

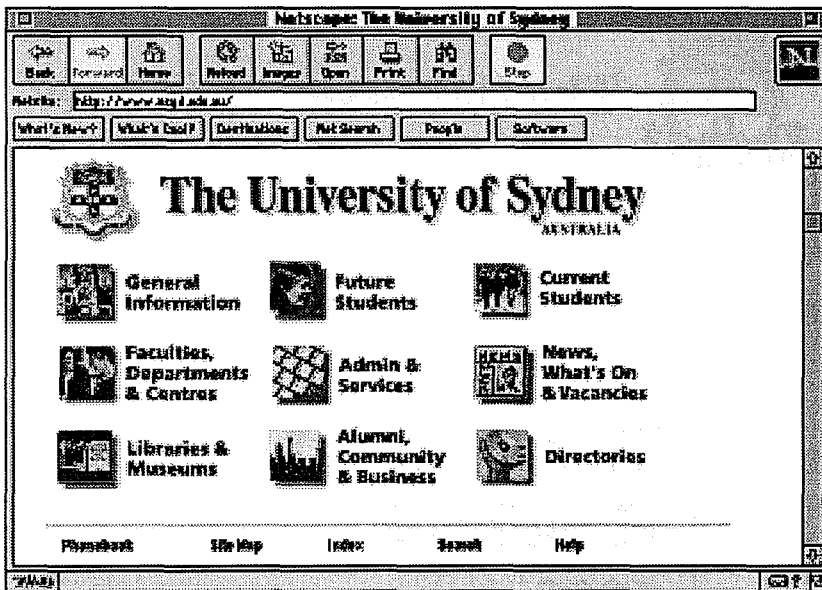


The University of Sydney

**Faculty of Science
Handbook
1998**

Editor
Anthony F Masters

The Editor gratefully acknowledges the substantial inputs to the preparation of the Handbook by Ms Elisabeth Van de Wetering, Ms Barbara Chmielewski and Ms Deirdre MacKay from the Faculty of Science. All Departmental and School Faculty Handbook Liaison Officers are also thanked for their assistance.



The University's homepage tells you all about courses at Sydney, some careers they can lead to, and what university life is like. The interactive website, with video and sound clips, has links to the University faculties and departments.

You can explore the University of Sydney at <http://www.usyd.edu.au>

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Faculty of Science Handbook 1998

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The information in this Handbook is subject to approval and/or change by the Faculty or the University. Students should always check the accuracy of the information with Faculty staff.

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NSW 2006
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Semester and Vacation Dates 1998

Semester	Day	1998
First Semester lectures begin	Monday	2 March
Easter recess		
Last day of lectures	Thursday	9 April
Lectures resume	Monday	20 April
Study vacation		
1 week beginning	Monday	15 June
Examinations commence	Monday	22 June
Second Semester lectures begin	Monday	27 July
Mid-semester recess		
Last day of lectures	Friday	25 September
Lectures resume	Tuesday	6 October
Study vacation		
1 week beginning	Monday	9 November
Examinations commence	Monday	16 November

Latest Dates for Withdrawals and Discontinuations

	Day	1998
Semester 1 Courses		
Last day for Withdrawal	Tuesday	31 March
Last day to Discontinue with Permission	Sunday	19 April
Last day to Discontinue	Friday	19 June
Semester 2 Courses		
Last day for Withdrawal	Monday	31 August
Last day to Discontinue with Permission	Sunday	6 September
Last day to Discontinue	Friday	13 November
Full Year Courses		
Last day for Withdrawal	Tuesday	31 March
Last day to Discontinue with Permission	Friday	31 July
Last day to Discontinue	Friday	13 November
<i>Please note:</i> No discontinuations can be made after 13 November 1998		

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Introduction - how to use this handbook

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 units of study are offered and the books required to do these; 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 unit of study 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 428 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 units of study or subjects consult the relevant Department.

Beginning Studies in the Faculty of Science.

Frequently Asked Questions

How do I qualify for the pass degree of Bachelor of Science?

You complete 144 credit points, normally over three years, including a major study in at least one Science Discipline Area.

How do I qualify for the Bachelor of Science with Honours?

You complete the requirements for the pass degree, followed by a fourth year of advanced study in a single Science Discipline Area.

What is meant by "credit points"?

