2: (1 lec, 1 tut & 4 prac)/wk

Assessment assignments, written exam, prac exam

A critical study of common computer applications (including word processors, spreadsheets, databases, image processing packages and web browsers). Emphasis will be given to acquiring a sophisticated level of skills in the usage of these tools. This will include: examining common concepts within and between classes of applications, the ability to transfer skills between releases and alternative packages, customisation and automation of environments, and the ability to design solutions to problems and use a tool to implement that solution. A central focus of the course will be the application of critical thinking to the problems of tool use, including the evaluation of tools and the selection of a suitable tool, and the evaluation of information produced by tools (including knowledge of common sources of error or misunderstanding, and ways to avoid them).

NOTE: Students intending to proceed to professional credential in Computer Science should enrol in COMP 101 in their first semester, and in COMP 102 in the second semester. If they wish they may also enrol in COMP 100.

COMP 101F Introductory Programming 6 units

Akn HSC 3-unit Mathematics

Classes Sem 1: (3 lec, 1 tut & 2 prac)/wk

Assessment assignments, written exam, prac exam

This course introduces the fundamental skill that underlines all of Computer Science: computer programming. Using the Blue object-oriented programming language, students learn modern programming techniques based on recent developments in the subject. No previous knowledge of computers or programming is assumed.

COMP 191F Introductory Programming (Advanced) 6 units

Akn HSC 3-unit Mathematics (Requires permission by the Head of Department)

Classes Sem 1: (3 lec, 1 tut & 2 prac)/wk

Assessment assignments, written exam, prac exam

This course is the advanced alternative to COMP 101. While the subject matter is the same, a higher degree of elegance and rigour in programming is expected, and the programming problems are more challenging, "although not more time consuming. No previous knowledge of computers or programming is assumed.

COMP 102S Introductory Computer Science 6 units

Prereq COMP 101 or 191

Classes Sem 2: (3 lec, 1 tut & 2 prac)/wk

Assessment assignments, written exam, prac exam

This course is a continuation of COMP 101. Advanced features of the blue programming languages are presented, and a beginning is made on some topics from the wider field of Computer Science, such as assembly language programming and reasoning about the correctness and efficiency of computer programs.

COMP 192S Introductory Computer Science (Advanced) 6 units

Prereq COMP 191 or 101 (with sufficient merit)

Classes Sem 2: (3 lec, 1 tut & 2 prac)/wk

Assessment assignments, written exam, prac exam

This course is the advanced alternative to COMP 101. While the subject matter is the same, a higher degree of elegance and rigour in programming is expected, the programming problems are more challenging although not more time consuming, and a deeper approach is taken to the Computer Science topics.

Intermediate Computer Science courses

COMP 201F Computer Systems 4 units

Qual COMP 102 or 192

Classes Sem 1: (2 lec, 2 prac)/wk

Assessment assignments, written exam

An overview of the aspects of computer hardware that are important for understanding the function and performance of software. The course consists of two principal components. Machine Principles: In this section we discuss the organisation of a computer central processing unit, CPU, and the assembly and machine language commands that control it. We also pay particular attention to the different data types supported, such as two's complement integers and floating point. System Structures: In this section we discuss the low-level organisation of system software including the organisation and action of a simple compiler and its run-time environment, and the system call and interrupt handling mechanisms.

COMP 291F Computer Systems (Advanced) 4 units

Qual COMP 192 or 102 (with sufficient merit)

Classes Sem 1: (2 lec, 2 prac)/wk

Assessment assignments, written exam

This course is the advanced alternative to COMP 201. Topics in Computer Systems are covered at an advanced and more challenging level.

COMP 202F Design and Data Structures 4 units

Qual COMP 102 or 192

Classes Sem 1: (2 lec & 1 tut)/wk

Assessment assignments, written exam

When there is numerous data, its structure (arrangement) determines what operations can be done with

it. For example, the Sydney telephone directory may be used to find out a subscriber's telephone number, but not which subscriber has a given number. Many data structures have been developed over the years, each suited to a particular set of operations. This course introduces the most frequently used ones, including the array, linked list, binary tree, B-tree, hash table, heap, adjacency matrix, and adjacency lists. It shows how to implement them, verify their correctness, calculate their time complexity, and decide when to use them. More generally, this focus on data and its associated operations will lead to a productive approach to the design of large programs: data abstraction.

COMP 292F Design and Data Structures (Advanced) 4 units

Qual COMP 192 or 102 (with sufficient merit)

Classes Sem 1: (2 lec & 1 tut)/wk

Assessment assignments, written exam

This course is the advanced alternative to COMP 202. Topics in Data Structures are covered at an advanced and more challenging level.

COMP 203S Languages and Logic 4 units

Qual COMP 102 or 192

Prereq COMP 202 or 292, (MATH 103 or 104 or 193 or 194)

Classes Sem 2: (2 lec & 1 tut)/wk

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 Pascal. This course studies 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 Pascal. 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 293S Languages and Logic (Advanced) 4 units

Qual COMP 192 or 102 (with sufficient merit)

Prereq COMP 292 or 202 (with sufficient merit), (MATH 103 or 104 or 193 or 194)

Classes Sem 2: (2 lec & 1 tut)/wk

Assessment assignments, written exam

This course is the advanced alternative to COMP 203. Topics in languages and Logic are covered at an advanced and more challenging level.

COMP 204S Programming Practice 4 units

Qual COMP 102 or 192

Prereq COMP 202 or 292

Classes Sem 2: (2 lec & 1 tut)/wk

Assessment assignments, written exam

In this course we attack the task of the programmer from an engineering viewpoint. This means that a major focus is on using existing tools as building blocks to complete a task. This course will teach C programming, its idiom and its considerable array of powerful programming tools. In addition, students will study the implementation of some of the library tools so that they gain an appreciation of how much better these are than a typical programmer would be able to create. In addition, it will introduce students to some of the very elegant ideas from computer science that have been applied in the construction of the tools.

COMP 294S Programming Practice (Advanced) 4 units

Qual COMP 192 or 102 (with sufficient merit)
Prereq COMP 292 or 202 (with sufficient merit)
Classes Sem 2: (2 lec & 1 tut)/wk
Assessment assignments, written exam

This course is the advanced alternative to COMP 204. Topics in Programming are covered at an advanced and more challenging level.

Senior Computer Science courses

Students are advised that doing less than 6 Senior courses 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.

COMP 301F Algorithms 4 units

Qual COMP 202 or 292
Prereq MATH 103 or 104 or 193 or 194 and 8 units Intermediate Mathematics *and/or* Statistics
Classes Sem 1: (2 lec & 1 tut)/wk
Assessment assignments, written exam

Algorithms are particularly important in all areas of Computer Science. The knowledge of basic algorithms, as well as the ability to design a new algorithm and to analyse an existing one in terms of time and space efficiency, are essential for a person to successfully work in a computer and information related professional area. This course will provide a systematic study of the analysis of existing algorithms and strategies for the design of new algorithms. The analysis skill includes the method of analysis of average computational complexity. The design strategies covered include divide-and-conquer, greedy method, and dynamic programming. Many interesting real-life problems and smart algorithm application examples will also be introduced.

COMP 302F Artificial Intelligence 4 units

Qual COMP 204 or 294
Prereq COMP 202 or 292 and 203 or 293 and 8 units Intermediate Mathematics *and/or* Statistics
Classes Sem 1: (2 lec & 1 tut)/wk
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 course 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 module will involve four assignments that require writing program components, using AI systems, and writing a report.

COMP 303S Computer Architecture 4 units

Qual COMP 201 or 291
Prereq COMP 202 or 292 and 203 or 293
Classes Sem 2: (2 lec, 1 tut & 2 prac)/wk
Assessment assignments, written exam

In this course we design and build simple computers. A major focus of the course is the series of Logic Laboratory workshop experiments. After a brief review of machine code programming students are familiarised with the basic modules from which a computer central processing unit can be assembled: arithmetic logic units, microprogram sequencers, read-only memory for microprograms, random access memory for programs and data, and various pieces of medium scale integration 'glue logic'. Another stream of lectures will be devoted to case studies of various computers emphasising their strengths and weaknesses. Emphasis will be placed on performance enhancement by parallelism, pipelining, and similar techniques.

COMP 304S Computer Graphics 4 units

Qual COMP 204 or 294
Prereq COMP 202 or 292 and MATH 101 or 191 and 8 units Intermediate Mathematics *and/or* Statistics
Classes Sem 2: (2 lec & 1 tut)/wk
Assessment assignments, 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. The Computer Graphics course examines established algorithms for picture generation, covering such topics as hidden-line elimination, shading and texturing, and ray-tracing in terms of the technology of standard graphical output devices and the 3-space geometry which applies. The effects on performance of algorithmic design choices are considered and connections are made with the cognate field of computational geometry.

COMP 305S Database Systems 4 units

Qual COMP 202 or 292
Classes Sem 2: (2 lec & 1 tut)/wk
Assessment assignments, written exam

An organisation needs to store a lot of data. The computer systems that manage data are called Database Management Systems (DBMSs). This course is an introduction to such systems, concentrating on the modern relational systems. The Oracle system will

be used in the practical work. You will learn how to understand the information stored in a relational DBMS, and how to find the answer to questions using the SQL language. You will also learn how to choose a good representation for data, using normalisation. This constitutes almost one half of the course. The other half of the course will concentrate on data modelling. Object-Oriented Database Management Systems, considered by many as the next generation DBMSs, will also be presented at the end of this course

COMP 306F Logic Programming 4 units

Qual COMP 203 or 293

Prereq COMP 202 or 292 and 8 units Intermediate Mathematics or Statistics

Classes Sem 1: (2 lec & 1 tut)/wk

Assessment assignments, written exam

The idea behind Logic Programming is that the programmer specifies the logic of a problem (the what to solve) while leaving the machine to handle the procedural aspects of solving that problem (the how to solve). In this course, Prolog is presented as a programming language in the broader context of Logic Programming (which is itself an application of the first-order logic taught in Junior Computer Science). The emphasis is on developing practical skills in Prolog programming in areas including expert systems, game playing and natural language processing. The application of Prolog to database theory is described, and more recent developments in Logic Programming such as object-oriented Logic Programming languages and parallel Logic Programming languages will also be discussed.

COMP 307F Networked Systems 4 units

Qual COMP 204 or 294

Prereq COMP 201 or 291 and 202 or 292

Classes Sem 1: (2 lec & 2 prac)/wk

Assessment assignments, written exam

This course deals with various aspects of communications and networking (local area and wide area networks). It introduces the concepts of computer communications, it exposes limitations of communications channels, and it identifies network components and the way they fit together to provide communications functions. The course is also a study of network organisations, and of protocols required at different levels for efficient, reliable, secure, and meaningful communications (International Standard Organisation's OSI reference model and protocols). The course also introduces students to some aspects of network management and applications. *

COMP 308F Object-Oriented Systems 4 units

Qual COMP 204 or 294

Prereq COMP 202 or 292

Classes Sem 1: (2 lec & 1 tut)/wk

Assessment assignments, written exam

Object-Oriented has recently become very popular in industry as a framework for organising software development. When done well, Object-Oriented

can improve programmer productivity by a factor of 5 or more. This module will introduce students to the use of object oriented thinking and tools through the whole software life cycle. It will study a widely used methodology for analysis of requirements, and design of software; it will also cover the most popular O-O language in industry, which is C++. Students will learn how an O-O design can be expressed in C++ code.

COMP 309F Operating Systems 4 units

Qual COMP 204 or 294

Prereq COMP 201 or 291 and 202 or 292

Classes Sem 1: (2 lec & 1 tut)/wk

Assessment assignments, written exam

This course provides an introduction to the design and construction of modern operating systems. The emphasis of the course is design and the identification of high-level abstractions. However, the course also has a strong practical component and includes practical exercises which involve the students in implementing components of an operating system. Topics covered include an introduction to concurrency and synchronisation, processes and process scheduling, memory management, virtual memory, file systems and security. The course is not based on a particular operating system, but frequent reference is made to a number of contemporary systems including Unix, Windows NT and MacOS.

COMP 310F Software Engineering 4 units

Qual COMP 202 or 292

Prereq COMP 204 or 294

Classes Sem 1: (2 lec & 1 tut)/wk

Assessment assignments, written exam

Software Engineering is designed to equip the students with the knowledge necessary to undertake large software design and implementation tasks in a team environment. Emphasis will be on specification, design, implementation and validation tuned to large applications. Students will learn about current software engineering tools and environments to prepare them for real projects. The contents of the module will include the software life cycle, human factors in software engineering, requirements analysis and specification techniques, design methodologies, implementation issues, software tools, validation, verification, quality assurance and software project management issues.

COMP 311S Theory of Computation 4 units

Qual COMP 203 or 293

Prereq 8 units Intermediate Mathematics and/or Statistics

Classes Sem 2: (2 lec & 1 tut)/wk

Assessment assignments, written exam

It is an embarrassing fact that many problems of interest to computer scientists have never been efficiently solved. Examples include the travelling salesperson problem, which asks for the fastest way to visit all the towns in a certain region, and the timetabling problem, which asks for a timetable that minimises clashes given a list of students' course

preferences and available times. The only known way to solve these problems is to try all possibilities, but this cannot be done in any reasonable time. There are also problems for which it is possible to show that there are no algorithms at all, let alone efficient ones.

This course is a study of such problems (technically, the NP-hard or NP-complete, and the unsolvable problems) and the techniques for proving that they are inherently difficult or impossible. To do these proofs we introduce a model of computation called Turing machines.

COMP312S User Interfaces 4 units

Qual COMP 204 or 294

Prereq COMP 202 or 292 and 203 or 293

Classes Sem 2: (2 lec & 1 tut)/wk

Assessment assignments, written exam

This course introduces several of the critical elements programmers need to create effective user interfaces. These include the essentially 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 skills of User Interface programming include learning current tools for building interfaces. The course will introduce students to 'web-technology', programming of interfaces in the World-Wide-Web environment, a visual programming environment and the Python scripting language and TK toolkit for building graphical interfaces.

COMP 321S Algorithmic Systems Project 4 units

Prereq COMP 301

Classes Sem 2: supervised project

Assessment quality of software product, written report, product presentation

Some of the most exciting work being done in the Algorithms and Complexity area today is concerned with the development of software which applies the algorithms and techniques to practical problems. Much progress has been made recently in graph drawing, computational geometry, timetable construction, etc. Real-life instances of these kinds of problems are typically too large to be solved without using efficient algorithms that have been developed for them. In this course you will work in a group to develop a software product of this kind. Past projects have included graph editors for X-windows, various computational geometry projects, and timetable construction.

COMP 322S Computer Systems Project 4 units

Prereq COMP 309

Classes Sem 2: supervised project

Assessment quality of software product, written report, product presentation

Students work in groups on a software project. The aim of the project is to provide substantial practical experience in designing and modifying an operating

system. The task will involve extension and modification of an operating system, which itself runs on simulated hardware above Unix. The simulation is very realistic and all of the usual operating system implementation problems, including synchronisation, memory management, I/O, etc, will be encountered.

COMP 323S Intelligence Systems Project 4 units

Prereq COMP 302

Classes Sem 2: supervised project

Assessment quality of software product, written report, product presentation

As with any other applied science, theories and techniques in Artificial Intelligence, regardless of how fancy they appear to be, are of little use by themselves unless they can be used to solve real world problems. Furthermore, they can best be understood and mastered by applying them to non-trivial practical problems. In this project, students will have a chance to write computer programs to solve practical problems in a way "similar" to what intelligent beings do. Specifically, students will be asked to apply learned AI techniques to solve small but realistic and knowledge intensive tasks (e.g., advice-giving, troubleshooting), in a carefully selected domain; and to evaluate the utility and performance of the techniques used. Students will work in groups.

COMP 324S Large-Scale Software Project 4 units

Prereq COMP 310

Classes Sem 2: supervised project

Assessment quality of software product, written report, product presentation

The Large-Scale Software Project is undertaken by students working in groups of four members. It consists of working as a member of a group, in the specification, design, implementation and testing of a substantial software product. The software produced is the result of either a number of groups working on the same system, or a single group extending an existing large system. The course has three aims. Firstly, students learn to use previously gained implementation, testing, and debugging skills in the realisation of a complete, practical product. Secondly, the importance of careful specification, design and project management to successful completion of a product by a co-operating team is made manifest. Thirdly, students learn to take responsibility for a project and work independently of detailed supervision under the demanding 'sink or swim' conditions of real software development.

COMP 325S Product Development Project 4 units

Qual COMP 308

Classes Sem 2: supervised project

Assessment quality of software product, written report, product presentation

The Product Development Project consists of working, as a member of a group of four students, in the specification, design, implementation and testing of a

substantial software product, using sophisticated techniques including object-oriented programming. The product is often intended for users elsewhere in the University or in the Department, and an important aspect is discussion with eventual users to determine their needs. The course has three aims. Firstly, students learn to use previously gained implementation, testing, and debugging skills in the realisation of a complete, practical product. Secondly, the importance of careful specification, design and project management to successful completion of a product by a co-operating team is made manifest. Thirdly, students learn to take responsibility for a project and work independently of detailed supervision under the demanding 'sink or swim' conditions of real software development.

Computer Science Honours

Permission by the Faculty is required.

Assessment exam, class, prac, project thesis

Computer Science Honours comprises coursework and a project. The project involves a substantial development task, generally in support of Departmental research activities. It provides a foretaste of, and a means of assessing a student's potential for, postgraduate research work.

Coursework currently offered covers: advanced operating systems, amortised complexity, computer networks, distributed algorithms, discrete event simulation systems, expert systems, graph algorithms and related topics; history of computing; linear geometry and signal processing; performance evaluation of computer systems; robotics; queuing systems; semantics; symbolic and algebraic computation.

Students are required to participate in Departmental seminars as part of their coursework and are encouraged to participate, along with staff and research students, in all activities of the Department. 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 Departmental Handbook and the Computer Science Honours Guide Book.

Postgraduate study

Details about fields of postgraduate study within the Department may be obtained from the Department.

Department of Geography

Geography is a varied and versatile subject covering a broad spectrum of knowledge. It was once concerned principally with the description of the earth, but modern geography now embraces society's relationship with the earth within a scientific and highly-structured framework. Currently there are three main elements of Geography actively pursued by the Department. Aspects of *Physical geography* deal with phenomena such as landforms, plants and soil as

elements of physical landscapes. *Human geography* consists mainly of social and economic geography and is concerned with such features as rural and urban settlements, cultural influences and way of life. Economic geography includes the study of agriculture, industry, transport, marketing and resources. *Environmental geography* is concerned with the human/land relationships. This was a traditional theme used as early as in Griffith Taylor's time in the 1920s. It has come to the forefront with contemporary concerns for the environment. However, these three divisions are arbitrary, and some courses involve integration of various aspects of them all.

As theoretical understanding and quantitative precision have advanced, geography has developed as a useful discipline for analysing and proposing solutions to practical problems. Geographers have proved their value in such fields as local government, town and regional planning, decentralisation and environmental management.

Location

The Department Enquiry Office is on the third level of the Institute Building (Room N421) on the eastern side of City Road.

Noticeboards

Junior course noticeboards are on the second level of the Dixon wing in the Institute Building outside Room N332. Intermediate and Senior course noticeboards are between the respective teaching laboratories on the second and third levels in the Institute Building. A general noticeboard is in the corridor of the Institute Building on the ground floor. Students should consult their respective noticeboards regularly for details of excursions, course outlines and so on.

Registration

In addition to complying with enrolment procedures required by the University, all students must register with the Department in the Geography Conference Room, Institute Building, during the orientation period.

Advice on courses

Students may consult with members of staff, especially year supervisors, at any time concerning their courses. During the latter part of the summer vacation, inquiries as to staff availability should be made at the Departmental Office.

Tutorials and practical work

First year students must attend one three-hour practical session each week (see timetable). All students in second and third years are required to attend tutorials and/or designated practical sessions each week.

Assigned work and examinations

In Junior, Intermediate and Senior courses, assignments contribute significantly to final marks.

Conducted field excursions

Students in Junior courses are required to attend two one-day excursions to localities within about 150 km of Sydney. In Intermediate and Senior courses, students are required to take part in long excursions, of about a week's duration, based on a centre remote from

Sydney. However, in physical and environmental geography, there may be the chance of substituting for this remote excursion by having a number of days each semester in the field (up to five days each semester). Those who wish to apply for an interest-free loan to enable them to meet the costs of excursions should consult the SRC and the financial assistance section of the central administration.

Excursion work will be assessed by written assignment and/or examination. Exemption from excursions will only be granted under exceptional circumstances. Requests for exemption must be submitted in writing to the Head of Department.

Departmental handbook

Further details of Departmental activities, courses, excursions, and other relevant material are contained in the *Geography Handbook* available from the Enquiry Office in the Institute Building.

Note: Some courses may be rescheduled to allow for expected staff changes.

Junior Geography courses

Geography offers two Junior courses: Geography 101F in Semester 1 and Geography 102S in Semester 2. Both courses consist of three lectures and three hours of laboratory work a week. Morning lectures are repeated in the afternoon. All students do the same course.

GEOG 101F Physical Geography 6 units

Assoc. Prof. Short, Dr Gale

Classes Sem 1: (3 lec & 3hr prac)/wk

Field excursion one half day/sem

Assessment one 3hr exam, 1500w report, prac assignments

This course is an introduction to the earth's physical environment. The course begins by considering the earth's place in the universe, its origin and development, and the nature and evolution of the earth's structure. This is followed by the evolution of the earth's physical environment and environmental change over time. With this background, the course goes on to examine the earth's hydrosphere and atmosphere and the major landforms produced by the interaction of the atmospheric and ocean processes with the earth's surface, including fluvial, arid, coastal, karst and glacial systems.

GEOG 102S Environmental and Human Geography 6 units

Assoc. Prof. Connell, Dr Davey

Classes Sem 2: (3 lec & 3hr prac)/wk

Assessment: one 3hr exam, 2000w essay, prac exercises

Environmental and Human Geography 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.

Intermediate Geography courses

The Department offers six Intermediate courses in 3 streams — namely geomorphology, environmental geography and human geography. The streams and their courses are:

Geomorphology	Geography 201F and 202S
Environmental	Geography 211F and 212S
Human	Geography 221F and 222S

Each course consists of three lecture and the equivalent of five hours assigned work (which may comprise 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 course which are held within the semester. Some courses hold two to three such excursions.

Students who have completed the Junior Geography and Junior Environmental Science prerequisites may elect to do courses in one or two of these streams.

To complete Intermediate Geography, a student must select two Intermediate Geography courses. Each course is 8 units. A student would normally select two sequential courses from one of the three streams (Geomorphology, Environmental, Human). However, students may vary the sequence of courses between streams and options within courses with the permission of the Head of Department. Not all courses may be offered in any given year.

Special Geography Sequence (Science students)

A candidate who has completed 12 Junior units in Mathematics and 12 Junior units of Physics or Chemistry and who has not taken Geography 101 or 102 may apply under Section 1(4) for permission to enrol in any Intermediate Geography course.

The Department of Geography is not normally prepared to support applications under Section 1 (4) to enrol in Intermediate Geography courses from persons other than those who, in their first year of studies, have completed four Junior courses above the concessional pass grade and have not subsequently failed in any Intermediate course. Students are permitted to count only 16 units of Intermediate Geography courses towards the BSc degree.

Physical Geography stream

GEOG 201F Megascale Physical Environments 8 units

Coordinator Dr Cowell, Lecturer to be determined

Prereq: Geography 101 or Environmental Science 102

Classes Sem 1: (3 lec or 2 prac or field)/wk

Assessment: one 3hr exam or 1500w essay or prac papers

This course 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 202S Geomorphology of Fluvial and Coastal Environments 8 units

Coordinator Dr Dragovich, Lecturer to be determined

Prereq Geography 101 or Environmental Science 102

Classes Sem 2: (3 lec or 2 prac or field)/wk

Assessment one 3hr exam, 1500w essay or prac reports

This course 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.

Environmental Geography stream

GEOG 211F Environmental Change and Human Response 8 units

Dr Chapman, Dr Dragovich

Prereq Geography 101 or 102 or Environmental Science 102

Classes Sem 1: (3 lec or 2 prac or field)/wk

Assessment one 3hr exam, 1500w essay or prac reports

This course considers in even greater detail geomorphological, biophysical and undulated environmental problems. Part of the course may be taken in Soil Science. This deals with soils and landforms and is useful to pedologists and geomorphologists. The other two components are concerned with the weathering of rocks, whether *on-site* or as building materials and a specialised topic in the fluvial area. In recent years, the major element in environmental geomorphology has rotated or varied. Topics emphasised includes: urban geomorphology; environmental impacts of mining; river management; environmental problems of stormwater. All these are topical and relevant to sustainable environmental management.

GEOG 212S Environmental Management 8 units

Dr Hirsch, Dr Davey

Prereq Geography 101 or 102 or Environmental Science 102

Classes Sem 2: (3 lec or 5hr tut or prac or fieldwork)/wk

Assessment one 3hr exam, 2000w essay, tut papers, prac and fieldwork report/s

This course 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 course 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.

Human Geography stream

GEOG 221F Social and Cultural Geography 8 units

Coordinator Assoc Prof Connell, Lecturer to be determined

Prereq Geography 102 or Environmental Science 102

Classes Sem 1: (3 lec & 5hr tut or prac or fieldwork)/wk

Assessment one 3hr exam, 2000w essay, tut papers, prac and fieldwork reports

This course has two components. The first deals with the significant role that society and culture play in influencing spatial structures. The course examines how people perceive and construct space in western and non-western contexts. Topics include the relativity and subjectivity of geography, mental maps, language, religion and music. The manner in which social values and ideologies shape rural and urban space is examined in different cultural contexts. Differences in perception and use of landscapes are compared against various social variables. The second component focuses on population and gender. Population processes and structures are applied and extended to national and global scales. Relationships between population, resources and development are considered, as are population policies. The geography of gender and sexuality is examined with reference to the role of distance and the area of constructing relations between men and women. Spatial variation in gender relations is also covered.

GEOG 222S Geography of Restructuring 8 units

Lecturers to be determined

Prereq Geography 102 or Environmental Science 102

Classes Sem 2: (3 lec & 5hr tut or prac or fieldwork)/wk

Assessment one 3hr exam, 2000w essay, tut papers, prac and fieldwork reports

This course 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 ideology of planning policies are considered, including governments' perception of and response to the informal sector, slums and rural-urban migration. The course then presents the main principles of economic geography, examining the processes which distribute and redistribute economic activities around the world, within nations and within regions. It examines the impact of geography from the global to the local level on economic dynamics. The course discusses the major alternative theories in economic geography and their implications for policy and politics.

Senior Geography courses

The Department offers seven Senior courses in 3 streams — namely geomorphology, environmental geography and human geography. The streams and their courses are:

Geomorphology	Geography 301F and 302S
Environmental	Geography 311F and 312S
Human	Geography 321F and 322S

Each course 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 course which are held within the semester. Some courses hold two to three such excursions.

Students who have completed the Intermediate Geography prerequisites may elect to do courses in one or two of these streams.

To complete Senior Geography, a student must select two courses. Each course is 12 units. A student would normally select two sequential courses from one of the three streams (Geomorphology, Environmental and Human). However, students may vary the sequence of courses between streams and options within courses with the permission of the Head of Department. Not all courses may be offered in any given year.

Advanced Geomorphology stream

These courses examine the evolution of the landscape involving the history of landforms and vegetation in association with tectonic forces, climatic change and biological factors. Physical, chemical and biological weathering processes are studied and there is an emphasis on pedogeomorphology.

GEOG 301F Coastal Environments and Dynamics 12 units

Assoc. Prof. Short, Dr Cowell

Prereq Geography 201 or 202 or 211 or Marine Science 201

Classes Sem 1: (3 lec & 6hr prac or field)/wk

Field excursion one 1-day, two 3-day

Assessment one 3hr exam, two 1500w essays, prac reports

This course examines the marine, terrestrial and atmospheric components that contribute to the formation and the nature of coastal environments, with particular emphasis on Australian coastal systems. It goes on to focus on the general principles of morphodynamic adjustment to changes in coastal boundary components and their impact on the inner shelf, shore-face and estuaries. The field excursions are closely linked to the course and practical work.

GEOG 302S Environmental Geomorphology 12 units

Coordinator Dr Dragovich, *Lecturer* to be determined

Prereq Geography 201 or 202 or 211

Classes Sem 2: (3 lec & 6 prac or field)/wk

Assessment one 3hr exam, two 1500w essays, prac and field reports

This course considers in even greater detail geomorphological, biophysical and related environmental problems. Part of the course may be taken with Soil Science. This part deals with soils and landforms and is useful to pedologists and geomorphologists. The other two components are concerned with the weathering of rocks, whether in landscapes or building materials; and a specialised topic in the fluvial area.

Advanced Environmental Geomorphology stream

GEOG 311F Fluvial Environments 12 units

Assoc. Prof. Warner, Dr Gale

Prereq Geography 201 or 202 or 211

Classes Sem 1: (3 lec or 1 tut or 8 prac or field)/wk

Assessment one 3hr exam, two 1500w essays

This course consists of two parts, one concerned with ancient environments and the other with the environmental geomorphology of today's and tomorrow's rivers. The first section deals with the long-term history of the Australian biophysical environment, tracing changes from the start of the Cenozoic up to the present. The second section focuses on human (European) impacts on fluvial systems in catchments, on floodplains and in channels, using recorded data and historical records to assess human influence on the environment.

GEOG 312S Coastal Environmental Management and GIS 12 units

Dr Chapman, Dr Cowell

Prereq Geography 201 or 202 or 111 or Marine Science 201

Classes Sem 1: (3 lec & 6 prac or field)/wk

Field excursion one 2-day

Assessment one 3hr exam, two 1500w essay, prac or reports

The coastal zone provides an ideal area for the study of resources management, since virtually all the central concerns of resources management are exemplified in that zone. Hence, the structure of the course will be determined by these concerns, with the application to the coastal zone providing the central unifying theme. The course first addresses critical physical systems and natural hazards in the coastal zone, and the ways in which decisions are made about resources management. The course then applies *geographical information systems* in environmental assessment and management of coastal drainage catchments. It focuses on the development and application of GIS models for strategic planning and is structured around a field exercise in location-analysis within a coastal catchment. Practical work involves extensive use of computers.

Advanced Social and Economic Geography stream

GEOG 321F Socio-Economic Development in the Asia-Pacific Rim 12 units

Assoc. Prof. Connell, Dr Hirsch

Prereq Geography 212 or 221 or 222

Classes Sem 1: (3 lec & 9hr tut or prac or fieldwork)/wk

Assessment one 3hr exam, two 2000w essays, tut papers, prac and fieldwork reports

This course deals with processes and consequences of development and restructuring in the dynamic Asia-Pacific economies. It provides a regional geography of Australia's neighbouring region and focuses on key social, political and economic patterns and trends. The region is presented as a highly differentiated entity undergoing rapid social and spatial transformation. Historical and contemporary processes of uneven development constitute a thematic focus for the course. The course builds on key human geographic

principles from the sub-disciplines of economic, development, social and urban geography.

The course contains three options. Two are taught sequentially within the semester by Assoc. Prof. Connell and Dr Hirsch. The third is a field course run by Dr Hirsch and held in South-East Asia before the commencement of Semester 1. Students who undertake the field option only take one of the other options within the semester.

GEOG 322S Urban and Regional Change in Australasia **12 units**

Staff to be determined

Prereq Geography 212 or 221 or 222

Classes Sem 2: (3 lec & 9 hrs tut or prac or fieldwork or indiv. research)/wk

Assessment one 3hr exam, two 2000w essays, tut papers, prac and fieldwork report/s

This course develops and extends an understanding of the varied human geographies of urban and regional Australia with an emphasis upon geographic change in response to local, national and international influences. The intention is that students completing this course will have a sound knowledge of the range of issues relevant for further study or policy applications to urban, rural and remote regions of Australia. Topics covered include: the interaction of economic, social and political processes, the geography of economic restructuring, the relationships among structures and processes, metropolitan and large city spatial management, policies and processes pertaining to smaller settlements and regional development issues.

Geography Senior Course Combinations **48 units**

Students may elect to do four Senior, courses (12 units each) in the one year, giving a total of 48 units. 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 courses at Honours level may proceed to an appropriate course in Geography Honours. Those choosing physical topics must have majored in the Geomorphology stream courses; they may elect to do either Geography or Geomorphology Honours.

Geography Honours

Students contemplating Geography Honours will be invited to complete a preliminary registration form in Semester 2. Following the publication of second semester Senior Geography course results, those eligible students who have preregistered will be invited to formally enrol. They are required to consult the Head of Department 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 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 second semester, followed by an examination that may include both written and oral work.

Geomorphology Honours

Students who enter fourth year through the Senior Geography Geomorphology stream, and who choose to work on landform studies, may elect to proceed to an Honours degree in Geomorphology in lieu of Geography. General course requirements are identical with those listed for Geography Honours.

Department of Geology and Geophysics

The Department offers courses in geology and geophysics that provide the necessary qualifications for professional employment in these fields of earth science. Courses are also offered for students seeking a geoscience component in an environmental science, marine science, or a broadly based science degree. Postgraduate research is conducted in many fields of earth science.

Location

The Department is housed in the Edgeworth David Building, immediately south of the Fisher Library on Eastern Avenue. First year lectures and laboratories are held in the Carslaw Building.

Noticeboards

Information for first year students is posted on the noticeboard inside Carslaw Laboratory 1. Noticeboards for students in Intermediate and later years are in the foyer and corridors of the Edgeworth David Building. Students should consult the noticeboards regularly.

Registration

All Junior Geology students are required to register with the Department in the first laboratory session of each semester. Students in Intermediate and Senior years are required to register in the Department Office, Edgeworth David Building, before each course commences.

Structure of courses

Entry into Junior courses in Geology does not require any prior knowledge of the subject. The Junior courses provide an introduction to the earth sciences. The Intermediate and Senior Geology courses build on the preceding coursework to present a balanced and wide ranging coverage of the subject. A degree of specialisation is built into the Senior Additional stream as it is designed especially for students majoring in geology and proposing to pursue a career in that profession.

Geophysics is a component of most of the courses in Geology but it is also offered as an autonomous Senior course.

Suitably qualified students may proceed to Honours courses in either Geology or Geophysics

Textbooks

For details of prescribed textbooks, students should consult the pamphlets relating to various Departmental courses. The pamphlets are available from the Enquiry Office in the Edgeworth David Building.

Examinations

These are held in June and November.

Junior Geology courses

Students considering enrolling in these courses should study the pamphlet on the Junior courses in Geology, obtainable from the Enquiry Office in the Edgeworth David Building. It gives details of course content, text and reference books, staffing and other relevant matters.

GEOL 101F Earth and Its Environment 6 units

Coordinator Dr Keene

Classes Sem 1: (3 lec & prac or tut)/wk

Assessment one 3hr exam, class and field work

The aim of this course 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. Students will learn techniques and types of observations used to decipher the history and evolution of the Earth, processes operating in the surface environments and dating sediments and rocks. Laboratory classes and a one day field trip to the south coast will involve exercises in observing and describing Earth materials and in interpreting Earth history from geological information, including fossils and maps.

GEOL 102S Earth Processes and Resources 6 units

Coordinator Dr Keene

Classes Sem 2: (3 lec & prac or tut)/wk

Assessment one 3hr exam, class and field work

The aim of this course 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. The course concludes with the study of Australia's sedimentary basins, their fossil fuel content and implications for our economy and an assessment of our own impact on the Earth together with the role of geologists in protecting and monitoring the environment. In addition to laboratory classes there are two field trips: one weekend excursion to the Hunter Valley and a one day excursion to the Blue Mountains. Students will be required to pay hostel accommodation for one night.

Intermediate Geology courses

Only part of geology can be learned from books and laboratory research, the rest has to be investigated in

the field. The courses designated Geology 201, 202 and 203 all contain a field work component.

For further details of the following courses consult the pamphlet on the Intermediate courses in Geology, obtainable from the Enquiry Office in the Edgeworth David Building.

GEOL 201F Plate Tectonics and Materials 8 units

Coordinator Dr Klepeis

Prereq Geology 102 or Environmental Science 101

Classes Sem 1: (4 lec & 2 prac or tut)/wk

Assessment two 2hr theory, lab exam, class work

This course introduces students to new practical techniques that provide a heightened understanding of the concepts introduced in the Junior courses in Geology. The principal objectives of this course are: (1) to explore the quantitative tectonophysical approach to global plate tectonics, (2) to introduce students to the analysis and interpretation of geological structures, (3) to provide a theoretical and practical introduction to the use of the polarising microscope in mineralogy and petrography, (4) to provide an introduction to the methods of optical crystallography and optical mineralogy, (5) to investigate the fundamental processes responsible for the origin and evolution of the main types of rocks, and (6) to use the polarising microscope to reveal the textures and phases present in the common igneous, sedimentary and metamorphic rocks.

GEOL 202S Resource Exploration 4 units

Coordinator Dr Birch

Prereq Geology 201

Classes Sem 2: (2 lec & 1 prac or tut)/wk

Assessment one 3hr exam, class work

Mining is an important and essential part of the Australian economy. This course reviews the various economic mineral deposits that are currently mined in Australia. It shows how the geological concepts developed in Geology 201 can be applied to the study of fuels and ore deposits. The course also includes an introduction to the techniques used in geophysical exploration.

GEOL 203S Fossils and Time 4 units

Coordinator Dr Buick

Prereq 24 units of Science courses

Classes Sem 2: (2 lec & 1 prac or tut)/wk

Assessment one 3hr theory, lab exam, class work

This palaeontology and stratigraphy course is aimed at geoscientists, archaeologists, biologists, geographers and others 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 age determination.

GEOL 204F Environmental Geology: Hazards 4 units

Coordinator Dr Birch

Prereq 24 units of Science courses

Classes Sem 1: 3 lec/wk & fieldwork

Assessment one 3hr exam

Geology provides the essential framework for understanding natural and anthropogenic hazards. Various geological and geophysical processes are discussed so that students can understand the geological setting and destructive potential of natural hazards, such as earthquakes, landslides and volcanic activity. The processes that operate in the Earth's surficial environment are complex and require to be understood if the impact of anthropogenic hazards is to be managed and minimised. Topics covered include seismic activity, coastal hazards, flooding, landslides, volcanic activity and human interaction with the environment, particularly groundwater use and pollution, land use and waste management.

GEOL 205S Environmental Geology: Resources 4 units

Coordinator Dr Birch

Prereq 24 units of Science courses

Classes Sem 2: 3 lec/wk & fieldwork

Assessment one 3hr exam

Australia is a major primary producing nation and mining accounts for a substantial part of its export income. This segment of the environmental geology program is concerned with the application of geological information and techniques in solving conflicts that may arise when new mines are proposed. It shows how geological principles can be used to minimise environmental degradation in areas of active mining. Topics covered include renewable and non-renewable global energy resources, the importance of minerals in an industrialised society, mineral extraction and processing, environmental impact of mining and mineral processing, site reclamation, recycling, ecologically sustainable development, global climate change and environmental law.

Senior Geology courses

Most of the Senior courses in Geology contain a field work component. For details of this component consult the pamphlet on Senior courses in Geology and Geophysics, obtainable from the Enquiry Office in the Edgeworth David Building.

GEOL 301F Petrology, Basins and Structure 12 units

Coordinator Dr Clarke

Prereq Geology 202 and 203

Classes Sem 1: 12hr of lec & prac/wk

Assessment two 2hr theory, lab exam, class work

This course consists of six sections, igneous petrology, metamorphic petrology, sedimentary environments, structures, tectonics and sequence stratigraphy. The first three sections contain an in-depth examination of the origin and evolution of the various types of rocks. In the structures module the focus is on the analysis,

synthesis and interpretation of different kinds of structural data and surface maps using advanced geometric methods. Students are also introduced to the techniques of kinematic analysis for both brittle and ductile deformation. The tectonics module aims to provide students with a more detailed understanding of the tectonic processes that have shaped the Earth's crust. It examines active tectonic environments, the structure of the crust in different tectonic settings, processes of mountain building, and the effects of modern and ancient plate boundaries on the evolution of the continents.

GEOL 302S Exploration for Resources 8 units

Coordinator Dr Wilkins

Prereq Geology 301

Classes Sem 2: 8hr of lec & prac/wk

Assessment two 2hr theory, lab exam, class work

This course is designed to provide a practical training in specific aspects of resource exploration, and it prepares students for employment in the mineral and petroleum industries. It contains modules on the geology of industrial and metalliferous mineral deposits, sedimentary resources, sequence stratigraphy, basin analysis, the use of geophysical methods to delineate buried mineral and hydrocarbon deposits, and a synthesis of the geological evolution of the Australian continent from its earliest beginnings to the present. The latter contains an evaluation of the resource potential of the various periods of geological time.

GEOL 303F Engineering and Exploration Methods 8 units

Coordinator Dr Wilkins

Coreq Geology 301

Classes Sem 1: 8hr of lec & prac/wk

Assessment one 3hr exam, lab, field reports

This course is designed to provide training in engineering geology and mineral exploration methods. The first module provides a balanced introduction to those aspects of geology, geophysics and hydrogeology that are important in site investigations for the construction of large engineering works such as dams, roads, bridges and buildings. The field studies program includes visits to active construction sites and completed works so that students can evaluate the influence that various geological settings have on the design and construction of large-scale engineering works. The second module introduces the geochemical and geophysical exploration techniques used in the mineral exploration industry. The main topics in the geochemical exploration part of the course include the mobility of elements in the surficial environment, the stability of minerals, indicator and pathfinder elements, geochemical dispersion patterns characteristic of ore deposits, ore deposit geochemistry, types of geochemical surveys, and the statistical interpretation of geochemical data sets. Topics in geophysical exploration include the principles of magnetic, gravity, resistivity, electromagnetic and induced polarisation techniques in the search for ore deposits.

GEOL 304F Paleobiology 4 units*Coordinator* Dr Buick*Prereq* Geology 203 or 8 units of Intermediate Biology*Classes* Sem 1: 4hr of lec & prac/wk*Assessment* one 4000w essay, class work

This course is aimed at geoscientists and biologists who are interested in the evolution of life and how it was constrained by environmental events and ecological interactions. It focuses on the major crises in the paleontological record, such as explosive radiations and mass extinctions, examining causes and effects, evolutionary and ecological influences and outcomes, from the early Archaean to the Recent, and across all known groups of organisms. The course includes seminars and a weekend field excursion to examine a mass-extinction horizon.

GEOL 305S Geochemistry and Structure 12 units*Coordinator* Dr Klepeis*Prereq* Geology 301*Classes* Sem 2: 10hr of lec & prac/wk & field work*Assessment* one 3hr exam, lab and field work

The geochemistry module examines topics such as the age and origin of the elements, cosmic abundance, planet-forming processes, the evolution of the Earth's core and mantle, distribution of trace elements in magmas and magmatic rocks, isotope geochemistry. It also provide students with a sound basis in the analytical techniques commonly used in geoscience. Techniques discussed include X-ray fluorescence, X-ray diffraction, mass spectrometric analysis, atomic absorption spectrometry, microprobe analysis, neutron activation and scanning electron microscopy. The structural geology module is designed to give students practical experience in advanced structural analysis of polyphase ductilely deformed terrains in the field. It examines current models proposed for the origin and evolution of multiply deformed gneiss terrains in different tectonic settings and shows how to combine different types of both field and laboratory data to develop structural models for these terrains.

GEOL 306S Petroleum Exploration 4 units*Coordinator* Dr Birch*Prereq* Geology 301*Coreq* Geophysics 304*Classes* Sem 2: 4hr of lec & prac/wk*Assessment* one 1hr exam, project

This course was developed to provide a comprehensive introduction to petroleum exploration. It acquaints students with the exploration techniques currently used in the petroleum industry, including the principles and practice of electrical logging, source rock evaluation and reservoir quality assessment. Problems of fluid migration and timing are examined in relation to source maturation. The course culminates in a comprehensive project in which all the techniques discussed during the course are used to solve a regional petroleum exploration problem.

Senior Geophysics courses**GEOP 301F Geophysical Signal Processing 4 units***Coordinator* Dr Miiller*Prereq* 6 units of Physics and 16 units of Intermediate Science courses*Classes* Sem 1: 4hr lec & prac/wk*Assessment* one 2hr exam, class work

Starting with a discussion of what signals are and how geophysical data are collected, this course covers basic signal definitions and properties, convolution and correlation, numerical transforms, some basic probability and statistics, converting analogue to digital data, re-sampling digital data, and the analysis of digital random data, including spectral density functions and coherence functions. An introduction to systems and digital filters is followed by examples of various filters. The course concludes with a review of the processing of seismic reflection and refraction data.

GEOP 302F Geodynamics 4 units*Coordinator* Dr Miiller*Prereq* 6 units of Physics and 16 units of Intermediate Science courses*Classes* Sem 1: 4hr lec & prac/wk*Assessment* one 2hr exam, class work

This course explores the nature and consequences of plate motions on a sphere. It includes a detailed analysis of major geodynamic processes such as plate boundary deformation, earthquake generation, continental rifting, plate subsidence, flexure and uplift, and the thermal evolution of various types of lithosphere

GEOP 303F Geophysical Exploration A 4 units*Coordinator* Prof. Mason*Prereq* 6 units of Physics and 16 units of Intermediate Science courses*Classes* Sem 1: 3hr lec & prac/wk and field work*Assessment* one 2hr exam, lab work, field reports

This course starts with an introduction to the exploration process and the principles that underlie the geophysical methods used in the search for mineral deposits. Topics examined include the use of gravity, IP, magnetic and electromagnetic methods in mineral exploration, analysis and interpretation of geophysical surveys, and the principles and methods of seismic surveying. The final part of the course discusses boreholes and drilling, drilling muds, blowout control, drill stem testing, casing perforation, borehole navigation, mud logging, coring, formation evaluation; wirelining for lithology, porosity, permeability; induction, spontaneous potential and resistivity logs; dipmeters, sonic logs, televiwers, nuclear methods, crosshole correlation, borehole transient electrical method, fundamentals of VSP and reservoir development.

GEOP 304S Petroleum Geophysics 4 units

Coordinator Prof. Mason

Prereq Geology 301

Coreq Geology 306

Classes Sem 2: 4hr lec & prac/wk

Assessment project and lab exercises

This is a hands-on course that is aimed at developing student skills in coordinating the various methods currently used in petroleum exploration. Particular emphasis is placed on seismo-stratigraphy, and the use of seismic profiles in structural interpretation, the recognition of clastic depositional facies, carbonate build-ups, and salt diapirism. Other important topics include acoustic wave transmission through the Earth, and the expression of tectonic styles on seismic profiles as an aid to understanding the formation and entrapment of hydrocarbons. Half of this course is spent in workshops, where the class is divided in competing teams that interpret a comprehensive set of marine seismic data. At the end of the course the teams submit competitive drilling proposals based on their structural interpretations.

GEOP 305S Environmental Geophysics 4 units

Coordinator Prof. Mason

Prereq 6 units of Physics and 16 units of Intermediate Science courses

Classes Sem 2: essentially field based

Assessment one 1.5hr exam, lab exercises

This course shows how a whole battery of geophysical techniques can be successfully used in site investigations and in monitoring fluids and pollutants on and beneath the surface. Topics examined in the first part of this course include real and synthetic aperture images, image acquisition from satellites and airborne platforms, radar images, images obtained from magnetic, gravimetric and seismic surveys, two dimensional image processing, human visual systems, image enhancement, image contrast and dynamic range modification, noise control, matched, inverse and Wiener filters, median and other non-linear data adaptive filters, edge detection and image degradation and restoration. The second part of the course is on site assessment and it includes trigonometric surveying, GPS, differential GPS and other electronic surveying techniques, drilling, monitoring and logging of shallow boreholes, groundwater assessment, crosshole surveying with ground penetrating radar, low frequency electromagnetics, direct current electromagnetics, seismic techniques, tomographic image acquisition, importance of uniform coverage in automatic image reduction and the role of forward modelling in the interpretation of sparse images.

GEOP 306S Geophysical Exploration B 4 units

Coordinator Prof. Mason

Prereq Geophysics 303

Classes Sem 2: essentially field based

Assessment one lab, field report

This is a practical course in the various geophysical exploration methods used in the search for economic

mineral deposits. It consists of lectures practical classes and field work. During the course students will be taken to an area of known sub-surface mineralisation, close to active mining operations, where they will be instructed in the design, implementation and interpretation of geological, magnetic, gravimetric, electromagnetic and electrical prospecting surveys. Data collected in the field will be examined and interpreted both on site and in the laboratory.

GEOL 103F Environmental Earth Science A 6 units

Coordinator Prof. Davies

Classes Sem 1: (3 lec & prac or tut)/wk

Assessment one 3hr exam, class work

The course is designed as an introduction to geology for students enrolled in the BSc(Environmental) degree program. No previous knowledge of geology is assumed. This course examines global geological processes and their controls on the human environment. It 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 course includes an examination of minerals and rocks as an introduction to the study of the Earth's mineral and energy resources.

Honours

Coordinator Dr Clarke

Suitably qualified students may take Honours in Geology or 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 Department.

Postgraduate study

Details concerning fields of postgraduate study in the Department of Geology and Geophysics may be obtained from Dr Dietmar Muller or the Head of Department.

History and Philosophy of Science

The History and Philosophy of Science courses are intended to provide a broad, socially relevant appreciation of the scientific enterprise. The educational objective of the courses is to enable students to stand back from the specialised concerns of their other subjects and gain some perspectives on what science is, how it came to acquire its modern form, and how it fits into contemporary society.

It is envisaged that the course will prove relevant to

students pursuing any of a large number of possible scientific careers, especially those involving science administration or education.

Location

Carslaw Building, Level 4.

Advice on courses

A member of staff will be available to advise on courses during the enrolment and orientation periods, either in the enrolment centre or in the History and Philosophy of Science Office.

Handbook

Detailed information on courses is available from the History and Philosophy of Science Office.

Registration

Students will need to register in tutorials. Arrangement for this will be made in lectures at the beginning of the year.

Intermediate History and Philosophy of Science courses

HPSC 201S Introductory Philosophy of Science 4 units

Assoc. Prof. Chalmers, Dr Rasmussen

Prereq 24 units of Junior Science courses

Classes Sem 1: (2 lec & 2 tut)/wk

Assessment onetake-home exam, tutorial assignments

HPSC 202F Introductory History of Science 4 units

Assoc. Prof. Shortland, Dr Rasmussen

Prereq 24 units of Junior Science courses

Classes Sem 2: (2 lec & 2 tut)/wk

Assessment one take-home exam, tutorial assignments

Senior History and Philosophy of Science courses

Up to 24 units of the following Senior courses may be taken. However, no more than two of the options 304, 305, 306, 307, 308 and 309 may be taken together.

Note: Options are offered subject to the availability of staff and on condition that they are chosen by an adequate number of students in each case. Students should consult the History and Philosophy of Senior Science Course Information leaflet at the beginning of the year for up-to-date information.

HPSC 301F History of Physical Sciences 6 units

Assoc. Prof. Chalmers

Qual History and Philosophy of Science 201 and 202

Classes Sem 1: (two 1hr lec & one 2hr tut)/wk

Assessment one take-home exam, tutorial work

HPSC 302F History of Biological Sciences 6 units

Assoc. Prof. Shortland, Dr Rasmussen

Qual History and Philosophy of Science 201 and 202

Classes Sem 1: (two 1hr lec & one 2hr tut)/wk

Assessment one take-home exam, tutorial work

HPSC 303F Social Relations of Science A 4 units

Dr Rasmussen

Qual History and Philosophy of Science 201 and 202

Classes Sem 1: (1 lec & 1 tut)/wk

Assessment one take-home exam, tutorial work

HPSC 304S Social Relations of Science B 4 units

Dr Rasmussen

Qual History and Philosophy of Science 201 and 202

Prereq History and Philosophy of Science 303

Classes Sem 2: (1 lec & 1 tut)/wk

Assessment one take-home exam, tutorial work

HPSC 305F History and Philosophy of Medicinal Science 4 units

Dr Hardy

Qual History and Philosophy of Science 201 and 202

Classes Sem 1: (1 lec & 1 tut)/wk

Assessment class work, essay

HPSC 306F Scientific Controversies 4 units

Assoc. Prof. Shortland

Qual History and Philosophy of Science 201 and 202

Classes Sem 1: (1 lec & 1 tut)/wk

Assessment classwork, one 2500w essay

HPSC 307S Science and Ethics 4 units

Assoc. Prof. Shortland

Qual History and Philosophy of Science 201 and 202

Classes Sem 2: 2hr/wk

Assessment classwork (50%), take-home exam (50%)

HPSC 308S The Nature of Experiment 4 units

Assoc. Prof. Keith Campbell, Dr Rasmussen

Qual History and Philosophy of Science 201 and 202

Classes Sem 2: 2hr/wk

Assessment classwork (50%), take-home exam (50%)

HPSC 309S Visualisation Techniques in Contemporary Science 4 units

Dr Rasmussen

Qual History and Philosophy of Science 201 and 202

Classes Sem 2: (1 lec & 1 tut)/wk

Assessment one take-home exam, tutorial work

HPSC 310F Contemporary Issues A 6 units

Assoc. Prof. Shortland, Dr Gaukroger

Qual History and Philosophy of Science 201 and 202

Coreq History and Philosophy of Science 301 or 302 or 303 or 304

Classes Sem 1: 2 lec/wk

Assessment classwork, take-home exam

HPSC 311S Contemporary Issues B 6 units

Assoc. Prof. Shortland, Dr Rasmussen

Qual History and Philosophy of Science 201 and 202

Coreq History and Philosophy of Science 301 or 302 or 303 or 304

Classes Sem 2: 2 lec/wk

Assessment classwork, take-home exam

History and Philosophy of Science Honours

Students of sufficient merit may be admitted to the Honours course. They are required to:

- carry out research work under the direction of a supervisor;
- submit a thesis of about 15 000 words on this work;
- complete four two-hour per week single semester courses including the assessment required;
- attend a fortnightly seminar.

Marine Sciences

The Marine Studies Centre offers Intermediate, Senior and Honours courses of a transdisciplinary nature in the marine sciences. Staff from the School of Biological Sciences, the Department of Geography and the Department of Geology and Geophysics teach in the undergraduate program.

Intermediate Marine Sciences courses

MARS 201F Introductory Marine Science A 4 units

Prereq 24 units of Junior courses from Science Discipline Areas

Classes Sem 1: (3 lec & 1 tut)/wk, 1 day excursion, .5 day excursions

Assessment one 3hr exam, classwork

Introduction to oceanography and its history; the morphology, geology and history of the continental shelves, continental slopes and ocean basins; ocean properties and circulation, ocean-atmosphere and ocean-sea floor relationships.

MARS 202S Introductory Marine Science B 4 units

Prereq Marine Sciences 201

Classes Sem 2: (3 lec & 1 tut)/wk, 1 day excursion, .5 day excursions

Assessment one 3hr exam, classwork

Introduction to physical processes affecting the coastal zone; chemical cycles within the oceans; major biological systems of the oceans; biological adaptation.

Senior Marine Sciences courses

MARS 301F Marine Science A 12 units

Qual Marine Science 202

■ *Prereq* There are prerequisites for some options, see below

Classes Sem 1: see individual options below

Assessment see individual options below

MARS 302S Marine Science B 12 units

Qual Marine Science 202

Prereq There are prerequisites for some options, see below

Classes Sem 2: see individual options below

Assessment see individual options below

General

This program is for Senior students of biology, geology, geography or mathematics who are interested in the

marine sciences. It can, however, be taken with a Senior course in any other subject. No special requirement of Junior courses is laid down.

Internal structure

Students may enrol in either or both semesters (i.e. MARS 301 or 302 or both). Within the program, options are available in each semester. Students are encouraged to select those in which they have a particular interest, subject to the unavoidable requirement in certain cases that they have completed some prior study in that subject area.

The options are in the following list. Options are usually provided in the form of three or four lectures together with eight or nine hours' practical or project work and, in some cases, a one hour tutorial each week. Some include an excursion of several days' duration. Not every option is available every year.

List of options

MS 12 Coastal Depositional Environments and Morphodynamics 12 units

May not be counted with Geography 301, students cannot also enrol in MS 67; comprises MS 1 and MS 2 below

MS 13 Coastal Depositional Environments and Marine Geology 12 units

May not be counted with Geography 301, comprises MS 1 and MS 3 below

MS 15 Coastal Depositional Environments and Marine Biology 12 units

May not be counted with Geography 301, nor with Biology 312; comprises MS 1 and MS 5 below

MS 42 Evolution and Diversity of Australian Biota and Coastal Morphodynamics 12 units

May not be counted with Geography 301, nor with Biology 312; comprises MS 2 and MS 4 below

MS 43 Evolution and Diversity of Australian Biota and Marine Geology 12 units

May not be counted with Biology 312; comprises MS 3 and MS 4 below

MS 45 Evolution and Diversity of Australian Biota and Marine Biology 12 units

May not be counted with Biology 312; comprises MS 4 and MS 5 below; students cannot also enrol in MS 10

MS 67 Coastal Zone Management and GIS 12 units

May not be counted with Geography 312; comprises MS 6 and MS 7 below; students cannot also enrol in MS 12

MS 69 Coastal Zone Management and Climate Change 12 units

May not be counted with Geography 312; comprises MS 6 and MS 9 below

MS 87 Chemical Process in the Ocean and GIS 12 units

May not be counted with Geography 312; comprises MS 7 and MS 8 below

MS 89 Chemical Processes in the Ocean and Climate Change 12 units

Comprises MS 8 and MS 9 below

MS 10 Marine Ecology**12 units**

May not be counted with Biology 322; students cannot also enrol in MS 45

Students intending to enrol in only one semester of Senior Marine Sciences courses may not choose only MS 45, MS 12, MS 67 or MS 10.

All enrolments are to be approved by the Director of the Marine Studies Centre.

MS 1 Coastal Depositional Environments

Assoc. Prof. Short

Classes Sem 1: Weeks 1-7: (2 lec & 1 tut)/wk, excursions (over 2 weekends, one 1 day)

Assessment assignments, exams

The aim of this course is to examine the form and process relationships that generate the world's major coastal deposition environments and to determine their long term evolution through examination of their surface morphology and three dimensional stratigraphy. More specifically, the course will examine sediment transport and deposition, nature and influence of sediment characteristics and the energy regime and morphology of the receiving basin that combines to produce a coastal depositional environment. The long term evolution of particular coastal depositional environments will be examined in the context of variation in the above parameters along with the variation in the Quaternary climate and sea level.

MS 2 Coastal Morphodynamics

Dr Cowell

Classes Sem 1: Weeks 8-14: (3 lec, 1 tut & 1hr prac)/wk, excursion (over 1 weekend)

Assessment assignments, exams

Coastal Morphodynamics is a course in the modelling of complex environmental systems. Specifically, the course concerns the interactions between fluid dynamics and changes in coastal geomorphology over a wide range of scale in space and time. More generally, the coast is used for exploring development and application of computer models for simulating the behaviour of complex environmental processes. Such processes involve non linear dynamical problems that go beyond the realm of classical mathematics and physics. Computer simulation of these problems provides practical insights into the application of chaos theory to the evolutionary behaviour of coasts. The course 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.

MS 3 Marine Geology

Dr Keene

Classes Sem 1: Weeks 8-14: (3 lec, 1 tut & 6hr prac)/wk, 1 day excursion

Assessment one 1.5hr exam, classwork

This option will examine in detail sedimentation processes and sedimentation history on the continental shelves, slope and deep sea basins including the origin

and evolution of organic, biogenic and chemical sediments. The emphasis will be on the seafloor around Australia using data from the Ocean Drilling program and other direct sampling from research cruises. An understanding of the geologic evolution of continental margins and the sea floor through time will include the study of stratigraphy and geochemical changes. Practical studies will involve the application and interpretation of remote sensing techniques including seismic reflection and side scan sonar and a one day field trip on Sydney Harbour. Current controversies in marine geology will be discussed in seminars.

MS 4 Evolution and Diversity of the Australian Biota (Core course)**6 units**

Dr Henwood, Assoc. Prof. Hinde, Dr Hoegh-Guldberg, Dr Kingsford, Prof. Larkum, Prof. Patterson, Prof. Shine, Dr Taylor and others

Classes Sem 1: (4 lec & 8hr prac)/wk. Timetable 2

Assessment one 1.5hr exam, assignments, projects

See *Evolution and Diversity of the Australian Biota* entry under School of Biological Sciences.

MS 5 Marine Biology Module**6 units**

Assoc. Prof. Hinde, Dr Hoegh-Guldberg, Dr Kingsford, Prof. Larkum

Qual Biology 201 or 291 and 202 or 292 or 16 units of Intermediate Biology including one of Biology 203 or 204 or 293 or 294

Classes Sem 1: (4lec & 8hr prac)/wk, field courses. Timetable 2

Assessment one 1.5hr exam, assignments and projects

See *Marine Biology Module* entry under School of Biological Sciences.

MS 6 Coastal Zone Management

Dr Chapman

Classes Sem 2: Weeks 1-7: (3 lec, 1hr prac & 1 tut)/wk, excursion (over 1 weekend)

Assessment assignments, exams

The coastal zone provides an ideal area for the study of resources management since virtually all the central concerns of resources management are exemplified in that zone. Hence the structure of the course will be determined by these concerns, with the application to the coastal zone providing the central unifying theme. Critical physical systems and natural hazards in the coastal zone are given due emphasis, and in addition the course addresses ways in which decisions are made about resources management and some of the models which can usefully be employed in this regard.

MS 7 Geographical Information Systems

Dr Cowell

Classes Sem 2: Weeks 8-14: (3lec, prac & 1 tut)/wk, excursion (over 1 weekend)

Assessment assignments, exams

Principles involved in computer based geographic information systems are applied to environmental assessment and management of coastal drainage catchments. The course focuses on the development and application of GIS models for strategic planning. It is structured around an exercise in location analysis within a coastal catchment. The exercise is undertaken

in three hour computer sessions during each week of the course. Lectures provide background to the techniques employed, such as satellite image processing, transformation and analysis of spatial data and decision support simulation. An overview is also given of the information technology upon which the GIS industry is based. The course aims to provide: (1) an applied understanding of concepts in strategic planning in environmental problems, (2) problem solving techniques of GIS in environmental assessment and strategic planning, and (3) vocational skills in computing and reporting. Practical work involves extensive use of computers.

MS 8 Chemical Processes in the Oceans

Dr Isern

Prereq 12 units of Chemistry

Classes Sem 2: Weeks 1-6: (4 lec, 1 tut & 2hr prac)/wk

Assessment one 1.5hr exam, classwork

This course provides an overview of organic and inorganic chemical processes in the oceans, particularly in relation to circulation, sedimentation and biological processes. Topics include properties of seawater, biological cycling of nutrients, carbon and carbonate cycles in the ocean, reactions within the sediments and exchanges with seawater, uses of stable isotopes, glacial-interglacial changes in the ocean chemistry and anthropogenic influences.

MS 9 Palaeoceanography and Climate Change

Dr Isern

Classes Sem 2: Weeks 8-14: (4 lec, 1 tut & 2hr prac)/wk

Assessment one 1.5hr exam, classwork

Climatic changes over time have greatly influenced oceanic biology, chemistry and environments on earth. This course will examine evidence for climatic change found in the marine geological and chemical records. Climatic change on long (million and billion year) and short (thousand year) time scales will be discussed. This option will review the natural changes in climate which have occurred over time and also those which are anthropogenically induced.

MS 10 Marine Ecology

12 units

Dr Dickman, Dr Kingsford, Dr Meats, Prof. Underwood and others

Qual Biology 201 or 291 and 202 or 292

Classes Sem 2: (4 lec & 8hr prac)/wk, one 8-day field course in vacation before Sem 2. Timetable 2

Students enrol in Core *Ecology*, including its field course and the *Marine Ecology Module*. See entry under School of Biological Sciences

Notes:

- Because of the limited facilities available for the marine biological courses it may be necessary to restrict the number of students taking any particular option. If this need arises selection will be based on academic merit.
- All students intending to enrol in any of the marine biology options must consult the booklet *Information for Students Considering Senior Biology Courses* 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

- Students intending to enrol in coastal geography options should complete a preliminary enrolment form in the Department of Geography before first semester commences.

Enrolment and registration

In addition to complying with enrolment procedures required by the University, all students in Senior Marine Sciences must register with the Marine Studies Centre during the first week of lectures. Enquires should be made to the course coordinator (Assoc. Prof. Short in the Department of Geography). All enrolments must be approved by the Director of the Marine Studies Centre.

Noticeboards

Please consult the Marine Sciences noticeboard on level 2 of the Department of Geology and Geophysics, Edgeworth David Building.

Summaries of course options

Students should consult handbook entries for details on course options as listed in the three contributing Departments/Schools (Biological Sciences, Geology and Geophysics, Geography).

Marine Sciences Honours

The structure of the course 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 courses mainly chosen from existing Honours course options offered in the Department of the student's principal interest. Background study in a subsidiary field of interest may be required. Thesis work will commence in February and continue to November.

In general, a Credit average or better in Senior Marine Sciences courses and at least a Pass in another Senior course are required for entry. A minimal WAM score is usually set for entry into Honours in Marine Sciences, preferably during second semester of the Senior program and otherwise as soon as possible after publication of the Senior course 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 Director of the Marine Studies Centre.

Postgraduate study

Details concerning fields of postgraduate study in Marine Sciences courses offered to postgraduate students and admission requirements may be obtained from Professor Underwood (Director of the Marine Studies Centre), Assoc. Prof. Hinde, Dr Keene or Assoc. Prof. Short.

School of Mathematics and Statistics

The School of Mathematics and Statistics offers courses in Applied Mathematics, Mathematical Statistics and Pure Mathematics.

The Junior courses 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 courses 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. Courses 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 courses are designed to train those who wish to become professional statisticians, tertiary teachers and research workers, but there are courses which provide a knowledge of statistical methods and techniques for students specialising in other fields.

Pure Mathematics courses have two main aims. One of these is to equip students with the background of mathematical knowledge, understanding and skill necessary for courses 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.

Location

The School is located in the Carslaw Building.

Noticeboards and registration

Details of locations of noticeboards and of registration for specific courses are available in the course handbooks available at the time of enrolment or during the first week of lectures.

Advice on courses

School advisers are normally available during the enrolment period. There are lists of advisers for specific courses at the front of this handbook and in the course handbooks.

Junior Mathematics courses

Various combinations of Junior courses may be taken,

subject to the prerequisites listed below. However, only one Junior course per semester may be counted towards a degree.

Before deciding on a particular combination of Junior courses, students are advised to check carefully the prerequisites relating to mathematics for all courses.

Life Science courses

These consists of two one semester courses, MATH 111 and MATH 112, intended to give a rounded view of mathematics and particularly designed for students intending to major in the life and social sciences.

Content

Topics covered include differential and integral calculus and linear algebra (in first semester) and differential equations and statistics (in second semester).

There are comprehensive details in the *Junior Mathematics Courses 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 courses

The Life Science courses together give 12 units of mathematics, which is the minimum required by the BSc degree regulations. They may not be counted together with any other Junior mathematics course offered in the same semester. Students obtaining a Distinction in MATH 111 are encouraged to enrol in normal courses in subsequent semesters. Only students obtaining a Distinction or better in MATH 111 may proceed to Intermediate courses in the Mathematics Discipline Area. Students with a Credit or better in MATH 111 and a Pass or better in MATH 112 may proceed to Intermediate courses in the statistics discipline area. Students with a Pass in only MATH 112 are limited to the Intermediate statistics courses STAT 216 and STAT 218 and the Senior statistics courses STAT 320 and STAT 323.

MATH 111F Life Sciences Mathematics A

6 units

AKn HSC 2-unit Mathematics

Classes Sem 1: (4 lec & 2 tut)/wk

Assessment two 2hr exams, assignments, computer project, class quizzes

MATH 112S Life Sciences Mathematics B

6 units

AKn HSC 2-unit Mathematics

Classes Sem 2: (4 lec & 2 tut)/wk

Assessment two 2hr exams, assignments, computer project, class quizzes

Normal courses

The various combinations of these Junior mathematics courses are designed to provide a thorough

preparation for further study in mathematics and statistics.

Content

One course is offered in first semester, covering mainly linear algebra and differential calculus.

Students may choose one of three courses in second semester. Between them, these cover integral calculus, differential equations and modelling, statistics, and discrete mathematics.

There are comprehensive details of these courses in the *Junior Mathematics Courses Handbook*, available from the School at the time of enrolment.

Assumed knowledge

Knowledge equivalent to the HSC 3-unit Mathematics course is assumed. Students who do not have this knowledge are strongly advised to attend a mathematics bridging course conducted jointly by the School and the Mathematics Learning Centre in February.

Relation to other courses

Students should take one course in each semester in order to meet the minimum requirement of 12 units of mathematics in the BSc degree. These courses may not be counted with any other Junior mathematics course offered in the same semester. Passes in Junior courses at this level qualify students to proceed to Intermediate courses in mathematics and statistics. Students should note however that some Intermediate courses in both mathematics and statistics require specific Junior courses to be passed as qualifying courses. Students obtaining a Distinction or better in Normal courses are encouraged to enrol in other Advanced courses.

MATH 101F Differential Calculus and Linear Algebra 6 units

AKn HSC 3-unit Mathematics

Classes Sem 1: (4 lec, 2 tut & 1 optional computer lab)/wk

Assessment two 2hr exams, assignments

MATH 102S Integral Calculus and Statistics 6 units

Prereq Mathematics 101 or 191 or Distinction in Mathematics 111

Classes Sem 2: (4 lec, 2 tut & 1 optional computer lab)/wk

Assessment two 2hr exams, assignments

MATH 103S Integral Calculus and Discrete Mathematics 6 units

Prereq Mathematics 101 or 191 or Distinction in Mathematics 111

Classes Sem 2: (4 lec, 2 tut & 1 optional computer lab)/wk

Assessment two 2hr exams, assignments

MATH 104S Statistics and Discrete Mathematics 6 units

AKn HSC 3-unit Mathematics

Classes Sem 1: (4 lec, 2 tut & 1 optional computer lab)/wk

Assessment two 2hr exams, assignments

Advanced courses

Advanced courses are available to students with a very good record in high school mathematics or university mathematics in a previous semester who

wish to take courses of a more challenging nature. All students aiming for high achievement, such as an Honours degree or postgraduate study, are advised to enrol in Advanced courses.

Content

The course content is similar in outline to that of the Normal courses above but proceeds at a faster rate and covers more difficult material.

There are comprehensive details of these courses in the *Junior Mathematics Courses Handbook*, available from the School at the time of enrolment.

Assumed knowledge

Knowledge equivalent to the HSC 4 unit, or the top decile of the 3 unit Mathematics course is assumed.

Relation to other courses

Students should take one course in each semester in order to meet the minimum requirement of 12 units of mathematics in the BSc degree. These courses may not be counted with any other Junior mathematics course offered in the same semester. Passes in Junior courses at this level qualify students to proceed to Intermediate courses in mathematics and statistics at either the Normal or the Advanced level. Students should note however that some Intermediate courses in both mathematics and statistics require specific junior courses to be passed as qualifying courses.

MATH 191F Differential Calculus and Linear Algebra (Advanced) 6 units

AKn HSC 4-unit or top decile 3-unit Mathematics

Classes Sem 1: (4 lec, 2 tut & 1 optional computer lab)/wk

Assessment two 2hr exams, assignments

MATH 192S Integral Calculus and Statistics (Advanced) 6 units

Prereq Credit in Mathematics 101 or 191

Classes Sem 2: (4 lec, 2 tut & 1 optional computer lab)/wk

Assessment two 2hr exams, assignments

MATH 193S Integral Calculus and Discrete Mathematics (Advanced) 6 units

Prereq Credit in Mathematics 101 or 191

Classes Sem 2: (4 lec,

Assessment two 2hr exams, assignments

MATH 194S Statistics and Discrete Mathematics (Advanced) 6 units

AKn HSC 4-unit or top decile 3-unit Mathematics

Classes Sem 2: (4 lec, 2 tut & 1 optional computer lab)/wk

Assessment two 2hr exams, assignments

Intermediate Mathematics courses

The School of Mathematics provides a range of 4-unit courses at the Intermediate level covering a variety of topics in Pure and Applied Mathematics. Students may take up to 32 units in Intermediate Mathematics courses and may combine them with up to 16 units in Intermediate Statistics. Anyone intending to specialise in Senior mathematics should take a minimum of 16 units of Intermediate courses.

The courses are taught at either the Normal or the

Advanced level. Entry to an Advanced course usually requires a Credit or better in a Normal level qualifying course or a Pass in an Advanced level qualifying course.

Full details of course structure, content and examination procedures are provided in the *Second Year Mathematics Course Handbook* available from the School at the time of enrolment.

For ease of overview, the courses are arranged under Pure for students wishing to specialise in Pure Mathematics, Applied for those wishing to specialise in Applied Mathematics, and Pure & Applied, which are suitable for both.

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Normal courses (Pure and Applied)

MATH 201F Vector Calculus and Complex Variables 4 units

Qual Mathematics 102 or 103 or 192 or 193

Classes Sem 1: (3 lec & 1 tut)/wk

Assessment one 2hr exam, assignments, tutorial participation

MATH 202F Matrix Applications 4 units

Qual Mathematics 101 or 191 or Distinction in Mathematics 111

Classes Sem 1: (2 lec, 1 tut & 1 computer lab)/wk

Assessment one 2hr exam, assignments, tutorial participation

MATH 205S Fourier Series and Differential Equations 4 units

Prereq Mathematics 201 or 291

Classes Sem 2: (3 lec & 1 tut)/wk

Assessment one 2hr exam, assignments

MATH 209F Graph Theory 4 units

Prereq 6 units of Junior Mathematics other than Mathematics 112, but Distinction necessary in Mathematics 111

Classes Sem 1: (3 lec & 1 tut)/wk

Assessment one 2hr exam, assignments, tutorial participation

Normal courses (Pure)

MATH 207S Analysis 4 units

Qual Mathematics 102 or 103 or 192 or 193

Classes Sem 2: (3 lec & 1 tut)/wk

Assessment one 2hr exam, assignments

MATH 208S Inner Products and Group Theory 4 units

Prereq Mathematics 202 or 292

Classes Sem 2: (2 lec, 1 tut & 1 computer lab)/wk

Assessment one 2hr exam, assignments

Normal courses (Applied)

MATH 203F Introduction to Mathematical Computing 4 units

Qual Mathematics 102 or 103 or 192 or 193

Classes Sem 1: (1 lec & 3 computer lab)/wk

Assessment one 1hr exam, assignments, computer lab participation

MATH 204F Dynamical Systems 4 units

Qual Mathematics 102 or 103 or 192 or 193

Classes Sem 1: (3 lec & 1 tut)/wk

Assessment one 2hr exam, assignments

MATH 206S Mechanics of Deformable Media 4 units

Prereq Mathematics 201 or 291

Classes Sem 2: (3 lec & 1 tut)/wk

Assessment one 2hr exam, assignments

MATH 21 OS Optimisation 4 units

Qual Mathematics 102 or 103 or 192 or 193 (strongly advise Mathematics 202 or 292)

Classes Sem 2: (3 lec & 1 tut)/wk

Assessment one 2hr exam, assignments

Advanced courses (Pure and Applied)

MATH 291F Vector Calculus and Complex Variables (Advanced) 4 units

Qual Mathematics 192 or 193 or Credit in either Mathematics 102 or 103

Classes Sem 1: (3 lec & 1 tut)/wk

Assessment one 2hr exam, assignments

Advanced courses (Pure)

MATH 292F Linear Algebra (Advanced) 4 units

Qual (Mathematics 191 or Credit in 101) and (Mathematics 192 or 193 or 194 or Credit in one of 102 or 103 or 104)

Classes Sem 2: (3 lec & 1 tut)/wk

Assessment one 2hr exam, assignments

MATH 297S Analysis (Advanced) 4 units

Prereq Mathematics 291 or Credit in 201

Classes Sem 2: (3 lec & 1 tut)/wk

Assessment one 2hr exam, assignments

MATH 298S Differential Equations and Group Theory (Advanced) 4 units

Prereq Mathematics 292

Classes Sem 2: (3 lec & 1 tut)/wk

Assessment one 2hr exam, assignments

Advanced courses (Applied)

MATH 293F Introduction to Mathematical Computing (Advanced) 4 units

Qual Mathematics 192 or 193 or Credit in either Mathematics 102 or 103

Classes Sem 1: (1 lec & 3 computer lab)/wk

Assessment one 1hr exam, assignments, computer lab participation

MATH 294F Lagrangian Dynamics (Advanced) 4 units

Qual Mathematics 192 or 193 or Credit in either Mathematics 102 or 103

Classes Sem 1: (3 lec & 1 tut)/wk

Assessment one 2hr exam, assignments

MATH 295S Mathematical Methods (Advanced) 4 units

Prereq Mathematics 291 or Credit in Mathematics 201

Classes Sem 2: (3 lec & 1 tut)/wk

Assessment one 2hr exam, assignments

MATH 296S Deformable Media and Waves (Advanced) 4 units

Prereq Mathematics 291 or Credit in 201 (strongly advise Mathematics 202 or 292)

Classes Sem 2: (3 lec & 1 tut)/wk

Assessment one 2hr exam, assignments

Statistics

The following courses are available in 1997 only. A new modularised system of 4-unit Intermediate Statistics courses will be available in 1998. From 1998, the prerequisites for Intermediate Statistics courses will be the new Junior Mathematics courses containing statistics.

The courses STAT 211/291 and STAT 213/293 together form a self contained one year course in mathematical statistics as well as providing the basis for a degree specialising in statistics. Entry to the Advanced courses usually requires a Credit or better in the prerequisite course.

Full details are provided in the *Second Year Mathematics Course Handbook* available from the School at the time of enrolment.

Normal courses

STAT 211F Mathematical Statistics 2(1) 8 units

Prereq Mathematics 1 or Mathematics 1 (Advanced) or Credit in Mathematics 1 (Life Sciences)

Classes Sem 1: (5 lec, 1 tut & one 2hr prac)/wk

Assessment two 1.5hr exams, assignments, pracs

Probability and distribution theory, exploratory data analysis.

STAT 212F Statistical Methods 8 units

Prereq 18 units of Junior Science courses

Classes Sem 1: (4 lec, 2 tut & one 1hr prac)/wk

Assessment two 1.5hr exams, assignments, pracs

Data analysis and nonparametrics, statistical distributions and inference.

STAT 213S Mathematical Statistics 2(2) 8 units

Prereq Statistics 211 or 291

Classes Sem 2: (4 lec, 1 tut & one 2hr prac)/wk

Assessment two 1.5hr exams, assignments, pracs

Hypothesis testing, estimation and dependence.

STAT 214S Applied Statistics 8 units

Prereq 12 units of Junior Mathematics and either Statistics 212 or Mathematical Statistics 2

Classes Sem 2: (4 lec, 2 tut & two 1hr prac)/wk

Assessment two 1.5hr exams, assignments, pracs

Applied linear models, design and sampling.

Advanced courses

STAT 291F Mathematical Statistics 2(1) (Advanced) 8 units

Prereq Mathematics 1 or Mathematics 1 (Advanced)

Classes Sem 1: (5 lec, 1 tut & one 2hr prac)/wk

Assessment two 1.5hr exams, assignments, pracs

Probability and distribution theory, exploratory data analysis.

STAT 293S Mathematical Statistics 2(2) (Advanced) 8 units

Prereq Statistics 211 or 291

Classes Sem 2: (5 lec, 1 tut & one 2hr prac)/wk

Assessment two 1.5hr & one 2 hr exams, assignments, pracs

Hypothesis testing, estimation and dependence, mathematical theory of probability.

Senior Mathematics courses

Mathematics provides a range of 4-unit courses at the Senior level covering a wide variety of topics in Pure and Applied Mathematics. Students may take up to 48 units of Senior courses. Those intending to proceed to Honours or simply to specialise in mathematics must take a minimum of 24 units from the Science Discipline Area of Mathematics.

The courses are taught at either the Normal or the Advanced level. Entry into the advanced courses is restricted to students who have met various qualifying course conditions. Students should consult the list below for requirements of individual Advanced courses.

The School encourages students undertaking an Advanced program to choose 3 or 4 Senior mathematics courses at the Advanced level.

Any student wishing to keep open the possibility of undertaking an Honours year is strongly advised to consult the appropriate Senior level coordinator about their choice of courses.

Full details of course structure, content and examination procedures are provided in the *Third Year Course Handbooks* for Applied Mathematics and Pure Mathematics available from the School at the time of enrolment.

If resources permit, courses are expected to include the following:

Normal courses (Pure and Applied)

MATH 303F Ordinary Differential Equations 4 units

Qual 8 units of Intermediate Mathematics (strongly advise 202 or 292, with 201 or 291)

Classes Sem 1: (2 lec & 1 tut)/wk

Assessment one 2hr exam, assignments

MATH 304F History of Mathematical Ideas 4 units

Qual 8 units of Intermediate Mathematics

Classes Sem 1: (2 lec & 1 tut)/wk

Assessment one 2hr exam, 2500w essay, tut presentation

MATH 307S Coding Theory 4 units

Qual 8 units of Intermediate Mathematics (strongly advise 202 or 292)

Classes Sem 2: (2 lec & 1 tut)/wk

Assessment one 2hr exam, assignments

MATH 310S Information Theory 4 units

Qual 8 units of Intermediate Mathematics (strongly advise 201 or 291 and some probability theory)

Classes Sem 2: (2 lec & 1 tut)/wk

Assessment one 2hr exam, assignments

MATH 315S Financial Mathematics 4 units
Qual 8 units of Intermediate Mathematics (strongly advise 210 and some probability theory) and one of Mathematics 102 or 103 or 192 or 193
Classes Sem 2: (2 lec & 1 tut)/wk
Assessment one 2hr exam, assignments

Normal courses (Pure)

MATH 301F Topology 4 units
Qual 8 units of Intermediate Mathematics
Classes Sem 1: (2 lec & 1 tut)/wk
Assessment one 2hr exam, assignments

MATH 302F Rings and Fields 4 units
Qual 8 units of Intermediate Mathematics (strongly advise 202 or 292, with 208 or 298)
Classes Sem 1: (2 lec & 1 tut)/wk
Assessment one 2hr exam, assignments

MATH 305F Logic 4 units
Qual (for all but BCST students) 8 units of Intermediate Mathematics
Prereq (for BCST students) 8 units of Intermediate Mathematics or 12 units of Junior Mathematics at Advanced level
Classes Sem 1: (2 lec & 1 tut)/wk
Assessment one 2hr exam, assignments

MATH 306S Geometry 4 units
Qual 8 units of Intermediate Mathematics (strongly advise 101)
Classes Sem 2: (2 lec & 1 tut)/wk
Assessment one 2hr exam, assignments

MATH 308S Real Variables 4 units
Qual 8 units of Intermediate Mathematics (strongly advise 201 or 207 or 291 or 297)
Classes Sem 2: (2 lec & 1 tut)/wk
Assessment one 2hr exam, assignments

MATH 309S Number Theory 4 units
Qual 8 units of Intermediate Mathematics
Classes Sem 2: (2 lec & 1 tut)/wk
Assessment one 2hr exam, assignments

Normal courses (Applied)

MATH 311F Lagrangian Dynamics 4 units
Qual Mathematics 205 or 295
Classes Sem 1: (2 lec & 1 tut)/wk
Assessment one 2hr exam, assignments

MATH 312F Mathematical Computing I 4 units
Qual 8 units of Intermediate Mathematics and one of Mathematics 102 or 103 or 192 or 193
Classes Sem 1: (2 lec & 1 tut)/wk
Assessment one 2hr exam, assignments

MATH 313F Signal Processing 4 units
Qual Mathematics 205 or 295
Classes Sem 1: (2 lec & 1 tut)/wk
Assessment one 2hr exam, assignments, computer project

MATH 314S Partial Differential Equations and Waves 4 units
Qual Mathematics 205 or 295
Classes (2 lec & 1 tut)/wk
Assessment one 2hr exam, assignments

MATH 316S Nonlinear Systems and Biomathematics 4 units
Qual 8 units of Intermediate Mathematics (strongly advise 298 or 303) and one of Mathematics 102 or 103 or 192 or 193
Classes Sem 2: (2 lec & 1 tut)/wk
Assessment one 2hr exam, assignments

Advanced courses (Pure and Applied)

MATH 393F Differential Geometry (Advanced) 4 units
Qual 12 units of Intermediate Mathematics (strongly advise 201 or 291, with Mathematics 301 or 391)
Classes Sem 1: (2 lec & 1 tut)/wk
Assessment one 2hr exam, assignments

MATH 398S Nonlinear Analysis (Advanced) 4 units
Qual 12 units of Intermediate Mathematics (strongly advise Mathematics 391)
Classes Sem 2: (2 lec & 1 tut)/wk
Assessment one 2hr exam, assignments

Advanced courses (Pure)

MATH 381S Differential Analysis (Advanced) 4 units
Qual 12 units of Intermediate Mathematics (strongly advise Mathematics 291 and 392)
Classes Sem 2: (2 lec & 1 tut)/wk
Assessment one 2hr exam, assignments
 This course is not offered every year.

MATH 382S Combinatorics (Advanced) 4 units
Qual 12 units of Intermediate Mathematics
Classes Sem 2: (2 lec & 1 tut)/wk
Assessment generally one 2hr exam, assignments

MATH 383S Computational Algebra (Advanced) 4 units
Qual 12 units of Intermediate Mathematics (strongly advise Mathematics 302 or 392)
Classes Sem 2: (2 lec & 1 tut)/wk
Assessment one 2hr exam, assignments

MATH 391F Metric Spaces (Advanced) 4 units
Qual 12 units of Intermediate Mathematics (strongly advise Mathematics 297)
Classes Sem 1: (2 lec & 1 tut)/wk
Assessment one 2hr exam, assignments

MATH 392F Algebra I (Advanced) 4 units
Qual 12 units of Intermediate Mathematics (strongly advise Mathematics 292)
Classes Sem 1: (2 lec & 1 tut)/wk
Assessment one 2hr exam, assignments

MATH 394F Complex Variable (Advanced) 4 units
Qual 12 units of Intermediate Mathematics (strongly advise Mathematics 201 or 291, with Mathematics 301 or 391)
Classes Sem 1: (2 lec & 1 tut)/wk
Assessment one 2hr exam, assignments

MATH 395F Categories and Computer Science (Advanced) 4 units
Qual 12 units of Intermediate Mathematics
Classes Sem 1: (2 lec & 1 tut)/wk
Assessment one 2hr exam, assignments

MATH 396S Group Representation Theory (Advanced) 4 units
Qual 12 units of Intermediate Mathematics (strongly advise Mathematics 392)
Classes Sem 2: (2 lec & 1 tut)/wk
Assessment one 2hr exam, assignments
 This course is offered only in odd years.

MATH 397S Algebra II (Advanced) 4 units
Qual 12 units of Intermediate Mathematics (strongly advise Mathematics 302 or 392)
Classes Sem 2: (2 lec & 1 tut)/wk
Assessment one 2hr exam, assignments

MATH 399S Lebesgue Integration and Fourier Analysis (Advanced) 4 units
Qual 12 units of Intermediate Mathematics (strongly advise Mathematics 297 and Mathematics 391)
Classes Sem 2: (2 lec & 1 tut)/wk
Assessment one 2hr exam, assignments

Advanced courses (Applied)

MATH 384F Fluid Dynamics (Advanced) 4 units
Qual Mathematics 295 or Credit in 205 (strongly advise Mathematics 296)
Classes Sem 1: (2 lec & 1 tut)/wk
Assessment one 2hr exam, assignments

MATH 385F Mathematical Methods (Advanced) 4 units
Qual Mathematics 295 or Credit in 205
Classes Sem 1: (2 lec & 1 tut)/wk
Assessment one 2hr exam, assignments

MATH 386S Mathematical Computing II (Advanced) 4 units
Qual Mathematics 312 or Engineering 2N2
Classes Sem 2: (1 lec & 2 computer lab)/wk
Assessment 3 computer projects

MATH 387S Hamiltonian Dynamics (Advanced) 4 units
Qual Mathematics 294
Classes Sem 2: (2 lec & 1 tut)/wk
Assessment one 2hr exam, assignments

MATH 388F Mathematical Computing I (Advanced) 4 units
Qual 8 units of Intermediate Mathematics and one of Mathematics 192 or 193 or Credit in 102 or Credit in 103
Classes Sem 1: (2 lec & 1 tut)/wk
Assessment one 2hr exam, assignments

MATH 389F Signal Processing (Advanced) 4 units
Qual Mathematics 295 or Credit in 205
Classes Sem 1: (2 lec & 1 tut)/wk
Assessment one 2hr exam, assignments, computer project

MATH 390S Nonlinear Systems and Biomathematics (Advanced) 4 units
Qual 8 units of Intermediate Mathematics (strongly advise 298 or 303) and one of Mathematics 192 or 193 or Credit in 102 or Credit in 103
Classes Sem 2: (2 lec & 1 tut)/wk
Assessment one 2hr exam, assignments

Senior Statistics courses

The following courses will be offered in 1997 only. A new modularised system of 4-unit Senior statistics courses will be available in 1998.

Students may take up to 24 units of Senior statistics courses. Those intending to proceed to Honours or simply to specialise in statistics must take a minimum of 24 units from the Science Discipline Area of Statistics. In addition to 24 units of statistics courses, students may take up to 24 further units from the Science Discipline Area of Mathematics.

The courses are taught at either the Normal or the Advanced level. Entry into the Advanced courses is restricted to students who have gained a Pass or better in the Advanced level qualifying course or a Credit or better in the Normal level qualifying course.