Credit points are allotted to each unit of study. A unit of study is a semester-length course in a particular subject - area requiring between four and twelve hours per week of class attendance. The number of credit points allotted to a unit of study is 4, 6, 8 or 12.

Is a "unit of study" the same as a "course"?

In Handbooks from previous years the word "unit" seems to have meant the same as "credit point"!

From 1998 on, the University of Sydney has adopted the terminology recommended by the Commonwealth Department of Employment, Education, Training and Youth Affairs (DEETYA). You may find that the academic staff sometimes use the old terms.

What is the difference between "Junior", "Intermediate" and "Senior" units of study?

Junior units of study are normally taken in your first year, Intermediate units of study have the completion of Junior units of study as entry requirements. Senior units of study have Intermediate units of study as entry requirements.

How many Junior credit points must I complete?

You must complete at least 36 Junior credit points (if you are a Combined Law student, you enrol in Legal Institutions I and II, Legal Research and Writing and 36 Junior credit points).

Are there compulsory elements in the BSc degree?

You must complete at least 12 credit points in Mathematics and Statistics. These are generally taken at the Junior level.

What are the Tables of Units of Study?

The Tables, published in the Faculty Handbook, list all the units of study which can be counted to a particular degree, including their enrolment code, official title, credit point value and entry requirements.

How can I get advice about selecting units of study?

First, you should read the unit of study descriptions in the Faculty Handbook. When enrolling you will be able to talk to representatives of the Departments and Schools. The Faculty Office staff can help you plan the structure of your degree at any time.

Can I count units of study not listed in the Table?

In special circumstances you may apply to take units of study from other degree programs or even from other universities

I have studied at a tertiary institution already.

Can previous studies be credited?

In general previous university studies can be credited, provided that they are recent.

I have other commitments (family, employment) - can I take the degree part-time?

Yes, but you must indicate this when enrolling. Day-time attendance at lectures and laboratory classes is required for most science units of study. If you have very demanding commitments it may be better to transfer to distance education study.

Is there a time limit?

You must complete all the degree requirements within ten years from the date of admission to candidature (if you start in 1998, you must have completed by the end of 2007). If you have credit points from previous study, the time is reduced appropriately.

Can I interrupt my studies to travel?

You can suspend for a year (usually this is for travel or in order to earn some money by full time work). If necessary, you can apply for a further year of suspension, but after this the candidature usually is considered to have lapsed.

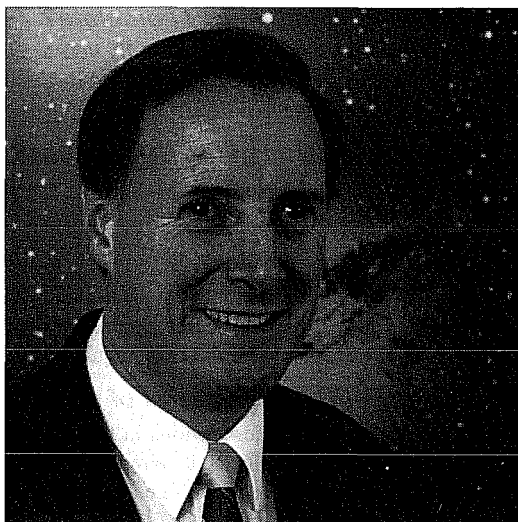
If I do well, can I get into another degree program with a higher entry mark?

Yes, but this will be competitive. It is realistic to assume you will be completing the degree in which you first enrol.

What are my chances of success?

Excellent. You have received an offer because the University believes you are qualified to complete the degree. Problems could arise if you are unable or unwilling to give your studies some priority over other interests, commitments and worries. Even if you have these problems, there are many ways in which you can find help and support within the University (these are publicised during Orientation Week). It is worth emphasising here that if your first language is not English, or if you have specific learning problems, you should consult the Learning Assistance Centre.

Message from the Dean



On behalf of the Faculty of Science, I extend a warm welcome to all students enrolling in Science in 1998, 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 subjects are available at an advanced level for students wishing for a special challenge in their studies. In addition, our Talented Student Programme provides enormous flexibility in study for students with exceptional ability.

In 1997, the Faculty fully semesterised its courses, increasing the flexibility for which the Faculty is reknowned. Students now have a wide choice of subject options and are able to "customise" their courses. This choice will be further increased in 1998 with the introduction of the Bachelor of Liberal Studies, a joint initiative of the Faculties of Arts and Science.

In this Handbook, you will find information about all of the courses and units of study 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 set out 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 unit of study and 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.

A handwritten signature in dark ink, appearing to read 'R G Hewitt'. The signature is fluid and cursive, with a large initial 'R' and 'H'.

Robert G Hewitt
Dean

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2. Study in the Faculty of Science

This handbook is intended to give you a comprehensive view of the courses and units of study 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 designed, 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.

Units of study available

The Faculty offers units of study 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, units of study are available for the degrees of Bachelor of Liberal Studies, Bachelor of Medical Science, Bachelor of Pharmacy, Bachelor of Psychology, Bachelor of Computer Science and Technology and the specially designated BSc (Advanced), BSc(Advanced Mathematics), BSc(Bioinformatics), BSc(Environmental) and BSc(Molecular Biology and Genetics) degree programs. Combined degree programs are also available with the Faculties of Arts, Economics, Engineering and Law.

Information about these units of study 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 see Mathematics and Statistics
 Animal Physiology see Biological Sciences
 see BMedSc
 see Physiology

Analytical Chemistry see Agricultural Chemistry and Soil Science
 see Chemistry
 Applied Mathematics see Mathematics and Statistics
 Applied Physics see Physics
 Artificial Intelligence see Computer Science
 Astronomy see Physics
 Astrophysics see Physics
 Atomic Physics see Physics
 Bacteriology see Biochemistry
 see Biological Sciences
 see BMedSc
 see Microbiology
 Beach Dynamics see Marine Studies
 see Geography
 Biodegradation see Microbiology
 see Agricultural Chemistry and Soil Science
 Biological Chemistry see Agricultural Chemistry and Soil Science
 see Biochemistry
 see Chemistry
 Bioremediation see Microbiology
 see Agricultural Chemistry and Soil Science
 Biotechnology see Biochemistry
 see Biological Sciences
 see Chemistry
 see Microbiology
 see Physiology
 Behavioural Science see Psychology
 Biomathematics see Mathematics and Statistics
 Biophysical Chemistry see Biochemistry
 see Chemistry
 Botany see Biological Sciences
 Carbohydrate Chemistry see Agricultural Chemistry and Soil Science
 see Biochemistry
 see Chemistry
 Catalysis see Biochemistry
 see Chemistry
 Category Theory see Mathematics and Statistics
 Cancer see Biochemistry
 see BMedSc
 see Cell Pathology
 see Physiology
 Cell Biology see Biochemistry
 see Biological Sciences
 see BSc (Molecular)
 see BMedSc
 see Cell Pathology
 see Histology
 see Microbiology
 see Physiology
 Chaos see Physics
 see Mathematics and Statistics
 Chemotherapy see Biochemistry
 see BSc (Molecular Biology & Genetics)
 see Chemistry
 see Microbiology