Full details of course structure, content and examination procedures are provided in the *Third Year Mathematical Statistics Course Handbook* available from the School at the time of enrolment.

Normal courses

STAT 317F Mathematical Statistics 3(1) 12 units
Qual Mathematical Statistics 2 or Mathematical Statistics 2 (Advanced)
Prereq Pure Mathematics 2 or Applied Mathematics 2 or Mathematics 2 Combined
Classes Sem 1: (6 lec, 3 tut & one 2hr prac)/wk
Assessment three 2hr exams, assignments, pracs
 Distribution theory, linear models, time series analysis.

STAT 318S Mathematical Statistics 3(2) 12 units
Prereq Statistics 317 or 397
Classes Sem 2: (6 lec, 3 tut & one 2hr prac)/wk
Assessment three 2hr exams, assignments, pracs
 Design of experiments, multivariate analysis, inference.

Advanced courses

STAT 397F Mathematical Statistics 3(1) (Advanced) 12 units

Qual Mathematical Statistics 2 (Advanced) *or* Credit in Mathematical Statistics 2

Prereq Pure Mathematics 2 *or* Applied Mathematics 2 *or* Mathematics 2 Combined

Classes Sem 1: (6 lec, 3 tut & one 2hr prac)/wk

Assessment three 2hr exams, assignments, pracs

Distribution theory, linear models, time series analysis.

STAT 398S Mathematical Statistics 3(2) (Advanced) 12 units

Prereq Statistics 397

Classes Sem 2: (8 lec, 3 tut & one 2hr prac)/wk

Assessment four 2hr exams, assignments, pracs

Design of experiments, multivariate analysis, inference, Markov processes.

Honours courses

The School offers to suitably qualified students Honours courses in the subject areas:

Applied Mathematics

Mathematical Statistics

Pure Mathematics

Honours courses consist of both formal coursework and an essay project. There is provision for students to take approved courses from other research areas within the School and from other Departments. The essay is a substantial part of the year's assessment and is closely supervised by a staff member. As part of the essay project, students are required to prepare a talk about their project.

Entry qualification into the course is a Credit or better in 24 units of Senior courses in the appropriate discipline area and is subject to the approval of the Head of School.

Interested students should contact the fourth year course coordinator at some convenient time before pre-enrolment. Senior level students contemplating an Honours year are strongly advised to consult the Senior course handbooks for further advice and to discuss their choice of Senior courses with the appropriate Senior level coordinator.

Further details of the Honours year are available from the course coordinators for Applied Mathematics 4, Mathematical Statistics 4 and Pure Mathematics 4 and the respective course handbooks.

Postgraduate studies

The School of Mathematics and Statistics offers a number of postgraduate courses, including both full time and part time options.

MA part time, with usual entry requirement a Pass degree with a major in Mathematics or Statistics.

Graduate Diploma full or part time for students who do not satisfy the usual entry requirements but seek to enter a PhD or an MSc degree by coursework or research.

MSc (by coursework and essay) full or part time with usual entry requirement an Honours degree in Mathematics or Statistics.

MSc (by research) full or part time with usual entry requirement an Honours degree in Mathematics or Statistics.

PhD full or part time by research.

Further details can be obtained from the Director of Postgraduate Studies in the School. The Director may be contacted by e-mail at pg-director@maths.usyd.edu.au.

Mechanical and Aeronautical Engineering Science

The Departments of Mechanical and Aeronautical Engineering are part of the Faculty of Engineering. In addition to providing professional training in mechanical and aeronautical engineering, they offer three one-semester courses in the Faculty of Science.

The courses are available as Intermediate courses in a Science degree for students majoring in mathematics, physics, chemistry, geology, computer science or soil science, and who are thinking of an applied science career in mechanical or aeronautical engineering. Candidates for the BSc degree are not permitted to count more than 16 units of engineering courses.

These courses are intended to demonstrate the application of scientific principles in an engineering context so that the science student will gain an understanding of some engineering systems.

Double degree

Some Science graduates, who have passed the three courses listed here in Mechanical and Aeronautical Engineering, may obtain a Bachelor of Engineering degree in Mechanical or Aeronautical Engineering after an additional two years' study. 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.

Location

Further details about admission to the BE degree course in Engineering may be obtained from the Departments of Mechanical and Aeronautical Engineering. They are in the northeast of the Engineering precinct, and can be entered from Shepherd Street. Lectures are normally held in the Peter Nicol Russell theatres.

Noticeboards

All noticeboards are in the foyer areas outside the lecture theatres on Levels 2 and 3. Notices relevant to these subjects will be displayed on the Level 3 noticeboards in the Department of Mechanical and Mechatronic Engineering.

Registration

All students are required to register with Ms C. Prasad on Level 4 in the Mechanical Engineering Building on either the last day of Orientation or on the first day of lectures.

Timetable information on alternative lecture/tutorial/laboratory/practical classes is available in the General Office of Mechanical Engineering.

Advice on courses

Members of staff are available during enrolment and orientation periods to give advice about these courses.

Students wishing to see a Departmental adviser should apply to the relevant Department Office.

Tutorials and laboratories

All students are required to undertake the tutorial and laboratory work associated with these courses, details of which are provided in the timetables. The experimental and tutorial work, an integral part of the course, complements the lecture material.

Intermediate Mechanical and Aeronautical Engineering Science courses

ENGS 241F Engineering Thermo-fluids

6 units

Prereq 12 units each of Junior Mathematics and Junior Physics

Mutually exclusive with U2.410 Mechanical Engineering

Classes Sem 1: (3 lec & one 3hr lab/tut)/wk

Assessment two 2hr exams, assignments and lab reports

Syllabus summary

- (a) Thermodynamics — concepts, work and heat > property of substances, 1st law of thermodynamics, control mass and control volume analysis of power and refrigeration cycles; thermal efficiency, entropy and 2nd law of thermodynamics, reversible and irreversible processes, isentropic efficiency.
- (b) Fluids — fluid properties, pressure, shear, hydrostatics, forces, moments, buoyancy, stability, continuity equations, streamlines, Euler, Bernoulli equations, linear momentum, propulsion, angular momentum, turbo machinery, dimensional analysis, boundary layers, pipe flow and friction.

Textbooks

Cengel and Boles *Thermodynamics, an Engineering Approach* 2nd edn (McGraw-Hill)

H.C. Potter and D.C. Wiggert *Mechanics of Fluids* (Prentice Hall)

ENGS 242S Engineering Dynamics 4 units

Prereq 12 units each of Junior Mathematics and Junior Physics

Mutually exclusive with U2.410 Mechanical Engineering

Classes Sem 2: 2 lec/wk, three 3hr labs, ten 2hr tuts

Assessment exam and assignments

Kinematics of bodies; frames of reference, velocity and acceleration; angular velocity and acceleration; rotating frame of reference; relative velocity and acceleration; gyroscopic acceleration. Kinetics of rigid bodies; linear momentum and Euler's first law; angular momentum and Euler's second law; centre of mass; moments of inertia; parallel axis and parallel plane theorems; principal axes and principal moments of inertia; rotation about an axis; impulse and momentum; work and energy; kinetic and potential energies. Applications to orbital and gyroscopic motion. Planar mechanisms; linkages; mobility; instant centres of rotation; Kennedy's theorem, velocity and acceleration polygons. Introduction to Lagrangian methods. Tutorial problems will include examples in Matlab computing environment.

Reference books

Smith and Smith *Mechanics* (Wiley, 1990)

Mabie and Reinholtz *Mechanisms and Dynamics of Machinery* 4th edn (Wiley, 1987)

Shigley and Vicker *Theory of Machines and Mechanisms* Int'l edn (McGraw-Hill, 1981)

ENGS 243S Mechanical Design for Engineers

6 units

Prereq 12 units each of Junior Mathematics and Junior Physics

Mutually exclusive with Mechanical Design 1

Classes Sem 2: (2 lec & two 3hr drawing office sessions)/wk

Assessment assignments carried out during the design office classes and elsewhere

Syllabus summary

- (a) Machine Drawing — Freehand sketching of machine components. Drafting techniques and standard drawing methods. Orthogonal projections and sections. Dimensioning, tolerancing, conventional symbols, detail and assembly drawings and descriptive geometry.
- (b) Machine Design — Engineering innovation, creativity. Teamwork. Design process, problem specification. Conceptual techniques and design evaluation. Ergonomic manufacturing and assembly considerations. Detail design of components including: design loads, failure and fracture of safety; calculation approach and presentation conventions; stress effects in shape definition and material selection; introduction to engineering hardware including fasteners, bearings and mechanical power transmission. Introduction to involute gears and gear trains (including epicyclic).

Textbook

Boudny *Engineering Drawing* (McGraw-Hill)

Reference book

Shigley *Mechanical Engineering Design* (McGraw-Hill)

Department of Microbiology

The Department of Microbiology offers courses that equip students for a career in microbiology in fields of health, industry and basic research.

In addition, it provides introductory courses to students of agriculture, pharmacy and science. These courses will help students who wish to specialise in related fields where microorganisms are often used in studying life processes, e.g. biochemistry, genetics, botany and physiology.

Location

The Department is on Level 5 of the Biochemistry Microbiology Building.

Noticeboards

Noticeboards are in the foyer to Level 5, and inside the student laboratories on Levels 3 and 5. Material displayed includes timetables, job vacancies, lists of seminars and lectures of student interest, as well as general announcements.

Registration

All BSc students (except Pharmacy students) must register with the Department **during the last week**

prior to the start of each semester. Students will then be allocated to practical classes. Failure to register during this time may preclude allocation to particular practical classes.

Advice on courses

A member of staff is generally among the Faculty advisers on duty during the enrolment period. In addition, all members of staff are available for consultation throughout the year. Students should apply through the Departmental secretary.

Intermediate Microbiology courses

MICR 201F Introductory Microbiology

8 units

Coordinator Mrs Dalins

Mrs Dalins, Prof. Reeves, Dr New, Dr Carter, Dr Duxbury
Qual 12 units of Junior Biology

Prereq Chemistry 112 or 192 or 194 and Mathematics 101 or 111 or 191 and one of Mathematics 102 or 104 or 112 or 192 or 194

Classes (3 lec, 1 tut & 4 prac)/wk

Assessment one 3hr exam, continuous assessment in prac, 2 assignments

This subject 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 e.g. 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, and genetics.

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 course focuses on basic, safe microbiological techniques and the use of these to study examples of microbial activity which are illustrative of the lecture course.

Textbook

L.M. Prescott *et al.* (eds) *Microbiology* 3rd edn (W.C. Brown, 1996)

MICR 202S Applied Microbiology

8 units

Coordinator Mrs Dalins

Mrs Dalins, Dr Carter, Prof. Reeves, Dr Humphery-Smith, Dr Duxbury

Prereq Microbiology 201 or 291

Classes (3 lec, 1 tut & 4 prac)/wk

Assessment one 3hr exam, continuous assessment in prac, 2 assignments

This subject is designed to expand the understanding of, and technical competence in, microbiology, building on the knowledge and skills acquired in Microbiology 201 or 291.

The lectures cover two broad topics: molecular microbiology of the organism and microbial biotechnology and applications. The molecular microbiology

covers microbial genetics, regulation and manipulation of the bacterial genome, 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. Several excursions to industrial concerns are included.

Work experience

After completion of Microbiology 202 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).

Textbook

As for Microbiology 201

MICR 203F Theoretical Microbiology A

4 units

Coordinator Mrs Dalins

Mrs Dalins, Prof. Reeves, Dr New, Dr Carter, Dr Duxbury
Qual 12 units of Junior Biology

Prereq Chemistry 112 or 192 or 194 and Mathematics (101 or 111 or 191) and 102 or 104 or 111 or 192 or 194

Classes 3 lec/wk

Assessment one 3hr exam

This course is suitable for students who are majoring in other aspects of biology and who wish to acquire a broad background knowledge of microbiology. Students attend the same lectures as those enrolled in Microbiology 201. There is no practical work and no tutorial component.

Textbook

As for Microbiology 201

MICR 204S Theoretical Microbiology B

4 units

Coordinator Mrs Dalins

Mrs Dalins, Dr Carter, Prof. Reeves, Dr Humphery-Smith, Dr Duxbury

Prereq Microbiology 201 or 203 or 291

Classes 3 lec/wk

Assessment one 3hr exam

This course is suitable for students who are majoring in other aspects of biology and wish to expand their knowledge of microbiology beyond that acquired in Microbiology 201, 203 or 291 with further theoretical considerations of the subject. Students attend the same lectures as those enrolled in Microbiology 202. There is no practical or tutorial component.

Textbook

As for Microbiology 201

MICR 291F Introductory Microbiology (Advanced) 8 units

Coordinator Mrs Dalins

Mrs Dalins, Prof. Reeves, Dr New, Dr Carter, Dr Duxbury
Qual Biology 102 or 103 or 192 or 193 and Chemistry 112 or 192 or 194

Prereq Mathematics (101 or 111 or 191) and 102 or 104 or 111 or 192 or 194

Classes (3 or 4 lec, 1 tut & 3 or 4 prac)/wk

Assessment as for Microbiology 201 plus one 1hr exam

This course will be available to students who have performed well in the Biology and Chemistry Junior courses. The course is based on Microbiology 201 with alternative components. The content and nature of these components may vary from year to year. Selection criteria for entry into the course will be available from the course coordinator at the time of enrolment.

Textbook

As for Microbiology 201

MICR 292S Applied Microbiology (Advanced) 8 units

Coordinator Mrs Dalins

Mrs Dalins, Dr Carter, Prof. Reeves, Dr Humphery-Smith, Dr Duxbury, Dr Ferenci

Qual Microbiology 201 at Credit+ or 291

Classes (4 lec, 1 tut & 3 prac)/wk

Assessment as for Microbiology 202 plus one 2hr exam

The course is based on Microbiology 202 with alternative components. The content and nature of these components may vary from year to year.

Textbook

As for Microbiology 201

Senior Microbiology courses

MICR 301F General and Medical Microbiology 12 units

Coordinator Dr Duxbury

Dr Duxbury, Dr New, Dr Carter, Dr Humphery-Smith, Dr Ferenci and others

Qual Microbiology (202 or 292) or (201 and 204) or (204 and 291)

Prereq Biochemistry (201 or 211 or 291) or Agricultural Chemistry 201 or Biology (205 or 295)

Classes (3 lec, 6-7 prac & 2-3 other)/wk

Assessment one 2hr exam and one 1.5hr exam, essay, prac

This course extends some of the topics covered in Microbiology 201 and 202. General Microbiology includes microbial growth and metabolism, microbial ecology, and food microbiology. The lecture course on microbial growth and metabolism covers aspects of biomass formation, growth rate and nutrient uptake, chemostat cultures, growth yield, aerobic and anaerobic growth, and growth under stress. Microbial ecology introduces the principles which underlie the behaviour of microorganisms in all environments whether they be soil, water, food, medical or industrial. Food microbiology includes the causes and prevention of foodborne disease, microbiological analysis of foods, the indicator concept, hazard analysis and critical control points, modified atmosphere packaging, fungal spoilage of foods and mycotoxins. Medical Micro-

biology covers aspects of epidemiology, host defences, sexually transmitted diseases, and other important bacterial, viral, fungal, protozoal, helminth and zoonotic infections.

The practical course is designed to enhance students' practical skills and to complement the lecture course.

Reference books

To be announced

MICR 302S Molecular and Environmental Microbiology 12 units

Coordinator Dr Duxbury

Dr Duxbury, Dr New, Dr Ferenci, Prof. Reeves

Qual Microbiology (202 or 292) or (201 and 204) or (204 and 291)

Prereq Biochemistry (201, 211 or 291) or Agricultural Chemistry 201 or Biology (205 or 295)

Classes (3 lec, 6-7 prac & 2-3 other)/wk

Assessment one 2hr exam and one 1.5hr exam, essay, prac

This course extends some of the topics covered in Microbiology 201. 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. In addition, the distribution and activities of microbes in natural environments will be discussed.

The practical course is designed to enhance students' practical skills and to complement the lecture course. Project work may form part of the practical course subject to the availability of resources.

Reference books

To be announced

MICR 391F General and Medical Microbiology (Advanced) 12 units

Coordinator Dr Duxbury

Dr Duxbury, Dr New, Dr Carter, Dr Humphery-Smith, Dr Ferenci and others

Qual Microbiology (202 or 292) or (201 and 204) or (204 and 291)

Prereq Biochemistry (201 or 211 or 291) or Agricultural Chemistry 201 or Biology (205 or 295)

Classes (4 lec, 6-7 prac & 1-2 other)/wk

Assessment two 2hr exams and one 1.5hr exam, essay, prac

This course is based on Microbiology 301.11 is available to students who have performed well in Microbiology 201 or 291, and 202, 204 or 292. The course consists of a series of additional lectures related to the research interests in the Department. Consequently, the course content may change from year to year. The selection criteria for entry into the course will be available from the Course Coordinator at the time of enrolment.

Reference books

To be announced

MICR 392S Molecular and Environmental Microbiology (Advanced) 12 units

Coordinator Dr Duxbury

Dr Duxbury, Dr New, Dr Ferenci, Prof. Reeves, Dr Carter
Qual Microbiology (202 or 292) or (201 and 204) or (204 and 291) -

Prereq Biochemistry (201 or 211 or 291) or Agricultural Chemistry 201 or Biology (205 or 295)

Classes (4 lec, 6-7 prac & 1-2 other)/wk

Assessment two 2hr exams and one 1.5hr exam, essay, prac.

This course is based on Microbiology 302. It will be available to students who have performed well in Microbiology 201 or 291, and 202, 204 or 292. The course consists of a series of additional lectures related to the research interests in the Department. Consequently, the course content may change from year to year. The selection criteria for entry into the course will be available from the Course Coordinator at the time of enrolment.

Reference books

To be announced

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 Departmental seminars and through a coursework component in first semester which will cover two 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 the Honours course is required from students by the end of second semester before the Honours year, on a form to be lodged with the Course Coordinator. Entry into the Honours year is usually dependent on an average of Credit level performance in Senior microbiology courses.

Department of Pharmacology

This Department offers a general training in pharmacology to students in the Faculty of Science studying for the BSc, BMedSc and BPharm degrees. It provides two Intermediate 4-unit courses and four Senior 12-unit courses for BSc students.

Location

The Department is located within the Medical School on Floor 2 (the ground floor) of the Blackburn Building, and Levels 1 and 2 of the adjoining Bosch Building.

Noticeboards

Information for students may be found on the noticeboard inside the main door of the laboratory wing of the Department on Level 2 of the Bosch Building.

Registration

All intending students should register with the secretary in Room 221 in the Bosch Building Level 2 before enrolment.

Advice on courses

Science students may consult Dr Spence or other members of the teaching staff for advice before enrolment. A member of the Department may also be present among Faculty advisers during the enrolment period.

Intermediate Pharmacology courses

PCOL 201F Pharmacology Fundamentals

4 units

Coordinator Dr Robin Allan

Prereq 12 units of Junior Chemistry (including Chemistry 112 or 192), 24 units of courses from other Science Discipline Areas

Classes 2 lec/wk & 4 prac/tut sessions

Assessment one 1.5hr exam, classwork

This course introduces students to the basic concepts of pharmacology — how drugs act and how they reach their sites of action. The concept of receptors is introduced 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.

Textbook

H.P. Rang *et al.* *Pharmacology* 3rd edn (Churchill Livingstone, 1995)

Study aids

R. Einstein *Pharmacology, Self-assessment Questions for Students* (Butterworths, 1989)

M.J. Neal *Medical Pharmacology at a Glance* (Blackwell Scientific Publications, 1992)

Reference books

A.G. Gilman *et al.* *Goodman and Gilman's The Pharmacological Basis of Therapeutics* (Pergamon Press, 1990)

B.G. Katzung (ed.) *Basic and Clinical Pharmacology* (Appleton & Lange, 1989)

PCOL 202S Pharmacology — Drugs and People 4 units

Coordinator Dr Robin Allan

Prereq 12 units of Junior Chemistry (including Chemistry 112 or 192), 24 units of courses from other Science Discipline Areas

Classes 2 lec/wk & 4 prac/tut sessions

Assessment one 1.5hr exam, classwork

This course 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.

Textbook

H.P. Rang *et al.* *Pharmacology* 3rd edn (Churchill Livingstone, 1995)

Study aids

R. Einstein *Pharmacology, Self-assessment Questions for Students* (Butterworths, 1989)

M.J. Neal *Medical Pharmacology at a Glance* (Blackwell Scientific Publications, 1992)

Reference books

A.G. Gilman *et al.* *Goodman and Gilman's The Pharmacological Basis of Therapeutics* (Pergamon Press, 1990)
B.G. Katzung (ed.) *Basic and Clinical Pharmacology* (Appleton & Lange, 1989)

Senior Pharmacology courses

PCOL 301F Molecular Pharmacology and Toxicology 12 units

Coordinator Dr Ian Spence
Qual Pharmacology 201 and 202
Classes (4 lec, 2 tut & 6 prac)/wk
Assessment two 3hr exams, classwork

This course 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 the topic with detailed examination of selected issues in toxicology. 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. As part of the course 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.

Reference books

A.G. Gilman *et al.* *Goodman and Gilman's The Pharmacological Basis of Therapeutics* (Pergamon Press, 1990)
C.D. Klaassen *Casarett & Doull's Toxicology, The Basic Science of Poisons* (Macmillan)
P. Krogsgaard-Larsen and H. Bundgaard (eds) *A Textbook of Drug Design and Development* (Harwood Academic Publishers, 1991)

PCOL 302S Neuro- and Cardiovascular Pharmacology 12 units

Coordinator Dr Ian Spence
Qual Pharmacology 201 and 202
Classes (4 lec, 2 tut & 6 prac)/wk
Assessment two 3hr exams, classwork

The lecture course 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.

In addition to the core course 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 second semester.

Textbook

P. Rang *et al.* *Pharmacology* 3rd edn (Churchill Livingstone, 1995)

Study aids

R. Einstein *Pharmacology Self-assessment Questions for Students* (Butterworths, 1989)
M.J. Neal *Medical Pharmacology at a Glance* (Blackwell Scientific Publications, 1992)

Reference books

J.R. Cooper *et al.* *The Biochemical Basis of Neuropharmacology* (Oxford, 1991)
A.G. Gilman *et al.* *Goodman and Gilman's The Pharmacological Basis of Therapeutics* (Pergamon Press, 1990)

PCOL 311F Toxicology and Computer-aided drug design 12 units

Coordinator Dr Ian Spence
Qual Pharmacology 201 and 202
Coreq Pharmacology 301
Assessment one 3hr exam, classwork

Subject to the approval of the Head of the Department of Pharmacology, exceptional students may take Pharmacology 311 simultaneously with Pharmacology 301. Pharmacology 311 involves extended practical work and seminars, and may include attendance at certain lectures in a related subject.

Textbooks and reference books

As for Pharmacology 301

PCOL 312S Advanced Pharmacodynamics 12 units

Coordinator Dr Ian Spence
Qual Pharmacology 201 and 202
Coreq Pharmacology 302
Assessment one 3hr exam, classwork

Subject to the approval of the Head of the Department of Pharmacology, exceptional students may take Pharmacology 312 simultaneously with Pharmacology 302. Pharmacology 312 involves extended practical work and seminars, and may include attendance at certain lectures in a related subject.

Textbooks and reference books

As for Pharmacology 302

Pharmacology Honours

Coordinators Dr R. Einstein, Dr J.L. Black

Subject to a satisfactory standard being attained in Pharmacology, a student may arrange to read for the Honours degree in this subject. 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 literature review and a written report on the research project must be prepared. Seminars on the literature review, the project and another chosen topic will be given by the student.

School of Physics

The School of Physics provides undergraduate courses in Physics at Junior, Intermediate, Senior and Honours levels. Appropriate course choices are available for

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Physics

candidates who wish to major in Physics, to proceed to Honours in Physics, or to combine Physics with a major in another subject. 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 courses 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 provides courses at the Junior and Intermediate level for students wishing to complement other studies with Physics courses which have an environmental emphasis, and for students wishing to major in Physics within the BSc (Environmental) degree program.

Location

Physics Junior courses Lectures in Physics Building, laboratories in Carslaw Building

Physics Intermediate, Senior and Honours courses Physics Building

Noticeboards

On the balcony outside the Carslaw Physics laboratories and in the Physics Building as appropriate for each course.

Registration

Junior courses At normal laboratory periods during the first week of lectures.

Intermediate courses At first lecture, in Physics Building. See noticeboard for allocation of lecture theatres.

Senior courses At first lecture, in Physics Building. Consult noticeboard early in the orientation period.

Advice on courses

A member of the physics staff is normally present among Faculty advisers during enrolment week to advise intending commencing students. Subsequent to this, if you wish to see an adviser, the Junior year administrative assistant will arrange it. Student advisers for later year courses (see chapter 2) may be consulted in the Physics Building.

Administrative Assistant

Junior Physics: Mrs E. Hing, Room 202, Physics Building.

Information booklet

Further information about Junior Physics courses is contained in a booklet for intending commencing students available at enrolment or during Orientation or from the Junior year administrative assistant.

Junior Physics courses

Lecturer in charge Mrs R.M. Millar, Head of Junior Physics

There are six different semester length courses offered at the Junior level. Physics 101 (Regular), Physics 102 (Fundamentals) and Physics 191 (Advanced) are offered in first semester only and Physics 103 (Technological), Physics 104 (Environmental and Life Sciences) and Physics 192 (Advanced) are offered in second semester only. Completion of one course in each semester provides a solid foundation for further studies in Physics in higher years. 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 a further introduction to experimental physics and students are given the opportunity to undertake short projects in the second half of the semester.

PHYS 101F Physics (Regular) 6 units

AKn HSC Physics or HSC 4-unit Science

Classes Sem 1: (3 lec/tut & 3 prac)/wk

Assessment one 3hr exam, lab & assignments

This course is for students who gained 65 marks or better in HSC 2-unit Physics or equivalent. The lecture course contains three four-week modules on the topics of Mechanics, Fluids and Fields, and Waves.

Textbooks

D. Halliday, R. Resnick and J. Walker *Fundamentals of Physics* 4th edn (John Wiley, 1993)

Physics Laboratory Manuals (School of Physics Publication)

PHYS 102F Physics (Fundamentals) 6 units

AKn no assumed knowledge of Physics

Classes Sem 1: (3 lec/tut & 3 prac)/wk

Assessment one 3hr exam, lab & assignments

This course is designed for students who have not studied Physics previously. The lecture course contains three four-week modules on the Language of Physics, Mechanics, and Waves.

Textbooks

D. Halliday, R. Resnick and J. Walker *Fundamentals of Physics* 4th edn (John Wiley, 1993)

Physics Laboratory Manuals (School of Physics Publication)

PHYS 191F Physics (Advanced) A 6 units

Prereq TER at least that for acceptance into BSc (Advanced) program or at least 90 in HSC 2-unit Physics or a least 180 in HSC 4-unit Physics

Classes Sem 1: (3 lec/tut & 3 prac)/wk

Assessment one 3hr exam, lab & assignments

Physics 191 (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 101 (Regular), covering further and more difficult material. The lecture course contains three four-week modules on the topics of Mechanics, Fluids and Fields, and Waves. The laboratory work also provides an introduction to computational physics using chaos theory as the topic of study.

Textbooks

D. Halliday, R. Resnick and J. Walker *Fundamentals of Physics* 4th edn (John Wiley, 1993)

Physics Laboratory Manuals (School of Physics Publication)

PHYS 103S Physics (Technological) 6 units

Prereq: Physics 101 or 102 or 191

Classes Sem 2: (3 lec/ tut & 3 prac)/wk

Assessment one 3hr exam, lab & assignments

This course is designed for students majoring in the physical and engineering sciences and emphasis is placed on applications of physical principles to the technological world. The lecture course contains three four-week modules on the topics of electromagnetism, thermal physics, and quantum and materials physics.

Textbooks

D. Halliday, R. Resnick and J. Walker *Fundamentals of Physics*
4th edn (John Wiley, 1993)
Physics Laboratory Manuals (School of Physics Publication)

PHYS 104S Physics (Environmental and Life Sciences) 6 units

Prereq Physics 101 or 102 or 191
Classes Sem 2: (3 lec/tut & 3 prac)/wk
Assessment one 3hr exam; lab & assignments

This course has been designed specifically for students interested in further study in environmental and life sciences. The lecture course contains three four-week modules on the topics of electromagnetism, properties of matter, and atoms, nuclei and quanta.

Textbooks

D. Halliday, R. Resnick and J. Walker *Fundamentals of Physics*
4th edn (John Wiley, 1993)
Physics Laboratory Manuals (School of Physics Publication)

PHYS 192S Physics (Advanced) B 6 units

Prereq Physics 191 or Distinction or better in Physics 101 or 102
Classes Sem 2: (3 lec/tut & 3 prac)/wk
Assessment one 3hr exam, lab & assignments

This course is a continuation of Physics 191 (Advanced) A. Students who have completed Physics 101 (Regular) or Physics 102 (Fundamentals) at Distinction level may enrol. It proceeds faster than Physics 103 (Technological), covering further and more difficult material. The lecture course contains three four-week modules on the topics of electromagnetism, thermal physics, quantum and materials physics, and superconductivity.

Textbooks

D. Halliday, R. Resnick and J. Walker *Fundamentals of Physics*
4th edn (John Wiley, 1993)
Physics Laboratory Manuals (School of Physics Publication)

Intermediate Physics courses

The School of Physics offers four courses in each semester at the Intermediate level. A full year Intermediate program in Physics would normally be selected from one of the following combinations: PHYS 201, 202, for students majoring in the physical and engineering sciences; PHYS 211, 212 for students with a strong interest in the environmental or life sciences; PHYS 291, 292, the advanced physics course for students who have achieved a Credit or better in Physics 103 or 104. These three programs are qualifying courses for Senior level physics. Two other courses, PHYS 213 and 214, are shorter courses for students in the environmental sciences who do not plan to continue with physics at a Senior level.

Full details of Intermediate Physics course structures, contents and assessment policies are provided in the Second Year Physics Information handbook available at the time of enrolment.

PHYS 201F Physics (Technological) A 8 units

Dr Tango

Qual Physics 103 or 104 or 192

Prereq Uurdis of Junior Mathematics other than Mathematics 111 and 112 (Mathematics 101 or 191 plus 102 or 192 recommended) or Credit or better in Mathematics 111 and 112

Classes Sem 1: (3 lec, 3 prac & 2 microlab)/wk
Assessment one 3hr exam, microlab (report & test)

Lectures

This course is designed for students majoring in the physical and engineering sciences. The lecture topics are quantum mechanics, with applications to solid state and particle physics, astronomy, and introductory electromagnetic theory.

Practical work

Experimental physics is taught as a laboratory course of three-hour sessions and includes experiments in the areas of instrumentation, quantum physics, properties of matter and environmental sensing and measurement. The course is based on mastery of the material, with marks awarded on completion of each experiment. Assessment is also based on reviews of the students' logbooks.

Microlab

Computational Physics is taught in ten two-hour sessions in a PC based computing laboratory. An introductory session is held at the beginning of the semester for students who are not familiar with personal computers. Students work in teams of three and using simple Pascal programming they develop computational solutions to problems in quantum mechanics. Computational physics is assessed by a short written report and a one-hour test administered individually.

Textbooks

R. Eisberg and R. Resnick *Quantum Physics* (Wiley, 1985)
J. C Byrne (ed.) *Experimental Physics Notes* (School of Physics)

PHYS 202S Physics (Technological) B 8 units

Dr Tango

Qual Physics 103 or 104 or 192

Prereq 12 units of Junior Mathematics other than Mathematics 111 and 112 (Mathematics 101 or 191 plus 102 or 192 recommended) or Credit or better in Mathematics 111 and 112

Classes Sem 2: (3 lec, 3 prac & 2 microlab)/wk
Assessment two 2.5hr exam, 2 prac reports, microlab (report & test)

Lectures

This course is designed for students majoring in the physical and engineering sciences. The lecture topics are electromagnetic properties of matter, instrumentation for the physical and environmental sciences, and optics for communications and sensing.

Practical work

As for Physics 201, except that in the second semester course students will be asked to submit one or two written and oral reports on selected experiments.

Microlab

The computational physics component is similar to that of Physics 201, except that the material for the course will be drawn from the optics textbook.

Textbook

J. CyByrne (ed.) *Experimental Physics Notes* (School of Physics)

Reference book

E. Hecht *Optics* (Addison-Wesley, 1987)

PHYS 211F Physics (Environmental) A

8 units

Dr Tango

Qual Physics 103 or 104 or 192

Prereq 12 units of Junior Mathematics other than Mathematics 111 and 112 (Mathematics 101 or 191 plus 102 or 192 recommended) or Credit or better in Mathematics 111 and 112

Classes Sem 1: (3 lec, 3 prac & 2 microlab)/wk

Assessment two 2.5hr exam, microlab (report & test)

Lectures

This course is designed principally for students majoring in the environmental or life sciences. The lecture topics are quantum physics, including an introduction to spectroscopy, astronomy, and an introduction to energy transport in the environment.

Practical work -

As for Physics 201.

Microlab

As for Physics 201.

Textbooks

R. Eisberg and R. Resnick *Quantum Physics* (Wiley, 1985)

J. C Byrne (ed.) *Experimental Physics Notes* (School of Physics)

PHYS 212S Physics (Environmental) B

8 units

Dr Tango

Qual Physics 103 or 104 or 192

Prereq 12 units of Junior Mathematics other than Mathematics 111 and 112 (Mathematics 101 or 191 plus 102 or 192 recommended) or Credit or better in Mathematics 111 and 112

Classes Sem 2: (3 lec, 3 prac & 2 microlab)/wk

Assessment two 2.5hr exam, 2 prac reports, microlab (report & test)

Lectures

This course is designed principally for students majoring in the environmental or life sciences. The lecture topics are energy transport in the environment, optics for communications and sensing, and instrumentation for the physical and environmental sciences.

Practical work

As for Physics 202.

Microlab

As for Physics 202.

Textbook

J. O'Byrne (ed.) *Experimental Physics Notes* (School of Physics)

Reference book

E. Hecht *Optics* (Addison-Wesley, 1987)

PHYS 213F Introduction to Environmental Physics

4 units

Dr Tango

Qual Physics 103 or 104 or 192

Prereq 12 units of Junior Mathematics other than Mathematics 111 and 112 (Mathematics 101 or 191 plus 102 or 192 recommended) or Credit or better in Mathematics 111 and 112

Classes Sem 1: 3 lec/wk

Assessment one 2.5hr exam

Lectures

This course is intended for students in the environmental sciences who do not plan to take Senior level courses in Physics. See Physics 211 for a description of the lecture material.

PHYS 214S Applications of Environmental Physics

4 units

Dr Tango

Qual Physics 103 or 104 or 192

Prereq 12 units of Junior Mathematics other than Mathematics 111 and 112 (Mathematics 101 or 191 plus 102 or 192 recommended) or Credit or better in Mathematics 111 and 112

Classes Sem 2: (2 lec & 3 prac)/wk

Assessment one 2.5hr exam, 2 prac reports

Lectures

This course is intended for students in the environmental sciences who do not plan to take Senior level courses in Physics. The lecture topics include instrumentation for the physical and environmental sciences, and energy transport in the environment.

Practical work

As for Physics 212.

Textbook

J. O'Byrne (ed.) *Experimental Physics Notes* (School of Physics)

PHYS 291F Physics (Advanced) A

8 units

Dr Tango

Qual Physics 192 or Credit or better in Physics 103 or 104

Prereq 12 units of Junior Mathematics other than Mathematics 111 and 112 (Mathematics 101 or 191 plus 102 or 192 recommended) or Credit or better in Mathematics 111 and 112

Classes Sem 1: (3 lec, 3 prac & 2 microlab)/wk

Assessment two 2.5hr exam, microlab (report & test)

Lectures

The advanced Intermediate courses are intended for students who have a strong interest in Physics. The advanced lecture subjects are generally more rigorous and cover material in greater depth than is done in the regular lecture series. The assessment of the advanced subjects will reflect the more challenging nature of the material presented. The lectures in Physics 291 include advanced quantum mechanics, astronomy, and an introduction to advanced electrodynamics.

Practical work

As for Physics 201.

Microlab

As for Physics 201.

Textbooks

R. Eisberg and R. Resnick *Quantum Physics* (Wiley, 1985)

J. O'Byrne (ed.) *Experimental Physics Notes* (School of Physics)

PHYS 292S Physics (Advanced) B 8 units

Dr Tango

Qual Physics 192 or Credit or better in Physics 103 or 104

Prereq 12 units of Junior Mathematics other than Mathematics 111 and 112 (Mathematics 101 or 191 plus 102 or 192 recommended) or Credit or better in Mathematics 111 and 112

Classes Sem 2: (3 lec, 3 prac & 2 microlab)/wk

Assessment two 2.5hr exam, 2 prac reports, microlab (report & test)

Lectures

Refer to Physics 291 for an overall description of the advanced Intermediate program. The lectures in Physics 292 include advanced electrodynamics, advanced optics, and instrumentation for the physical and environmental sciences.

Practical work

As for Physics 202.

Microlab

As for Physics 202.

Textbooks

D.J. Griffiths *Introduction to Electrodynamics* (Prentice Hall, 1989)

J. O'Byrne (ed.) *Experimental Physics Notes* (School of Physics)

Reference Book

E. Hecht *Optics* (Addison-Wesley, 1987)

Senior Physics courses

Two Senior level courses are offered each semester. Some of the material is common between courses. Any combination of courses qualifies a student for Physics Honours. For further details of each course consult the Departmental handbook.

PHYS 391F Physics (Advanced) A 12 units

Dr Cramer

Qual Physics (291 and 292), or Credit or better in Physics (201 or 211) and Credit or better in Physics 202 or 212

Prereq 16 units of Intermediate Mathematics

Classes Sem 1: (4 lec, 6hr prac & 2hr microlab)/wk

The topics covered in this course are: principles of quantum mechanics, thermal physics, electromagnetism and special relativity, experimental physics, computational physics.

PHYS 301F Physics (Technological) A 12 units

Dr Cramer

Qual 16 units of Intermediate Physics

Prereq 8 units of Intermediate Mathematics

Classes Sem 1: (4 lec, 6hr prac & 2hr microlab)/wk

The topics covered in this course are quantum physics, thermal physics, photonic technology, experimental physics, computational physics.

PHYS 392S Physics (Advanced) B 12 units

Dr Cramer

Qual Physics (291 and 292), or Credit or better in Physics 201 or 211 or Credit or better in Physics 202 or 212

Prereq 16 units of Intermediate Mathematics

Classes Sem 2: (5 lec & 7hr prac)/wk

The components of this course are: statistical mechanics, experimental physics, essay plus two options from the list: acoustics and ultrasonics, astrophysics, condensed matter physics, modern optics, nuclear and particle physics, plasma physics.

Not all options will be offered each year. Advanced students undertake extension material in their two options.

PHYS 302S Physics (Technological) B 12 units

Dr Cramer

Qual 16 units of Intermediate Physics

Prereq 8 units of Intermediate Mathematics

Classes Sem 2: (5 lec & 7hr prac)/wk

The components of this course are: applications of thermal physics, condensed matter physics, experimental physics, essay plus one option from the list: acoustics and ultrasonics, astrophysics, modern optics, nuclear and particle physics, plasma physics. Not all options will be offered each year.

PHYS 321F Scientific Computing 12 units

Assoc. Prof. Pailthorpe

[This course will be available from 1998]

Qual Credit or better in Mathematics 203 or 293

Prereq 16 units of Intermediate courses in Chemistry, Computer Science, Mathematics, Physics or Statistics

Classes Sem 2: (3 lec & 3 lab)/wk

Assessment 3 modules of equal weight, assessed by written exams and written assignments and/or lab work

This course covers the computational techniques used to model aspects of the physical world in order to study them. The course will present the main issues in computational modelling, numerical techniques and accuracy, and the use of mathematical packages. It includes hands-on tutorials. As this course deals with general principles it is suitable for students in any scientific discipline.

Textbook

See Departmental Handbook

PHYS 322S Scientific Visualisation 12 units

Assoc. Prof. Pailthorpe

[This course will be available from 1998]

Prereq Physics 321

Classes Sem 2: (3 lec & 3 lab)/wk

Assessment 3 modules of equal weight, assessed by written exams and written assignments and/or lab work

In this course students will investigate the ways of presenting complicated data so that scientists can understand the underlying patterns and communicate this understanding. Students will study several options applying these principles to specific scientific disciplines, or furthering their knowledge of the techniques. The course modules will be offered by several Schools/Departments (Physics, Chemistry, Mathematics and Computer Science). The School of Physics will act as coordinator. Students who wish to take this course are advised to take 12 units of Physics and/or Chemistry in their Junior year.

Textbook

See Departmental Handbook

Physics Honours

Dr Robinson

Qual 24 units of Intermediate Physics

Classes Yr. 160 lec & research project

Assessment three 3hr and five 2hr exams, one 9000w report

Students of sufficient merit may be admitted to an Honours course in fourth year. They must devote their whole time to work in connection with Physics. Physics Honours comprises coursework (weight 50%) and a research project (weight 50%).

The courses of lectures and prescribed reading cover quantum mechanics, statistical mechanics and kinetic theory, electromagnetic theory, solid state physics, plasma physics, modern optics, sub atomic physics, astrophysics, relativistic quantum mechanics and mathematical methods. Additional optional courses, which may not be offered every year, include general relativity, materials physics, laser physics, cosmology, millimetre wave physics, signal and image processing, solar energy, fundamentals of physics, and plasma astrophysics.

Honours students are associated with one of the research groups in the School of Physics, including the education research group, and their research project is a part of the research activity of that group. Students are required to submit a formal report on their research work. Only students with a strong mathematical background are permitted to undertake a wholly theoretical research project. A mathematical methods course is provided for such students.

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, seminars and meetings of the Physics Board. They may be employed for a few hours per week in Junior teaching.

Postgraduate study

Details concerning fields of postgraduate study in the School of Physics may be obtained on application to the Convenor of the Physics Postgraduate Committee, School of Physics.

Department of Physiology

The Department of Physiology provides the following courses for those wishing to study Physiology:

Introductory general Intermediate courses and for those wishing to major in the subject, in-depth Senior courses encompassing Neuroscience in semesters one and two and Heart and Circulation in semester two.

Location

The Department is in the Anderson Stuart Building opposite Fisher Library bookstack; the Office is on the ground floor.

Noticeboards

Information on courses and examination results are placed on a noticeboard near the Manning Road entrance (north side).

Registration

All students (including repeat students and non degree students) must complete a registration card (available in the Office) during the orientation period or earlier. Consult the noticeboard to determine the procedure for arranging your laboratory class time.

Advice on courses

The Office will direct you to an appropriate member of staff.

Information booklet

An information booklet and synopses of courses are available in the Office.

Physiology 2

16 units

This course is not available to students who first enrolled in the BSc degree after 1991.

See 1994 Faculty of Science Handbook, p. 102 or consult Department for details of this course.

Intermediate Physiology courses

PHSI 201F Introductory Physiology A

4 units

Coordinator Dr Frommer, other Department of Physiology staff

Prereq 12 Junior units each of Chemistry and Mathematics, and 12 Junior units of two of Biology, Computer Science, Physics or Psychology

Classes Sem 1: (3 lec & 1 tut or 1 prac)/wk

Assessment one 3hr exam, data analysis, essays

This is a general course dealing with the functions of the major human body systems: cardiovascular, respiratory, haematological, renal, gastrointestinal systems.

Textbook

R. Rhoades and R. R. Pflanzner *Human Physiology* (Saunders, 1996)

PHSI 202S Introductory Physiology B

4 units

Coordinator Dr Frommer, other Department of Physiology staff

Prereq Physiology 201

Classes Sem 2: (3 lec & 1 tut or 1 prac)/wk

Assessment one 3hr exam, data analysis, essays

This is a general course dealing with the functions of the major human body systems: cell physiology, central nervous system (neuroanatomy, neurophysiology), endocrine system.

Textbook

R. Rhoades and R. R. Pflanzner *Human Physiology* (Saunders, 1996)

Senior Physiology courses

PHSI 301F Neuroscience

12 units

Qual Physiology 202 or Anatomy and Histology 202

Prereq Biochemistry (201 and 202) or (211 and 212) and an additional 8 or more units from any Intermediate course(s) in the following subjects: Anatomy and Histology, Biology, Chemistry, Computer Science, Mathematics, Microbiology, Pharmacology, Physics, Physiology, Psychology or Statistics

Students in the Faculty of Engineering who have completed Physiology 202 plus at least one other Intermediate course similar to one of the above prerequisites may also be permitted to enrol

Classes Sem 1: (4 lec & 8 prac)/wk

Assessment one 3hr exam, spot tests, essays, prac reports, seminar presentations

This course is concerned with the structure and function of the nervous system at the molecular, cellular and integrative level. Some examples of neurological disorders will be discussed. The following topics will be covered: the regional anatomy of the central nervous system; somatomotor and autonomic control systems; visual system; auditory system; somatosensory system; hypothalamus; development and regeneration of the nervous system. The practical component of the course consists of experiments in physiological methods, small group tutorials on neuroanatomy and small group sessions in which students discuss current research papers in a wide variety of subdisciplines of neuroscience.