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

	see Biological Sciences	Marine Ecology	see Biological Sciences
	see BMedSc		see Marine Sciences
	see BSc (Molecular Biology and Genetics)	Marine Geology	see Geology and Geophysics
	see Microbiology	Marine Geophysics	see Geology and Geophysics
Geochemistry	see Chemistry	Marine Science	see Biological Sciences
	see Geography		see Chemistry
	see Geology and Geophysics		see Geography
Geographical Information Systems (GIS)	see Agricultural Chemistry and Soil Science		see Geology and Geophysics
	see Geography		see Marine Studies
Geomagnetism	see Mathematics and Statistics	Materials Science	see Chemistry
Geometry	see Mathematics and Statistics		see Physics
Geomorphology	see Geography	Mathematical Modeling	see Mathematics and Statistics
Geostatistics	see Agricultural Chemistry and Soil Science		see Physics
	see Mathematics and Statistics	Mathematical Statistics	see Mathematics and Statistics
Geophysics	see Geology and Geophysics	Measurement Science	see Physics
Geoscience	see Geology and Geophysics	Medicinal Chemistry	see Chemistry
	see Geography		see Pharmacology
Haematology	see Histology		see Pharmacy
	see BMedSc	Medical Biochemistry	see Biochemistry
Histochemistry	see Histology		see BMedSc
	see BMedSc		see BSc (Molecular Biology and Genetics)
History of Science	see BMedSc	Medical Microbiology	see BMedSc
	see History and Philosophy of Science		see Microbiology
Human Life Sciences	see Anatomy	Medical Molecular Biology	see Biochemistry
	see Biochemistry		see Microbiology
	see BMedSc		see BMedSc
	see Cell Pathology		see BSc (Molecular Biology and Genetics)
	see Histology	Membrane Biology	see Biological Sciences
	see Physiology	Metabolism	see Agricultural Chemistry and Soil Science
Human Nutrition	see Biochemistry		see Biochemistry
	see Master of Nutritional Science		see Biological Sciences
	see Master of Nutrition and Dietetics		see BMedSc
Hydrology	see Agricultural Chemistry and Soil Science		see Microbiology
	see BSc (Environmental)	Microanalysis	see Chemistry
	see Geography		see Physics
Image Processing	see Physics		see Grad Dip (Microscopy and Microanalysis)
Immunology	see Biochemistry		see MSc (Microscopy and Microanalysis)
	see Biological Sciences	Microscopy	see Agricultural Chemistry and Soil Science
	see BMedSc		see Biological Sciences
	see Cell Pathology		see BMedSc
Industrial Chemistry	see Chemistry		see Histology
Inorganic Chemistry	see Chemistry		see Microbiology
Infectious Diseases	see BMedSc		see Physics
	see Cell Pathology		see Grad Dip (Microscopy and Microanalysis)
	see Microbiology		see MSc (Microscopy and Microanalysis)
Information Technology	see Computer Science	Microtechniques	see Histology
Instrumentation	see Physics		see BMedSc
Inorganic Chemistry	see Chemistry	Mineralogy	see Geology and Geophysics
Intertidal Ecology	see Marine Sciences	Mineral Physics	see Geology and Geophysics
Invertebrate Zoology	see Biological Sciences	Molecular Biology	see Biochemistry
Land Resources	see Agricultural Chemistry and Soil Science		see Biological Sciences
	see Geography		see BMedSc
Lasers	see Physics		see BSc (Molecular Biology and Genetics)
Macromolecular Structure	see Biochemistry		see Cell Pathology
Magnetic Resonance	see Chemistry		see Chemistry
Imaging	see Biochemistry		see Microbiology
	see BMedSc		see Physiology
Mammalian Biology	see Biological Sciences	Molecular Engineering	see Chemistry
Marine Biology	see Biological Sciences	Molecular Genetics	see Biochemistry
	see Marine Studies		see Biological Sciences

	see BMedSc	Plate Tectonics	see Geology and Geophysics
	see BSc (Molecular Biology and Genetics)	Polymer Science	see Chemistry
Molecular Modeling	see Chemistry	Programming	see Computer Science
	see Pharmacology	Proteins	see Biochemistry
Molecular Physics	see Physics		see Chemistry
Morphology	see BMedSc	Protozoology	see Biological Sciences
Mycology	see Biological Sciences	Public Health	see BMedSc
	see BMedSc	Pure Mathematics	see Mathematics and Statistics
Natural Hazards	see Geography	Quantum Mechanics	see Chemistry
	see Geology and Geophysics		see Physics
Natural Products Chemistry	see Agricultural Chemistry and Soil Science	Recombinant DNA Technology	see Biochemistry
	see Chemistry		see Biological Sciences
Neural Networks	see Mathematics and Statistics		see BMedSc
	see Physiology		see BSc (Molecular Biology and Genetics)
	see BMedSc	Resource Management	see Microbiology
Neuroanatomy	see BMedSc	River Systems	see Geography
Neurochemistry	see Pharmacology		see BSc (Environmental)
Neurophysiology	see BMedSc	Robotics	see Geography
	see Physiology	Scientific Revolution	see Computer Science
	see Anatomy	Sedimentology	see History and Philosophy of Science
Neuroscience	see Anatomy		see Geography
	see BMedSc	Social Relations of Science	see Geology and Geophysics
	see Physiology	Software Engineering	see Marine Studies
	see Psychology	Soil Chemistry	see History and Philosophy of Science
Nitrogen Fixation	see Agricultural Chemistry and Soil Science	Soil Physics	see Computer Science
	see Chemistry	Soil Science	see Agricultural Chemistry and Soil Science
	see Microbiology	Solar Physics	see Agricultural Chemistry and Soil Science
Nonlinear Analysis	see Mathematics and Statistics	Solid State Chemistry	see Physics
Nuclear Magnetic Resonance (NMR)	see Chemistry	Solid State Physics	see Chemistry
Nuclear Physics	see Biochemistry	Solid State Science	see Physics
Nutrition	see Physics	Spectroscopy	see Chemistry
	see Biochemistry		see Physics
	see BMedSc	Statistics	see Chemistry
	see Postgraduate study MNutrSc & MNutrDiet	Structural Geology	see Physics
Oceanography	see Geology and Geophysics	Surface Science	see Mathematics and Statistics
	see Marine Studies	Systems Analysis	see Geology and Geophysics
Optics	see Physics	Therapeutics	see Chemistry
Organic Chemistry	see Chemistry		see Physics
Organometallic Chemistry	see Chemistry	Theoretical Chemistry	see Computer Science
Paleontology	see Geology and Geophysics	Theoretical Physics	see BMedSc
Parasitology	see BMedSc	Thermal Physics	see Pharmacology
Pathogenicity	see Microbiology	Toxicology	see Chemistry
Pedogeomorphology	see Geography		see Pharmacy
Pedology	see Geography		see Chemistry
Pesticide Chemistry	see Agricultural Chemistry and Soil Science		see Physics
	see Chemistry		see Pharmacy
Petrochemicals	see Chemistry		see Pharmacy
Petroleum Geology	see Chemistry		see Pharmacy
Petrology	see Geology and Geophysics	Vertebrate Zoology	see Biological Sciences
Pharmaceutical Chemistry	see Chemistry	Virology	see BMedSc
	see Pharmacy		see BSc (Molecular Biology and Genetics)
Philosophy of Science	see History and Philosophy of Science	Volcanology	see Microbiology
Photonics	see Physics	X-Ray Crystallography	see Geology and Geophysics
Physical Chemistry	see Physics	Zoology	see Chemistry
Plant Management	see Chemistry		see Biological Sciences
Plant Metabolism	see Biological Sciences		
Plant Molecular Biology	see Biological Sciences		
Plant Physiology	see Agricultural Chemistry and Soil Science		
Plant Science	see Biological Sciences		
Plasma Physics	see Biological Sciences		
	see Physics		

Departmental and Faculty advisers

The selection of units of study 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 (Advanced Maths) — Associate Professor Don Taylor (Departmental contact)

BSc (Bioinformatics) — Dr Michael Wise (Departmental contact)

BSc (Environmental) — Dr Julia James

BSc (Molecular Biology and Genetics) — Professor Peter Lay

BMedSc — Dr Ian Spence

BCST - Dr Alan Fekete (Departmental contact)

Agricultural Chemistry

Associate Professor Les Copeland, Dr Edith M. Lees

Anatomy

Dr John Mitrofanis, Dr Jan Provis

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, Dr Ben Oldroyd, Dr Michael Thompson, Dr Murray J. Henwood

Senior year: Associate Professor Chris Gillies, Professor Ian Hume, Dr Bruce Lyon, Dr Alan Meats

4th year: contact School Office

Cell Pathology

Professor Nicholas Hunt, Dr Nicholas King

Chemistry

Junior year: Dr Ray Pierens

Intermediate year: Dr Julia James

Senior year: Associate Professor Max Crossley

4th year: Associate Professor Tony Masters

Computer Science

Undergraduate (Junior, Intermediate & Senior years): Dr Jeff Kingston

4th year: Dr Nitin Indurkha

Master of Information Technology: Dr Alan Fekete

Course Committee & International Students: Dr Doan Hoang

Research Committee (Research Students): Dr (David) Dagan Feng

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 Keith Klepeis

Intermediate year Environmental Geology: Dr Gavin Birch

Senior year: Dr Roger Buick

4th year: Dr Geoffrey L. Clarke

Geophysics: Professor Iain Mason

Histology

Dr Christopher R. Murphy, Dr Maria Byrne

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) and Ms Jenny Henderson (Pure Mathematics)

4th year: Dr Hugh Luckock (Applied Mathematics), Professor John Robinson (Mathematical Statistics) and Dr Karl Wehrhahn (Pure Mathematics)