Textbook

E. Kandel, J. Schwartz and T. Jessell *Principles of Neural Science*

PHSI 302S Neuroscience Cellular and Integrative 12 units

Qual Physiology 301

Classes Sem 2: (3 lec, 3 tut & 6hr prac)/wk

Assessment one 3hr exam, spot tests, essays, prac reports, seminar presentations

This course will allow students to study in depth a range of topics in neuroscience at the molecular, cellular and integrative level. The topics covered are: the relationships between glia and neurones; the molecular basis of brain function; the integrated central neural control of autonomic and somatomotor functions; vision and higher cortical functions. Practical work will take the form of either an experimental project carried out in a research laboratory or an extensive library research project.

Textbook

E. Kandel, J. Schwartz and T. Jessell *Principles of Neural Science*

PHSI 303S Heart and Circulation 12 units

Qual Physiology 202

Prereq Biochemistry (201 and 202) or (211 and 212) and an additional 8 or more units from any Intermediate course(s) in the following subjects: Anatomy and Histology, Biology, Chemistry, Computer Science, Mathematics, Microbiology, Pharmacology, Physics, Physiology, Psychology or Statistics

Students in the Faculty of Engineering who have completed Physiology 202 plus at least one other Intermediate course similar to one of the above prerequisites may also be permitted to enrol

Classes Sem 2: (4 lec, 2 tut & 6hr prac)/wk

Assessment one 3hr exam, spot tests, essays, prac reports, seminar presentations

This course 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 course 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. Lectures are combined with practical laboratory experiments on animals and human subjects.

Physiology Honours

Coordinator Assoc. Prof. Davey

During fourth year, no formal course 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.

Department of Psychology

Psychology is the study of behaviour. As a study it is approached on a scientific basis, with provision for professional training at the postgraduate level. The research activities of the Department cover almost all of the main branches of the subject.

Registration and noticeboards

Students in all years must register during the orientation period. Psychology 101 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 Griffith-Taylor Building.

Information about registration meetings for Psychology 201, 202, 301 and 302 students will also be posted at the Enrolment Centre, and on the Departmental noticeboards on the 5th floor of the Griffith-Taylor Building.

Enquiries

The main enquiry office of the Department is Room 416, Griffith-Taylor Building (tel. 9351 2872). Staff members available to discuss particular courses may be contacted directly or through this office.

Honours

In order to be eligible to graduate with Honours in Psychology, it is necessary (except as provided in the by-laws or resolutions) to gain a year average of Pass with at least Credit in Psychology 201 and 202 and also in Psychology 301 and 302. 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 courses 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 course or section of a course, students are advised of its relative weight and the contributions of exam and classwork for assessment purposes.

Textbooks

Check Departmental noticeboards before buying prescribed texts.

*Junior Psychology courses***PSYC101F Psychology 101** 6 units

Classes Sem 1: (3 lec, one 1hr tut & one 1hr demonstration)/wk

Assessment one 3hr exam, one 1000w essay, tut test; experimental participation

The course 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. The course covers the following areas: subject matter and methods of psychology; basic statistics and measurement; behavioural neuroscience; sensory processes; social psychology; personality theory.

Textbook

To be advised

and *Handbook and Practical Worksheets for Psychology 1* (1997)

PSYC 102S Psychology 102 6 units

Prereq Psychology 101

Classes Sem 2: (3 lec, one 1hr tut & one 1hr demonstration)/wk

Assessment one 3hr exam, one 1500w prac report, tut test; experimental participation

The course covers the following areas: human development; human mental abilities; learning, motivation and abnormal psychology; visual perception; cognitive processes.

Textbook

As for Psychology 101

*Intermediate Psychology courses***PSYC 201F Psychology 201** 8 units

Qual Psychology 102

Classes Sem 1: (4 lec & up to 4hr tut/prac)/wk

Assessment two 2hr exams, essays, prac, reports

Psychology 201 deals with material on both basic and complex psychological processes and covers the following topics:

Psychological statistics

Classes (1 lec & 1 tut)/wk

Assessment one 1hr exam, quiz

Personality

Classes (1 lec & 1 tut)/wk

Assessment one 1hr exam, one 1500w essay

Individual differences

Classes (1 lec & 1 tut)/wk

Assessment one 1hr exam

Sensation and Perception

Classes (1 lec & 1 prac)/wk

Assessment one 1hr exam

Textbooks

To be advised

PSYC 202S Psychology 202 8 units

Prereq Psychology 201

Classes Sem 2: (4 lec & up to 4hr tut/prac)/wk

Assessment two 2hr exams, essays, prac, reports

Psychology 202 deals with material on both basic and complex psychological processes and covers the following topics:

Psychological statistics

Classes (1 lec & 1 tut)/wk

Assessment one 1hr exam, quiz

Behavioural neuroscience and learning

Classes (1 lec & 1 prac)/wk

Assessment one 1hr exam, prac report

Social psychology

Classes (1 lec & 1 tut)/wk

Assessment one 1hr exam, quiz

Cognitive processes

Classes (1 lec & 1 prac)/wk

Assessment one 1hr exam, one prac report

Textbooks

To be advised

*Senior Psychology courses***PSYC 301F Psychology 301** 12 units

Qual Psychology 202 -

Classes Sem 1: (4 lec & up to 6hr of tut/prac)/wk in first semester

Assessment four 45min exams, essays, prac reports

Classes

The course consists of four lectures and up to six hours of practical-tutorial work each week. The class work includes essays and reports of practical or laboratory work done under supervision.

Courses

Because of timetabling difficulties some courses are offered at times other than those listed for Psychology 301 and 302 in the timetable for Senior courses.

Students wishing to proceed to Psychology 4 Honours must complete History and Philosophy of Psychology I and II and the options in Measurement and Psychometrics and Statistics and Research Design, plus two options in each semester.

Students not wishing to proceed to Psychology 4 Honours must complete four options each semester.

All Psychology options are offered subject to the availability of staff and on the condition that they are chosen by an adequate number of students in each case. The topics include:

Abnormal psychology

Classes (1 lec & 1 tut)/wk

Assessment one 45min exam, one 1500w essay, tut paper

Cognitive processes: recognition, search and memory

Classes (1 lec & 1 tut)/wk

Assessment one 45min exam, prac reports

History and philosophy of psychology I: historical foundations

Classes (1 lec & 1 tut)/wk

Assessment one 45min exam, one 2000w essay, tut paper

Required of students wishing to proceed to Psychology Honours

Intelligence

Classes (1 lec & 1 tut)/wk

Assessment one 45min exam, one prac report, tut paper

Learning and motivation

Classes (1 lec & up to 2hr of tut or prac)/wk

Assessment one 45min exam, prac report

Measurement and psychometrics

Classes (1 lec & 1 tut)/wk

Assessment one 45min exam, prac report

Required of students wishing to proceed to Psychology Honours

Social psychology

Classes (1 lec & 1 tut)/wk

Assessment one 45min exam, prac report

Theoretical bases of development

Classes (1 lec & 1 tut)/wk

Assessment one 45min exam, prac report

PSYC 302S Psychology 302 12 units

Qual Psychology 202. History and Philosophy II option requires History and Philosophy I

Classes Sem 2: (4 lec & up to 6hr of tut/prac)/wk

Assessment four 45min exams, essays, prac reports

Classes and courses information: See Psychology 301 above.

The topics include:

Behavioural neuroscience

Classes (1 lec & up to 2hr of prac or tut)/wk

Assessment one 45min exam, prac report

Child abnormal psychology

Classes (1 lec & 1 tut)/wk

Assessment one 45min exam, one 1000w essay, tut paper

Developmental issues

Classes (1 lec & 1 tut)/wk

Assessment one 45min exam, report

Environmental and organisational psychology

Classes (1 lec & 1 tut)/wk

Assessment one 45min exam, one prac report

History and philosophy of psychology II: philosophical principles

Prereq History and philosophy of psychology I: historical foundations

Classes (1 lec & 1 tut)/wk

Assessment one 45min exam, one 2000w essay, tut paper

Required of students wishing to proceed to Psychology Honours

Human performance

Classes (1 lec & 1 tut)/wk

Assessment one 45min exam, 10 short reports, tutorial quiz

Language and communication

Classes (1 lec & 2 prac)/wk

Assessment one 45min exam, assignment

Perceptual systems

Classes (1 lec & 1 up to 2hr of tut or prac)/wk

Assessment one 45min exam, prac report

Personality

Classes (1 lec & 1 tut)/wk

Assessment one 45min exam, assignment

Statistics and research design

Classes (1 lec & 1 tut)/wk

Assessment one 45min exam, prac report

Required of students wishing to proceed to Psychology Honours

The nature/nurture controversy in psychology

Classes (1 lec & 1 tut)/wk

Assessment one 45min exam, one 1500w essay, tut paper

Psychology 4 Honours

Entry Requirement Average of Credit or better in Psychology

201 and 202, and also in 301 and 302; specified options in

Psychology 301 and 302

Assessment one 2hr & one 3hr exam or equivalent, report of empirical research project, theoretical thesis or review

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.

Students are required to (a) devise, conduct and report upon an empirical research project, (b) write a theoretical thesis or review, and (c) attend one lecture course, two seminar courses and, two method courses. The areas of psychology in which these activities may occur depend on the interests and specialities of staff members.

Reference lists will be supplied by staff handling the numerous special fields that are available.

Postgraduate study

Doctor of Philosophy

See the University's *Statutes and Regulations 1996* for by laws and resolutions. Direct enquiries to the Head of Department.

Master of Psychology

Postgraduate training in clinical psychology is controlled by the Faculty of Science. Details of the Master of Psychology degree awarded on successful completion of this training are available in the *Statutes and Regulations 1994-95* and Chapter 7 of this handbook.

Graduate Diploma in Science (Psychology)

This diploma provides a fourth year in Psychology at the Pass level, and consists predominantly of course work. See Chapter 7 of this Handbook.

Psychology for Graduates — Non-degree program

Offers undergraduate courses in Psychology to holders of the degree of Bachelor of Science, Arts or Economics (Social Science) from the University of Sydney, or equivalent, who have not previously completed a major in Psychology.

Soil Science

See under **Department of Agricultural Chemistry and Soil Science**.

Bachelor of Science (Advanced) degree program

Please refer to Chapter 3 of this book for resolutions and the Tables of Courses, and to earlier parts of this chapter for the Bachelor of Science course descriptions.

Bachelor of Science (Environmental) degree program

The Bachelor of Science (Environmental) requires three years of full-time study. An Honours program is available and requires a further year of full-time study.

Progression in the Bachelor of Science (Environmental) degree program is by accumulation of credit points gained by completing courses. A total of 140 units is required for the degree.

For information on other relevant courses for this degree program, please refer to the Bachelor of Science course descriptions in this chapter.

HSC Aggregate

A quota exists for admission into the degree of Bachelor of Science (Environmental).

Transferring into the BSc (Environmental)

From 1997 students will be permitted to transfer from other degrees offered by the Faculty of Science into the BSc (Environmental).

Junior Environmental Science courses

ENV1101F Environmental Earth Science A 6 units

Coordinator Dr M. Hughes

Coreq Biology (101 or 191) and Chemistry (111 or 191 or 193) and Mathematics (101 or 111 or 191)

Classes Sem 1: (3 lec & prac/tut)/wk

Assessment one 3hr exam, class work

The course serves as an introduction to environmental geology by examining global geological processes and their controls on the human environment. The course 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 course 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 course should study the pamphlet on the Junior courses in Geology, obtainable from the Enquiry Office in the Edgeworth David Building. It gives details of course content, text and reference books, staffing and other relevant matters

ENV1102S Environmental Earth Science B 6 units

Coordinator Dr D. Dragovich

Prereq Environmental Science 101

Coreq Biology (102 or 192) and Chemistry (112 or 192 or 194) and Mathematics (102 or 103 or 104 or 112 or 192 or 193 or 194)

Classes Sem 1: (3 lec & prac/tut)/wk

Assessment one 3hr exam, class work

This course completes the introduction to environmental earth sciences by examining geographical scales of environmental concern, such as catchments, river basins, hydrology and land-use. The course also considers the soil environment including physical, chemical and biological aspects. Students will learn how to integrate information from related disciplines to understand relationships between earth sciences and solutions to environmental problems

In intermediate Environmental Science courses

ENV1 201F Environmental Science A1

8 units

Prereq Environmental Science (101 and 102) and Biology (102 or 192) and Chemistry (112 or 192 or 194) and Mathematics (102 or 103 or 104 or (111 and 112) or 192 or 193 or 194)

Coreq Environmental Science 211 and 8 units from the approved list of courses (consult the Chair of the Committee for BSc(Environmental))

Classes Sem 1: (3 lec, 1 tut & 2 prac)/wk, field excursions in prac time and in vacations

Assessment one 3hr exam, 3 prac assignments

ENV1 202S Environmental Science A2

8 units

Prereq Environmental Science 201 and 211

Coreq Environmental Science 212

Classes Sem 2: (3 lec, 1 tut & 2 prac)/wk, field excursions in prac time and in vacations

Assessment one 3hr exam, 3 prac assignments per semester

These two courses must be taken. You must also enrol in ENVI 211 and 212 below.

Environmental Science A1 and A2 provide the integrated framework for understanding natural environments in terms of their 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. Emphasis is on practical measurement and interpretation to provide professional training in the use of numerous relevant disciplines.

ENV1 211F Environmental Science B1

8 units

Prereq As for Environmental Science 201 above

Coreq Environmental Science 201 and 8 units from the approved list of courses (consult the Chair of the Committee for BSc(Environmental))

ENVI 212S Environmental Science B2

8 units

Prereq As for Environmental Science 201 and 202 above

Coreq Environmental Science 202

You must enrol in both Environmental Science 211 and 212 in addition to Environmental Science 201 and 202 above.

Module 1a Introduction to Environmental Physics

Classes Sem 1: (3 lec/tut & 3 prac)/wk

Assessment one 3hr exam, lab and assignments

Students will take Physics 101 or 102 or 191. A complete description is available in the Physics entry of the Faculty Handbook.

Module 1b Introduction to Environmental Physics

Classes Sem 2: (3 lec/tut & 3 prac)/wk

Assessment one 3hr exam, lab and assignments

Students will take Physics 104. A complete description is available in the Physics entry of the Faculty Handbook.

Module 2 Design and Analysis of Environmental Sampling

Classes Sem 2: Weeks 1-6: (2 lec & prac)/wk

Assessment one 1.5hr exam

This course is a modification of a successful module in the Senior Biology (Ecology) course and will run in conjunction with it. The course introduces the logical structure of environmental sampling, including the nature of variables, univariate and multivariate measures, correlation of environmental variables and interpretation of data.

This course 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. Practical classes are computer-interactive exercises on these topics, plus an introduction to modelling environmental impacts in biological populations.

Senior Environmental Science courses

ENVI 301F Environmental Science A

12 units

Prereq Environmental Science 202 and 212; 16 units of approved Intermediate subjects

Coreq 12 units of Senior courses from approved Science Discipline Areas (Biology, Chemistry, Geography or Geology)

ENVI 302S Environmental Science B

12 units

Prereq Environmental Science 301

Coreq 12 units of Senior courses from approved Science Discipline Areas (Biology, Chemistry, Geography or Geology)

You must enrol in both ENVI 301 and ENVI 302.

Course structure

The Senior courses consists of 6 units of Core and 3 x 6-unit modules to be taken from those offered in the relevant contributory Schools and Departments. The Core courses (6 units) are taken in their entirety throughout both semesters, including field-courses. Three options are to be taken (subject to the approval of the Chair of the Interdepartmental Board for Environmental Studies). No student may take more than 12 units in any one relevant discipline. No option may be counted towards Senior Environmental Science and any other Senior or other enrolment. Consult the relevant Department/School or Course Executive Officer well in advance of enrolment. All enrolments in options other than the core must also be approved by the host Department/School or Course Executive Officer.

Environmental Science Core courses

6 units

Classes Yr: (1 lec or tut)/wk; 52hr of prac and field-courses

Assessment Yr: one 1.5hr exam, 2 prac assignments each semester; one major environmental report

The Core courses in Senior Environmental Science build on foundations from Intermediate Environmental Science courses to provide the integration of scientific and other aspects of environmental problem-solving and professional responsibilities. Topics include introductions to environmental ethics law, economics, and issues of planning, regulation and management for the built and natural environments.

Emphasis will be on practical work in field-courses to learn how to interpret and synthesise environmental data, to make decisions and recommendations about possible environmental management and how to use diverse sources of specialist information for large scale problem-solving.

Bachelor of Science (Molecular Biology and Genetics) degree program

Please refer to the Bachelor of Science section of this chapter for course descriptions for the Bachelor of Science (Molecular Biology and Genetics).

CHEM 293F Life Sciences (Advanced)

8 units

Qual Chemistry 192 or 194

Prereq 12 units of Junior Mathematics

Classes Sem 1: (4 lec & 4hr prac)/wk

Assessment exam, prac reports

The aim of this course is to provide students enrolled in the Molecular Biology and Genetics degree program with some of the chemical knowledge required for an understanding of the subject. Approximately 36 of the lectures form a core, which is common with other Intermediate Chemistry courses. The remaining 20 lectures are distinct for this course and apply the core knowledge to chemical problems in the life sciences. 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
To be advised

MICR 205F Fundamental Microbiology 4 units

Coordinator Dr Carter
Qual Biology 191 and (192 or 193), Chemistry 192 or 194
Classes Sem 1: (2 lec & 4hr prac)/wk for 7wks
Assessment one 2hr exam (65%), continuous assessment (15%), prac exam (15%), assignment (5%)

This course aims to give the student sufficient knowledge and technical skills to form a foundation for the future study of Microbiology and Molecular Biology and Genetics. Topics covered include nature and scope of Microbiology; methodology for handling microbes; a detailed study of prokaryotes including structure and function; introduction to virus structure and mechanisms of replication; consideration of molecular trends in microbiological research.

Textbook
As for Microbiology 201*

MICR 206S Microbiological Applications and Biotechnology 4 units

Coordinator Dr Carter
Qual Microbiology 205, Biology 191 and (192 or 193), Chemistry 192 or 194
Classes Sem 2: (2 lec & 4hr prac)/wk for 6wks
Assessment one 2hr exam (65%), continuous prac assessment (15%), continuous assessment (15%), assignment (5%)

This course is designed to expand the understanding of and the technical competence in Microbiology, building on the knowledge and skills acquired in Microbiology 205. It focuses on the role of micro-organisms in health and disease and in industrial processes. Topics covered include: major groups of medically important bacteria; pathogenesis and host defence mechanisms; microbial biotechnology covering traditional processes and recombinant DNA products, biosensors, biocontrol agents and bioremediation.

Textbook
As for Microbiology 202

BSc/LLB

For an introductory statement on the Science/Law course, see Chapter 3.

These Law courses are taken on the main University campus. The remainder of the course for the Bachelor

of Laws degree will be completed at the Law School in the city during a period of two years. The Law School is located on the corner of King and Elizabeth Streets in the city. Enquiries may be made on: 9351 0344 or 9351 0345.

All courses except Legal Institutions may be offered in Semester 1 and Semester 2 depending on availability of staff.

Legal Institutions I 6 units

Classes Sem 1: (1hr lec & two 2hr tut)/wk

Legal Institutions II 6 units

Prereq Legal Institutions I
Classes Sem 2: (1hr lec & two 2hr tut)/wk

The Law course Legal Institutions is taught as part of the combined degree in two semester components, Legal Institutions I and Legal Institutions II). The two components provide an introduction to law which explores the origin, nature and sources of law in Australia, and the institutions through which it is created and administered today. Particular attention is given to the legislative process and the constitutional framework in which it takes place including a study of the judiciary in shaping the law. Major theories about the nature and purpose of the law are integrated throughout the course and the response of law to a range of contemporary social problems is examined.

Small group teaching is used for detailed consideration of the reading materials, which form the basis of the course, and assessment is directed to, the development of skills of legal writing, oral communication and argument.

Legal Research and Writing

This course must be completed before the Bachelor of Laws degree can be awarded. It is graded on a Pass/Fail basis, and all components of the course must be satisfied, including attendance at legal writing skills and legal research classes, satisfactory completion of legal research assignments and legal writing computer tutorials, and of specified written assessment tasks in host subjects for the course. These host subjects are usually Legal Institutions and Torts. Host subjects will be advised.

Legal Research

This component of the course aims to promote the efficient use of a law library by all students. The major Australian legal research resources, both in hard copy and computer based formats, will be located, analysed and explained. Students will thus gain invaluable practice in (1) finding relevant primary and secondary materials, (2) evaluating them, and (3) utilising them effectively. During the course of instruction, students will be encouraged to adopt efficient and up-to-date research methods.

Legal Writing

This component of the course aims to provide students with skills in reader-centred approaches to legal writing, and with a range of generic writing skills which will equip them both for University study of law and a range of careers open to law graduates.

Constitutional Law

8 units

Prereq Legal Institutions I and II
Classes Sem 1, Sem 2: two 2hr/wk

The aim of the course is to give students an understanding of State, and especially Federal constitutional law. In the latter area, the aim is to give an overall appreciation, combined with a more detailed examination of selected topics.

The State context includes the Constitution Act 1902 (N.S.W.) generally, particular provisions (e.g. peace, welfare and good government, manner and form, territoriality, separation of powers), the Australia Acts 1986, the State Constitution as affected by, and as compared with, the State Constitution as affected by, and as compared with, the Commonwealth Constitution. The Federal content includes introductory material (e.g. Federation, characterisation, severance, outline of judicial review and interpretation), selected federal legislative powers, the judicial power and jurisdiction, prohibitions on power, inconsistency of laws, Commonwealth State relations.

Torts

8 units

Prereq Legal Institutions I and II
Classes Sem 1, Sem 2: two 2hr/wk

This is a general introductory course concerned with liability for civil wrongs. The course 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 rationale and utility of its governing principles. Particular topics on which the course will focus include:

- (a) The relationship between torts and other branches of the common law including contract and criminal law;
- (b) The role of fault as the principal basis of liability in the modern law;
- (c) Historical development of trespass and the action on the case and the contemporary relevance of this development;
- (d) Trespass to the person (battery, assault, and false imprisonment);
- (e) Trespass to land;
- (f) The action on the case for intentional injury;
- (g) Defences to trespass, including consent, intellectual disability, minority, necessity and contributory negligence;
- (h) 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;
- (i) Injuries to relational interests, including compensation to relatives of victims of fatal accidents;
- (j) Concurrent and vicarious liability;
- (k) Defences to torts of negligence;
- (l) Breach of statutory duty;
- (m) Public nuisance;
- (n) Private nuisance; and
- (o) Liability for animals

Criminal Law

8 units

Prereq Legal Institutions I and II
Classes Sem 1, Sem 2: two 2hr/wk

This course is designed to assist students in developing the following understandings:

- (1) A critical understanding 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 understanding 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.

Administrative Law

8 units

Prereq Legal Institutions I and II
Classes Sem 1, Sem 2: two 2hr/wk

This course involves a study of the relationships of individuals and organisations with government decision-makers. This course examines the legal principles which apply to those relationships with the aim of developing an understanding of the extent to which decision-makers within the executive branch of government are accountable to Parliament, to the courts and to other administrators, such as ombudsmen and review tribunals. The course encourages the development of a critical perspective upon the legal principles and an understanding of how the values of openness, fairness and participation may be promoted. The critical perspective requires an appreciation of how political theory and the insights of other disciplines may provide a framework for analysing the choices made by administrators, and by judges in judicial review.

Contracts

8 units

Prereq Legal Institutions I and II
Classes Sem 1 and Sem 2: two 2hr/wk

Contract law provides the legal background for transactions involving the supply of goods and services and one means, arguably the most significant, by which 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 courses.

It necessarily follows from the above that the aims of the course are composite in nature. Perhaps the central aim is to provide an understanding of the basic principles of common law and statutes applicable to contracts and to provide a grounding in one of the

most important areas of law in practice. A second aim is for students to be given the means to evaluate, to make normative judgements, about the operation of the law. This leads to a further aim, admittedly fairly modest in scope, to make some examination of contract law in other countries. As Contracts is basically a case law subject, the final aim of the course is to provide experience in problem solving by application of principles provided by the decided cases.

Degree of Bachelor of Computer Science and Technology

Table V(i) courses

ENGS 151Y Digital and Electronics Technology 1 12 units

AKn Mathematics 3-unit course and the Physics section of the Science 3-unit or 4-unit course or 2-unit Physics

Coreq Mathematics (101 or 191) and (103 or 193) and Computer Science (101 or 191) and (102 or 192)

Classes Yr: (6hr lec, lab, tut & computing)/wk

Assessment two 2hr exams/sem, assignments, laboratory reports

Introductory Electronic Systems (6 units): an integrated course which combines computer-based problem solving and simulation with an introductory study of electronic components, circuits and systems. Linear DC circuits, DC switching and transients; AC circuits and frequency response. Electrical safety. Operational amplifier functions. The laboratory work includes instrumentation and computer-based instrument emulation.

Introductory Digital Systems (6 units): an integrated course which combines construction and manufacture techniques for digital systems, schematic capture, simulation and printed circuit board design software with number representation, combinatorial logic design, sequential logic design, registers, counters, ROM and RAM elements and synchronous sequential circuits. Associated laboratories include a team-based digital design construct and test project.

Textbook

To be determined

ENGS 251F Electrical and Digital Systems 8 units

Prereq Engineering Science 151, Computer Science (102 or 192)

Classes Sem 1: (5 lec & 3hr prac/tut)/wk

Assessment two 2hr exams, lab reports and assignments

Transient and steady state responses of electric circuits. Complex frequency analysis, phasors. Laplace transforms, transfer functions and frequency response. Transformers. Two port networks. Principles of filtering. Introduction to energy conversion; balanced three phase circuits.

Computer architecture and assembly language ■ programming. Microprocessor and microcontroller systems, memory and IO interfacing, serial and parallel communications; real time control; system design decision, implementation and debugging.

Engineering in history; early electrical engineering; engineering in Australia; industry and the economy; Australian economy in a world context, electrical engineering and economic development.

Textbooks

To be advised

ENGS 252S Electronics and Signals 8 units

Prereq Engineering Science 151

Classes Sem 2: (5 lec & 3hr prac/tut)/wk

Assessment two 2hr exams, lab reports, assignments

Basics of semiconductors, diodes, transistors, small-signal and large-signal models, rectification, biasing, gain; FET and BJT circuits, introduction to operational amplifiers.

Signal properties: time and frequency domain representations, power and energy signals, continuous and discrete-time signals, periodic and non-periodic signals, elementary signals; Fourier series and Fourier transform; signal spectra; statistical properties. Linear systems: definitions, properties and examples; impulse and frequency response, convolution. System functions of analog filters. Communication systems components: system functions of transmission lines, optical fibre and radio channels. Baseband communications, including overview of baseband binary data transmission. Amplitude and frequency modulation and demodulation of continuous signals in the absences of noise.

The product innovation process; role of the engineer in innovation.

Textbooks

To be advised

Table V(ii) courses

All qualifying, pre- and corequisite courses, details of staff, examinations, course delivery and descriptions are as described in the appropriate Department or School entry for the BSc (above).

COMP 321S Algorithmic System Project 4 units

COMP 322S Computer Systems Project 4 units

COMP 323S Intelligent Systems Project 4 units

COMP 324S Large-Scale Software Project 4 units

COMP 325S Product Development Project 4 units

Table V(iii) courses

With the exception of Econometrics 351 and 352, all qualifying, pre- and co-requisite courses, details of staff, examinations, course delivery and descriptions are as described in the appropriate Department or School entry for the BSc (above).

MATH 305F Logic	4 units	BIOL 193S Human Biology (Advanced)	6 units
MATH 307S Coding Theory	4 units	CHEM 111F Chemistry 1A	6 units
MATH 31 OS Information Theory	4 units	CHEM 112S Chemistry 1B	6 units
MATH 312F Mathematical Computing I	4 units	CHEM 191F Chemistry 1A (Advanced)	6 units
MATH 313F Signal Processing	4 units	CHEM 192S Chemistry 1B (Advanced)	6 units
MATH 382S Combinatorics (Advanced)	4 units	CHEM 193F Chemistry 1A (Special Studies Program)	6 units
MATH 383S Computational Algebra (Advanced)	4 units	CHEM 194S Chemistry 1B (Special Studies Program)	6 units
MATH 386S Mathematical Computing II (Advanced)	4 units	COMP 101F Introductory Programming	6 units
MATH 395F Categories & Computer Science (Advanced)	4 units	COMP 102S Introductory Computer Science	6 units
STAT 323S Design of Experiments	4 units	COMP 191F Introductory Programming (Advanced)	6 units
GEOG 312S Coastal Environmental Management and GIS	12units	COMP 192S Introductory Computer Science (Advanced)	6 units
Econometrics 351F Operations Research A	8 units	MATH 101F Differential Calculus and Linear Algebra	6 units
Consult Faculty of Economics Handbook 1997 for details.		MATH 102S Integral Calculus and Statistics	6 units
Econometrics 352S Operations Research B	8 units	MATH 103S Integral Calculus and Discrete Mathematics	6 units
Consult Faculty of Economics Handbook 1997 for details.		MATH 104S Statistics and Discrete Mathematics	6 units
PHYS 321F Scientific Computing	12 units	MATH 111F Life Sciences Mathematics 1	6 units
This course will be offered in 1998.		MATH 112S Life Sciences Mathematics 2	6 units
PHYS 322S Scientific Visualisation	12 units	MATH 191F Advanced Differential Calculus and Linear Algebra	6 units
This course will be offered in 1998.		MATH 192S Advanced Integral Calculus and Statistics	6 units

Degree of Bachelor of Medical Science

The following courses are as prescribed by the Senate resolutions in force from 1997.

Junior courses

All qualifying, pre- and corequisite courses, details of staff, examinations, course delivery and descriptions are as described under the appropriate Department or School entry for the BSc (above).

BIOL 101F Concepts in Biology	6 units	PHYS 101F Physics (Regular)	6 units
BIOL 102S Living Systems	6 units	PHYS 102F Physics (Fundamentals)	6 units
BIOL 103S Human Biology	6 units	PHYS 103S Physics (Technological)	6 units
BIOL 191F Concepts in Biology (Advanced)	6 units	PHYS 104S Physics (Environmental and Life Sciences)	6 units
BIOL 192S Living Systems (Advanced)	6 units	PHYS 191F Physics (Advanced) A	6 units
		PHYS 192S Physics (Advanced) B	6 units
		PSYC101F Psychology 101	6 units
		PSYC 102S Psychology 102	6 units

Intermediate courses

Except for BMED 201, all qualifying, pre- and co-requisite courses, details of staff, examinations, course delivery and descriptions are as described under the appropriate Department or School entry for the BSc (above).

(i) Core courses

BMED 201Y Human Life Sciences 24 units

Coordinator Dr Dampney

Classes Yr: (5 lec, 2 tut & 7 prac)/wk

Assessment written & prac exams, essays, prac reports

This course is a broadly based integrated course on the structure and function of the human body, taught by the Departments of Anatomy and Histology, Pathology and Physiology. Examples will be given, at an elementary level, of the pathology of particular tissues and organ systems. The response of the body to environmental stress will also be discussed. The following topics will be taught, under three broad headings:

Being Alive Introduction to basic cell types and tissues, and to the organisation of the nervous system. Structure and functions of bones and joints, Musculoskeletal structure of the trunk, with reference to breathing and movement Motor systems. Structure and function of the autonomic nervous system, and of the sensory systems. Central nervous system processing of information. Basic cellular mechanisms of signal transduction, nerve impulse conduction and muscle contraction.

Maintaining Life Principles of homeostasis at systemic and cellular levels. Structure and function of blood. Cell injury and adaptation. Inflammation, wound healing and repair. Structure and function of: heart and circulation, including haemodynamic derangements; respiratory, urinary, digestive and endocrine systems. Basic cellular mechanisms of membrane transport, secretion and hormone action. Neoplasia. Effects of environmental stresses on body function.

Creating Life Structure and function of reproductive organs. Elementary physiology of the embryo and fetus.

PCOL 201F Fundamentals 4 units

PCOL 202S Drug Actions 4 units

BCHM 211F Genes and Proteins Theory 4 units

BCHM 212S Molecules, Metabolism and Cells Theory 4 units

All qualifying, pre- and co-requisite courses, details of staff, examinations, course delivery and descriptions are as described under the appropriate Department or School entry for the BSc (above).

(ii) Electives (Select one)

For Biochemistry electives, students will choose any combination of first and second semester courses listed below (total units 16) in place of the core Biochemistry courses.

BCHM 201F Genes and Proteins 8 units

BCHM 291F Genes and Proteins (Advanced) 8 units

BCHM 202S Molecules, Metabolism and Cells 8 units

BCHM 292S Molecules, Metabolism and Cells (Advanced) 8 units

BIOL 205S Molecular and General Genetics 8 units

BIOL 295S Molecular and General Genetics (Advanced) 8 units

HPSC 201S Introductory Philosophy of Science 4 units

HPSC 202F Introductory History of Science 4 units

Senior courses

(i) Semester 1 Core courses

BMED 301F Human Life Sciences 4 units

Coordinator Assoc. Prof. Cook

Classes Sem 1: (1-2 lec & 2 tut)/wk

Assessment tut assessment, 5 topic reports & 1 assignment

In this course students will investigate five topics drawn from the most active areas of research in cellular physiology and biology. The intention of the course is to teach students some of the basic principles of cellular function while giving them experience in extracting information from the scientific literature, summarising it and drawing conclusions from it. Emphasis is placed on the oral and written presentation by students of the results of their work. The course makes extensive use of small-group teaching methods and problem-based learning with the lectures providing background information on the concepts and techniques dealt with in the small-group sessions. Assessment is based on (1) performance in the small-group sessions, (2) five reports, one in each of the topics studied in the small-group sessions, and (3) an assignment on a subject related to the broad area of the course.

The topics covered are as follows.

Membrane transport processes The description of transport processes. The structural and functional properties of membrane transport proteins.

Cellular homeostatic mechanisms The mechanisms by which cells control their composition and volume.

Signal-response coupling The mechanisms by which cellular activity is controlled by events external to the cell. This includes receptor mechanisms, second messenger systems and the major types of cellular responses.

The cytoskeleton The structure of the cytoskeleton and its role in cellular processes such as motility.

Cell-cell and cell-matrix interactions The mechanisms by which cells adhere to each other and to their substrate and the influence of this on cellular behaviour.

BMED 302F Microbiology and Immunology 8 units

Coordinator Dr Humphery-Smith
Dr Britton, Prof. Reeves, Dr New, Mrs Dalins, Dr Carter, Dr
Briscoe

Classes Sem 1: (4 lec & 6 prac)/wk

Assessment one 3hr exam, prac

This core course is taught by the Department of Microbiology with a contribution from the Centenary Institute of Cancer Medicine and Cell Biology. It is designed to provide a basic understanding of (1) micro-organisms and their role in human biology, and (2) introductory immunology.

Topics

Introduction to techniques. Comparative structure and function of micro-organisms. Principles and practice of taxonomy and identification of bacteria. Survey of major groups of medically important bacteria. Strategies of pathogenic organisms; host defence mechanisms; common modes of transmission; epidemiology. Immunology: functioning of the immune system, basic immunological techniques. Virology: structure of viruses, mechanisms of replication, virus interactions.

(ii) Semester 1 Elective Options

Except for History and Philosophy of Science 312, all qualifying, pre- and co-requisite courses, details of staff, examinations, course delivery and descriptions are as described under the appropriate Department or School entry for the BSc (above).

ANAT 301F Microscopy and Histochemistry 12 units

BCHM 301F Molecular Biology and Structural Biochemistry 12 units

BCHM 391F Molecular Biology and Structural Biochemistry (Advanced) 12 units

BIOL 313F Molecular Genetics and Recombinant DNA Technology 12 units

BIOL 393F Molecular Genetics and Recombinant DNA Technology (Advanced) 12 units

CPAT 301F Cell Pathology A 12 units

HPSC 312F History of the Biomedical Sciences 12 units

Assoc. Prof. Chalmers, Dr Shortland

Qual History and Philosophy of Science 201 and 202

Classes Sem 1: (4 lec, 4 tut & 4 prac)/wk

Assessment tut assignment, one 3000w essay, project report, take-home exam

This course offers a rounded but focused account of the development of some of the central themes of biological science, or more accurately (since physiology and embryology are also treated) of the sciences of life. Starting with surveys of Greek and medieval work in the fields of classification, physiology, and

reproduction, the course then examines the importance of the 16th and 17th century Scientific Revolution for the life sciences through a study of William Harvey's work on the circulation of the blood, Rene Descartes' writings on the mind-body problem, and continental European microscopical studies of plant and animal cells.

At the heart of the course is the examination of the development of evolutionary theory in the 19th and 20th centuries, and the earlier lectures provide a historical context for this examination. Eighteenth century work in classification (Linnaeus and Buffon), comparative anatomy (Cuvier) and natural history are also ingredients in the development of evolutionary ideas and will therefore be treated. Following several sessions devoted to the origins, development, launch and reception of evolutionary ideas, the course will consider later developments in life sciences, particularly in genetics. The discovery of the structure of DNA brings the course to an end.

Throughout the course, emphasis will be placed on reading and discussing primary sources and on considering the social and intellectual contexts of scientific development. It is hoped that medical science students will gain a richer appreciation of many topics in their degree course and of the human dimension to science by taking this broad option.

PCOL 301F Molecular Pharmacology and Toxicology 12 units

PHSI 301F Neuroscience 12 units

(iii) Semester 2 Elective Options

Except for Anatomy and Histology 303, Microbiology 303, Immunology (BMED 303) and Infectious Diseases (BMED 304), all qualifying, pre- and co-requisite courses, details of staff, examinations, course delivery and descriptions are as described under the appropriate Department or School entry for the BSc (above).

ANAT 302S Cells and Development 12 units

ANAT 305S Topographical Anatomy 12 units

Dr Provis

Classes Sem 2: (3 lec & 9 tut or prac)/wk

Assessment one 3hr exam, one prac exam, one 2500w essay

This course comprises two strands of topographical anatomy — head and neck anatomy and musculoskeletal anatomy. The anatomy of the head and neck region will be studied in one lecture, one tutorial and one dissection class per week. The course 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.

BCHM 302S Metabolic and Medical Biochemistry 12 units

BCHM 392S Metabolic and Medical Biochemistry (Advanced) 12 units

BIOL 323S Eukaryotic Genetics and Development 12 units

BIOL 394S Eukaryotic Genetics and Development (Advanced) 12 units

CPAT 302S Cell Pathology B 12 units

MICR 303S Molecular Biology of Pathogens 12 units

Coordinator Dr Humphery-Smith

Dr Ferenci, Prof. Reeves, Dr Carter, Dr Humphery-Smith

Classes Sem 2: (4 lec & 8 prac)/wk

Assessment two 2hr exams, practical

This course 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.

BMED 303S Immunology 12 units

Dr Britton

Classes Sem 2: (3 lec, 1 tut & 8 prac)/wk

Assessment exam, essays, prac

This course, which will be taught by the Immunology Unit of the Department of Medicine, is designed to provide a comprehensive understanding of (1) the components and function of the immune system; (2) the mechanisms of pathological immune processes; (3) immunological techniques in diagnostic and research laboratories. A quota will apply for entry into the course. The following topics will be covered: the normal immune system; immunopathology; and immunological techniques.

BMED 304S Infectious Diseases 12 units

Dr Harbour, Prof. Reeves

Coreq Microbiology 303

Classes Sem 2: (4 lec & 8 prac)/wk

Assessment one 3hr exam, one 1hr prac, three lab reports

This course is coordinated by the Department of Infectious Diseases with assistance from the Department of Microbiology. The intake is restricted to a very limited number of students, and intending students should consult the Department of Infectious Diseases.

The course is designed to provide an understanding of the infection process involving host-parasite interactions as well as the scientific basis of diagnosis and control. A small number of infections will be examined to show how traditional and advanced

technology can be combined for diagnosis and epidemiological study of infectious disease. In addition, students will be expected to participate in a short vacation assignment of work experience in an approved diagnostic or public health laboratory.

PCOL 302S Neuro- and Cardiovascular Pharmacology 12 units

PHSI 302S Neuroscience — Cellular and Integrative 12 units

PHSI 303S Heart and Circulation 12 units

Honours degree

The Bachelor of Medical Science Honours degree is governed by regulations of the Senate and of the Faculty of Science that are parallel with those of the Bachelor of Science Honours degree as set out in this Handbook.

An Honours degree may be taken by students of sufficient merit in any of the Departments offering Senior level core or option courses. Entry to Honours courses 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.

Degree of Bachelor of Pharmacy

First Year Bachelor of Pharmacy courses

Pre-1997 Resolutions

Consult the *Faculty of Science Handbook 1996* for details of courses available under the pre-1997 Resolutions. The courses are as prescribed by the Senate Resolutions in force from 1990. For further details consult the appropriate Department.

First Year courses available under the 1997 Resolutions

BIOL 161Y Biology (Pharmacy) 12 units

Biological Sciences staff

AKn Biology section of the HSC 3-unit Science course

Classes Yr: (3 lec & 3 prac)/wk

Assessment one 2hr exam, assignments, classwork

This course starts with an introduction to modern biology. It progresses from interactions between organisms in biological communities to the diversity of micro-organisms, plants and animals. 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. Second semester begins with human evolution, human population dynamics and the impact of people on the environment. The course 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 the course concludes with some controversial aspects of human genetics. This course comprises the combination of Biology 101 and 103 available to Bachelor of Science students.

Textbooks

Sem 1: R.B. Knox *et al. Biology* (McGraw-Hill, 1995)
Sem 2: S.S. Mader *Human Biology* 4th edri (Wm. C. Brown, 1995)

CHEM 162Y Chemistry (Pharmacy) 12 units

See School of Chemistry for list of staff

AKn HSC Chemistry 2-unit *or* the chemistry component of the 3/4-unit Science course *and* the 2-unit Mathematics course

Classes Yr: (3 lec, 1 tut & 2 prac)/wk

Assessment Sem 1: one 3hr exam; Sem 2: one 2.5hr exam & one 2hr exam

Introduction, states and properties of matter, stoichiometry, chemical energetics, equilibrium theory, solution equilibrium, atomic structure, chemical bonding, general acid-base theory, electrochemistry, comparative chemistry of elements, introduction to organic chemistry, nomenclature, aliphatic chemistry, aromatic chemistry, isomerism, stereoisomerism, reaction mechanism, biomolecules.

Special preparative studies

Students wishing to enrol in CHEM 162 who do not have assumed chemical knowledge (*AKn* above) are advised to consult the School of Chemistry.

Textbooks

Students should obtain a booklist from the School of Chemistry during the orientation period

163S Introductory Pharmacy 6 units

Coordinator Ms Sainsbury

AKn HSC 2-unit Chemistry *or* equivalent and as below

Classes as below

Assessment as below

This course is made up of two sections:

Pharmaceutical Science

AKn HSC Physics section of the 3/4-unit Science course *or* 2-unit Physics (but see footnote to Table of Courses for Pharmacy in Chapter 3 above)

Classes Sem 2: (3 lec & 2hr tut/workshops)/wk for 8 weeks

Assessment two 2hr exams; reports from workshop sessions
Introduction to dosage forms, plant drugs and galenicals, intermolecular forces in liquids and solids, acidic and basic drugs, partitioning of drugs, phase equilibrium and polymorphism, pharmaceutical calculations.

Pharmacy Practice

Classes Sem 2: (1 lec & 2hr tut)/wk for 5 weeks & two 3hr fieldwork

Assessment one 1hr exam, group presentation & report, assignment

Introduction to the pharmacist's role in the health care system. The relationship of pharmacists to other health care professionals is examined through lectures and fieldwork in clinical settings. Development of oracy

and literacy skills in the context of professional pharmacy issues.

Textbook

A.N. Martin *Physical Pharmacy* (Lea & Febinger, 1993)

MATH 164F Mathematics/Statistics (Pharmacy) 6 units

AKn HSC 2-unit Mathematics *or* equivalent (Students without this assumed knowledge are advised to attend a bridging course in February)

Mathematics

Classes Sem 1: (2 lec & 4 tut)/wk

Assessment assignments (15%), one 2hr exam (85%)

This course provides mathematical tools, mostly from the calculus, that are needed by other courses in this degree. The emphasis is on the behaviour of functions of various kinds, leading to the solution of differential equations.