Microbiology

Intermediate year: Mrs Ilze Dalins

Senior year: Dr Trevor Duxbury

4th year: Dr Tom Ferenci

BMedSc: Dr Ian Humphrey-Smith

BSc (Molecular Biology and Genetics): Dr Dee Carter

Pharmacology

Intermediate Year: Dr Robin Allan

Senior Year: Dr Ian Spence, Professor Graham Johnston

4th Year: Associate Professor Rosemarie Einstein

Pharmacy

Associate Professor Gerald M. Holder, Dr Ines Krass

Physics

Junior year: Mrs Rosemary M. Millar

Intermediate year: Dr Juris Ulrichs

Senior year: Dr Neil Cramer

4th year: Dr Peter Robinson

Physiology

Intermediate year: Dr Miriam Frommer

Senior year: Dr Joseph Hoh, Dr Paul Martin

4th year: Dr Joseph Hoh

BMedSc: Mrs Francoise Janod-Groves

Psychology

Junior year: Mr James Dalziel

Intermediate year: Dr Brian Crabbe

Senior year: Dr Brian Crabbe

Honours year: Dr Pauline Howie

Soil Science

Intermediate year: Dr Stephen Cattle

Senior and Honours year: Professor Alexander B. McBratney

Recommended Combinations of units of study in first year of attendance

Units of study to be taken during the first year of attendance must be selected with subsequent years of candidature in mind. The list below shows you how to find a first year combination that 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 specialization are strongly advised to take Junior units of study 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 units of study are offered only as part of the BMedSc degree.

Schools or Departments, and recommended Junior level combinations

Refer to Table I for specific qualifying and/or pre- and/or co-requisite units of study. Junior Computer Science units of study must not be taken without the Mathematics units of study specified in Table I.

Agricultural Chemistry'

12 credit points of Junior units of study in each of Chemistry + Mathematics + 24 credit points from one of Physics, Biology 1001 or 1901 + Biology 1002 or 1902, Geology or Geography

Biochemistry'

12 credit points of Junior units of study in each of Chemistry + Physics + Mathematics + Biology 1001 or 1901 + Biology 1002 or 1902

Biology

Biology 1001 or 1901 + Biology 1002 or 1902 + 12 credit points of Junior units of study in each of Chemistry + Physics + Mathematics

Cell Pathology²

12 credit points of Junior units of study in each of Chemistry + Physics + Mathematics + Biology 1001 or 1901 + Biology 1002 or 1003 or 1902 or 1903

Chemical Engineering Science

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

Chemistry

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

Civil Engineering Science

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

Computer Science

COMP 1001 + COMP 1002 + MATH 1701 + MATH 1703 or MATH 1704 + 24 credit points of other Junior units of study. (Each of the above units of study can be replaced by the corresponding Advanced course.)

Geography

12 credit points of Junior units of study in each of Geography + Mathematics + Geology or Biology 1001 or 1901 + Biology 1002 or 1902 + either Chemistry or Physics

Geology

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

Geophysics

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

Marine Sciences²

Biology 1001 or 1901 + Biology 1002 or 1902 + 12 credit points of Junior units of study in each of Geology + Chemistry or Physics

+ Mathematics

Mathematical Statistics'

MATH 1701 or 1791 + MATH 1702 or 1792 + 36 other Junior credit points

Mathematics

MATH 1701 or 1791 + MATH 1702 or 1792 or MATH 1701 or 1791 + MATH 1703 or 1793 + 36 other Junior credit points

Mechanical and Aeronautical Engineering Science

12 credit points of Junior units of study in each of Physics + Mathematics + two units of study selected in consultation with an adviser

Microbiology'

12 credit points of Junior Biology + 12 credit points of Junior Chemistry including 1102 or 1902 or 1904 + 12 credit points of Junior Mathematics including 1701 or 1711 or 1791 and one of 1702 or 1704 or 1712 or 1792 or 1794

Pharmacology²

12 credit points of Junior units of study in each of Chemistry + Physics + Mathematics + Biology 1001 or 1901 + Biology 1002 or 1003 or 1902 or 1903

Physics

12 credit points of Junior units of study in each of Physics + Chemistry + MATH 1701 or 1791 + MATH 1702 or 1792 + 12 credit points of other Junior units of study selected in consultation with an adviser

Physiology

12 credit points of Junior units of study in each of Mathematics + Chemistry plus two units of study selected in consultation with an adviser.