Textbooks

Lecture notes will be available

Reference books

J.C. Arya and R.W. Lardner *Mathematics for the Biological Sciences* (Prentice-Hall)

R.D. Gentry *Introduction to Calculus for the Biological and Health Sciences* (Addison-Wesley)

Statistics

Classes Sem 1: (2 lec & 1 tut)/wk

Assessment one 2hr exam, assignments

Data analysis, descriptive statistics, elementary probability theory, sampling methods, statistical inference, hypothesis testing, correlation and regression, analysis of variance.

Textbook

M. Pagano and K. Gauvreau *Principles of Biostatistics* (Duxbury Press, 1993)

PSYC 165Y Psychology (Pharmacy) 12 units

This course is a combination of PSYC 101 and 102. See Department of Psychology entry under BSc for details.

Second Year courses

None of the new 200-level courses required to satisfy the 1997 Resolutions will be available until 1998. It is anticipated that most students enrolled in the (pre-1997) three year BPharm degree will complete their candidatures under the Resolutions in force prior to 1997. Courses available in 1997 under the pre-1997 Regulations are listed below, followed by the replacement courses, which will be available from 1998. These latter course descriptions are included for information.

Second Year courses offered in 1997 under Pre-1997 Resolutions

Physical Pharmacy 2 10 units

Coordinator Dr Chan

Prereq Introductory Pharmacy, Chemistry 1 for Pharmacy
Classes Sem 1: 3 lec/wk; Sem 2: 2 lec/wk, prac (see below)

Assessment Sem 1: one 3hr exam (45%); Sem 2: one 3hr exam (45%) and prac (10%)

Course Description Macromolecular dispersion; surface and interfacial tension, surface active materials, solubilisation; complexation, chemical kinetics, drug stability; diffusion theory, dissolution models; drug-plastic interaction, controlled release; solid pharmaceuticals and particle science; liquid formulations, water cosolvents, oils and fats; suspensions, emulsions and semi-solids; origin and properties of pharmaceutical materials.

Practical work Topics include: diffusional models for drug transport; stability of drugs; dissolution and release from dose forms; physical properties of solid, semi-solid and liquid dose forms.

Textbook

A.N. Martin *Physical Pharmacy* (Lea & Febiger, 1993)

Reference books

M.E. Aulton (ed.) *Pharmaceutics: The Science of Dosage Form Design* (Churchill Livingstone, 1988)

G.S. Banker and C.T. Rhodes (eds) *Modern Pharmaceutics* (Marcel Dekker, 1990)

K.A. Connors *et al.* *Chemical Stability of Pharmaceuticals* (Wiley-Interscience, 1979)

A.T. Florence and D. Attwood *Physicochemical Principles of Pharmacy* (Macmillan, 1988)

A.R. Gennaro (ed.) *Remington's Pharmaceutical Sciences* (Macmillan, 1985)

L. Lachman *et al.* *The Theory and Practice of Industrial Pharmacy* (Lea & Febiger, 1986)

Pharmaceutical Analysis 2

8 units

Coordinator Assoc. Prof. Moore

Prereq Chemistry 1 for Pharmacy

Classes Sem 1: (2 lec, 1hr tut & 5hr prac)/wk

Assessment one 2hr exam, classwork

Lecture topics Quantitative analysis; absorption spectrophotometry, UV, visible, fluorescence; gas and liquid chromatography; electrophoresis; electrochemical methods. Qualitative analysis, the determination of chemical structure using instrumental methods; nuclear magnetic resonance and mass spectrometry.

Practical work. The practical component of this course includes quantitative analysis using titrimetric, chromatographic and spectrophotometric methods as well as clinical analysis experiments.

Reference books

K.A. Connors *A Textbook of Pharmaceutical Analysis* (Wiley, 1982)

A.N. Martin *Physical Pharmacy* (Lea & Febiger, 1993)

J.W. Munson *Pharmaceutical Analysis — Modern Methods* (Marcel Dekker, 1981)

R.L. Pecsok *et al.* *Modern Methods of Chemical Analysis* (Wiley, 1976)

T.W.G. Solomons *Organic Chemistry* (Wiley, 1992)

A.I. Vogel *Quantitative Inorganic Analysis* (Longmans, 1978)

Medicinal Chemistry 2

4 units

Coordinator Dr Morris

Prereq Chemistry 1 for Pharmacy, Introductory Pharmacy 1

Coreq Biochemistry 2 for Pharmacy, Pharmacology 2 for Pharmacy

Classes 2 lec/wk

Assessment (3hr exam, one 45 min quiz)/sem, workshop

Lecture topics Physicochemical properties and

biological activity; partition coefficients and non-specifically acting drugs; surface activity and drug action. Drug metabolism; bioactivation and inactivation. Structural features and pharmacological activity; stereochemical aspects; chirality of drugs; conformation. Macromolecular targets for drug action; bonding and biological activity; drug-receptor interactions and receptor-effector theories. Enzymes as targets of drug action; enzyme catalysis and receptor kinetics. Receptors as targets of drug action.

Textbook

T. Nogrady *Medicinal Chemistry — a Biochemical Approach* (Oxford U.P., 1988)

or

W.O. Foye *et al.* *Principles of Medicinal Chemistry* (Lea & Febiger, 1995)

Reference books

A. Burger *Medicinal Chemistry* (Interscience, 1980/1995)

W. Pratt *et al.* (eds) *Principles of Drug Action at the Basis of Pharmacology* (Churchill/Livingstone, 1990)

B. Alberts *et al.* *Molecular Biology of the Cell* (Garland, 1994)

Dispensing Practice 2

4 units

Coordinator Miss Sainsbury

Prereq Introductory Pharmacy 1

Coreq Physical Pharmacy 2

Classes Sem 1: 5hr prac/wk for 6 wks; Sem 2: 5hr prac for 4 wks

Assessment one prac exam/sem, classwork

This course is a practical/tutorial course which deals with the extemporaneous preparation of dosage forms.

Textbooks

Australian Pharmaceutical Formulary 15 (Pharmaceutical Society of Australia, 1992)

Extra Pharmacopoeia: Martindale (Pharmaceutical Press, 1993) (This is the 30th edition; the 27th, 28th or 29th editions are also acceptable)

Reference books

British Pharmacopoeia (Pharmaceutical Press, 1993)

Pharmaceutical Handbook 19th edn (Pharmaceutical Press, 1980)

D.M. Collett and M.E. Aulton (eds) *Pharmaceutical Practice* (Churchill Livingstone, 1990)

Pharmaceutical Microbiology 2

4 units

Coordinator Dr Gi-pps

Prereq Introductory Pharmacy 1, Microbiology 1 for Pharmacy

Classes Sem 1: 1 lec/wk, 1 tut/fn, 5hr of prac/wk for 6 wks

Assessment Sem 1: one 1.5hr exam, classwork

Lecture topics Production of sterile and preserved pharmaceutical products; contamination control; sterilisation methods dynamics; disinfection, antiseptics and preservation; official use of antiseptics and disinfectants; hygienic administration of pharmaceutical products.

The practical course consists of a series of exercises conducted over six sessions to illustrate the principles covered in lectures.

Reference books

M.E. Aulton (ed.) *Pharmaceutics. The Science of Dosage Form Design* (Churchill Livingstone, 1988)

W.B. Hugo and A.D. Russell *Pharmaceutical Microbiology* (Blackwell, 1992)

Pharmacy Practice 2

8 units

Coordinator Dr Krass

Prereq Introductory Pharmacy 1, Physiology 1 for Pharmacy

Coreq Pharmacology 2 for Pharmacy, Pharmaceutical Microbiology 2, Medicinal Chemistry 2

Assessment Sem 1: one 1hr exam, 0.5hr tut assessment; Sem 2: one 1.5hr exam, tut group role play assessment

Psychology

Dr D. Kavanagh

Classes Sem 1: 9 lec

This section introduces students to aspects of psychology necessary for a profession concerned with people. The theory of communication will be covered including issues such as verbal and non-verbal cues. Topics include the role of health and illness in a person and factors affecting compliance to medical regimens.

Pharmacy Communication

Classes Sem 1: 7 lec & six 2hr tut

The theory of communication will be applied to specific pharmacy situations such as pharmacist/patient and pharmacist/doctor interactions. Issues relating to the provision of disease and medication information to consumers, patients and other health professionals will be covered. Aspects of communication relevant to the practice environment including hospital, nursing homes and community pharmacy will be studied. The tutorials will enable students to practise various communication skills in a group setting.

Tutorials Six 2-hour tutorials will enable students to practice various communication skills in a group setting. Specifically, the tutorials will focus on the recognition of non verbal communication, the use of compliance aids and questioning and listening techniques. The utilization of video equipment will allow self and group assessment of communication exercises such as scripted role plays.

Textbook

W.N. Tindall *et al.* *Communication Skills in Pharmacy Practice* (Lea & Febiger, 1994)

Therapeutics

Classes Sem 2: (2 lec, one 1hr tut & 3hr of externship)/wk

Lecture topics drug information, adverse drug reactions, drug interactions, epidemiology, pathophysiology, symptoms, signs, management—drug and non drug treatment of diseases of the endocrine system, central nervous system, cardiovascular system, psychiatry and nutrition. Actual applications of drug knowledge gained in other parts of the course will be emphasised with priority given to the delivery of drug and disease state information to patients and other health professionals. The lectures will emphasise the role of the pharmacists in the community and hospital settings. The externship will attempt to integrate lecture material with practice. Clinical case studies will be discussed in tutorials.

Textbooks

E.T. Herfindal *et al.* *Clinical Pharmacy and Therapeutics* (Williams & Wilkins, Baltimore, 1996)

USP DI *Drug Information for the Health Care Professional* 1996 16th edn (United States Pharmacopoeial Convention Inc.)

Facts and Comparison Drug Interactions (Lippincott, U.S.A., 1995)

Reference books

Prescription Products Guide 1996 vols 1 & 2 (Australian Pharmacy Publications Co.)

The Merck Manual of Diagnosis and Therapy 16th edn (Merck Sharp & Dohme Research Industries, 1992)

Minis Annual (Multimedia Australia Pty Ltd, 1996)

Biochemistry 2 for Pharmacy

6 units

Dr Darvey

Prereq Chemistry 1 for Pharmacy

Classes Yr: 3 lec/wk

Assessment one 3hr exam/sem

This course in Biochemistry and Molecular Biology is designed to provide a firm basis in the chemistry of life. Questions to be addressed include: What are the chemical structures of the components of living matter? How do their interactions lead to the assembly of organised macromolecules, cells, and multicellular tissues and organisms? How does living matter 'extract' energy from its environment? How are chemical reactions controlled inside living cells? How does an organism store and decipher the information it needs to grow and reproduce?

Specifically, the course will cover the following topics: structures of biological macromolecules (proteins, nucleic acids, and sugars); molecular morphology of cells; genetic engineering and the genetic code — storage, utilisation, and control of genetic information (DNA); digestion, storage, and utilisation of dietary carbohydrate, lipid and protein; biological catalysts (enzymes); generation of metabolic energy; metabolic adaptation during starvation, exercise, and diabetes; inherited disorders of metabolism; pharmaceutical intervention in metabolic pathways.

Textbooks

To be advised

Pharmacology 2 for Pharmacy

4 units

Coordinators Assoc. Prof. Starmer, Assoc. Prof. Mylecharane

Prereq Chemistry 1 for Pharmacy, Physiology 1 for Pharmacy

Coreq Biochemistry 2 for Pharmacy, Pharmacy Practice 2

Classes Yr: 2 lec/wk, five 1hr tut/yr

Assessment one 1.5hr exam/sem

Principles of drug action and receptor pharmacology. Neuropharmacology: peripheral and central neurotransmission, and drugs affecting these systems. Autacoids. Endocrine pharmacology. Cardiovascular and renal drugs. Chemotherapy principles.

Textbook

H.P. Rang *et al.* *Pharmacology* 3rd edn (Churchill Livingstone, 1995)

Study aids

M.M. Dale and A.H. Dickenson *Companion to Pharmacology* (Churchill Livingstone, 1993)

R. Einstein *Pharmacology. Self-assessment Questions for Study* (Butterworths, 1989)

M.J. Neal *Medical Pharmacology at a Glance* (Blackwell Scientific Publications, 1992)

Reference books

- J.R. Cooper *et al.* *The Biochemical Basis of Neuropharmacology* (Oxford, 1991)
 A.G. Gilman *et al.* (eds) *Goodman and Gilman's The Pharmacological Basis of Therapeutics* (Pergamon, 1990)
 B.G. Katzung (ed.) *Basic and Clinical Pharmacology* (Appleton & Lange, 1992)

Second Year Pharmacy courses available from 1998 (under 1997 Resolutions)¹

BCHM 261Y Biochemistry (Pharmacy)¹ 6 units

Will replace Biochemistry 2 for Pharmacy. See description of course, delivery and assessment above.

PCOL 262Y Pharmacology (Pharmacy)¹ 4 units

Will replace Pharmacology 2 for Pharmacy. See description of course, delivery and assessment above.

PHSI 263Y Physiology (Pharmacy)¹ 6 units

Prereq Biology (Pharmacy) 161

Classes Yr: 3 lec/wk

Assessment Sem 1: one 1.5hr exam (50%); Sem 2: one 1.5hr exam (50%)

This course provides a broad basic knowledge of human functions and includes studies of nerve and muscle physiology, blood, heart and circulation, respiration, endocrinology, reproduction, gastrointestinal function, body fluid regulation, sensory perception, movement and consciousness.

264Y Medicinal Chemistry¹ 10 units

Prereq Chemistry (Pharmacy) 162, Introductory Pharmacy 163

Coreq Biochemistry (Pharmacy) 261, Pharmacology (Pharmacy) 262

Classes Sem 1: (3 lec, 1 tut & 3hr prac)/wk; Sem 2: (2 lec & 1hr tut)/wk

Assessment Sem 1: one 3hr exam, classwork; Sem 2: one 2hr exam, classwork

Chemical structure and physico-chemical properties related to biological activity; chemical kinetics of drug stability; quantitative analysis of drug substances and formulations; stereochemical aspects of pharmacological activity; macromolecular targets of drug action; drug-receptor interactions and receptor-effector theories; drug design; QSAR and molecular modelling; drug metabolism, bioactivation and inactivation; advanced analytical methods for the identification of drugs, their metabolites and degradation products.

MICR 265F Microbiology (Pharmacy)¹ 3 units

Prereq Biology (Pharmacy) 161

Classes Sem 1: (2 lec & 2 or 2.5hr prac)/wk for 10 wks

Assessment one 2hr exam, prac

This course provides information on the biology of micro-organisms with particular reference to the importance of micro-organisms in pharmaceutical sciences. Topics covered include: history and scope of microbiology, methodology, comparison of major

groups of micro-organisms in terms of structure, function and importance as well as selected aspects of applied microbiology (microbial pathogenicity and epidemiology, growth, death and control of micro-organisms including introduction to disinfection, preservation and spoilage of pharmaceutical products).

267S Pharmaceutical Microbiology¹ 4 units

Prereq Introductory Pharmacy 163

Coreq Microbiology (Pharmacy) 265

Classes Sem 1: 2 lec/wk for 3 wks then (1 lec, 1 tut & 4hr of prac)/wk for 8 wks

Assessment 1.5hr exam (85%), laboratory work, presentation & assignment (15%)

A pharmacist should be able to make *clean* products and create *clean* situations. The definition of *clean* and the methods for achieving it depend on the product or situation. It may include sterilisation, asepsis, disinfection, antisepsis, preservation and contamination control. This course covers reasons and standards for sterile, preserved and clean products, sources of contamination and contamination control in manufacture of pharmaceutical products, kinetics of killing micro-organisms by physical and chemical means, sterilisation: principles and methods, plus disinfection, antisepsis and preservation: principles and methods. Examples of case studies in contamination control include oral mixtures or topical creams in community or hospital pharmacy, intravenous or intramuscular solution injection in industry, endoscopes which can only be disinfected, protein injection such as insulin, rational use of antiseptics in the community e.g., for minor cuts or burns.

266Y Pharmacy Practice¹ 5 units

Prereq Psychology (Pharmacy) 165, Introductory Pharmacy 163

Coreq Pharmacology (Pharmacy) 262

Classes Sem 1: 1 lec/wk, seven 2hr tut; Sem 2: 2 lec/wk, seven 2hr tut

Assessment Sem 1: one 1hr exam (35%), 0.5hr tut assessment (10%); Sem 2: one 1.5hr exam (45%), tut assessment (10%)

Psychology

This section introduces students to aspects of psychology necessary for a profession concerned with people. The theory of communication will be covered including issues such as verbal and non-verbal cues. Topics include the role of health and illness in a person and factors affecting compliance to medical regimens.

Pharmacy communication

The theory of communication will be applied to specific pharmacy situations such as pharmacist/patient and pharmacist/doctor interactions. Issues relating to the provision of disease and medication information to consumers, patients and other health professionals will be covered. Aspects of communication relevant to the practice environment including hospital, nursing homes and community pharmacy will be studied. The tutorials will enable students to practise various communication skills in a group setting.

¹These courses are not available in 1997.

Therapeutics

Lecture topics: drug information, adverse drug reactions, drug interactions, epidemiology, pathophysiology, symptoms, signs, management of drug and non drug treatment of diseases of the endocrine system, central nervous system, cardiovascular system, psychiatry and nutrition. Actual applications of drug knowledge gained in other parts of the course will be emphasised with priority given to the delivery of drug and disease state information to patients and other health professionals. The lectures will emphasise the role of the pharmacists in the community and hospital settings. The externship will attempt to integrate lecture material with practice. Clinical case studies will be discussed in tutorials.

268Y Physical Pharmaceutics¹ 10 units

Prereq Chemistry (Pharmacy) 162, Introductory Pharmacy 163

Classes Yr. 3 lec/wk, 1 tut/fn, 32hr prac (Sem 1)

Assessment Sem 1: one 3hr exam (45%) and prac (10%); Sem 2: one 3hr exam (45%)

Introduction to dosage forms, plant products and galenicals, rheology, macromolecular dispersion; surface and interfacial tension, surface active materials, solubilisation; complexation, drug stability; diffusion theory, dissolution models; drug-plastic interaction, controlled release; solid pharmaceuticals and particle science; liquid formulations, water cosolvents, oils and fats; suspensions, emulsions and semi-solids; origin and properties of pharmaceutical materials.

Third Year Pharmacy courses

None of the new 300-level courses required to satisfy the 1997 Resolutions will be available until 1999. It is anticipated that most students enrolled in the (pre-1997) three year BPharm degree will complete their candidatures under the Resolutions in force prior to 1997. Courses available in 1997 under the pre-1997 Regulations are listed below, followed by the replacement courses, which will be available from 1999. These latter course descriptions are included for information.

Third Year courses offered in 1997 and 1998 under Pre-1997 Resolutions

Students are required to complete a total of 50 units, of which 42 are from required or core courses. The remaining eight units are made up by the selection of one of the four elective courses offered.

Core courses

Pharmacokinetics 3 4 units

Coordinator Dr Cutler

Prereq Physical Pharmacy 2

Classes Sem 1: 4 lec or tut/wk

Assessment Sem 1: one 3hr exam

Fundamental concepts of pharmacokinetics; mass balance principle; elimination, extraction ratio,

first pass effect; volume of distribution; i.v. bolus kinetics, duration and intensity of drug action; kinetics clearance, bioavailability, calculation of infusion rates, clearance, bioavailability, calculation of infusion rates, following extravascular doses; metabolite kinetics; renal excretion; hepatic elimination; tissue distribution; plasma protein binding; calculation of multiple dose regimens, clearance method, half-life method; pharmacodynamics, variability in pharmacokinetics and pharmacodynamics, pharmacokinetics and biopharmaceutics of selected drug classes including antibiotics, cardiovascular agents, analgesics, bronchodilators, anticonvulsants and anticoagulants.

Reference books

M. Gibaldi *Biopharmaceutics and Clinical Pharmacokinetics* 2nd edn (Lea and Febiger, 1990)

S.B. Hladky *Pharmacokinetics* (Manchester University Press, 1990)

M. Rowland and T.N. Tozer *Clinical Pharmacokinetics* 2nd edn (Lea & Febiger, 1989)

Formulation 3 4 units

Coordinator Dr Kennedy

Prereq Physical Pharmacy 2

Classes Sem 1: 3-4 lec/wk, 5hr of prac/wk for 2 wks

Assessment Sem 1: one 3hr exam, classwork

Biopharmaceutical reasons for different formulations; dosage form and drug transport; metabolism and elimination as related to routes of administration, local vs. systemic delivery; rate control of drug input; parenteral, rectal, dermal, transdermal, ophthalmic, aerosols, capsules and tablets; radiopharmaceuticals and their use in diagnosis and therapy; photobiology, phototherapy and sunscreens; chemical stability of finished dose forms; *in vivo* and *in vitro* correlations in drug and formulation design; use of *in vitro* tests and models in research and development in quality control and in relation to official tests; advanced drug delivery, targeting and controlled release; formulation of vaccines and other biologicals.

Textbooks

As recommended for Introductory Pharmacy 1, Dispensing Practice 2 and Physical Pharmacy 2

Reference books

H.C. Ansel *Introduction to Pharmaceutical dose Forms* (Lea & Febiger, 1985)

Australian Pharmaceutical Formulary 15

M.E. Aulton (ed.) *Pharmaceutics: The Science of Dosage Form Design* (Churchill Livingstone, 1988)

K.A. Connors *et al.* *Chemical Stability of Pharmaceuticals* (Wiley-Interscience, 1979)

A.T. Florence and D. Atwood *Physicochemical Principles of Pharmacy* (MacMillan, 1988)

W.O. Foye *Principles of Medicinal Chemistry* Chapters 41 & 42 (Williams & Wilkins, 1995)

A.R. Gennaro (ed.) *Remington's Pharmaceutical Sciences* (MacMillan, 1985)

L. Lachman *et al.* *Theory and Practice of Industrial Pharmacy* (Lea & Febiger, 1986)

M. Rowland and T.N. Tozer *Clinical Pharmacokinetics* (Lea & Febiger, 1980)

C.B. Sampson *Textbook of Radiopharmacy* (Gordon & Breach, 1990)

K.C. Smith (ed.) *The Science of Photobiology* (Plenum, 1989)

¹These courses are not available in 1997.

Medicinal Chemistry 3**4 units***Coordinator* Assoc. Prof. Holder*Prereq* Biochemistry 2 for Pharmacy*Coreq* Pharmacology 3 for Pharmacy*Classes* Sem 1: 3 lec/wk, 6hr of prac/wk for 4 wks, tuts*Assessment* Sem 1: two 2hr exam, classwork

Quantitative structure-activity relationships, molecular modelling and drug design; cholesterol; steroid hormones and drugs; metabolic antagonism; antibiotics; parasite chemotherapy; antifungals; antivirals; cancer chemotherapy; therapeutic products from biotechnology.

Practical work Development of a drug profile based on the requirements of the Therapeutic Goods Administration.

Textbooks

W.O. Foye *et al.* *Principles of Medicinal Chemistry* (Lea & Febiger, 1995)

Reference books

A. Burger *Medicinal Chemistry* (Interscience, 1980;1995)C. Hansch (ed.) *Comprehensive Medicinal Chemistry* (Pergamon, 1990)W. Pratt *et al.* (eds) *Principles of Drug Action — the Basis of Pharmacology* (Churchill Livingstone, 1990)**Pharmacy Practice 3****18 units***Coordinator* Dr Salole*Coreq* Medicinal Chemistry 3, Pharmacokinetics 3
Pharmacology 3 for Pharmacy*Classes* (2 or 5 lec, one 2hr tut & one 3hr externship (community))/wk, 1 wk of externship (hospital)*Assessment* Sem 1: one 1hr exam (clinical), 0.5hr viva, externship (case studies); Sem 2: one 2hr exam (clinical), 0.5hr viva, one 1hr exam (admin.), 1hr externship (case studies), tut participation

Textbooks

As for Pharmacy Practice 2 (Therapeutics section)

Therapeutics*Coordinator* To be advised*Classes* Sem 1: (2 lec, one 2hr tut & one 3hr externship)/wk;
Sem 2: (5 lec, one 2hr tut & one 3hr externship)/wk

This section is a continuation of the therapeutics section of Pharmacy Practice 2. Topics covered in first semester include epidemiology, pathophysiology, symptoms, signs, management as drug and non-drug treatment of diseases associated with the respiratory tract, cardiology and rheumatology. In second semester the topics will include endocrinology, obstetrics and gynaecology, dermatology, oncology, genito-urinary tract, hepatic, pain, paediatrics, geriatrics and renal; immunological aspects of drug therapy and new therapeutic agents arising from the biotechnological revolution will also be covered.

Externships*Coordinator* Mr Chen

The externships will integrate lecture material with practice. Students will complete case studies and report back to tutorials. Problem-solving skills will be enhanced.

Tutorial

The tutorials will employ problem-based learning techniques. Computer patient medication review systems will be analysed. A number of computerised drug information data bases will be used. Role play will be used to develop students' communication skills in pharmacist/patient and pharmacist/doctor interactions. Familiarisation with microcomputer software written specifically for pharmacists will take place. A joint practical with Pharmacology will be provided.

Pharmacy Administration*Classes* Sem 2: 1 lec/wk for 4 weeks

This section includes ethics and principles of management, with topics on business structures, accounting and law being discussed. Pharmacy administration relating to hospitals and to government agencies will be presented also.

Pharmacology 3 for Pharmacy**8 units***Coordinator* Assoc. Prof. Starmer, Assoc. Prof. Mylecharane*Prereq* Biochemistry 2 for Pharmacy*Coreq* Pharmacy Practice 3*Classes* Sem 1: 2 lec/wk & nine 6hr prac; Sem 2: 2 lec/wk*Assessment* Sem 1: one 1.5hr exam, prac exam, classwork;
Sem 2: one 1.5hr exam

Chemotherapy: antibacterial, antiviral, antifungal, antiprotazoal, anthelmintic and anticancer drugs. Immunosuppressants. Respiratory and gastrointestinal pharmacology. Anti-inflammatory agents and analgesics. Vitamins and drugs affecting nutritional and metabolic function. Drugs affecting blood. Local and general anaesthetics. Drugs used to treat central nervous system disorders. Clinical toxicology and the introduction of new drugs. Drug abuse. The practical course reinforces and illustrates the theory underlying the actions of drugs.

Textbooks, study aids and reference books

As recommended for Pharmacology 2 for Pharmacy

Dispensing Practice 3**4 units***Coordinator* Dr McLachlan*Coreq* Formulation 3*Classes* Sem 1: 1 lec/wk for 6 wks, one 5hr prac/wk for 9 wks*Assessment* one 1.5hr exam (forensic pharmacy), one 2.5hr prac exam & classwork

This subject covers the many tasks required of pharmacists in the dispensing of medicines. Dispensing Practice 3 is divided into two main streams: forensic pharmacy and pharmaceutical compounding. Forensic pharmacy deals with the rules and regulations that govern the supply of medicines and is presented in a series of 6 lectures. During nine 5-hour practical classes all aspects of the compounding and dispensing of pharmaceutical products are covered.

Textbooks and reference books

As recommended for Dispensing Practice 2

Elective courses

Experimental Pharmacology 3 8 units

Coordinators Assoc. Prof. Mylecharane, Assoc. Prof. Starmmer
Coreq Pharmacology 3 for Pharmacy, Medicinal Chemistry 3

Classes Sem 2: 2 seminar/wk, 6hr prac/wk for 9 wks, 6hr research assignment/wk for 5 wks

Assessment one 2hr exam (seminar), one 1hr exam (prac), classwork and reports

The seminar sessions will comprise discussions and presentations by students, under the guidance of staff, on the contribution of experimental pharmacological evaluation to the development of a series of selected drug classes, and the role of particular experimental methodologies in screening and evaluation of drug activity. The practical laboratory classes will provide training in general experimental pharmacological techniques, to evaluate the actions of drugs whose activity is well established. The research assignment will involve observation and discussion of the various research techniques currently in use in the Department, plus allocation to a particular research group for more detailed observation and participation, together with completion of written reports.

Textbooks and reference books

As recommended for Pharmacology 3 for Pharmacy. Students will be required to refer to an extensive range of journals and monographs available in the University's libraries

Toxicology 3 8 units

Coordinator Assoc. Prof. Holder

Coreq Medicinal Chemistry 3

Classes Sem 2: (3 lec, 1 tut & 5hr prac)/wk for 8 wks or an essay

Assessment one 3hr exam, classwork (including an essay if this is the option chosen)

Theory. The lecture course consists of three sections:

General toxicity testing (12 lectures)

Design and interpretation of toxicity tests; toxicity in the community and the regulation of toxic substances. Measurement of acute, subacute and chronic toxicity. Carcinogenicity, teratogenicity and mutagenicity; short-term tests for the prediction of carcinogenicity. Inhalation toxicity; eye irritancy; dermal toxicity; ototoxicity.

Biochemical mechanisms of toxicity (12 lectures)

Factors affecting toxicity and the mode of action of toxic chemicals. Metabolic and pharmacokinetic factors in the balance between intoxicification and detoxification processes; genetic factors; induction and inhibition of metabolism. Mutagens, teratogens and carcinogens; furosemide and paracetamol; oxygen.

Toxicological applications in analytical chemistry (12 lectures)

Chemical analysis in relation to governmental regulations. Sensitivity, selectivity, accuracy and precision of basic analytical techniques. Separation and identification of metabolites; selective detection in liquid chromatography. Forensic applications; newer techniques in gas chromatography and mass spectrometry. Environmental analysis; pesticides and

herbicides by electron capture; atomic absorption and x-ray fluorescence; immunological techniques.

Practical work Eight 5-hour sessions designed to illustrate some of the areas listed above.

Reference books

A.W. Hayes (ed.) *Principles and Methods of Toxicology* (Raven Press, 1989)

A. Kaplan, L.L. Szabo and K.E. Opheim *Clinical Chemistry: Interpretation and Techniques* (Lea & Febiger, 1988)

CD. Klaasen, J. Doull and M.O. Amdur (eds) *Casarett and Doull's 'Toxicology - the Basic Science of Poisons'* (Pergamon 1991)

Industrial Pharmacy 3 8 units

Coordinator Prof. Brown

Coreq Pharmacokinetics 3, Formulation 3

Classes 4 lec/wk, 1tut/fn, 2 wk fieldwork

Assessment one 3hr exam (Sem 2), essay report on prac

Theory The course consists of the following sections:

Registration of therapeutic substances in Australia (9 lectures)

Introduction to the registration of new drugs and formulations with the Commonwealth Department of Health; NDF5 applications for general marketing and clinical investigational use of drugs; evaluation of NDF5 submissions; data bases on chemistry, pharmacology and clinical use of drugs.

Clinical research trials (4 lectures)

Clinical notification and exemption schemes: requirements of institutional ethics committees. Design of clinical trials and clinical trial protocols. Requirements for good clinical research practice. Monitoring trials.

Pharmacoeconomics (4 lectures)

Economic aspects of pharmaceuticals: international and Australian perspectives. Principles of health economics, cost benefit analysis, design and analysis of trials to demonstrate benefit versus cost. Case histories and worked examples.

Industrial Management (eleven 1hr lec/workshop sessions)

Company and industry structure. Communication skills. Operation management. Market concepts. Personnel management and industrial relations. Financial management.

Students are also required to take both a 12-lecture series entitled 'Toxicological applications in analytical chemistry' as described under the course 'Toxicology 3' and the lecture and seminar component of the section entitled 'Formulation and dosage form design', as described under the course Biopharmaceutics 3.

Practical experience Students spend a ten-day period working in a pharmaceutical company, and will be required to take this segment of the course during either the June/July or September/October vacation. The first week is devoted to obtaining a perception of the general structure and operation of the company and of the various Departments within it. The second week is devoted to specific work selected by consultation between the student, the Department and members of the company.

Biopharmaceutics 3**8 units***Coordinator* Dr Ramzan*Coreq* Formulation 3, Pharmacokinetics 3, Dispensing Practice 3

The course consists of the following sections of which students are required to take any two of the following three segments:

Applied Biopharmaceutics and Pharmacokinetics*Course Coordinator* Dr Ramzan*Classes* Sem 2: 20 lec, 34hrs of prac/seminars*Assessment* one 2hr exam

Theory Twenty lectures on topics related to the acquisition of biopharmaceutical data. Dissolution testing and evaluation of methodology; blood concentration monitoring; computer-based analysis of pharmacokinetic data; bioavailability; assessment and design of trials.

Practical (34 hours) A series of experiments and laboratory exercises to illustrate the concepts discussed in the theory course.

Dosage-form design*Coordinator* Dr Gipps, Dr Kennedy*Classes* Sem 2: 12 lec, 6 seminars, 5hr prac/wk for 6wks*Assessment* classwork and presentation of project

Specific examples and problems of dosage-form design. Students are assigned a practical project illustrating one of the aspects dealt with in lectures and seminars.

Computer programming*Course Coordinator* Dr Cutler*Classes* Sem 2: 6hr prac/wk for 9wks*Assessment* classwork, one 1hr exam

This course is given in a tutorial/practical format and occupies nine 6-hour sessions. It deals with programming in FORTRAN language and emphasises the use of computers in scientific calculations.

Third Year courses offered from 1999 under the 1997 Resolutions**361S Dispensing¹****4 units***Prereq* Physical Pharmaceutics 268, Microbiology (Pharmacy) 265, Pharmaceutical Microbiology 267*Coreq* Formulation 363*Classes* Sem 1: (1 lec & 3hr prac)/wk*Assessment* two 3hr exams (including theory and prac), continuous assessment

Introduction to dispensing practice, the prescription, approaches to dispensing prescriptions, labelling of dispensed medicines, containers, documentation of dispensing procedures, dispensing of particular formulations, effect of changing formulation variables on the physical properties and efficacy of pharmaceutical products.

Twelve 3-hour practical classes complement the lecture course and allow the students to prepare a variety of pharmaceutical products and critically assess them.

363Y Formulation¹**5 units***Prereq* Pharmaceutical Microbiology 267, Physical Pharmaceutics 268*Coreq* Dispensing 361*Classes* Yr: (2 lec, 12hr of prac & two 1hr tut)/wk*Assessment* one 2hr exam (45%) (each semester); prac (5%), tut (5%)

This course will provide a sound understanding of the relative merits and disadvantages of different formulations of drugs as well as the methods used in their manufacture and those used to assure the quality of the dose forms.

364Y Medicinal Chemistry¹**4 units***Prereq* Biochemistry (Pharmacy) 362*Coreq* Pharmacology (Pharmacy) 362, Pharmacy Practice 366*Classes* Yr: (3 lec, 4hr of prac & 1hr tut)/wk*Assessment* one 3hr exam (35%), classwork (15%) (each semester)

This course deals with the application of the principles of medicinal chemistry to drugs categorised by their pharmacological action and will cover drug development, chemistry pertinent to drug use and the mode of drug action.

Lectures will be on the following: drugs acting on neurotransmitters and their receptors to cover cholinergics, anticholinergics, opiate analgesics, opiates used for diarrhoea and as antitussives, adrenergic drugs, dopaminergics; local anaesthetics; NSAIDS; enzyme inhibitors as drugs to include anticholinesterases, MAO, ACE; inhibitors as antiviral compounds, antibacterials, and anticancer drugs; cardiac glycosides; antilipidemic drugs; drugs acting on nucleic acids used as antitumor, antimalarials and antimicrobials (antibacterial and antiviral); antimetabolites (against amino acid and nucleic acids); diuretics; drugs acting on hormones to include antihormone therapy of cancer, hormone therapy, sex hormone analogues, corticosteroids, vitamins and minerals; photochemistry and photobiology; radiopharmaceuticals, their production, handling and use; drugs from plants to include organic and inorganic substances; herbal medicines and remedies and their active ingredients; pharmacognosy.

Laboratory work in first semester will consist of the preparation of an analytical profile of a drug and is to be undertaken as a team activity over 6 weeks. In second semester practical work will be selected from the preparation, characterisation and testing of an enzyme inhibitor; the characterisation of plant materials and the extraction and identification of active principles; the investigation of drug metabolism and metabolite characterisation; peptide synthesis; purification and assay for biological activity; receptor characterisation through binding studies of ligands.

365Y Pharmacokinetics¹**6 units***Prereq* Physical Pharmaceutics*Classes* Sem 1: (4 lec or tut)/wk*Assessment* one 3hr exam

¹These courses are not available in 1997.

Fundamental concepts of pharmacokinetics; mass balance principle; elimination, extraction ratio, clearance, bioavailability, calculation of infusion rates, first pass effect; volume of distribution; i.v. bolus kinetics, duration and intensity of drug action; kinetics following extravascular doses; metabolite kinetics; renal excretion; hepatic elimination; tissue distribution; plasma protein binding; calculation of multiple dose regimens, clearance method, half-life method; pharmacodynamics, variability in pharmacokinetics and pharmacodynamics, pharmacokinetics and biopharmaceutics of selected drug classes including antibiotics, cardiovascular agents, analgesics, bronchodilators, anticonvulsants and anticoagulants.

PCQL 362Y Pharmacology (Pharmacy)¹ 8 units

Coordinator Assoc. Prof. Mylecharane

Prereq Physiology (Pharmacy)

Coreq Medicinal Chemistry 364, Pharmacy Practice 366

Classes Sem 1: (2 lec & 4hr prac)/wk; Sem 2: 2 lec/wk

Assessment one 1.5hr exam (each semester), prac exam, classwork

The aims of this course are first, for students to continue the development of an understanding of the therapeutic applications of drugs based on their underlying pharmacodynamic and pharmacokinetic properties, and second, to understand clinical toxicology in the context of drug therapy and usage. The first part of the course covers chemotherapy (antibacterial, antiviral, antifungal, antiprotozoal, anthelmintic and anticancer drugs), analgesics and anti-inflammatory agents, respiratory drugs, gastrointestinal drugs, drugs affecting nutritional and metabolic function, drugs affecting blood, immunosuppressants, local and general anaesthetics, hypnotics, sedatives, anticonvulsants, anxiolytics, antidepressants, neuroleptics, and drugs used to treat motor disturbances and dementias. The final part of the course commences midway through second semester and covers principles of clinical toxicology, drug reactions and interactions, reportage of drug reactions and the introduction of new drugs, treatment of poisoning with drugs and other agents, and drug abuse. The practical classes provide an opportunity to observe and experience the effects of drugs in biological systems, and include experimental, video, computer-interactive, tutorial, assignment and workshop components; the classes are designed to illustrate, revise and extend material covered in the lectures in both the second and third year Pharmacology courses.

366Y Pharmacy Practice¹ 13 units

Coreq Pharmacology (Pharmacy) 362, Pharmacokinetics 365

Classes Sem 1: 2 lec/wk, ten 2hr tut, nine 4hr fieldwork; Sem

2: 3 lec/wk, ten 2hr tut, nine 4hr fieldwork

Assessment Sem 1: (40%) 1hr clinical exam (15%), 0.5hr oral exam (15%), tut (5%), externship assessment (5%) Sem 2: (60%) one 2hr exam (25%), 0.5hr oral exam (15%), tut (5%), externship (15%)

Therapeutics

This section is a continuation of the therapeutics section of Pharmacy Practice 2. Topics covered in first semester

include epidemiology, pathophysiology, symptoms, signs, management as drug and non-drug treatment of diseases associated with obstetrics and gynaecology, dermatology, oncology, genito-urinary tract, ear/eye, hepatic, psychiatry, neurology, infectious disease, gastrointestinal, rheumatology and nutrition. The course will explore the role of pharmacists in conducting medication regime reviews, implementing clinical intervention and inter professional communications.

Externships

The externship will integrate lecture material with practice. Students will complete case studies and report back to tutorials. Problem-solving skills will be enhanced.

Tutorial

The tutorials will employ problem-based learning techniques. Computer patient medication review systems will be analysed. A number of computerised drug information data bases will be used. Role play will be used to develop students' communication skills in pharmacist/patient and pharmacist/doctor interactions. Familiarisation with microcomputer software written specifically for pharmacists will take place. A joint practical with Pharmacology will be provided.

Fourth Year Pharmacy courses

Honours program available from 1997 to 1999 under the Pre-1997 Resolutions

Honours degree

The Bachelor of Pharmacy Honours degree is governed by regulations of the Senate and of the Faculty of Science that are parallel with those of the Bachelor of Science Honours degree as set out and explained in this Handbook. Sections 10-12 of the 1990 Senate resolutions for BPharm are analogous to 16-18 of those for the BSc (1997 Resolutions).

Within the *Department of Pharmacy* the Honours degree may be taken in one of the three subjects Pharmaceutical Chemistry, Pharmaceutics or Pharmacy Practice. In each case the fourth year program comprises:

- (i) one or two projects in which the student investigates a problem and presents oral and written accounts of his/her work.
- (ii) a variety of coursework some parts of which are compulsory and others are chosen from a number offered within the Department and by other Departments.
- (iii) participation in a number of seminar discussions within the Department.

The degree is awarded on the basis of a mixture of continuous assessment — including an evaluation of essays and reports of projects — and the results of examinations, as well as on academic performance in the earlier years of the undergraduate course.

Students who are considering the Honours course are encouraged to consult widely with members of

¹These courses are not available in 1997.

the academic staff during their Senior year. Further information, in the form of course outlines, is available from the Department.

Suitably qualified graduates in Pharmacy from the University of Sydney may apply to be accepted into the Honours program.

In the *Department of Pharmacology* Honours students are given a project designed to provide training in the fundamentals of pharmacological research. A literature review and a written report on the research project must be prepared. Seminars on the literature review, the project and another chosen topic will be given by the student. An Honours degree is awarded considering the following:

- (i) marks awarded for the literature review and the seminars
- (ii) marks awarded for the project thesis
- (iii) level of passes gained in the second and third year examinations.

Fourth Year courses available under the 1997 Resolutions from 2000

The following Fourth Year courses are scheduled for implementation in 2000. The pre- and corequisites are listed in Table 7 as an aid in the selection of courses in the lower years.

461F Integrated Dispensing ¹	4 units
462F New Drug Technologies ¹	4 units
463F Pharmaceutics Workshop ¹	4 units
464Y Pharmacotherapeutics ¹	12 units
465Y Clinical Practice ¹	12 units
466S Clinical Information/Technology ¹	2 units
467S Clinical Pathology ¹	4 units
468S Ethics and History of Pharmacy ¹	2 units
469S Pharmaceutical Management ¹	4 units

Pharmacy Honours courses (1997 Resolutions only)

The following Third and Fourth Year courses are additional or replacement courses required for the BPharm(Hons) (see section 11 of the 1997 Resolutions). They are scheduled for implementation in 1999 (300 level courses) and 2000 (400 level courses). For further information, consult the Department.

371F Pharmacy (Honours) ¹	5 units
376S Pharmaceutical Chemistry (Honours) ¹	5 units
377S Pharmaceutics (Honours) ¹	5 units
PCOL 378S Pharmacology (Pharmacy Honours) ¹	5 units
379S Pharmacy Practice (Honours) ¹	5 units

474Y Pharmacotherapeutics (Honours) ¹	13 units
475F Clinical Practice (Honours) ¹	6 units
476Y Pharmaceutical Chemistry (Honours) ¹	29 units
477Y Pharmaceutics (Honours) ¹	29 units
PCOL 478Y Pharmacology (Pharmacy Honours) ¹	29 units
479Y Pharmacy Practice (Honours) ¹	29 units

Degree of Bachelor of Psychology

Psychology 101F	6 units
Psychology 102S	6 units
Psychology 201F	8 units
Psychology 202S	8 units
Psychology 301F	12 units
Psychology 302S	12 units

In addition, Bachelor of Psychology students must study either one or both of:

Psychology 303F	12 units
Psychology 304S	12 units

These consist of additional options not chosen by students within Psychology 301 and 302.

For details of courses offered in the Bachelor of Psychology degree, please refer to the course descriptions listed under the Bachelor of Science degree section in this chapter.

¹These courses are not available in 1997.

6 Other Faculty information

General University information

This chapter of the handbook is concerned specifically with the Faculty of Science. For further details about the University — its organisation, examinations, child care facilities, assistance for disabled students, housing, health, counselling, financial assistance, careers advice and a range of other matters — see the separate publication *University of Sydney Diary*, available free from the Student Centre or from University of Sydney Union outlets.

Scholarships and prizes: undergraduate

This handbook contains simplified details of some of the prizes and scholarships available to students at the University. For full details you are advised to consult the Scholarships Office.

The scholarships and prizes may be scheduled as follows:

Prizes awarded automatically on results. Successful students are notified of these by the Records Services section.

Prizes awarded on application. Closing dates for these may be obtained from the Scholarships Office.

Prize or scholarship	Value \$	Qualifications
Alumni Scholarship	3 000 p.a. up to 4 yrs, 5 yrs for BSc/LLB	TER of 95 or above. Awarded on the basis of academic merit and personal attributes.
Australian Coal Association	600-1 200 (closes mid January)	In Mining, Mechanical or Electrical Engineering, or Geology. Applications to: GPO Box 2668, Sydney 2001.
Robert Campbell	200 p.a.	Students in financial need and of sufficient merit. Application from Year 1 students at any time.
Council of Education	400 p.a.	Children of teachers or officers in the Department of Education of at least three years' standing. Certificate of eligibility required.
A.P. Elkin Fund	varies	Students of Aboriginal descent.
Farrand Science Scholarship (up to 6)	2 500	Full-time first year BSc student who has not undertaken previous tertiary study. Awarded on the basis of academic merit.
Freemasons' (2)	300 p.a.	Sons of Freemasons of five years' standing. Certificate of eligibility required.
Joint Coal Board	700-1 200 (closes mid-January)	In Mining Engineering or Geology. Applications to: The Secretary, Joint Coal Board, GPO 3842, Sydney 2001. Graduates to work in coal mining or related fields.
James Robinson Orange Memorial Prize	700	Children or grandchildren of members of the Loyal Orange Institution. Certificate of eligibility required.
Proctor and Gamble	2 500	Awarded on academic merit and leadership qualities.
Universities Credit Union Scholarship	500	Undergraduates who are members (of at least one year's standing) of Universities Credit Union.
The University of Sydney Science Scholarships	500	Full-time first year BSc students for academic merit in the HSC (or equivalent) who have not previously undertaken tertiary study.
Plumian Scholarship	275 p.a.	For general proficiency at the HSC to a student in at least one of Biology, Geology or Geography in the candidate's first year.
Undergraduate Prizes		
Korner Prize	100	Proficiency in the core courses within the second year of the BMedSc.
Prize in Marine Sciences	30	Proficiency Marine Sciences courses.
Brian Rawson Memorial Prize	250	Most improved performance from Junior to Intermediate Science.

Prize or scholarship	Value \$	Qualifications
Biochemistry		
Amrad Pharmacia Award in Molecular Biology	400	Most outstanding Honours thesis in Molecular Biology to a student proceeding to a PhD in Biochemistry.
Amrad Pharmacia Award in Protein Chemistry	400	Most outstanding Honours thesis in Protein Chemistry to a student proceeding to a PhD in Biochemistry.
Amrad Pharmacia Award in Experimental Biochemistry	250	Most outstanding student in Senior Biochemistry practical to a student proceeding to Biochemistry Honours.
Biochemistry Alumni Award	250	Merit in Senior Biochemistry to a student proceeding to Biochemistry Honours.
G.S. Caird Scholarship	650	Proficiency in Intermediate Biochemistry to a student proceeding to Senior Biochemistry.
Fisons Award	400	Merit in Biochemistry 302 to a student proceeding to Biochemistry Honours.
Roslyn Flora Goulston Prize	530	Distinction in Senior Biochemistry to a student proceeding to Biochemistry Honours.
Johnson & Johnson Awards (2)	250	Merit in Intermediate Biochemistry practical to a student proceeding to Senior Biochemistry.
Slade Prizes (6)	80	Proficiency in practical classes in Intermediate Chemistry, Geology, Biochemistry, or Junior Geography or Biology.
Biological Sciences		
lima Brewer Prize	300	Excellence in Honours Botany or Plant Sciences.
George Herbert Clarke Prize	100	Merit in Intermediate Plant Morphology to a student born in Australia.
Collie Prize	160	Highest aggregate mark in Junior Biology.
John H. Elliott Memorial Prize	150	Best BSc(Hons) thesis in Animal Biology.
Haswell Prize	120	Proficiency in 24 units of Senior Zoology.
Professor Spencer Smith-White Prize	200	Proficiency in Genetics, Honours.
Gabriella Wittman Prize	140	Proficiency in Genetics, Senior Biology.
G.S. Caird Scholarship	650	Merit in Senior Plant Sciences to a student proceeding to Honours.
E.N. (Ted) O'Reilly Memorial Prize	275	Merit in Senior Plant Physiology.
Eva Saunders Memorial Prize	60	To a female student for merit in Intermediate or Senior Plant Sciences.
Mary Besly Memorial Prize	100	Merit in Intermediate or Senior Invertebrate Zoology.
G.S. Caird Scholarship	650	Merit in Senior Zoology to a student proceeding to Zoology Honours.
Eleanor Chase Memorial Prize	200	Merit in Biology 201 and 202.
William John Dakin Memorial Prize in Zoology	250	Greatest proficiency in First Class Honours in Biology.
Chemistry		
Walter Burfitt Scholarship No. 1	750	Merit in Senior Chemistry to a student proceeding to Chemistry Honours.
G.S. Caird Major Scholarship	1350	Merit in Senior Chemistry to a student proceeding to Chemistry Honours.
G.S. Caird Scholarships (3)	850	Merit in Senior Chemistry to students proceeding to Chemistry Honours.
Janet Elspeth Crawford Prize in Chemistry	1400	To a female graduate for merit in Honours in Chemistry.
Frank E. Dixon Scholarship	650	Merit in Senior Chemistry to a student proceeding to Chemistry Honours.

Prize or scholarship	Value \$	Qualifications
Charles E. Fawsitt Prize	120	For merit in Junior Chemistry.
Edna Maude Goulston Prize in Organic Chemistry	275	Merit in Organic Chemistry Honours.
Arthur Hollis Memorial Prize	150	Merit in Intermediate Organic Chemistry.
Inglis Hudson Scholarships (3)	150x2 300x1	Merit in Senior Science for students proceeding to Organic Chemistry Honours.
Hush Prize in Theoretical Chemistry	350	Merit in Senior Theoretical Chemistry.
Iredale Prize	95	Merit in Intermediate Physical Chemistry.
Liversidge Scholarships	450 p.a.	Chemistry 192 or 194 student who in the immediately preceding year, achieved the highest number of marks in HSC 4 unit chemistry.
Levey Scholarship (Major)	525	Merit in Junior Chemistry for a student proceeding to Intermediate Chemistry.
Levey Scholarships (Minor)	300	Merit in Junior Chemistry for a student proceeding to Intermediate Chemistry.
Royal Australian Chemical Institute Prize	500	Merit in undergraduate Chemistry (preference to RACI members).
Royal Australian Chemical Institute Analytical Chemistry Prize	250	Merit in Senior analytical chemistry courses.
C.H. Wilson Prize	70	Highest grade in Organic Chemistry Honours.
Computer Science		
CISCO Prize	500	Merit in COMP 307.
G.S. Caird Scholarship	650	Merit in Intermediate Computer Science.
Canon Scholarship for Excellence in Computer Science	10 000	Honours students in Computer Science.
Ian Jackson Memorial Prize	50	Merit in Senior Computer Science.
Research Foundation for Information Technology Prize	300	Merit in Junior Computer Science.
Research Foundation for Information Technology Prize	200	Merit in Junior Computer Science.
Lionel Singer Corporation Prize for Excellence in the Field of Computing	200	Merit in Senior Computer Science.
Geography		
G.S. Caird Scholarship	650	Proficiency in Senior Geography.
Edgar Ford Memorial Scholarship	275	Proficiency in Senior Geography, Geomorphology and Environmental Geography to a student proceeding to Geography Honours.
Professor James Macdonald Holmes Prize	20	Merit in Junior Geography courses.
Rev. A.S. McCook Memorial Scholarship	700	Proficiency in Senior Geography, to a student proceeding to Geography or Geomorphology Honours.
Slade Prize in Junior Geography	80	Proficiency in Junior Geography practical.
Professor Griffith Taylor Prize	50	The female student with highest marks in Junior Geography.
W.H. Maze Prize	250	Proficiency in Intermediate Geography.
Geological Sciences		
AusIMM Charles Marshall Thesis Prize	1000	Best Honours thesis in a Geoscience, Mining or Extractive Metallurgical Engineering Department in N.S.W. and A.C.T.
Olga Marian Browne Prize	50	Best Intermediate Geology field report.
Leo A. Cotton Prize in Exploration Geophysics	80	Proficiency in Intermediate Exploration Geophysics.

Prize or scholarship	Value \$	Qualifications
CRAE Mapping Prize	250	Proficiency in Senior Mapping.
CRAE Ore Deposits Prize	150	Proficiency in Senior Ore Deposit/Economic Geology.
Earth Resources Foundation Scholarships (4)	600	Merit in Junior Geology.
Earth Resources Foundation Second Year Scholarships (4)	800	Proficiency in Junior Geology.
Earth Resources Foundation Third Year Scholarships (3)	1000	Proficiency in Intermediate Geology/Geophysics.
Earth Resources Foundation Honours Year Scholarships (2)	1000	Proficiency in Senior Geological Sciences.
Edgeworth David Prize for Palaeontology	60	Proficiency in Senior Palaeontology.
Deas-Thomson Scholarship in Geology	6 500	Proficiency in Geology Honours to a student proceeding to postgraduate Geology.
Deas-Thomson Scholarship in Mineralogy	1000	Merit in Senior Geology to a student proceeding to Honours.
Elliston Medal	medal	Proficiency in Economic Geology, Igneous Petrology, Metamorphic Petrology or Sedimentology Honours.
Geo Instruments Prize	1000	Best overall Senior student in Geophysics.
Geological Society of Australia Prize		Merit in Senior Geology to a student proceeding to Honours.
Jack Mahoney Memorial Prize	90	Junior Geology practical.
C.E. Marshall Scholarship	525	Proficiency in Junior Geology.
Quodling Testimonial Prize	200	Proficiency in Senior Petrology.
Ken Richards Memorial Scholarship	1 250	For Geological Science Honours.
L.A. Richardson Memorial Prize	3 000	Best Honours thesis in Geology or Geophysics to a student proceeding to postgraduate research in Geology or Geophysics.
A.J. Shearsby Prize	80	Junior Geology student gaining the highest place in HSC 2-unit Science/Geology.
Sheila Mitchell Swain Memorial Prize	210	Senior Geological Science field report.
University Prize for Geology	10	Proficiency in Junior Geology.
Western Mining Corporation Prize	300	Most outstanding Senior student in Resource Exploration.
History and Philosophy of Science		
Dr G.A.M. Heydon Prize	60	Proficiency in Intermediate History and Philosophy of Science.
Ian Langham Memorial Prize	150	Proficiency in Senior History and Philosophy of Science.
Mathematics and Statistics		
George Allen Scholarships (3)	400	Merit in Senior Mathematics and Statistics to students proceeding to Honours.
Australian Federation of University Women (N.S.W.) Prize in Mathematics	50	Merit in Mathematics Honours by a female graduate.
Barker Scholarship, No. I	600	Merit in Intermediate Mathematics to a student proceeding to Senior Mathematics.
Barker Scholarship, No. II	600	Merit in Junior Mathematics to a student proceeding to Intermediate Mathematics.
Barker Prize	375	Merit in Mathematics or Statistics Honours.
Tim Brown Prize, No. 1	130	Merit in Intermediate Mathematical Statistics.
Tim Brown Prize, No. 2	210	Merit in Senior Mathematical Statistics.
K.E. Bullen Memorial Prize	650	Merit in Applied Mathematics Honours.

Prize or scholarship	Value \$	Qualifications
K.E. Bullen (UNISYS Australia Limited) Scholarship	1250	Merit in Junior Mathematics.
The M.J. and M. Ashby Prize for Mathematics in Science	250	Best Honours essay in the School.
Norbert Quirk Prizes (4)	130	Best essay in each of Junior, Intermediate, Senior and Honours years.
Statistical Society of Australia (N.S.W. Branch) Prize in Mathematical Statistics	200	Merit in Statistics Honours.
Veronica Thomas Prize	100	Proficiency in General Statistical Methods.
Wadsworth Publishers Prize	125	Merit in Junior Mathematics.
Medical Oncology		
Medical Oncology Scholarship	1000	Honours student to undertake research in Cancer Biology.
Microbiology		
Sydney Chinese Association Prize	30	Proficiency in Senior Microbiology or Agricultural Microbiology.
Pharmacology		
Roland H. Thorpe Prize	200	Proficiency in Senior Pharmacology.
Pharmacy		
Pamela Frances Anderson Prize	110	Merit in Pharmacology 3 for Pharmacy.
Walter Noel Gillies Scholarship in Pharmacy	1000	Merit in First Year of BPharm.
Guild Insurance Company Limited Prize	100	Merit in Senior Pharmacy.
David Hutcheson Prize for Pharmacy Practice	150	Merit in Pharmacy Practice 3.
Pharmaceutical Society of New South Wales Prizes (3)	- 70	Merit in Junior, Intermediate and Senior year BPharm.
William Joseph Collett Shoppee Prize	90	Merit in Pharmaceutical Chemistry (Honours).
Physics		
Australian Institute of Physics (N.S.W. Branch) Prize in Physics	100	Merit in Physics Honours.
Walter Burfitt Scholarship, No. II	750	Merit in Senior Physics.
Geoffrey Builder — AWA Prize	250	Intermediate Physics practical.
The Cadbury — Julius Sumner Miller Scholarships for Academic Excellence (No. 1) (2)	700	Merit in Junior Physics.
(No. 2) (2)	800	Merit in Intermediate Physics.
(No. 3) (2)	900	Merit in Senior Physics.
Deas-Thomson Scholarship in Physics	6 500	Merit in Senior Physics.
Levey Scholarships No 1	825	Merit in Junior Physics.
Science Foundation for Physics Scholarships, No. 1 (5)	700	Merit in Junior Physics.
No. 2 (5)	800	Merit in Intermediate Physics.
No. 3 (5)	900	Merit in Senior Physics.
The Shiroki Prize	500	Merit in Physics Honours.
Smith Prize	200	Merit in Junior Experimental Physics.
W.I.B. Smith Prize	300	Merit in Senior Physics practical.
Physiology		
David J. Monk Adams Award	600	Travel grant for Honours candidate.
Colin Dunlop Prize	100	Best performance in Physiology Honours.

Prize or scholarship	Value \$	Qualifications
Psychology		
Frank Albert Prize in Psychology	70	Merit in Intermediate Psychology.
Australian Psychological Society Prize in Psychology	200	Merit in Fourth Year Psychology.
Blanka Buring Prize	400	Merit in Senior Psychology (Arts or Arts/Science students only).
Lithgow Scholarship, No. V	650	Merit in Junior Psychology.
Lithgow Scholarship, No. VI	650	Merit in Intermediate Psychology.
Lithgow Scholarship, No. VII	650	Merit in Senior Psychology.
O'Neil Prize in Psychology 4 Honours	100	Merit in Psychology 4 Honours theoretical thesis.
Dick Thomson Prize	60	Merit in Psychology 4 Honours.
Both Undergraduates and Postgraduates		
Henry Chamberlain Russell Prize	250-1 400	Astronomy research.
Lewy Miall Pattinson Scholarships	300-1 000	Undergraduate study in Pharmacy or postgraduate research in Pharmaceutical Science.
Postgraduate Awards		
The David Coffey Geotechnical Research Scholarship	15 000 p.a.	Postgraduate research scholarship in Geotechnics and Geomechanics.
John Coutts Scholarship	1 000 p.a.	Postgraduate research in Science.
George Harris Scholarships (2)	1200	One for a research student in Chemistry and one for a research student in Geology and Geophysics.
Jabez King Heydon Memorial Prize	700	PhD thesis in Biological Sciences.
C.G. and R.J.W. Le Fevre Postgraduate Student Lectures	80	Research in Chemistry.
H. Tasman Lovell Memorial Medallion		PhD thesis in psychology.
A.H. Martin Scholarship	550	Merit in MPsych.
Nutrition Research Foundation Scholarships	7 600	Postgraduate research in Human Nutrition.
Ricegrowers' Prize in Nutrition	1000	Merit in Master of Nutrition and Dietetics.
T.G. Room Medal		PhD thesis in Pure Mathematics.
Martin and Elizabeth Jane Simmat Prize No. 2	250	Merit in MPsych.
The Margaret Stewart Fund Scholarship	15 364 p.a.	Postgraduate research in Psychology.
Elizabeth Wunsch Postgraduate Research Scholarship in Pharmacy	14 260 p.a.	Postgraduate research in Pharmacy.
Postgraduate, Postdoctoral or Visiting		
Professor Harry Messel Research Fellowships in Physics (2)	27139-30133	Research in Physics.
Travelling Scholarships		
The R.J.W. Le Fevre Research Travelling Scholarship	2 500	Conference travel grant for female postgraduate student in Chemistry.
James Vincent Scholarship in Microbiology		Conference travel grant or research support in Microbiology.
Grants in Aid		
R. and M. Bentwich Scholarship		Postgraduate research in Science.
Edgeworth David Travelling Scholarship		Postgraduate research in the Geological Sciences.

Prize or scholarship	Value \$	Qualifications
Bursaries		
AusIMM Mining and Metallurgical Bursaries	600	Best Intermediate, Senior and Honours students in a Geoscience, Mining or Extractive Metallurgical Department in N.S.W. or A.C.T.
Australian Computer Society Fund Bursary	125	Undergraduate student in Computer Science.
Roy Lindseth Bursary	180	Undergraduate student in Geology and Geophysics.
Mining and Metallurgical Bursaries	200	Undergraduate students in appropriate courses.

Prize compositions. Details of these may be obtained from the Scholarships Officer with whom applications generally close in the third week of second semester. This Handbook contains simplified details of some of the prizes, scholarships and awards offered by the University. Candidates should consult the Scholarships Office and the University's Calendar for full details. Note that additional criteria are attached to the above awards. In particular, requirements of sufficient merit or of higher year enrolment in particular subjects or degrees are common. *The University may not offer an award every year. The values of awards listed in Chapters 6 and 7 of this Handbook are indicative only and may vary without notice.*

Bursaries. Bursaries are awarded on the combined grounds of financial need and academic merit and application may be made at any time to the Financial Assistance Office (open Monday to Thursday from 9.30 am to 2.30 pm).

Applications are invited for the following:

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 eight 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.

Three of the eight 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 Association, the Sydney University Pharmacy Association 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 *Statutes and Regulations 1994-95*.

Students may request permission to attend Faculty meetings as observers. Details are available from the Faculty Office.

Map Library

The Map Library within the Department of Geography in the Institute Building is open to all faculties and departments in the University. The collection offers world coverage with 45 complete topographic series produced by agencies within the various countries, together with geological, regional, thematic and specialist maps. There are also a number of maps of historic interest. Atlases are held in the Geography Library nearby.

Among the local holdings of the library are the Australian topographic series of 1:100 000, 1:250 000, as well as maps produced by the Departments of Lands and Mineral Resources, the Forestry Commission, conservation and planning establishments, census departments, and most other map producing agencies throughout Australia.

The Map Library, which contains over 80 000 maps, is open from 8.30 am to 4.30 pm on weekdays. Its comprehensive collection of wall maps is available for lecture use throughout the University. In other respects the library is for reference only, map identity being obtained from a visual index or catalogue. The map custodian is the chief cartographer of the Department of Geography.

Marine Studies Centre

The Marine Studies Centre integrates and coordinates teaching, supervision of postgraduate students and research in all aspects of marine sciences. Membership of the Centre is open to academic staff and research students working in marine studies. The Centre is run by the Director and the Board which oversees coursework and research initiatives. Operation of the One Tree Island Research Station on the Great Barrier Reef is a responsibility of the Centre. The Centre also facilitates contact from the public about, and advises the University on, all matters of research and teaching in marine sciences and related environmental and resource issues.

Further information is available from the Director, Marine Studies Centre, tel. (02) 9351 2699.

Mathematics Learning Centre

Lecturer-in-charge Jacqueline M. Nicholas

The Mathematics Learning Centre offers help to students who enter the University with insufficient preparation in mathematics to enable them to cope either with the normal first year mathematics courses or with the mathematical requirements of other subjects.

Many university courses assume that students have a certain level of knowledge of mathematics. These include Junior courses in chemistry, computer science, economics and physics and many Intermediate Senior courses, among them biology, physiology, psychology and some options in marine sciences. You should check your faculty handbook carefully to see what is assumed in the courses you have chosen. If you know that you lack the assumed knowledge, or if you are doubtful whether you are well enough prepared for a course, you should contact the Mathematics Learning Centre.

At the centre we can advise you about your choice of courses, and help you decide which topics you need to do extra work on. We provide resources for individual study, with guidance from tutors, and we also arrange small supplementary tutorials for students who are having difficulties. Introductory and bridging courses are organised during the summer.

Location The Centre is on the 4th floor of the Carslaw Building (go to the 4th floor from the stairway opposite the Stephen Roberts Theatre). Any student seeking assistance should call at the Centre, or phone 93514061.

Faculty and departmental societies

Sydney University Science Association

As a student in the Faculty of Science you are a member of the Sydney University Science Association (SUScA), the faculty society. Part of the fee you pay to the SRC is allocated to your faculty society; the Science Association uses this money to promote activities of both an educational and a social nature.

The Association holds a number of activities throughout the year, including barbecues and the Annual Science Ball. The Science Association appoints sports directors who help organise interfaculty sport.

The Association runs a stall during orientation week where T-shirts are sold and you can find out more about what the Association does. *The Science Bulletin* (official publication of SUScA) which heralds information concerning the activities of SUScA and Science departmental societies, is produced weekly and can be found on official departmental noticeboards. The postal address is Box 270, Wentworth Building, University of Sydney, 2006.

The affairs of the Association 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 First Semester) and to take an active part in the association 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 SUScA effectively meets the needs of science students on campus.

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, Geographical Society, Geological Students' Society, Mathematical Society, Microbiology Society, Physics Society, and Psychological Society. The societies receive grants from the Science Association. They 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. Many science graduates choose to undertake further study to prepare themselves for employment. There is a wide range of graduate diplomas and coursework master's degrees available. Some of these are: biotechnology, food technology, computers and control, electronics, nutrition and dietetics, and the better known ones such as education and librarianship.

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 aeronautical, 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 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 leg-work and initiative involved in finding one will pay off in the long run.

Careers and Appointments Service

The Careers and Appointments Service (CAS) can help you throughout your course. Visit it as often as you like. Some of the areas in which CAS might be of assistance to you are: to help you plan a science course that fits in with your personal aptitudes and interests and that keeps as many career options open for you as possible; to answer any queries you may have about careers (CAS has a careers library that you can browse in whenever you feel like it); to let you know about job prospects for any subject you wish to major in; to help you find employment on graduation; and last but not least, CAS's Student Employment Section is able to offer you vacation employment and part-time jobs throughout the year.

You will need to make an appointment to talk with one of the advisers about careers, but you do not need one to use the careers library or the Student Employment Section.

CAS is in the Mackie Building, Arundel Street, Forest Lodge, cross the Parramatta Road footbridge at the Holme Building, turn left, and it is the first building you come to.

A brief history of the Faculty

On 17 April 1882 there was a special meeting of the University Senate to receive a report from the By-laws and Curriculum Committee. The adoption of this report was moved by Mr Rolleston; it recommended:

1. There shall be four Faculties in the University—viz. Arts, Science, Medicine and Law.
2. All undergraduates shall attend first year Arts and after satisfactory examination at the end of first year 'may elect which of the following Faculties, whether Arts, Science or Medicine, they will graduate in, and after the Second Year examination' they may elect to graduate in Law.

After deciding upon the regulations for the Faculty of Arts the meeting was adjourned to the following day. It was then (18 April 1882) that regulations for the Faculty of Science were formulated. Two degrees, BSc and DSc, were established. The course of study in the bachelor's degree was as follows:

First Year Arts: Latin; one of Greek, French or German; mathematics; elementary chemistry; elements of natural philosophy.

Second Year: chemistry; physics; natural history; mathematics; French or German.

Third Year: At least three of: chemistry; physics; mathematics; mineralogy; geology and palaeontology; zoology and botany.

This, then, was the formal beginning of the Faculty. It was not the beginning of the teaching of science in the University. The first professors, all based in the Faculty of Arts, arrived in 1852; they were the Rev. Dr John Woolley (Classics), M.B. Pell (Mathematics and Natural Philosophy) and John Smith (Chemistry and Experimental Philosophy (i.e. Physics)). In 1853 there were suggestions that chairs in geology and natural history be established; however, no appointments were made. There was evidently some pressure for academic studies in geology and mineralogy and in 1866 A.M. Thomson was appointed reader in geology and mineralogy and demonstrator in practical chemistry. In 1870 he became professor of geology.

In 1880 two events occurred that were to have a profound influence upon the development of the University: the Public Instruction Act, framed by Sir Henry Parkes, was passed by the N.S.W. Parliament; and John Henry Challis died. The Public Instruction Act meant that a much wider group of children received a secondary education and formed a reservoir for increased university enrolments. And upon the death of Challis, a prosperous businessman who had earlier endowed the remarkable Royal Window in the Great Hall, it was revealed that he had left his fortune to the University. This money, a colossal sum for the then financially struggling institution, was to accrue for five years after the death of Mrs Challis, and when finally received in 1889-90 amounted to more than £250 000. At that time the annual governmental funding was around £5-10 000, and by 1902 had risen to only £14 000. The knowledge of these riches-to-come gave the Senate a sense of financial security for the first time; hitherto, apart from fees charged, the University had been completely dependent upon the Government of New South Wales. There was an air of optimism; the University could expand instead of merely survive.

On 26 July 1882 the draft of a Bill went to Parliament entitled 'A Bill for attending the Faculties and Schools in the University of Sydney and for other purposes in relation thereto'. The Senate was empowered to establish the Faculty of Science, the government providing the money required until the Challis bequest should be received. In 1882 the chair of geology was replaced by a chair in natural history, and J.S. Stephens was appointed to it. He also doubled as professor of classics from 1884, when the Rev. Dr Charles Badham died, until a new appointment was made. The chair of chemistry and experimental philosophy was divided, Smith retaining chemistry, the new chair of physics being filled by R. Threlfall. He insisted upon the introduction of practical work and designed and supervised the construction of a physical laboratory. The names of the first graduates in science appeared in the *Calendar* for 1885. They were Frank Leverrier and Clarence E. Wood. By 1890 there were nine graduates, including the first woman, Fanny E. Hunt (1888).

In 1890 the obligatory year of Arts for entry to the Faculty of Science was dropped. Entry became by means of an Arts degree, a pass in Arts I or a pass in the Senior Public Examination (equivalent to today's HSC) or equivalent examination in the following subjects:

Latin; one of Greek, French or German; and three of arithmetic, algebra, geometry, trigonometry, elementary surveying and astronomy, mechanics, and applied mechanics. There was now a three-year course in science (the fourth year for honours came in 1922) and all first year students took biology, chemistry, mathematics, physics and physiography.

In 1932, when the Faculty was 50-years-old, there were six chairs: physics, chemistry, zoology, geology and physical geography, botany, and chemistry (pure and applied). There were 353 undergraduates. In 1982 (the centenary year) there were 31 chairs; many of these were in new disciplines, and some disciplines had several professors. The number of students had grown to 2500.

At the end of the Second World War, the Commonwealth Reconstruction Training Scheme provided entry to the University for many ex-servicemen and ex-servicewomen. The increased numbers of students required additional facilities; the staff was enlarged and several temporary buildings (some of which are still in use) were put up. The next period of expansion came in 1951 when the then Prime Minister, R.G. Menzies, announced the entry of the Commonwealth Government into University financing. This led to the expansion of the University into the Darlington area and the erection of many new buildings: Carslaw, Chemistry, Geology and Geophysics, and Biochemistry, to name a few.

In 1954 a donation from Adolph Basser enabled the University to buy its first computer; in 1956 an electron microscope was purchased. These items of major equipment opened up many new fields of research and teaching.

Undergraduates have come to play an increasing part in the activities and operation of the Faculty. In 1904 the Science Society was established, which eventually became the Sydney University Science Association, and in 1971 the first students were elected to the Faculty of Science.

In 1985 the Faculty celebrated the centenary of its first graduates. A series of lectures, exhibitions, films and social events was held. A history book *Ever Reaping Something New* was published. A film about the Faculty entitled *A Century of Science* was also produced and broadcast nationally by the ABC.

7 Postgraduate study

Higher degrees

The higher degrees in the Faculty of Science are:

MSc	Master of Science
MInfTech	Master of Information Technology
MPharm	Master of Pharmacy
MPharm(Clin)	Master of Pharmacy (Clinical)
MPsych	Master of Psychology
MNutrDiet	Master of Nutrition and Dietetics
MNutrSc	Master of Nutritional Science
PhD	Doctor of Philosophy
DS	Doctor of Science

Diplomas

The Diplomas in the Faculty of Science are:

DipHPharm	Diploma in Hospital Pharmacy
GradDipSc	Graduate Diploma in Science
GradDipSc (EnvironSc)	Graduate Diploma in Science (Environmental Science)
GradDipSc (Micr&An)	Graduate Diploma in Science (Microscopy and Microanalysis)
GradDipSc (OptFibreTech)	Graduate Diploma in Science (Optical Fibre Technology)
GradDipSc (Psych)	Graduate Diploma in Science (Psychology)

The regulations governing the award of these degrees and diplomas are printed in the *University of Sydney Calendar 1996, Vol. I: Statutes and Regulations*. Prospective candidates should consult with the Head of the Department most closely concerned as early as possible.

Doctor of Philosophy

The degree of Doctor of Philosophy is a research degree awarded for a thesis considered to be a substantially original contribution to the subject concerned. Some coursework may be required (mainly in the form of seminars) but in no case is it a major component.

Applicants should normally hold a master's degree or a bachelor's degree with first or second class honours of 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 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 five 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 seven years.

MSc and MPharm

Graduates of the University of Sydney with first or second class honours and candidates in the final year of an approved honours course for the BSc or BPharm degrees 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.

A graduate who holds the degree of BPharm of this University with first or second class honours, or, with approval, an equivalent qualification from another institution, may apply for admission to candidature for the MPharm degree. This degree is completed by research and thesis.

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

MInfTech¹

The degree of Master of Information Technology (MInfTech) requires three semesters (72 units) of full-time study. MInfTech extends the knowledge base of qualified computer professionals and provides them with further training and experience. The degree consists of two semesters devoted to coursework (48 units) and one semester devoted to an Information Technology project (24 units). The degree is available to full fee-paying students on a full-time as well as a part-time basis.

Candidates for the degree must normally hold a three year degree majoring in Computer Science, or equivalent, with a Credit or above in the final year of the Computer Science component. The requirement

¹Subject to the approval of the Senate.

for Computer Science results at Credit or better can be waived for applicants who supply evidence of two years experience in the Information Technology industry, in roles such as Analysis/Programming, Network Management, Technical Support and/or Systems Integration. (Note that experience in Sales or Operations is not counted as technical.)

Candidates for the degree are required to complete satisfactory coursework and project components worth 72 units according to the syllabus approved by the Faculty of Science. Each student is allocated an adviser. Each student must make a study plan at the beginning of his/her studies which must be approved by the student's adviser and can be modified only with the adviser's approval. The study plan guarantees breadth and ensures that all courses cover material new to the student.

The following syllabus has been approved by the Faculty of Science:

- Each candidate must complete coursework worth 72 units.
- Each candidate must complete at least 60 units of coursework from Tables I-V below, satisfying the following rules:
 - Each candidate must complete one course from Table V ('supervised project' course).
 - Each candidate can complete at most one course from Table II.
 - Each candidate must complete at least 24 units of coursework from Table III and/or Table IV.
- Each candidate can complete at most 12 units of coursework from other departments/faculties (approval by the student's adviser is required).

Table I (each course 4 units)

COMP 501 Algorithms
 COMP 502 Artificial Intelligence
 COMP 503 Computer Architecture
 COMP 504 Computer Graphics
 COMP 505 Database Systems
 COMP 506 Logic Programming
 COMP 507 Networked Systems
 COMP 508 Object Oriented Systems
 COMP 509 Operating Systems
 COMP 510 Software Engineering
 COMP 511 Theory of Computation
 COMP 512 User Interfaces

Table II (each course 4 units)

COMP 521 Algorithmic Systems Project
 COMP 522 Computer Systems Project
 COMP 523 Intelligent Systems Project
 COMP 524 Large-Scale Software Project
 COMP 525 Product Development Project

Table III (each course 4 units)

COMP 531 Algorithms (Adv. Topic)
 COMP 532 Artificial Intell (Adv. Topic)
 COMP 533 Comp Architecture (Adv. Topic)
 COMP 534 Computer Graphics (Adv. Topic)
 COMP 535 Computer Networks (Adv. Topic)
 COMP 536 Database Systems (Adv. Topic)
 COMP 537 Distributed Systems (Adv. Topic)
 COMP 538 Machine Learning (Adv. Topic)

COMP 539 O-O Systems (Adv. Topic)
 COMP 540 Operating Systems (Adv. Topic)
 COMP 541 Software Eng (Adv. Topic)
 COMP 542 User Interfaces (Adv. Topic)
 COMP 543 Computation Theory (Adv. Topic)
 COMP 544 Scientific Visualisation (Adv. Topic) •

Table IV (each course 4 units)

COMP 561 Advances in Computer Science 1
 COMP 562 Advances in Computer Science 2
 COMP 563 Advances in Computer Science 3
 COMP 564 Advances in Computer Science 4

Table V (24 units)

COMP 571 Information Technology Project

Resolutions of the Senate¹

Master of Information Technology (MInfTech)

Eligibility for admission

1. An applicant for admission to candidature for the degree shall, except as provided in Chapter 10 of the by-laws—

- (i) have completed a three-year degree majoring in Computer Science or equivalent and achieved a grade of Credit or better in the final year of the Computer Science component; or
- (ii) have completed a three-year degree majoring in Computer Science or equivalent and have two years' experience in the Information Technology industry, in roles such as Analysis/Programming, Network Management, Technical Support and/or Systems Integration.

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 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

3. (1) A candidate for the degree shall proceed by completing courses and a project as prescribed by the Faculty.
- (2) A course shall consist of such lectures, seminars, tutorial instruction, essays, exercises or practical work as may be prescribed.
- (3) In these resolutions the expression 'to complete a course' means

¹Subject to the approval of the Senate.

- (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 the examinations of the course.

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 sixth 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 sixth semester and not later than the end of the tenth semester of candidature, unless otherwise determined by the Faculty.

Requirements for the degree

6. Candidates for the degree are required to complete satisfactorily:
 - (i) 48 units of courses covering material new to the candidate and selected from courses satisfying the conditions approved from time to time by the Faculty; and
 - (ii) a supervised project component worth 24 units.

Examination

7. On completion of requirements for the degree, the Faculty shall determine the results of the candidature, on the recommendation of the Head of the Basser Department of Computer Science.

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) where the candidate does not show good cause, terminate the candidature.

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 courses prescribed for the degree, may receive credit of up to 24 units towards the requirements for the degree, provided that the completed work was not counted towards the requirements of another degree.

MPharm(Clin)

The degree of Master of Pharmacy (Clinical) requires six semesters (48 units) of part-time study. The Master of Pharmacy (Clinical) is designed for practising pharmacists to provide postgraduate training in both coursework and research methodology. The degree

consists of three semesters of coursework (24 units) and three semesters over which a research project will be conducted (24 units). The degree is available to full fee-paying students on a part-time basis.

Candidates for the degree must have completed a Pharmacy degree and an honours or diploma course. Candidates may also be admitted if they have completed a Pharmacy degree and have a minimum of three years experience as a pharmacist, subject to approval by the Head of Department.

Candidates for the degree are required to complete satisfactorily both coursework and research equivalent to 48 units, according to the syllabus approved by the Faculty of Science.

The 24 units of coursework shall consist of:

Semester 1

Drug Information	(2 units)
Medication Review 1	(4 units)
Advanced Therapeutics	(2 units)

Semester 2

Pharmacoepidemiology	(2 units)
Statistics	(2 units)
Advanced Therapeutics 2	(4 units)

Semester 3

Scientific Presentation	(2 units)
Medication Review 2	(4 units)
Advanced Pharmacokinetics	(2 units)

Semester 4-6

Research Methods and Design

The 24 units of research will be conducted after completion of the coursework components. The supervised research project and research thesis will be conducted over three semesters (minimum) to seven semesters (maximum) under the supervision of a research advisor.

Resolutions of the Senate¹

Master of Pharmacy (Clinical)

Eligibility for admission

1. An applicant for admission to candidature for the degree shall, except as provided in Chapter 10 of the by-laws:

- (i) have successfully completed a Pharmacy degree and an honours or diploma course; or
- (ii) have successfully completed a Pharmacy degree and have a minimum of three years experience as a pharmacist, subject to approval by the Head of the Department of Pharmacy.

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
 - (ii) availability of adequate and appropriate supervision.

¹Subject to the approval of the Senate.

(2) In considering an application for admission the Head of Department will take into account the quota and entrance will be based on the applicants who are most meritorious in terms of section 1.

Method of progression

3. (1) A candidate for the degree shall proceed by completing courses and a project as prescribed by the Faculty of Science.
- (2) A course shall consist of lectures, seminars, tutorial instruction, essays and practical work as prescribed.
- (3) In these resolutions to complete a course means
 - (i) to attend lectures, tutorials and seminars
 - (ii) to complete satisfactorily the essays, exercises and practical work
 - (iii) to pass the examinations of the course
 - (iv) to prepare a research thesis and pass the examination of this thesis.

Time limits

4. A candidate will proceed on a part-time basis and shall complete the requirements for the degree not earlier than the end of the sixth semester and not later than the end of the tenth semester, unless otherwise determined by the Faculty.

Requirements for the degree

5. Candidates for the degree are required to complete satisfactorily:
 - (i) 24 units of courses covering new material to the candidate, selected from courses satisfying the conditions approved by the Faculty, and
 - (ii) a supervised research project worth 24 units.

Examination

6. On completion of the requirements for the degree, the Faculty shall determine the results of candidature, on the recommendation of the Head of Department.

Progress

7. The Faculty may—
 - (i) call upon any candidate to show cause why that candidature should not be terminated by reason of unsatisfactory progress towards the completion of the degree; and
 - (ii) where the candidate does not show good cause, terminate the candidature.

Credit

8. A candidate who, before admission to the candidature, has spent time in graduate study and has completed coursework considered by the Faculty to be equivalent to courses prescribed by the degree, may receive credit of up to 8 units towards the requirements for the degree.

MPsych/PhD

The combined Master of Psychology and Doctor of Philosophy program allows students who have an exceptionally strong undergraduate record in Psychology to undertake both degrees in a minimum of four years full-time. Applicants will normally hold a bachelor's degree, in Science, Arts or Psychology, with first or second class honours (first division) in Psychology from the University of Sydney, or an equivalent qualification from another institution.

Admission to the degree will normally be as a full-time student. The minimum period of candidature is four years and the maximum is normally six years full-time. Students may be allowed to transfer to part-time status where they can demonstrate that they are engaged in an occupation or other activity that leaves them substantially free to pursue their candidature: in such cases, the minimum candidature would be four years and the maximum would be seven years.

In the first two full-time years (or first four part-time years), students complete all coursework and practicum placements for the MPsych. As part of the coursework in the first year, they complete a literature review and proispectus for their doctoral research. All of the course arrangements and requirements for the MPsych are applied, except that a satisfactory PhD thesis is held to satisfy the research requirements for the MPsych.

Enrolment in the second year is normally part-time in the MPsych and part-time in the PhD. In the third and subsequent years of candidature, candidates complete their PhD research. Standard regulations relating to the nature and examination of the PhD thesis apply.

MPsych

The degree of Master of Psychology provides professional training in clinical psychology and involves supervised field experience for two days a week during semester and up to three days a week during vacations. Formal classes are held in assessment of problem behaviour, behaviour change, clinical research techniques, neuropsychology, and related topics. A research thesis is also required.

Candidates for the degree must normally hold the degree of Bachelor of Arts or Science with honours in Psychology and have completed work in Abnormal Psychology acceptable to the Faculty.

The course for the MPsych degree can be completed in two years of full-time study or four years of part-time study.

Some details of the course arrangements and requirements are as follows:

1. Candidates for the degree are required to complete satisfactorily—
 - (a) a coursework component according to the syllabus approved by the Faculty of ■ Science;
 - (b) a practicum component involving both training in therapeutic and assessment techniques and field placements;
 - (c) a research project and submit a dissertation on that project.

2. (a) The requirements for the degree shall be completed in two parts; and Part I must be satisfactorily completed before Part II.
- (b) Full-time candidates are required, except with the 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.
- (c) Part-time candidates are required, except with the permission of the Faculty, to complete the requirements of Part I of the course within two years of first enrolment and to complete Part II of the course within four years of first enrolment.

The following syllabus has been approved by the Faculty of Science:

1. *Course component*

The following topics are covered: abnormal behaviour; assessment; behaviour change; behavioural medicine; child abnormal psychology; intellectual, physical and sensory handicap; neuropsychology; professional issues; psychometrics; psychopharmacology; psychophysiology; research methods.

Assessment four written papers to be taken by the end of Part I together with essay and seminar papers over both parts of the course.

2. *Practicum component*

Students are required to undertake training in both therapeutic and assessment techniques and to undertake field placements.

Assessment by mastery tests, supervisors' reports, written or oral case presentations.

MNutrDiet and MNutrSc

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 MNutrSc provides the same survey of all aspects of human nutrition in the first year but is designed for those persons who wish to undertake research in this area. The second year is devoted to a research project, with regular seminars.

Admission

An applicant for admission to candidature of either degree course must be a graduate and have completed 24 units of Intermediate courses in Biochemistry and Human Physiology¹ or equivalent courses. Applications for admission should be lodged with the Registrar by 15 November of the year prior to the one in which candidature is sought.

¹For instance in a Sydney BSc degree Biochemistry 201 and 202 and Physiology 201 and 202 or in the BMedSc degree Biochemistry 211 and 212 and BMED 201.

Timing

Both courses occupy two years. The first year is common to both and involves academic study in prescribed courses. In the second year the courses proceed as follows:

MNutrDiet One semester is devoted to a short research project, which is presented for examination in the form of a long essay. The other semester is for clinical training in dietetics in recognised teaching hospitals and in community dietetics.

MNutrSc A candidate carries out an original investigation on a topic which will result in the writing of a short thesis.

Lecturers

The courses are taught and coordinated by the Boden Professor of Human Nutrition and the staff of the Human Nutrition Unit with the cooperation of the Nutrition and Dietetics Department of the Royal Prince Alfred Hospital and the Dietetic Department of the New Children's Hospital. There are specialist lecturers from several departments at the University of Sydney (Medicine, Public Health, Geography, etc.), from the School of Food Technology at the University of New South Wales, and other specialist institutions.

The courses are supervised by a Board of Studies in Nutrition and Dietetics, whose chairperson is the Dean of the Faculty of Science.

Courses of study

First Year

1. Nutritional Science
2. Nutritional Biochemistry
3. Food Science and Technology
4. Food Intake Measurements
5. Community Nutrition
6. Public Health Nutrition
7. Medicine
8. Clinical Nutrition and Therapeutic Dietetics
9. Food Service Management and Production
10. Principles of Communication and Education
11. Sociology and Anthropology of Food Habits
12. Principles of Professional Dietetic Practice (MNutrDiet only)

Second Year

- (a) Dietetic Practical Placement in approved hospital and community health centres (one 20-week semester).
- (b) Research Project. One semester on a supervised research project approved by the Head of the Human Nutrition Unit.

Students attend the University on a regular basis to undertake the following senior courses:

1. Management
2. Theory of Counselling
3. Dietetic Counselling
4. Advanced Clinical Nutrition
5. Advanced Community Nutrition

Assessment

First Year of MNutrDiet & MNutrSc four 3-hour exams (Nutritional Science I and II, Clinical Nutrition and Public Health Nutrition) and assignments on food intake measurement, food habits and community nutrition.

Second Year of MNutrDiet continuous assessment throughout the Dietetics training semester and one 3-hour final exam. Research semester is assessed by presentation of a long essay and formal oral presentation.

Second Year of MNutrSc: Assessment is by progress in the two semester research projects and by the short thesis based on the candidate's research.

Graduate diplomas

Graduate Diploma in Science

The Graduate Diploma in Science serves as an entry qualification for the degrees of Master of Science, Master of Pharmacy or Doctor of Philosophy. It consists of equivalent work to that carried out by candidates enrolled in the fourth year honours courses, and is available to candidates who are not eligible to enrol in those courses. Entry to the Graduate Diploma is subject to approval by the relevant Head of Department and confirmation that requirements for the award of the degree of Bachelor of Science, Bachelor of Pharmacy, Bachelor of Medical Science, or an equivalent degree have been met.

Graduate Diploma in Science (Environmental Science)

Graduate Diploma in Science (Optical Fibre Technology)

Resolutions of the Senate governing the Graduate Diploma in Science and the other graduate diplomas above may be found in the *University Calendar 1996, Vol. 1: Statutes and Regulations*.

In addition, the following applies, from 1997, to the Graduate Diploma in Science (Psychology):

Graduate Diploma in Science (Psychology)

Eligibility for admission

1. (1) The Faculty of Science, on the recommendation of the appropriate Interdepartmental Committee, may admit to candidature the following:
 - (d) Graduate Diploma in Science (Psychology)
an applicant who is a holder of the degree of Bachelor of Science or Bachelor of Arts, or any other degree at the University of Sydney which includes courses in Psychology acceptable to the Faculty.

Graduate Diploma in Science (Optical Fibre Technology)

Coordinator Dr Ian Bassett

Classes and assessment Details from the Optical Fibre Technology Centre

Admission Consult the Manager, Education and Training at the Optical Fibre Technology Centre

The Graduate Diploma provides an interdisciplinary qualification in this fast changing, leading-edge technology, which is of particular relevance for those entering the telecommunications, cable TV and broadband services industries of the future. Successful completion of all the courses in the Graduate Diploma

at a satisfactory level may allow the candidate to proceed to the Master's by coursework program with further courses, additional laboratory work and a long essay. For further information, please consult the Manager, Education and Training at the Optical Fibre Technology Centre.

Introductory Optical Fibre Technology¹

Basic course for students with little or no optical fibre background. This introductory course gives an overview of optical fibre technology and its applications.

Basic Optics and Mathematical Preliminaries¹

This covers the mathematics and optics which is required for Course 3 and later courses. This includes ordinary differential equations, partial differential equations, complex analysis, theory of reflection, refraction, interference and diffraction, Maxwell's equations, waveguide modes, wave packets and group velocity.

Optical Fibres: Principles, Systems and Devices

Basic optical fibre theory and practice. Fibre waveguide theory, fibre fabrication and characterisation, sources and detectors, telecommunication systems and fibre sensors.

Systems and Networks

Basic theory and methods of communication systems and networks with emphasis on optical fibre aspects. This course reviews the network architectures and the technological alternatives for communications are then presented. There is particular emphasis placed on optical fibre technology in the implementation of broadband networks.

Sources and Lasers

Basic theory and practice of lasers with particular reference to sources for optical fibre. This course introduces the concepts of absorption and stimulated and spontaneous emission of light. It explains how stimulated emission process can lead to amplification of light. The design of the resonator is also introduced. This course studies the properties of laser light—monochromaticity, coherence, intensity, pulse duration and others — and emphasises lasers of particular importance to optical fibre systems. Laser safety issues will also be addressed.

Photonics

Basic course in the principles and techniques of information processing by optical methods. This module begins with a review of solid state physics which is then applied to a discussion of semiconductor lasers and guided wave structures. Then will follow non-linear optics, highlighting second harmonic generation and the Kerr effect. Finally attention turns to light itself with a quantum mechanical description in terms of coherence, optical squeezing and solitons.

¹These courses shall be completed prior to the remaining courses in the program. Any exemptions must be applied for at the time of application for admission and be granted only with the Interdepartmental Committee's approval.

Optical Fibre Sensors — Basics

Basic principles • and representative examples of detection and measurement by means of optical fibres. The course examines fibre sensing systems and includes hands-on experiments with laser sources and detectors, fibre cleaving and splicing, optical power measurement, attenuation and optical time domain reflectometry (OTDR) measurements.

Devices and Components for Optoelectronics

Use and characteristics of linear and non-linear devices and components in optoelectronics. Optoelectronic devices employ a suitable material (often semiconductor and/or crystalline) which allows an interaction between light and electricity. This module introduces such optoelectronic devices as detectors and modulators of light and electro-optic switches. Techniques for the characterisation of such devices will be covered and examples of applications of optoelectronic devices to optical fibres will be given.

Resolutions of the Faculty

Graduate Diploma in Science (Environmental Science)

1. A course shall consist of lectures together with such tutorial instructions, essays, exercises or practical work as may be prescribed. In these resolutions, to 'complete a course' and derivative expressions 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 course.

2. A candidate shall complete the courses listed below, in addition to satisfactorily completing a project.

Courses —

Full-year

Environmental Biology
Environmental Geology

First Semester

Environmental Geomorphology and Hydro-geomorphology
Sampling and Techniques for Environmental Monitoring/Assessment
Resource Modelling
Environmental Law
Natural Resource Economics
The Built Environment and Planning Aspects of the Environment

Second Semester

Total Catchment Management
Environmental Physics

Graduate Diploma In Science (Microscopy and Microanalysis) (GradDipSc(Micr&An))

1. A course shall consist of lectures together with such tutorial instructions, essays, exercises or practical work as may be prescribed. In these resolutions, to 'complete a course' and derivative expressions 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 course.

2. A candidate shall complete coursework to value of 48 units comprising ten core courses and an independent project and report, worth 36 units, and optional courses worth 12 units selected from the following table:

Core courses

Principles of Microscopy and Microanalysis	2 units
Instrumentation — Light Microscopy	2 units
Instrumentation — Transmission Electron Microscopy	2 units
Instrumentation — Monitoring and Maintaining Electron Microscopes	2 units
Introductory Specimen Preparation for Optical Microscopy	2 units
Specimen Preparation (Biological or Materials) — TEM and SEM	4 units
Surface Microscopy	2 units
Signal and Image Processing	4 units
Advanced Instrumentation — Optical, X-ray and Electron Spectroscopy	4 units
Advanced Instrumentation — Confocal Microscopy	4 units
Independent Project and Report	4 units

Optional courses

Instrumentation — Scanning Electron Microscopy	2 units
Advanced Instrumentation — Transmission Electron Microscopy	1 unit
Advanced Instrumentation — Scanning Electron Microscopy	1 unit
Advanced Biological Specimen Preparation for Optical Microscopy	2 units
Introduction to Diffraction	2 units
Diffraction Techniques — Advanced Microanalysis for Materials — Electron Techniques	4 units
Microanalysis for Materials — Non-electron Techniques	4 units
Microanalysis in Life Sciences	2 units
Advanced Techniques in Biological EM	4 units
Advanced Techniques for Optical Microscopy	4 units
Image Analysis	2 units
Stereology	2 units
Image Capture and Recording	2 units

3. Satisfactory progress shall be as determined by the Faculty.

Graduate Diploma in Science (Optical Fibre Technology)

1. A course 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 course' 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 course.
2. A candidate shall complete the courses shown in the following table:

Course 1	Introductory Optical Fibre Technology
Course 2	Basic Optics and Mathematical Preliminaries
Course 3	Optical Fibres: Principles, Systems and Devices
Course 4	Systems and Networks
Course 5	Sources and Lasers
Course 6	Photonics
Course 7	Optical Fibre Sensors — Basics
Course 8	Devices and Components for Opto-electronics

3. Part-time candidates generally shall complete the course work for four courses in the first year followed by four in the second year.
4. Candidates shall be required to complete courses 1 and 2 before proceeding to the remaining courses of the Diploma.
5. Satisfactory progress shall be determined by the Interdepartmental Committee.

Graduate Diploma in Science (Psychology)

1. A course shall consist of lectures together with such tutorial instructions, essays, exercises or practical work as may be prescribed. In these resolutions, to 'complete a course' and derivative expressions 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 course.
2. A candidate shall complete coursework to the value of 20 units comprising three core courses and two elective courses selected from the following table:

Core Courses (4 units each)

Psychological Research
Psychological Theory
Research Project

Elective Courses (4 units each)

Abnormal and Health Psychology
Counselling Psychology
Psychology of Addiction

3. Satisfactory progress shall be as determined by the Faculty.

Current Departmental rules on progress

In the event of a candidate failing one course, permission may be granted for the candidate to repeat the course in the following year. Candidature will normally be terminated if any two courses are failed or if a course is failed twice.

Diploma in Hospital Pharmacy

Coordinator Dr Armour

Classes and assessment details from Department
Admission consult the coordinator

Hospital experience

Students spend approximately two-thirds of the course time in hospitals where comprehensive programs of clinical and other hospital pharmacy activities are conducted. Students work in four different hospitals throughout the year.

Courses of study

*Therapeutics*¹ This course consists of approximately 100 hours of lectures and 50 hours of tutorials. Lectures cover pathophysiology, clinical manifestations and treatments of diseases with emphasis on current drug therapy. Tutorials are broadly based with emphasis placed on current hospital pharmacy practice.

Clinical Epidemiology This is a course of lectures and tutorial/discussion sessions (approximately one hour per week) in which clinical study designs are examined. Current clinical scientific and medical literature is critically evaluated.

*Therapeutic Drug Monitoring*¹ This course, in approximately 15 hours distributed over the year, presents the clinical pharmacokinetics of relevant drugs.

Clinical Biochemistry This course consists of nine lectures covering the procedures used for determination of biochemical and microbiological values in patients and the interpretation of these tests with respect to the clinical evaluation of the patient and the assessment of drug therapy.

Case History Presentation This course involves development of skills required to access current information on new technology and/or drugs and presentation of this information in a formal style for assessment.

Scientific Presentation This is a course of ten hours which deals with how to present orally as well as developing written skills.

Computing An introduction to the Macintosh and IBM word processing and statistics packages is provided.

Research project

Each student carries out a hospital pharmacy-based research project selected by the director of pharmaceutical services of the participating hospital in consultation with the staff of the Department of Pharmacy. The project extends over most of the year and includes a literature survey, development of a protocol, collection and treatment of data and presentation of results in the form of written and verbal reports.

Masters Qualifying Procedure

The Masters Qualifying Procedure serves as an entry qualification/probation period for the degrees of Master of Science, Master of Pharmacy, Master of Nutrition and Dietetics, Master of Nutritional Science and Doctor of Philosophy. It is designed to cater for candidates who have satisfied the general requirements for entry to the degree program but who are required to undertake further work to satisfy the Department concerned that entrance to the degree program is appropriate.

¹These courses are extensions of undergraduate courses and presume adequate knowledge of the undergraduate course.

Scholarships and prizes: postgraduate

This handbook contains simplified details of some of the prizes and scholarships available to students at the University. For full details you are advised to consult the Scholarships Office. The scholarships and prizes may be scheduled as follows:

Grants-in-aid These are offered by application (closing: 31 May each year) to postgraduate students seeking assistance with travel or maintenance.

Postgraduate scholarships tenable at the University of Sydney Prospective postgraduate students should consult the Scholarships Office in August/September each year about Australian Postgraduate Research Awards (closing: 31 October) and Australian Postgraduate Course Awards (closing: 31 October).

Postgraduate travelling scholarships Each year the University offers five or six travelling scholarships with a closing date in November. Generally, applicants need to have a first class honours degree approaching medal standard to be successful.

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 Scholarships Office in the Holme Building.

Additional scholarship information is collected in Chapter 6 of this Handbook.

Scholarship	Value \$	Closing date for applications	Qualifications
1. Tenable at the University of Sydney			
Australian and University Postgraduate Research Awards	15 364 (1996)	31 October	Graduates with Honours I. For research in any field
Australian Postgraduate Course awards	11687	31 October	Graduates with honours degrees or very good pass degrees. For Masters degrees undertaken by coursework
R. and M. Bentwich Scholarship			Graduate who holds a postgraduate research scholarship and who requires a supplementary grant
Earth Resources Foundation Scholarship	10 500		Research in geology and geophysics
Farrand Postdoctoral Research Fellowship	27139-30133		Research in area of science
Henry Bertie and Florence Mabel Postgraduate Research Scholarships — Senior	27 139-30133	as advertised	For research in chemistry in relation to industry and agriculture
— Junior	15 087-16 598	as advertised	
George Harris Scholarships (2)	1200 each		One for a research student in chemistry and one for a research student in geology and geophysics
Linnean Macleay Fellowships	800-3200		Graduates in science or agriculture who are members of the Linnean Society of N.S.W.
Richard Claude Mankin Scholarship — Postdoctoral	27 139-30133	as advertised	For research into water conservation
— Postgraduate	10 500		
Professor Harry Messel Research Fellowship in Physics — Postdoctoral	27 139-30133	as advertised	Research in physics
— Postgraduate	8882		
A.E. & F.A.Q. Stephens Research Scholarship	10 500	as advertised	Graduates with research experience. For research in any field
Elizabeth Wunsch Research Scholarship in Pharmacy	14 474		Research in pharmacy

Scholarship	Value \$	Closing date for applications	Qualifications
2. Travelling Scholarships			
Awarded by the University of Sydney			
Barker Graduate Scholarship	9000*	as advertised	For postgraduate research in mathematics
Harriett Beard Scholarship	9000*	as advertised	For postgraduate research in the physical sciences, engineering, veterinary science and dentistry
Edgeworth David Travelling Scholarship		as advertised	For postgraduate research in geology
Charles Gilbert Heydon Travelling Fellowship	10 500	as advertised	For postgraduate research in biological sciences
Herbert Johnson Travel Grants	under review	31 May	Travel grant for graduates holding travelling scholarships
James King of Irrawang Travelling Scholarship	1000	31 May	Travel grants for graduates in any faculty
G.H.S. & I.R. Lightoller Scholarship	1000'	as advertised	Travel grants for graduates in Arts, Medicine, Science, Veterinary Science, Agriculture and Engineering
University of Sydney Postgraduate Research Travelling Scholarships (2)	9000*	31 October	Graduates from any Faculty
J.B. Watt Travelling Scholarship	9000*	as advertised	Graduate with Honours I in any faculty
Eleanor Sophia Wood Travelling Fellowships	varies	31 March	For overseas study or research to persons who have been engaged full-time for at least three years in teaching or postgraduate research in the University of Sydney
Awarded by external bodies			
Caltex	24 000	30 September	Female graduates completing degree or diploma in year of application
Commonwealth Scholarship and Fellowship Plan Awards	living allowance ⁵	September	Tenable in British Commonwealth countries. For research in any field
Gowrie Postgraduate Research Scholarship (2)	4000*	31 October	Descendants of ex-servicemen. For research in any field
Nuffield Foundation Dominion Travelling Fellowship		February	For research in any field
Rhodes Scholarship	£3500+ return air-fare	1 October	Age limit 25. For tenure at the University of Oxford
Rotary Foundation Fellowships			For research in any field
Royal Australian Chemical Institute Comforth Medal	medal	varies	Best Australian chemistry PhD thesis in the preceding 13 months
Rutherford Scholarship	£3850 (under review)	14 December	For experimental research in any branch of the natural sciences
Shell Postgraduate Scholarship	£3600*	25 September	Graduate in Arts, Science and Engineering
H. Tasman Lovell Memorial Medallion			For best thesis for PhD degree in Department of Psychology
Ormsby Hamilton Radio Prize	600	awarded every two years	For an essay in any aspect of radio science

*Additional benefits include cost of travel and payment <af fees.

Presentation of Theses

The following information is presented for the guidance of candidates. It should be regarded as a summary only. Candidates should consult the University's *Calendar* and the *Postgraduate Studies Handbook* and the Faculty of Science for the most current and detailed advice. The Postgraduate Studies Handbook is available on the University's home page (<http://www.usyd.edu.au/su/planning/pghand/pgcon.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 Postgraduate Studies Committee, a thesis may have an absolute upper limit of 100 000 words.

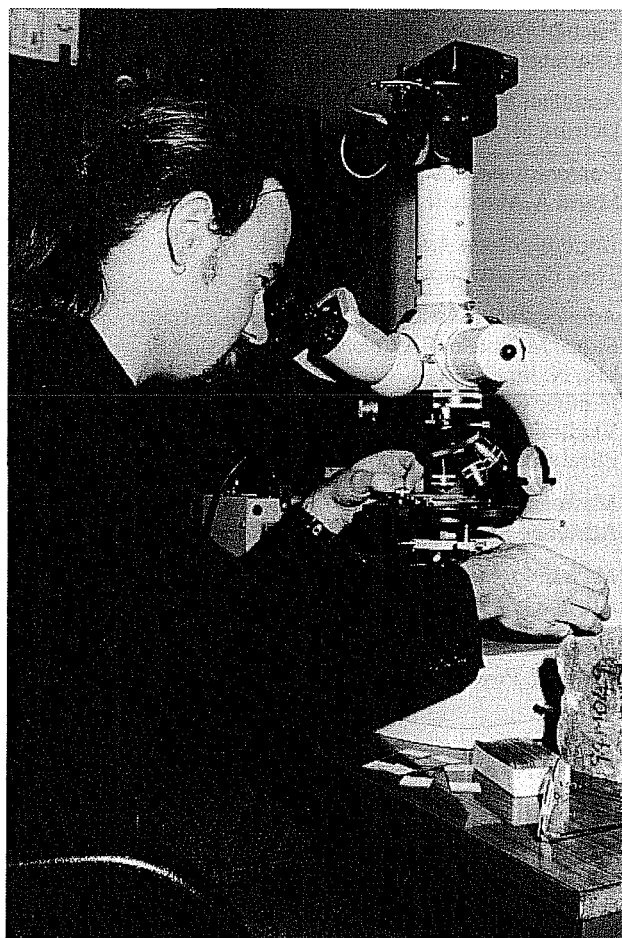
Amendments do not have to involve re-keying if a black ink/biro amendment is clear. Amendments can also be made by way of an appendix to the thesis.

Candidates are advised to consult the SUPRA publication, *Practical Aspects of Producing a Thesis at the University of Sydney* for other guidelines and suggestions in addition to the formal requirements above.

Summary

Within the Faculty of Science, there are no formal requirements / guidelines other than those listed above. There are no requirements for single/double spacing or single/doubled sided presentation, nor point size,

Figure presentation, format of bibliographic citations, etc. Candidates should however, be aware that, if the degree is awarded, the thesis becomes a public document, the quality of which reflects on the ability of the candidate. Moreover, utilising a format which will make the examiners' tasks easier is obviously sensible.



FACULTY

The Faculty of Science

Carlaw Building F07
The University of Sydney
N.S.W. 2006
Telephone +61 (02) 9351 3021
Facsimile +61 (02) 9351 4846
e-mail facsci@scifac.su.oz.au

Acting Dean

Associate Professor Helen C. Beh

Pro-Deans

Associate Professor Christopher B. Gillies
Associate Professor Anthony F. Masters

Associate Deans

Associate Professor Gerald M. Holder
Associate Professor Brian W. James
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Associate Professor Cedric D. Shorey
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Associate Professor Donald E. Taylor
Dr Michael A.W., Thomas

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Resources Manager

Dorothea Sophia, BEd Deakin

Faculty Manager

Charlene Griffiths, BA

Assistant to the Faculty Manager

Deirdre McKay, BA U.N.S.W.

Postgraduate Adviser

Maria A. Marshall

Undergraduate Adviser

Thea Papageorgiou

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Lisa N. Jones, BA
Jennifer R. McCallister
Vladimir Y. Tretyakov, BJourn L.H.M.P.C. Ukraine
Elisabeth van de Wetering, BA

Marketing Manager

Adrienne Jerram, BA Macq. GDipCommMan U.T.S

Marketing Assistant

Alison Gall, BACom U.C.

Professional Development Course Coordinator

Anne M. Powell, BBusCom Q.U.T.

DEPARTMENTS/SCHOOLS

Agricultural Chemistry and Soil Science

*Professor in Agricultural and Environmental Chemistry
(Personal Chair)*

Ivan R. Kennedy, PhD DSc(Agric) W.Aust. FRACI CChem
Appointed 1996

Professor in Soil Science (Pedometrics) (Personal Chair)

Alexander B. McBratney, BSc PhD Aberd.
Appointed 1995

Associate Professors

Les Copeland, BSc PhD, MRACI CChem
Anthony J. Koppi, BSc PhD Aberd.

Senior Lecturers

Robert A. Caldwell, MSc PhD, MRACI CChem
Harold R. Geering, MS C'nell
Edith M. Lees, BSc PhD Lond.

Research Associates

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Shahid Chohan, MSc Faisalabad PhD U.M.I.S.T.
Sunitha Katupitiya, MSc Perad'ya PhD Leuven

CRC for Sustainable Cotton Production

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Francisco Sanchez-Bayo, MSc PhD Madrid (Auton)

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Senior Research Assistant

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Pamela Clifford

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FRSChem

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Rodney J. Roughley, BScAgr PhD Lond.

Research Affiliate

Claudine Elmerich, DSc Paris

Anatomy and Histology

Challis Professor of Anatomy

Jonathan Stone, BSc(Med) PhD DSc, FAA
Appointed 1987

Personal Chair in Visual Neuroscience

Bogdan Dreher, MS PhD Warsaw DSc

Reader

Johnston W. McAvoy, BSc Belf. PhD Flin.

Associate Professors

Richard J. Bandler, BA Miami (Ohio) PhD Carnegie-Mellon
DSc

*Staff as known at September 1996.

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 Coral G. Chamberlain, MSc PhD

Research Fellow

Tailoi Chan-Ling, MOptn PhD *U.N.S.W.*, FAAO

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Visiting Scholar

Stephen Cui

Biochemistry

McCaughey Professor

Robert Gerard Wake, MSc PhD, FAA
 Appointed 1977

Professor

Philip William Kuchel, BMedSc MB BS *Adel.* PhD A.N. LT.
 Appointed 1980

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Lecturer

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 Joan P. Loke, GradDipEdStudies *Kuring-gai* C.A.E. MSc

Senior Research Fellow

J. Mitchell Guss, BSc PhD

Research Fellow

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 DipBusStud *N.E.*

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 Sharin Saad

Librarian

Sarah L. Barrett, DipIM(Lib) *U.N.S.W.* BA

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 Anne Madden (part-time)
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Ronald Hill, MSc PhD
 Michael A. Messer, MSc PhD *Melb.*

Honorary Research Associate
Stephen D. Lyons, BSc *Melb.* PhD

Human Nutrition Unit

Boden Professor of Human Nutrition

Ian Douglas Caterson, BSc MB BS PhD, FRACP
Appointment from 1 January 1997

Professor

Arthur Stewart Truswell, MB ChB MD *Cape T.*, FRCP FFPHM
FRACP (half-time)
Appointed 1978

Associate Professor

Janette C. Brand Miller, BSc PhD *U.N.S.W.*, FAIFST

Senior Lecturers

Margaret A. Allman, BSc PhD DipNutrDiet
Samir Samman, BSc PhD

Kellogg Lecturer in the Human Nutrition Unit
Philippa Wall, BSc DipNutrDiet PhD

Lecturer

Sue Amanatidis, BSc DipNutrDiet (half-time)

Associate Lecturer

Sue Munro, BSc DipNutrDiet DTeach

Professional Officer

Ziaul I. Ahmad, BAppSc(Biomed) MAppSc *U.T.S.*

Laboratory Assistant
Zaffar Khan (half-time)

Administrative Assistants
Marianne Alexander
Isa Hopwood (half-time)

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June Bullock, BSc CertDiet
Susan Burke, BSc DipFoodTech *U.N.S.W.* DipNutrDiet
Jo Burton, BSc DipNutrDiet
Susan Dumbrell, BSc MNutrDiet
Jane Francis, BSc DipNutrDiet
Peter Guest, DipEd *W.Syd.* DipSportsSc MBA *Macq.* BSc
DipNutrDiet
Jenny Hazelton, BSc *A.N.U.* DipNutrDiet
Hilda High, BSc DipNutrDiet
Wendy Hodge, BSc *U.N.S.W.* DipNutrDiet
Margaret Holyday, BSc DipNutrDiet
Michelle Hughes, BSc DipNutrDiet
Keryn Kahl, BSc *Adel.* DipHNutDirt *Flin.*
Nina Karen, BSc DipNutrDiet
Helen Knott, BSc CertDiet *N'cle(N.S.W.)*
Maria Kokkinakos, BSc DipNutrDiet
Debbie Lillienthal, BScHEc *Canada* GradDipEdStud
Maria Loveday, BSc *Deakin* CertDiet *Vic.*
Jenny McDonnell, BSc DipNutrDiet
Felicity McLean, BSc *U.N.E.* GradDipNutrDiet *Q.I.T.*
Anne McMahon, BSppSc *W.Syd.* MNutrDiet
Marcelle Middleton, BSc *A.N.U.* BSc *U.C.* DipNutrDiet
Lesley Miller, BSc DipNutrDiet
Sandra Millet, BSc DipNutrDiet
Dianne Muniz, BSc *U.N.S.W.* DipNutrDiet *Adel.*
Gillian Nesbit, BSc DipNutrDiet
Margaret Nicholson, BSc DipNutrDiet
Rita Nicolaou, BSc DipNutrDiet
Nola Paterson, BSc *Qld* DipNutrDiet
Maria C. Plaza, BSc DipNutrDiet *Chile* DipEd *N.E.*
Joanne Prendergast, BSc *Acad.Pdt Montr.* MHPed *U.N.S. W.*
Julianne Quaine, BSc *A.N.U.* DipNutrDiet

Jennifer Ravens, BSc CertDiet
Leigh Reeve, BSc *Qld* DipNutrDiet
Elizabeth Robinson, BAppSc *W.Syd.* MNutrDiet *W'gong*
Beth Rohrlach, BSc DipNutrDiet
Janice Sangster, BSc DipNutrDiet
Angela Saunders, BSc(Diet) *Loma Linda* RD *U.S.A.*
Fifi Spechler, BSc DipNutrDiet
Brett Thompson, BSc GradDipDiet *Curtin*
Dian Tranter, BSc DipNutrDiet
Deanne Waldron, BSc *U.N.E.* MNutrDiet
Kathy Walsh, BSc DipNutrDiet
Peter Williams, BSc *A.N.U.* MHP *U.N.S.W.* DipNutrDiet
Sue Wright, BSc DipNutrDiet

Biological Sciences

Challis Professor of Biology

Ian Douglas Hume, BSc(Agric) PhD *W.Aust.* DSc *N.E.*,
FAIBiol
Appointed 1987

Professor of Biology

David Joseph Patterson, PhD *Brist.* DSc *Qu.*
Appointed 1992

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

Professor in Evolutionary Biology (Personal Chair)

Richard Shine, BSc *A.N.U.* PhD *N.E.* DSc
Appointed 1993

Professor in Plant Sciences (Personal Chair)

Anthony W.D. Larkum, BSc *Lond.* DPhil *Oxf.*, ARCS

Reader

Alan W. Meats, BSc *Durh.* *FhDN'cle(U.K.)*, FRES (*McCaughy*
Lecturer in Entomology)

Associate Professors

William G. Allaway, MA *Camb.* PhD *Lane.*
Patricia J. Armati, MSc PhD, MAIBiol
Christopher B. Gillies, MAgrSc *Qld* PhD *Alta*
Rosalind T. Hinde, BSc PhD

Director of First Year Biology

Mary Peat, BSc *Birm.* PhD *Brist.*

Senior Lecturers

Christopher Dickman, BSc *Leeds* PhD *A.N.U.*
Ove Hoegh-Guldberg, PhD *Calif.* BSc
Michael J. Kingsford, BSc *Cant.* MSc PhD *Auck.*
Stephen Morris, BSc *Lond.* PhD *Glas.*
Robyn L. Overall, BSc *U.N.S. W.* PhD *A.N.U.*
Michael B. Thompson, BSc PhD *Adel.*

Lecturers

Susan Franklin, BSc *Aberystwyth* MSc *S'ton* PhD
Murray J. Henwood, BSc *Well.* PhD *A.N.U.*
Bruce Lyon, BSc PhD *Monash*
Peter McGee, BAgSc PhD *Adel.* DipHEd *U.N.S. W.*
Jan Marc, BSc PhD *U.N.S. W.*
Benjamin Oldroyd, BScAgr PhD
Glenda Wardle, MSc *Auck.* MS PhD *Chic.*

Associate Lecturers

Russell Graham, BAppSc *U.T.S.* DipEd *Syd.Inst.Ed.* BSc
Dieter Hochuli, BSc *Monash*
Kaliope Katsikaros, MSc

Osu Lilje, BSc
Robert Paterson, BSc *James Cook*
Joanna Rush, BSc
Deborah Shearman, MSc
Charlotte Taylor, BSc *Bund.* PhD *Aberd.*
Jennifer Wilkinson, BSc *Qld* PhD *Macq.*

Associate Lecturers (half-time)
Laura Danckwerts, BSc PhD *U.N.S. W.*
Eric Dorfman, BA *Calif.* MSc *San Jose' State*
Elizabeth May, BSc DipEd *U.N.S. W.*
Jennifer Saleeba, BSc PhD *Melb.*

ARC Senior Research Fellow
Marianne Frommer, BSc PhD

Senior Research Associate
John Harper, BSc PhD *Qu.*

Research and Postdoctoral Fellows, Research Associates and Research Academics

Christopher Airriess BSc PhD *Calg.*
Ambariyanto, BSc *Deponegoro* PhD
Catherine Bernard, DEA PhD *Clermont-Ferrand*
Melissa H. Brown, BSc PhD *Adel.*
Karen M. Cullen, BSc *Brown* PhD
Neville B.C. Firth, BSc PhD *Monash*
Adrienne Grant, PhD *A.N.U.*
Ross Jones, BSc *S'ton.* PhD *James Cook*
Michael Lee, BSc *Qld* PhD *Camb.*
William K. Loh, PhD (half-time)
Thomas Madsen, PhD *Lund*
Mats Olsson, BSc PhD *Gotenborg*
Ian Paulsen, BSc PhD *Monash*
Raymond J. Ritchie, BSc PhD
Gregory W. Rouse, MSc *Qld* PhD
Jennifer Saleeba, BSc PhD *Melb.*
An Van der Borre, LicGent PhD *A.N.U.*

Professional Officers Grade III

Mark Curran, BSc(GenSc)
Janice L. Jacobs, BSc(GenSc)
Michael Joseph, BSc

Administrative Officers

Margaret Atkinson, MSc *Auck.* (Half-time)
Maureen Claxton, BA *R'dg* DipEd *N.E.*

Computer Systems Officer

Michael Kong, BSc

Senior Technical Officers

George Barrett, HNC(ApplBiol) *U.K.*
Virginia Klomp, BiolTechCert BiolTechHigherCert *S.T.C.*
Robert Mackay-Wood, BSc *Cant.*
Andrew Oulianoff
Basil Panayotakos
Malcolm Ricketts, BSc *Macq.* PhotogCert *S.T.C.*
Salvatore Ruggeri
Heather Sowden, BiolTechCert *S.T.C.*
Klaus-Peter Suckau, DiplIng *Tech.Univ. Munich*

Technical Officers

Christa Blaess, BAppSc *R.M.I.T.*
Margaret Gilchrist, BiolCert *S.T.C.*
Graham Housefield, BiolTechCert Arm.T.C. BAppSc *C.Sturt*
Hamish MacKenzie, BiolCert *S.T.C.*
Ralph Maddox, BiolTechCert *Arm.T.C.*
Anne-Laure Markovina, BSc
Claudio Muhlfad, BiolTechCert *S.T.C.*
Christine Newman, BAppSc *U.T.S.*
Helen Orphanides, BSc
Kylie Robert

Technical Officer (half-time)

Mark Dickson, BSc

Curator of Zoological Collections

Angela Low, BSc (part-time)

Laboratory Assistants

Stephen Burrowes, BSc
Leslie Edwards (half-time)
Hamlet Giragossyan (half-time)
Mihaly Ferenczi, BAgSc *Godallo*

Animal House Attendant (part-time)

Cara Chambers

Attendants

Hamlet Giragossyan (half-time)
Julio Pena

Caretaker (Crommelin Biological Field Station, Pearl Beach)

Eric Pearce

Administrative Assistants

Brigid McKay, BSc *Auck.*
Sabine Krause
Roslyn Malin (half-time)
Paulette Ripikoi
Sylvia Warren
Pamela Wray, BA *N.E.*

Honorary Appointments

Emeritus Professors

Donald Thomas Anderson, AO, PhD *Lond.* DSc *Lond.*, and
Syd., FRS FLS FAIBiol
Charles Birch, BAgSc *Melb.* DSc *Adel.*, FAA FFAAS
Michael G. Pitman, OBE, MA PhD ScD *Camb.*, FAA
Spencer Smith-White, DScAgr, FAA
John Alexander Thomson, MSc MAgrSc PhD *Melb.*

Visiting Professor

Frank Talbot, BSc *Witw.* PhD *Cape T.*

Honorary Research Associates

Heather Adamson, PhD *Macq.* BSc
Tony D. Auld, BSc PhD
Augusto Becerra, MSc *Cayetano Heredia*
Iqbal Bhandal, MSc PhD *Punjab*
Ross A. Bradstock, BSc PhD
Donald Colgan, BSc *A.N.U.* PhD *Melb.*
Stephen Cork, BSc PhD *U.N.S. W.*
Graham J. Faichney, BSc(AgrSc) MScAgr PhD DAgSc *Melb.*
Timothy Hannery, BA *LaT.* MSc *Monash* PhD *U.N.S.W.*
Leslie Hall, BAppSc *Carib.* PhD *Qld*
George Humphrey, LLB *U.N.S.W.* BA PhD
Julia M. Hush, PhD
Francis L. Lemckert, MSc
Valerie B. Morris, BSc PhD *Edin.*
John D. PoUard, BSc MB BS PhD
John A Sved, BSc PhD *Adel.*

Honorary Teaching Associates

Walter E. Boles, BSc *Emporia State*
Allen E. Greer, BA *Stan.* PhD *Harv.*
Patricia A. Hutchings, BSc *Lond.* PhD DSc *N'cle(U.K.)*
Jeffrey M. Leis, BSc *Arizona* PhD *Hawaii*
John R Paxton, BA MSc PhD *S.Calif.*

Visiting Scholars

Michael Helfrich, PhD *Munich*
William Vickery, MS PhD *Quebec*

Chemistry

Professor of Chemistry (Theoretical Chemistry)

Anthony D.J. Haymet, PhD *Chic.* DSc, FRACI CChem
Appointed 1991

Professor of Chemistry (Inorganic Chemistry)

Len Lindoy, PhD DSc *U.N.S. W.*, FAA FRACI CChem FRSC
Appointed 1996

Professor of Chemistry (Physical Chemistry)

Donald Harold Napper, PhD *Camb.* MSc, FAA FRACI CChem
Appointed 1985

Professor of Chemistry (Organic Chemistry)

Sever Sternhell, PhD DSc *DIC Lond.* MSc, FAA FRACI CChem
Appointed 1977

Professor of Chemistry

Hans Charles Freeman, MSc PhD, FAA FRACI FRSC CChem
Appointed 1971

Professor in Chemistry (Organic Chemistry) (Personal Chair)

Leslie D. Field, PhD DSc, FRACI CChem
Appointed 1994

Professor in Chemistry (Polymer Chemistry) (Personal Chair)

Robert G. Gilbert, PhD *A.N.U.* BSc, FAA FRACI CChem
Appointed 1992

Professor in Chemistry (Organic Chemistry) (Personal Chair)

John T. Pinhey, PhD DSc, FRACI CChem
Appointed 1992

Professor of Chemistry (Organic Chemistry) (Personal Chair)

Walter Charles Taylor, PhD DSc *Mane.* MSc, FRACI CChem
Appointed 1985

Reader

Peter A. Lay, BSc *Melb.* PhD *A.N.U.*, FRACI CChem

Associate Professors

Robert S. Armstrong, MSc PhD, MRACI CChem
James K. Beattie, BA *Prin.* MA *Camb.* PhD *Northwestern*,
FAAAS FRACI FRSC CChem
Maxwell J. Crossley, BSc PhD *Melb.*, MRACI CChem
John C. Mackie, PhD DSc, FRACI CChem
Anthony F. Masters, BSc *Melb.* PhD *A.N.U.*, FRACI CChem
Damon D. Ridley, BSc PhD, FRACI CChem

Director of First Year Studies

Raymond K. Pierens, MSc PhD, MRSChem MRACI CChem

Senior Lecturers

George Bacskay, BSc *Melb.* PhD *Camb.*
Margaret A. Brimble, MSc *Auck.* PhD *S'ton*
James M. Eckert, BA MSc PhD, MRACI CChem
Trevor W. Hambley, BSc *W.Aust.* PhD *Adel.* FRACI CChem
Margaret M. Harding, BSc PhD, MRACI CChem
Peter R. Harrowell, BSc PhD *Chic.*
Julia M. James, BSc PhD *Lond.*, MRACI CChem
Brendan J. Kennedy/BEd *Melb.* S.C. PhD *Monash*
Anthony R. Lacey, MSc PhD, MRACI CChem
Donald V. Radford, MSc PhD DipEd *N.E.*
Gregory G. Warr, BSc PhD *Melb.*, MRACI CChem

Lecturers

Robert W. Baker, BSc PhD *W.Aust.* ■
Scott H. Kable, BSc PhD *Griffith* DipBusAdmin *Q.I.T.*

Lecturers (fixed-term)

Ronald R. Fenton, BSc PhD *Macq.*, MRACI CChem
Ian J. McNaught, BEd BSc PhD *Monash*
Mark W. Rutland, BSc PhD *A.N.U.*

ARC Senior Research Fellows

Addy Pross, BSc PhD (*Organic Chemistry*)
Jeffery R. Reimers, BSc PhD *A.N.U.*, MRACI CChem
ARC Research Fellow
Christopher J Burns, BSc PhD *Melb.*
Wendy A. Clucas, BSc PhD, MRACI CChem

QEII Research Fellows

Barbara Messerle, BSc PhD, MRACI CChem
Simone C. Vonwiller, BSc PhD, MRACI CChem

Senior Research Associates

Jognandan Prashar, BSc MSc *Meerut* PhD *U.N.S.W.*
Saman Sandanayake, BSc PhD *Belf.*
Charles W. Tansey, BSc PhD, MRACI CChem
Peter Turner, BSc *Flind.* MSc PhD *U.N.E.*
Sally Wright-Lucas, BSc PhD *LaT.*
Ping Yin, PhD *Sus.*, MRSC CChem

Research Associates

Luke Doepel, BSc
Mark A. Houghton, BSc PhD *U.N.S.W.*
Paul Humphrey, PhD GradDipEd *Adel.*, MRACI CChem
Darryl McConnell, BSc *A.N.U.* PhD *U.N.S.W.*
Christine Paul, BSc *Philippines* PhD *Alta*

Postdoctoral Fellows

Lachlan Hall, BSc
Dugald MacLachlan, BSc PhD *Well.*
Greg Metha, BSc PhD *Monash*

Professional Officers

Bradley Collins, BSc PhD *Qld* (*Optical Spectroscopy*)
Hashim R. Durrani, DME *Karachi* (*Ultracentrifuge*)
Tuan La, BE *U.N.S.W.* (*Electronics*)
Jacques L.E. Nemorin, MSc *Uppsala* PhD (*NMR Spectroscopy*)
Kelvin Picker, BSc PhD, MRACI (*GLC and HPLC*)
Jaroslaw T. Popiolkiewicz (*Electronics*)
Michael P. Smyth, BSc(GenSc) (*Mass Spectrometry*)
Xiaomin Song, PhD *III.* (*Mass Spectrometry*)
Z. John Trafalski (*Electronics*)
V. Hoi Vu, BSc ME MEngSc *U.N.S.W.* (*Instrumentation*)
Chuan-Liang Xie, PhD *III.* (*NMR Spectroscopy*)
Professional Assistant
S. Warren Lazer, BSc PhD

Laboratory Manager

John Duckworth

Assistants to the Head of the School

Pat Matterson
Catherine H. Woods, BA

Administrative Assistants

Vimila Ananda-Rajah
Carolyn Budweg
Manisha Chotalia
Lynne Harvey
Sophie Patsalides
Janet Sassanfar
Lisa Wu

Honorary Appointments**Professorial Fellow**

Dalway J. Swaine, MSc *Melb.* PhD *Aberd.*, FRACI CChem
(*Inorganic Chemistry*)

Visiting Professor

Robert K. Norris, DIC *Lond.* PhD DSc, FRACI CChem

Honorary Associate Professors

Manuel Aroney, AM OBE, PhD DSc, FRACI FRSC CChem
CorrMembAcadAthens
Robert J. Hunter, BSc PhD, FAA FRACI CChem

Research Associates

Peter Hidi, MSc *Bud.*, FRACI CChem
Richard W. O'Brien, BE *U.N.S.W.* PhD *Camb.*

Honorary lecturer

Alan J. Williams, MSc PhD, MRACI CChem

Basser Department of Computer Science

Professors

J. Ross Quinlan, PhD *Wash.* BSc
Appointed 1988

John Rosenberg, BSc PhD *Monash*
Appointed 1991

Associate Professors

Allan G. Bromley, BSc PhD
Robert J. Kummerfeld, BSc PhD

Senior Lecturers

Alan Fekete, PhD *Harv.* BSc
David Feng, MS *Shanghai Jiao Tong* MS PhD *Calif.*
Doan B. Hoang, BE *W.Aust.* ME PhD *N'cle(N.S.W.)*
Judy Kay, MSc
Jeff Kingston, BSc PhD
Ian A. Parkin, BSc PhD *Adel.*
Suleyman Sevinc, BS *Istanbul* MS PhD *Arizona*
Michael Wise, BA BE PhD *U.N.S.W.*

Lecturers

Nitin Indurkha, PhD *Rutgers*
Antonios Symvonis, DipCompEng&InfoSc *Patras* MS PhD
Texas
Wayne Wobcke, BSc MSc *Qld* PhD *Essex*

Associate Lecturers

James Donovan, BA DipCompSc MSc
Anthony Greening, BAppSci *C.Sturt*
Scott Hopwood, BSc *U.T.S.*
Michael Hitchens, BMath PhD *N'cle(N.S.W.)*
Michael Kolling, DiplInfomatik *Bremen*

Computer Systems Supervisor

Raymond Loyzaga, BSc *U.N.S.W.*

Computer Systems Officers

John Bignucolo, MSc
Piers R. Dick-Lauder, BSc DipCompSc *Brad.*
Roy Giles, BSc *Wales*
Bruce Janson, BSc
Tim Nicholson, PhD
Greg Ryan, BSc

Senior Technical Officers

Allan Creighton
Remo Di Giovanni
Arthur Scott

Technical Officer

Witold Janus

Administrative Officer

Helene Orr

Administrative Assistants

Peggylu
Georgina Keatch

Honorary Appointments

Emeritus Professor

John Makepeace Bennett, AO, BE(Civ) BE(Mech&Elec) BSc
Qld PhD *Camb.*, FTS FACS FBCS FIEAust FIMA

Honorary Research Associates

Norman Foo, ME *Cant.* MA PhD *Mich.*

Frans Henskens, BMath PhD DipEd DipCompSc
N'cle(N.S.W.)

Jack R. Phillips, BMEchE PhD *Melb.*

Eric Tsui, PhD *Deakin*

Geography

McCaughey Professor

Associate Professors

John Connell, BA PhD *Lond.*
Andrew D. Short, MA *Hawaii* PhD *Louisiana State* BA
Robin F. Warner, BA *Birm.* PhD *N.E.* (Head of Department)

Senior Lecturers

David E.M. Chapman, MEngSc *U.N.S.W.* BA PhD
Peter J. Cowell, BA PhD
Colin Davey, BA *U.N.E.* PhD *Macq.*
Deirdre Dragovich, MA *Adel.* PhD
Philip Hirsch, BA *Oxf.* MPhil *Dundee* PhD *Lond.*

Lecturers

Stephen J Gale, MA *Oxf.* PhD *Keele*
Jamie Gough, BA PhD *Oxf.*

Associate Lecturers

Gavin Doyle BSc *N'cle(N.S.W.)*
Samantha Graham, BComm *U.N.S.W.* MSc *Edin.*

Chief Cartographer

John E. Roberts

Honorary Appointments

Emeritus Professor

Maurice T. Daly, BA PhD
Trevor Langford-Smith, BAMEZb. MSc *Adel.* PhD *A.N.U.* BSc

Honorary Research Associates

Chris Devery, BA *U.N.S.W.* PhD
John P. Hudson, MA PhD *A.N.U.*
Robert A. Jones, BEng *W.Aust.* MEng *Auck.* MSc *Lond.*
Peter Roy, BSc PhD *Imp.Coll.*
John Rutherford, BA PhD *A.N.U.*
Philip D. Tilley, BA CertEd *Birm.* DrPhil *Bonn* MSc
Edward Wheelwright, DFC MA *St.And.*

Geology and Geophysics

Edgeworth David Professor of Geology and William Hilton

Hove!! Lecturer

Peter John Davies, BSc *Leic.* PhD *Sheff.*
Appointed 1991

Professor of Geophysics

Ian M. Mason, BScEng *Cape T.* PhD *Edin.*
Appointed 1995

Senior Lecturers

Gavin F. Birch, MSc PhD GradDipIndAdmin *Cape T.*
Geoffrey L. Clarke, BSc PhD *Melb.*
John B. Keene, BAgEc ME PhD *Calif.* BSc
Eric A.K. Middlemost, MSc PhD *Cape T.*
Joop Stienstra, MSc *Defi (netherlands)*

Lecturers

Roger Buick, BSc PhD *W.Aust.*
Michael Glen Hughes, BSc PhD
Alexandra R. Isern, BSc *Flor.* MSc *Rhode Island* PhD *E.T.H.*
Zurich
Keith Klepis, BA *Colgate* PhD *Texas*
Dietmar Miiller, BSc *Kiel* PhD *Calif.*

Associate Lecturers

Thomas C.T. Hubble, MSc *U.N.S.W.* MSc DipEd
Colin Wilkins, BSc *Hull* PhD *James Cook*

Honorary Appointments

Honorary Research Associates

Mike Asten, PhD *Macq.*
 David F. Branagan, PhD, FGS
 David Clark, MSc
 Alan A. Day, PhD *Camb.* BSc, FRAS
 Donald W. Emerson, BE MSc *U.N.S. W.* PhD, FAIG FAIMM
 Richard Facer, BSc PhD
 Gabor Foldvary, MSc *U.N.S. W.*
 Larry Harrington BSc PhD
 Hendrik Heijnis BSc PhD
 Roger Henderson, MSc
 Huw Jenkins, PhD *Wales*
 Philip Mulhearn, PhD
 Gordon Packham, BSc PhD
 Anne Reeckmann, BSc PhD *Melb.*
 Erwin Schneiber, RNDR *J.A. Comenius U.*
 Barry Webby, MSc *N.Z.* PhD DSc *Brist.*, FGS
 Kenneth Williams, MSc *N.E.* PhD *A.N. U.* BSc

Mathematics and Statistics

Professors

Edward Norman Dancer, BSc *A.N.U.* PhD *Camb.*, EAA
 Appointed 1993
 Eugene Seneta, MSc *Adel.* PhD *A.N.U.*, FAA
 Appointed 1979

Professor in Pure Mathematics (Personal Chair)

Gustav Isaac Lehrer, PhD *Warm.* BSc
 Appointed 1990

Professor in Mathematical Statistics (Personal Chair)

John Robinson, BSc *Qld* PhD
 Appointed 1991

Professor (fractional)

Peter Robert Wilson, BA MSc *Melb.* PhD, FRAS

Readers

John J. Cannon, MSc PhD
 Donald I. Cartwright, PhD *III.* BSc
 Jonathan Hillman, BSc *W.Aust.* AM *Harv.* PhD *A.N.U.*
 Tzee-Char Kuo, BS *Natnl Taiwan* PhD *Chic.*
 King-Fai Lai, BSc *Lond.* MPhil PhD *Yale*

Associate Professors

Christopher J. Durrant, MA PhD *Camb.*
 Edward D. Fackerell, MSc PhD
 Terence M. Gagen, BSc *Qld* PhD *A.N. U.*
 William G. Gibson, MSc *Cant.* PhD *U.N.S.W.*
 Ronald W. James, BSc PhD
 John M. Mack, MA *Camb.* BSc PhD
 Donald E. Taylor, MSc *Monash* DPhil *Oxf.*
 Robert F.C. Walters, MSc *Qld* PhD *A.N.U.*
 Denis E. Winch, MSc PhD, FRAS

Senior Lecturers

Peter W. Buchen, PhD *Camb.* BSc
 Koo-Guan Choo, BSc *Nan.* MSc *Ott.* PhD *Br.Col.*
 Christopher M. Cosgrove, BSc PhD
 David Easdown, BA *A.N.U.* PhD *Monash*
 Roger W. Eyland, PhD *Camb.* MSc
 W. Barrie Fraser, BSc *ME Cant.* SM PhD *Harv.*
 David J. Galloway, BA PhD *Camb.*
 Robert B. Howlett, BA PhD *Adel.*
 Charles Macaskill, BSc PhD *Adel.*
 Gordon P. Monro, BSc *Monash* PhD *Brist.*
 Nigel R. O'Brian, MA *Camb.* PhD *Warm.*
 William D. Palmer, MLitt MA *N.E.* BSc PhD DipEd
 Malcolm P. Quine, MSc *Lond.* PhD *A.N.U.*
 James N. Ward, BSc PhD

Neville C Weber, MSc PhD
 Karl H. Wehrhahn, BSc *Alta* PhD

Lecturers

Sandra C. Britton, BSc *U.N.S. W.* MA
 Howard J. D'Abrera, PhD *Calif.* BSc
 Daniel Daners, PhD *Zurich*
 Humphrey M. Gastineau-Hills, MSc PhD
 Jenny Henderson, DipEd *Flin.* MSc
 Alexander V. Iltyakov, MSc PhD *Novosibirsk*
 David J. Ivers, BSc PhD
 Anwar Joarder, BSc MSc *Dhaka* MSc PhD *Western Ontario*
 Hugh Luckcock, BSc *Auck.* PhD *N'cle(U.K.)*
 Mary R. Myerscough, DPhil *Oxf.* MSc
 Adrian M. Nelson, PhD *Lond.* BSc
 Adam Parusinski, MSc *Gdansk* PhD *Jagiellonian*
 Laurentiu Paunescu, MSc *Bucharest* PhD
 M. Shelton Peiris, DipMath MSc *Peradeniya* PhD *Monash*
 Mary C. Phipps, MSc
 Vladislav Zheligovsky, DipSci PhD *Moscow*

Associate Lecturers

Mark J. Craddock, BSc PhD *U.N.S.W.*
 Stephen W. Goulter, BSc *Cant.* MSc DipOR *Well.*
 Matthew Hardman, BSc
 Xuezhong He, BSc *Ningxia* MSc *Hebei* PhD *Flin.*
 Jennifer Kearns, BSc *U.N.S.W.* BA *Macq.*
 Jennifer S. Law, BSc
 Michael Stewart, BSc MA
 Vinsensia Suhana, BSc *Auck.* BSc *U.N.S. W.*
 William R. Unger, MSc PhD

Computer Systems Officers

Geoffrey Bailey, BSc
 Robert B. Pearson, BSc ADipA *M.C.A.E.*
 James S. Richardson, PhD *Warw.* MSc
 Paul Szabo, BSc *Havana*
 Michael R. Wilson, BSc
 Senior Research Associate
 Barbu-Rudolf Berceanu, PhD *Bucharest*

NH&MRC Research Fellow

Rosemary S. Thompson, BSc *A.N.U.* PhD

ARC Postdoctoral Research Fellow

Andrew L. Matacz, BAppSc *Curtin* BSc *W.Aust.* PhD *Adel.*

Postdoctoral Fellows

Piergiulio Katis, BSc
 Stephen G. Lack, BSc
 Shusen Yan, MS *South China Uni.Tech.* PhD *Wuhan Inst.*

ARC Research Associate

Harm Voskuil, PhD *Groningen*

Senior Research Assistants

Bruce C. Cox, BSc
 Allan K. Steel, BA

Research Assistants

Aaron Avagliano, BMath *W'gong*
 Gregory Cave, BSc
 Yan Li, BSc PhD *N'cle(N.S. W.)*

Administrative Officers

Deirdre Lawrie, MA *Dund.*
 Kazuko Yamamoto, BA *Tokyo Women's Christian Coll.*

Administrative Assistants

Flora Armaghanian
 Viola Chao
 Yit-Sin Chpo
 Janet Doyle
 Adele James
 Sonia Morr

Honorary Appointments

Emeritus Professors

Gordon Elliott Wall, BSc *Adel.* PhD *Camb.*, FAA
Gregory Maxwell Kelly, BA PhD *Camb.* BSc, FAA

Honorary Research Associate

David C. Edelman, MPhil PhD *Col. SM M.I.T.*
Stephen Glasby, BSc PhD
Michael S. Johnson, BSc PhD
David E. Rees, MSc PhD
Ross H. Street, BSc PhD

Microbiology

Professor

Peter Richard Reeves, BSc PhD *Lond.*, MASM
Appointed 1985

Reader

Thomas Ferenci, BSc *Lond.* PhD *Leic.*

Senior Lecturers

Trevor Duxbury, BSc PhD *Liv.*, MASM
Peter B. New, BAgSc *Tas.* PhD *Adel.*

Lecturers

Deidre A. Carter, BSc *Otago* PhD *Lond.*
Ilze Dalins, MSc
Ian Humphery-Smith, BSc PhD *Qld*

Associate Lecturers

Helen M. Agus, MSc *U.N.S.W.*, MASM
Disa J. Pryor, BMedSc

Honorary Appointments

Honorary Associates

K. Yip Cho, BSc *U.N.S.W.* PhD *A.N.U.*
WiUiam G. Murrell, PhD *Oxf.* DScAgr, FAIFST MASM

Pathology

Cell Pathology

Professor

Nicholas H. Hunt, BSc PhD *Aston*
Appointed 1989

Reader

John R. Gibbins, MDS PhD

Senior Lecturers

Brett D. Hambly, BSc(Med) MB BS PhD
Nicholas J.C. King, MB ChB *Cape T.* PhD *A.N.U.*

Pharmacology

Professor of Clinical Pharmacology

J. Paul Seale, PhD *Lond.* MB BS, FRACP
Appointed 1992

Professor

Graham Allen Ross Johnston, MSc PhD *Camb.*, FRACI FTSE
Appointed 1980

Clinical Professor

Gillian M. Shenfield, MA BCh DM *Oxf.*, FRCP FRACP

Associate Professors

Judith L. Black, MB BS PhD, FRACP
Rosemarie Einstein, BSc PhD
Ewan J. Mylecharane, BPharm *V.I.C.* BSc *FhD Melb.*
Graham A. Starmer, MSc *Mane.* PhD

Clinical Associate Professor

Geoffrey G. Duggin, PhC MB BS, FRACP

Senior Lecturers

Robin D. Allan, BSc *Qld* PhD *fames Cook*
Macdonald J. Christie, BSc *Flin.* PhD
Richard Donnelly, MB ChB *Birm.* PhD *Glas.*, MRCP FRACP
Christopher Liddle, MB BS BSc(Med) *U.N.S.W.* PhD, FRACP
Hilary G.E. Lloyd, BSc *Brist.* MSc PhD *Lond.*
Jill E. Maddison, BVSc PhD, FACVSc
Ian Spence, PhD *Monash* BSc

Associate Lecturers

Izabela M. Brzuszcak, BSc

Honorary Appointments

Honorary Associates

Sandra-D. Anderson, PhD *Lond.* BSc
James Bell, BA MB BS, FRACP
Gregory B. Chesher, MSc PhD
Annette S. Gross, BPharm PhD
David LB. Kerr, BSc PhD *Adel.*
Jennifer Ong, BSc PhD *Adel.*
Diana M. Temple, BSc *W.Aust.* MSc PhD
Sandra N. Webb, BPharm *Vic.I.C.* PhD *Strath.*

Pharmacy

Professor of Pharmaceutical Chemistry

Basil Don Rouf ogalis, MPharm PhD DSc, MPS
Appointed 1989

Professor of Pharmaceutics

Kenneth Frederick Brown, MPharm PhD, MPS
Appointed 1992

Professor of Pharmacy Practice

Shalom Isaac Benrimoj, BPharm PhD *Bradford*, MPS
Appointed 1991

Reader

H.T. Andrew Cheung, MSc *H.K.* DIC PhD DSc *Lond.*, FRACI
FRSChem

Associate Professors

Carol L. Armour, BPharm PhD, MPS
Gerald M. Holder, PhD *Lond.* MSc, MPS
Douglas E. Moore, MSc PhD

Senior Lecturers

David J. Cutler, PhD *Lond.* BPharm MSc
Colin C. Duke, BSc *Qld FhDfames Cook*, MRACI
Iqbal M. Ramzan, DipPharm *C.I.T. N.Z.* MSc PhD
Eugene G. Salole, BSc *C.N.A.A.* MPH *Glas.* PhD *Strath.*,
MRPharm FRSH

Lecturers

Philip A. Atkin, BPharm PhD
Hak-Kim Chan, BPharm *N.D.M.C. Taipei* PhD
Elizabeth M. Gipps, MPharm *V.I.C.* DrScNat *E.T.H. Zurich*
DipHPharm, MPS MRPharmS
Ross A. Kennedy, BPharm PhD *Qld*
Ines Krass, BPharm GradDipEd DipHPharm PhD, MPS
Andrew J. McLachlan, BPharm PhD, MPS
Michael B. Morris, BSc PhD

Associate Lecturers

Timothy F. Chen, BPharm DipHPharm, MPS
Erica Sainsbury, BPharm MSc, MPS
Michael D. Smith, BSc *fames Cook*
Susan J. Taylor, MSc *Lond.* BPharm, MRPharmS

Joint Appointments — Teacher Practitioners

Ben J. Basger, BPharm MSc DipHPharm, MPS
Lisa Pulver, BPharm DipHPharm, MPS
Kim Sucic, BSc BPharm DipHPharm
Warwick Marks, BPharm, MPS

Academic (Research only)

Alaina J. Ammit, BAppSc *U.T.S.* MSc PhD
 John W. Holland, BSc *U.N.S.W.* PhD *W.Aust.*
 Margaret Hughes, BSc PhD
 Jane H. Langford, BSc MPharm *Qld* PhD
 Yong Shu Liu, BSc *China* PhD *LaT.*

Professional Officers

Warren A. Olsen, BCom *U.N.S.W.* BPharm MSc, MPS
 Bruce N. Tattam, MSTIA
 Fred T.K. Wong, DipMedTech *S.T.C.* MSc, FACBS

Project Officers

Claudine P. Casson, BA PGDipPsych *Qld*
 Fiona Kelly, BPharm

Senior Research Assistants

Dieu D. Chau, PhD *Macq.*
 Abilio deAlmeida Neto, BSc *U.N.S. W.*

Research Assistants

Chong L.L., BMed
 Dale W. Larden, BPharm PhD
 Qian Li, MSc PhD *Zhongshan*
 Damien Liu-Brennan, BMedSc
 Rosalie A. Robinson, BA MEd GradDipEng *U.N.S.W.*
 Philippa M. Zucker

Senior Technical Officers

Helen Elimelakh, BE *Mendeleev Inst.*
 Bill Rae
 Jiamin You, BSc *Shanghai*

Technical Officers

Neville J. Baker, ADAS *Syd.Inst.Tech.*
 Catherine H. Mortimer, BSc DipEd ADAS *Syd.Inst.Tech.*

Laboratory Assistants

Jenny Bell
 Christopher J. Hick, ADAS *Syd.Inst.Tech.*

Administrative Assistants

Pauline Moore, BA (part-time)
 Lynnette White
 S.H. Gina Ybabao

Administrative Officer

Judy Banwell BA

Computer Liaison

David Hogan, BSc

Librarian

Gail Y. Higgins, BA DipEd GDipLibSc *Ku-ring-gai C.A.E., ALIA*

Attendant

Jay CSullivan

Glassware Cleaners

Freda Kamposos
 Win Kyi

Honorary Appointments**Professorial Fellow**

Barry J. Allen, PhD *W'gong* DSc *Melb.*, FAIP

Honorary Associate

Richard Thomas, PhD MSc, FPS

Honorary Clinical Senior Lecturer

Susan Tett, PhD BPharm

Honorary Clinical Lecturers

Margaret J. Duguid, BPharm DipAdmin
 Gwen M. Higgins, BPharm, FSHP
 Kingsley Ng, BPharm MSc DipFDA, FSHP FAIPM MPS

Terry Maunsell, BPharm, FSHP MPS

William Montgomery, BPharm
 Elizabeth M. Perks, BPharm, FSHP
 Lynn Weekes, BPharm, FSHP

Honorary Clinical Supervisors

Eugenia Fiakos, BPharm
 Stephen Kerr, BPharm

Physics**Professor of Physics (Theoretical Physics)**

Donald Blair Melrose, BSc *Tas.* DPhil *Oxf.*, FAA
 Appointed 1979.

Professor of Applied Physics

Richard Edward Collins, PhD *N.Y.* BSc, FTS FIE
 Appointed 1980

Professor of Physics (Plasma Physics)

Maxwell Howard Brennan, AO, HonDSc *Flin.* BSc PhD,
 FAA
 Appointed 1981

Professor of Physics (Astrophysics)

Lawrence Edward Cram, BSc BE PhD
 Appointed 1987

Professor of Physics (Astronomy)

John Davis, BSc PhD *Mane.*
 Appointed 1987

Professor of Physics (Physical Optics)

Colin J.R. Sheppard, MA PhD *Camb.* DSc *Oxf.*
 Appointed 1989

Professor in Physics (Electromagnetic Physics)

Ross C. McPhedran, BSc PhD *Tas.*

Readers

Richard W. Hunstead, BSc PhD
 David R. McKenzie, BSc PhD *U.N.S.W.*

Telescope Project Manager

Michael I. Large, BA PhD *Camb.*

Associate Professors

Rodney C. Cross, BSc PhD DipEd
 Robert G. Hewitt, BSc PhD
 Brian W. James, BSc PhD
 Ian D.S. Johnston, BSc *Qld* PhD
 Bernard A. Pailthorpe, BSc *U.N.S.W.* PhD *Indiana*
 Lawrence S. Peak, BSc PhD

Senior Lecturers

Ian M. Bassett, MSc PhD *Melb.*
 G. Fergus Brand, MSc *Otago* PhD
 Carol J. Cogswell, MA MArch *Oregon*
 Neil F. Cramer, BSc PhD
 David F. Crawford, BSc PhD
 Martijn de Sterke, MEng *Delft* PhD *Rochester*
 Ian S. Falconer, MSc *NZ.* PhD *A.N.U.*
 James B.T. McCaughan, MSc PhD
 J. Gordon Robertson, BSc *Adel.* PhD
 Peter A. Robinson, BSc PhD
 William J. Tango, BS *Calif.* PhD *Colorado*
 Anthony J. Turtle, BA PhD *Camb.*
 Juris Ulrichs, BSc PhD

Senior Research Fellow

David R. Mills, BSc PhD *U.N.S.W.*

Lecturers

Timothy R. Bedding, BSc PhD
 Andrew J. Booth, BA DPhil *Oxf.*
 Ian J. Cooper, BSc MPhysics DipEd *U.N.S.W.*

Anne Green, BSc *Melb.* PhD
Rosemary M. Millar, BSc *Qld* MEd
John W. O'Byrne, BScPhD

ARC Research Fellows

Elaine M. Sadler, BSc *Qld* PhD *A.N.U.*
Sergei Vladimirov, MSc PhD *Moscow Inst. Phys. & Eng.*

Research Fellows

Yongbai Yin, MSc PhD
Qi-Chu Zhang, MSc PhD *U.N.S.W.*

Associate Lecturers

George Braoudakis, BSc PhD
Joseph Khachan, BSc PhD *U.N.S.W.*
Manjula D. Sharma, MSc DAPh *S.Pac.*

Postdoctoral Fellows

Pal Fekete, BSc PhD
Nicolae Nicorovici-Porambaru, MSc *Bucharest* PhD
Inst. At. Phys. Bucharest
Paul F. Soler, BSc *Autonoma Madrid* PhD

Professional Officers

Andrew Bakich, MSc
Duncan Campbell-Wilson, BSc *A.N.U.*
S. Reza Hashemi-Nezhad, MSc PhD *Birm.*
Philip B. Lukins, PhD

Honorary Appointments

Emeritus Professors

Robert Hanbury-Brown, AC, BScEng DIC *Lond.* DSc *Mane.*
FRS ERAS FAA HonFNA HonFASc MIEE
Charles B.A. McCusker, DSc *Mane.*, MRIA
Harry Messel, CBE, BSc *Qu.* PhD *N.U.I.*
Bernard Y. Mills, BSc ME DScEng, FAA FRS

Honorary Reader

Graham Derrick, BSc *Qld* PhD

Honorary Associate Professors

Brian McInnes, BSc PhD *Qld*
Murray Winn, PhD *Birm.* BSc

Honorary Senior Lecturers

Bruce McAdam, MSc *N.Z.* PhD *Camb.*
Ian Sefton, MSc
Robert Shobbrook, BSc *St.And.* PhD *AN.U.*

Honorary Research Associates

Lindsay C. Botten, BSc *Tas.* PhD
Russell D. Cannon, BA MA PhD *Camb.*
Ian J. Donnelly, BSc PhD
Julienne I. Harnett, DipT *Tas.C.A.E.* BA *Macq.* PhD
David L. Jauncey, BSc PhD
Richard N. Manchester, BSc *Cant.* PhD *N'cle(N.S.W.)*
Francois Oullette, BSc *Montr.* PhD *Laval*
Lindsey F. Smith, BSc PhD *A.N.U.*
Kevin E. Varvell, BSc *W.Aust.* DPhil *Oxf.*

Visiting Professors

Parameswaran Hariharan, BSc *Travancore* PhD *Kerala*
Colin A. Norman, BE *Melb.* DPhil *Oxf.*

Research Centre for Theoretical Astrophysics

Director

Donald B. Melrose, BSc *Tas.* DPhil *Oxf.* FAA

Senior Research Fellow

Lewis T. Ball, BSc PhD

Research Fellows

Simon Johnston, BSc *Edin.* PhD *Mane.*
Jennifer A. Nicholls, BSc *Flin.* PhD *Durh.*
Michelle C. Storey, BSc PhD

Mark A. Walker, BA *Oxf.* PhD *Penn.*
Mark J. Wardle, MSc *Auck.* PhD *Prin.*
Kinwah Wu, MS PhD *Louisiana*

Postdoctoral Fellows

Eric Rowe, BSc PhD
Jeanette I. Weise, BSc PhD *Melb.*

Julius Sumner Miller Fellow

Karl Kruszelnicki, BSc MBioMedE *U.N.S.W.* MB BS

Physiology

Professors

John Atherton Young, AO, BSc(Path) MD BS DSc *Qld.*
FRACPFAA
Appointed 1976
(*Dean of the Faculty of Medicine*)

Maxwell Richard Bennett, BE MSc PhD *Melb.* DSc, FAA
Appointed 1983

David Grant Allen, BSc MB BS PhD *Lond.*
Appointed 1989

Ann E. Sefton, BSc(Med) MB BS PhD DSc
Appointed 1992

Readers

Roger A.L. Dampney, PhD DSc
Joseph F.Y. Hoh, PhD *A.N.U.* BSc(Med) MB BS DSc
Brian J. Morris, BSc *Adel.* PhD *Monash* DSc

Associate Professors

David I. Cook, BSc(Med) MB BS MSc
David F. Davey, BSc PhD *McG.*

Clinical Associate Professor

Christopher O'Neil, BSc PhD *N'cle(N.S.W.)* (*Obstetrics and Gynaecology*)

Senior Lecturers

Nickolas A. Lavidis, BSc PhD
Rebecca S. Mason, MB BS PhD

Lecturers

Simon Carlile, BSc PhD
Lynne J. Cottee, BSc PhD
Miriam Frommer, PhD *Lond.* BSc
Paul R. Martin, BSc PhD
William D. Phillips, BSc PhD

Associate Lecturer

Francoise Janod-Groves, BSc *N.S.W.I.T.* MAppSc *U.T.S.*

Professional Officer Grade II

Alanjoffe, BSc *U.N.S.W.*

Computer Network Manager

John W.A. Dodson, HNC *Lond.*, MIEEIEI Eng

Computer Systems Officer

Yan Li, MEng *Beijing Univ. of Tech.*

Administrative Officer

Yee-Fong Lee, BSocSc(Econ) *Sci.U.M'sia*

Administrative Assistants

Michele L. Fodrd
Christine Hermely, BSc
Michelle R. Tickle

Honorary Appointments

Emeritus Professor

William Burke, BSc PhD *Lond.*

Research Affiliates

Annick Ansselin, BA *Macq.* MSc PhD
William Burke, BSc PhD *Lond.* (*Emeritus Professor*)

Thomas Fitzgibbon, BSc *Vic.* PhD (*Clinical Ophthalmology*)
 Lyn R. Griffiths, BSc *U.N.S.W.* PhD *Griffith*
 Michael D.L. Slater, BSc *U.N.S.W.* FAIMS

Honorary Associate Professor

Barry Gow, MDS PhD, FRACDS

Honorary Associates

Brian G. Cleland, BE *U.N.S.W.* MS PhD *Northwestern DSc*
 Peter M. Wenderoth, MA PhD DSc

Psychology

Professors

Robert Alan Boakes, BA *Cant.* PhD *Harv.*
 Appointed 1989

Stephen W. Touyz, BSc PhD *Cape T.* BSc *Witw.*
 Appointed 1996

Readers

Dale M. Atrens, BA *Windsor* MA *Hollins* PhD *Rutgers*
 Ian S. Curthoys, PhD *Monash* BA
 Lazar Stankov, MA *Belgrade* PhD *Denver*

Associate Professor

Helen C. Beh, BA PhD *N.E.*

Senior Lecturers

Brian D. Crabbe, BA PhD
 Alan E. Craddock, BA PhD
 R.F. Soames Job, BA PhD
 David J. Kavanagh, BA PhD *Stan.* DipPsych
 Cyril R. Latimer, BA PhD
 David J. Livesey, BSc PhD *W.Aust.*
 Roslyn H. Markham, MA PhD
 Terence McMullen, BA PhD
 Joel B. Michell, BA PhD
 John M. Predebon, BA PhD
 David E. Schotte, MS PhD *Virginia*
 John Soyland, MA *Adel.* PhD *Camb.*
 Robyn Tate, MA MPsyh *U.N.S.W.* PhD *N'cle(N.S.W.)*
 Alison M. Turtle, MA
 Michael B. Walker, BSc *WAust.* BA *Adel.* DPhil *Oxf.*

Lecturers

Pauline M. Howie, BA PhD *U.N.S.W.*
 Iain McGregor, MA *Oxf.* PhD
 Rick van der Zwan, BSc PhD
 Stephanie P. Whitmont, BA PhD MPsyh

Associate Lecturers

Laurel Bornholt, BA *Melb.* PhD *Macq.*
 Robert M. Buckingham, BA *Cant.* MA *Auck.*
 Margaret Charles, BA PhD
 James Dalziel, BA
 Agi O'Hara, BA
 Fiona Hibberd, BA
 Agnes Petocz, BA PhD
 Sandra Rickards, BA
 Lynne Sweeney, BA *Calif.S.U.* PhD(Clin) *Calif.*
 Fiona White, BA

Honorary Clinical Supervisors

Gregory Aldridge, MPsyh
 Theresa Altting, MA
 SaUy V. Arpadi, BA MPsyh *U.N.S.W.*
 Gary Banks, BA MPsyh MQA
 Christopher Basten, BA MPsyh
 J.E. Benson, BA MPsyh
 A. Blaszczyński, MA DipPsych PhD
 Carol Boland, BA MPsyh
 Philippa Bowden, BA MPsyh
 Diana Caine, BA *N.E.* MSc *Melb.*

Bob Duncan, BE BA MPsyh *U.N.S.W.*

Jill Faddy, BA DipPsych

Megan Forbes, BSc *U.N.S.W.* MA MPsyh

Eleanor Gait, BA DipPsych

Lean Giarratano, BA MPsyh

Timothy Hannan, BA MPsyh

David Harding, MPsyh

Brian Kearney, BA MPsyh

Deborah Knight, BA MPsyh

E.W. Kobylinska, MA DipPsych *Poland*, MPsyh PhD

Roy Laube, BSc MA *Loyola*

Barbara Liddle, BPharm BA MPsyh

Kaye Matthews, BA MPsyh

Helen McCathie, BA MPsyh

Antonia McKinnon, MA DipPsych

Michael McMahon, MA *Melb.*

Roslyn Montague, DipTMed BA MPsyh

Gena Naomi, MA

Kevin O'Sullivan, PhD

Olivier Pigué, BA MPsyh

Jon Plapp, PhD

Gail Purkiss, BSc *U.N.S.W.* DipPsych

Fernando Roldan, PhD

Dieter Schlosser, BSc *U.N.S.W.* MPsyh

Marie-Leonie Sequeira, DipPsych

Melissa Staples, BA MPsyh

Gill Stott, BA MCLinPsych *Flin.*

Stephen W. Touyz, BSc PhD *Cape T.* BSc *Witw.*

Carolyn Tow, BSc *Lond.* MPsyh

Fazileh Zolfaghari, PhD

Honorary Clinical Lecturers

Phyllis N. Butdw, BA PhD

Olga Katchan, BA

Nicholas Marlowe, BA PhD

Michael Nicholas, BA PhD

George Oliphant, BA PhD

Wayne Reid, BA PhD

Michael Young, BA *Macq.* MPsyh PhD *U.N.S.W.*

Honorary Research Associate

Anne-Marie Feyer, BA PhD *U.N.S.W.*

Computer Systems Officer Grade IV

John Holden

Administrative Officers

Sandra Cheng, BBus *U.T.S.* CPA

Kathy Pearce, BA *U.N.S.W.*

Honorary Appointments

Emeritus Professors

Richard Annells Champion, MA, FASSA

Philip Ley, BA *Mane.* PhD *Liv.* DipPsychol *Lond.*

John Philip Sutcliffe, MA PhD, FASSA

OTHER UNITS

Coastal Studies Unit

Director

Andrew D. Short, MA *Hawaii* PhD *Louisiana State* BA

History and Philosophy of Science

Associate Professors

Alan F. Chalmers, BSc *Brist.* MSc *Mane.* PhD *Lond.*

Michael Shortland, BSc MA *Lond.* PhD *Leeds*

Lecturer

Nicolas Rasmussen, AM *Chic.* MPhil *Camb.* PhD *Stan.*

Administrative Assistant

Shari Lee, BA *Sing.*

Institute of Marine Ecology

Director

Antony J. Underwood, PhD DSc *Brist.*, FAA FLS FIBiol
FAIBiolCBiol

Associate Director

Rosalind T. Hinde, BSc PhD

Senior Research Fellow

Maura G. Chapman, BSc *Natal* MSc PhD

Malcolm Haddon, BSc *Aberystwyth* MSc *Bangor* PhD *Otago*

Research Fellows

Michael Beck, BA MS *U.V.A.* PhD *F.S.U.*

Ian Montgomery, BSc *Dub.* PhD

Shane Richards, BSc PhD *AM.*

Research Assistants

Peter Barnes, BSc *U.N.S.W.*

Robert Cawley, BSc *N.E.*

Joanne Cunningham, BSc

Peter Gibson, BSc *U.N.S.W.*

Jane Harris, BSc

Grahame Housefield, BSc *C.Sturt*

Vanessa Mathews, BSc

Shannon McCune, BSc

Honorary Appointments

Honorary Associate

J. Howard Choat, MSc PhD *Qld*

Research Affiliates

Neil L. Andrew, MSc *Auck.* PhD

Alan J. Butler, BSc PhD *AM.*

Peter G. Fairweather, BSc PhD

Steven J. Kennelly, BSc PhD

Nicholas M. Otway, BSc PhD

Marine Studies Centre

Director

Antony J. Underwood, PhD DSc *Brist.*, FAA FLS FIBiol
FLABiol CBiol

Technical Officer

David Mitchell

Administrative Assistant

Jennifer Winzar

Ocean Sciences Institute

Director

Peter John Davies, BSc *Leic.* PhD *Sheff.*

Research Scientists (part-time)

John B. Keene, BAgEc *N.E.* PhD *Calif.* BSc (part-time)

Gavin F. Birch, MSc PhD DTA *Cape T.*

Dietmar Müller, BSc *Kiel* PhD *Calif.*

Thomas C.T. Hubble, MSc GradDipEd

Alexandra R. Isern, BSc *Flor.* MSc *Rhode Island* PhD *E.T.H.*
Zürich

Professional Officer

Elaine Baker, BSc *LaT.*

Research Assistant

Alison Cole, BSc *U.N.S.W.*

Mathematics Learning Centre

Lecturer in Charge

Jacqueline M. Nicholas, MSc *Hull*

Lecturer

Susan E. Gordon, MSc *Witw.* DipEd DipDatametrics *S.A.*

Appendix: Explanation of symbols for courses of study

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Symbols may have been used in the courses of study chapter in the handbook as a succinct way of presenting teaching and assessment information. Because of the varied nature of the work described and occasional difficulties in interpretation and typesetting, such details are not construed as a firm undertaking. Students are advised to check details with the departments concerned. The significance of symbols used is as follows:

Hypothetical examples of symbols used

Title of course	Double Dutch 1
Actual lecturers	Assoc. Prof. Holland Dr Nederlands
Allied studies	<i>AKn</i> HSC German
Class contact & course duration	<i>Classes</i> Yr: (3 lec & 1 tut)/wk
Exams, essays, etc.	<i>Assessment</i> one 3hr exam, two 2000w essays/sem, 4 tut papers/sem
Title of course	8766 Star Wars 5
Actual lecturers	Dr Lazer Ms Gunn
Allied studies	<i>Prereq</i> 7653 <i>Coreq</i> Intro. Media Manipulation
Class contact & course duration	<i>Classes</i> Sem 1: (2 lec & 3 tut/ prac)/wk; Sem 2: (2 lec & 2 tut/prac)/wk
Exams, essays, etc.	<i>Assessment</i> one 3hr exam/sem, classwork

Allied studies

<i>AKn</i>	assumed knowledge
<i>Prereq</i>	prerequisite (you must have passed the indicated prerequisite before you start the course)
<i>Coreq</i>	corequisite (you must enrol in this course at the same time unless you have already passed it)

Type of class contact/assessment

class.....	class contact of any form
lab.....	laboratory
lec.....	lecture
prac.....	practical
tut.....	tutorial
exam.....	examination
tut paper.....	tutorial paper

Duration

hr.....	hour
Sem 1.....	Semester 1
Sem 2.....	Semester 2
Yr.....	throughout the year

Frequency

/wk.....	per week
/fn.....	per fortnight
/sem.....	per semester
/yr.....	per year

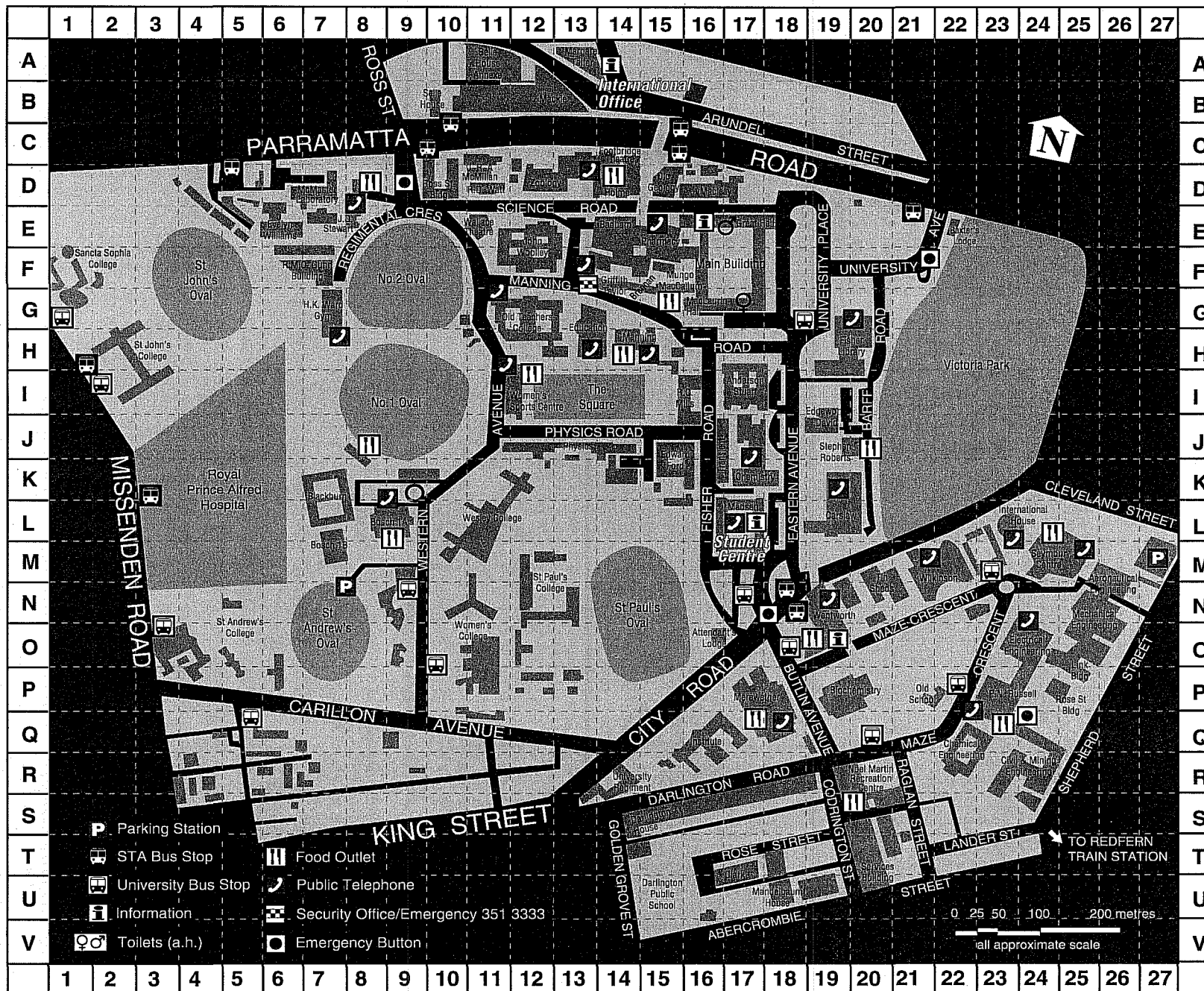
Examples

Classes

Sem 1:1 class/wk	one class work session each week during Semester 1
Yr: (2 lec & 3 tut/ prac)/wk	two lectures and three tutorials or practicals weekly, throughout the year
Sem 2: 3 lec/wk & 1 tut/fn	three lectures per week and one tutorial per fortnight, during Semester 2

Assessment

one 3hr exam	one 3-hour exam
two 3hr exams/sem	two 3-hour exams per semester
one 2000w essay	one 2000-word essay
one 3000w essay, two 2000w essays/sem, 4 tut papers	one 3000-word essay for the course, two 2000-word essays per semester and four tutorial papers for the course
(one 3000w & two 2000w essays)/sem	one 3000- and two 2000-word essays per semester



- **Student Centre (17L):**
- academic transcripts
- admissions
- enrolments
- examinations
- graduations
- handbook sales
- HECS enquiries
- travel concessions

- **Student Services (13G):**
- accommodation
- counselling
- financial assistance
- special services (disabilities, etc.)

Departments, schools and buildings -main campus

Academic & Executive Services	16E	Computer Science, Basser Dept	17L	Language Centre	14F	Russell, Peter Nicol, Bldg	23P
Accounting	17P	Continuing Education, Centre for	13B	Learning Assistance Centre	13G	St Andrew's College 2	50
Administrative Policy & Strategic Planning Division	16E	Coppleson Postgraduate Medical Institute	9K	Linguistics	16J	St John's College 3	3H
Administrative Support Services Division	16E	Counselling Service	13G	Link Bldg	250	St Paul's College 4	12N
Aeronautical Engineering	26M	Crop Sciences	13F	Lost Property	14F	Sancta Sophia College 5	1F
Agricultural Chemistry & Soil Science	10D	Darlington House H66	14S	Mackie Bldg	13B	Scholarships	16F
Agricultural Economics	11D	• Development Office	160	MacLaurin Hall	16G	Schools Liaison	11E
Agriculture Faculty Office	11C	Disability & Welfare Services	13G	Macleay Bldg SMuseum	16D	Science Faculty Office	19L
Alma Street Glasshouse	23N	Econometrics	17P	Madsen Bldg	17L	Security & Bldg Services	14F
Anaesthesia	7K	Economic History	17P	Mail Room (Internal)	20T	Selle House	10B
Anderson Stuart Bldg	17I	Edgeworth David Bldg	19J	Main Bldg	17F	Semitic Studies	17F
Anatomy & Histology	17I	Education Bldg & Faculty Office	13G	Mandelbaum House	18U	Senate Room	16G
Animal Science	7F	Educational Development & Evaluation	15K	Manning House	14H	Services Bldg	20T
Anthropology	16F	Educational Psych., Measurement & Technology	13G	Margaret Telfer Bldg	13A	Seymour Theatre Centre	24M
Archaeology, Classics & Ancient History	22M	Edward Ford Bldg	15K	Marketing, Dept of	16Q	Shepherd St Parking Station	27M
Architectural & Design Science	22M	Electrical Engineering	240	Marketing & Publications	11E	Sir Hermann Black Gallery	19N
Architecture, Dept & Faculty Office	19H	Employment Service, Casual	14C	Mathematics & Statistics	19L	Social & Policy Studies in Education	13G
Archives	20M	Engineering Faculty Office	250	McMaster Laboratory CSIRO	7D	Social Work & Social Policy	15I
Arts Faculty Office	16F	English	12E	McMillan, J.R.A., Bldg	11C	Solicitor, University	16E
Asset Management	13A	Equal Employment Opportunity Unit	16S	Mechanical & Aeronautical Engineering Bdg	25N	Sports:	
Asian Studies	14F	Evelyn Williams Bldg	6E	Mechanical Engineering	25N	Noel Martin Recreation Centre	20R
Attendant's Lodge	160	Experimental Medicine	7K	Media Office	16E	Sports Union	7G
Badham Bldg & Library	14E	External Relations Division	16E	Medicine	7K	Swimming Pool	20R
Banks (see Financial institutions)		Facilities Planning, Office of	20T	Medicine, Dept of	7K	Tennis courts	20D
Baxter's Lodge	22E	<i>Financial institutions:</i>		Medicine Faculty Office	15K	Ward, H.K., Gymnasium	7G
Behavioural Sciences in Medicine	7K	Commonwealth	14C	Merewether Bldg	17P	Women's Sports Association	12I
Biochemistry	20P	Credit Union	14D	Microbiology	20P	Stephen Roberts Theatre	20J
Biological Sciences	16D	National Australia	15E	Mills, R.C., Bldg	15I	Stewart, J.D., Bldg	8E
Blackburn Bldg	7K	National Australia	19N	Mungo MacCallum Bldg	15G	Stores	20T
<i>Bookshops:</i>		Financial Services Division	16E	Music	24M	Student Centre*	17L
Medical	7K	Finance, Dept of	16Q	Nicholson Museum	16G	Student Services*	13G
SRC Secondhand	19N	Financial Management & Reporting	13A	Obstetrics & Gynaecology	9K	SRC	19N
University Co-operative	16J	Financial Services Division	16E	Occupational Health	15K	SUPRA	4R
Bosch 1A (lecture theatres)	8L	Fine Arts	15I	Old Geology Bldg	15D	Surgery	7K
Bosch 1B Bldg	7M	Fisher Library	19G	Old School Bldg	21P	SydU-tech	19U
Botany	16D	Footbridge Theatre	14C	Old Teachers' College Bldg	12G	Systems Development	13A
Brennan, C, Bldg	15F	French Studies	15F	Operations Accounting	13A	Teaching & Curriculum Studies	13G
Business Liaison Office	13D	Garage, University	21T	Pathology	7K	Tin Sheds Gallery	20M
Business Services	19U	Geography	16Q	Performance Studies (entrance Manning Rd)	12F	Trades & Grounds Serrvices'	20T
Campus Services	20T	Geology & Geophysics	19J	Personnel Services	13A	Traffic Office	14F
Careers Centre	13B	Germanic Studies	15F	Pharmacology	7M	Transient Bldg	16J
Carlsaw Bldg	19L	Government & Public Administration	17P	Pharmacy	15E	Union, University of Sydney	19N
Cashiers	13A	Great Hall	18E	Philosophy	17G	Unistaff	19U
Celtic Studies	12E	Greek, Modern	14F	Photowise Imaging	20T	University Collection	19H
Central Services	22E	Griffith Taylor Bldg	14F	Physics	13J	University of Sydney Club	15G
• Centre for English Teaching	17L	Gunn, R.M.C., Bldg	7F	Physiology	17I	Urban & Regional Planning	22M
Centre for Teaching & Learning	19L	Health Service		Planning Support Office	16E	Veterinary Anatomy	8E
Chancellor's Committee Shop	17F	Holme Bldg	14C	Post Office	15E	Veterinary Clinic	6E
Chaplains' Centre	10G	Wentworth Bldg	19N	Printing Services, University	20T	Veterinary Clinical Sciences	6E
Chemical Engineering	22Q	History	15G	Properties & Investments	13A	Veterinary Pathology	7E
Chemistry	17K	History & Philosophy of Science	19L	Psychological Medicine	4K	Veterinary Science Faculty Office	8D
<i>Child Care:</i>		Holme Bldg	14C	Psychology	14F	Vice-Chancellor's Office	16E
Boundary Lane	16U	Industrial Relations, Dept of	16Q	Purchasing	20T	Wallace Theatre	11E
Carillon Avenue	90	Infectious Diseases	7K	Publications Unit	11E	War Memorial Gallery	17E
Laurel Tree House (Glebe)	16B	Information Technology Services	19U	Public Health & Community Medicine	15K	Watt, R.D., Bldg	11D
Union (Darlington)	21S	Institute Bldg	16Q	Quadrangle	17F	Wentworth Bldg	19N
Civil & Mining Engineering	24R	International Office & International Student Services	13A	Queen Elizabeth II Research Institute	9K	Wesley College 6	11L
Clark Bldg	17T	International House	23L	Regiment, University	14R	Western Avenue Underground Parking Station	8N
Clock Tower	17F	Italian	15I	Religion, School of Studies in	12E	Wilkinson Bldg	22M
Community & Alumni Relations	19H	Koori Centre	12G	Research & Scholarships	16E	Women's College 7	110
				Revenue Services	13A	Women's Studies	15S
				Risk Management	13A	Woolley Bldg, John	12E
				Rose Street Bldg	24P	Yeoman Bedell's Office	17E
				Ross Street Bldg	10D	Zoology	12D

Notes