Preparation for Masters course in Nutrition and Dietetics

12 credit points of Junior units of study in each of Chemistry + Physics + Mathematics + Biology 1001 or 1901 + Biology 1002 or 1003 or 1902 or 1903

Psychology

12 credit points of Junior units of study in each of Psychology + Mathematics + Chemistry or Physics + Biology 1001 or 1901 + Biology 1002 or 1003 or 1902 or 1903 or Computer Science or two units of study selected in consultation with an adviser

Soil Science'

12 credit points of Junior units of study in each of Chemistry + Physics or Mathematics or Computer Science

Selection of units of study in second year of attendance

During the second semester of the first year of attendance you are advised to discuss your choice of units of study for the following year with members of the academic staff in the departments in which you propose to study.

¹ Major subject beginning at Intermediate level

² Major subject beginning at Senior level

3 Undergraduate degree requirements

This chapter sets out the requirements for the degrees of Bachelor of Science, Bachelor of Liberal Studies, 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, Advanced Mathematics, Bioinformatics, Environmental and Molecular Biology and Genetics, and the combined degrees of BSc/BComm, BSc/LLB, BA/BSc, BSc/BA, BSc/BE and BSc/MBBS. The courses for the pass BSc (which includes the Advanced, Advanced Mathematics, Bioinformatics, Environmental and Molecular Biology and Genetics degree programs), BMedSc and BCST degrees extend over a minimum of three years. For the Honours BSc, BPharm, BMedSc and BCST degrees a fourth year is taken and students must qualify to enter the Honours year. The courses for the BLibStud, 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 units of study chosen.

Restrictions (general)

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

Time limits

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

Suspension

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

The Faculty also resolved that, except with the prior permission of the Faculty, a student shall not be granted a suspension of candidature in order to enrol in another course of tertiary study. Candidature will lapse if a student 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 unit of study listed in the Tables may be given credit for that unit of study providing that the unit of study was completed not more than 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 unit of study should include an examination or examinations conducted under University supervision and requiring written answers to unseen questions, provided that the general scope of a supervised examination paper may be made known to students in advance.

Results

For all Junior, Intermediate and Senior units of study in the Bachelor of Science, Bachelor of Liberal Studies, Bachelor of 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 units of study in the Bachelor of Pharmacy degree.

**Valid for Junior units of study only; student to contact Department.

For Final Year Honours units of study, 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 in	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 may be adversely affected by an occurrence of illness or misadventure may request Faculty to give special consideration to the circumstances. *Such a request must be made within one week of the occurrence and must be accompanied by an appropriate medical certificate or other relevant documentary evidence.*

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

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

Any student who is subject to a chronic or recurrent disability or who has been in need of, or undertaken 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. 1, 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 units of study 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 unit of study or year after the end of lectures in that unit of study 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 units of study

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

Withdrawal from Second Semester units of study

6. A candidate for a degree of Bachelor who discontinues enrolment in a Second Semester unit of study 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 unit of study 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 unit of study; or
- (b) up to the last day of the seventh week of teaching in a one semester unit of study.

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

- (a) after the Friday of the first week of Second Semester for a full-year unit of study; or
- (b) after the last day of the seventh week of teaching in a one semester unit of study.

(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 unit of study 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 unit(s) of study concerned both in the Faculty or Board of Studies and in any other Faculty or Board of Studies in which that unit(s) of study 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 units of study 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 unit(s) of study 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 unit(s) of study from which he or she was previously excluded.

(b) Any student who has been excluded from a unit(s) of study by one Faculty or Board of Studies in accordance with section 2 and who wishes to enrol in that unit(s) of study 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 unit(s) of study 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 unit of study 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 unit of study, a Faculty or Board of Studies shall consult the Head of the Department or School responsible for the unit of study.

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

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 unit of study 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 unit of study in which he or she has failed or discontinued more than once whether that unit of study 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 unit of study 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 credit points 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 credit point value of units of study attempted, unless in one of these two years he or she successfully completes all units of study 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 units of study 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 credit points 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 credit points and then fails to gain a total of 44 credit points in the two years of attendance, unless in one of these two years he or she successfully completes all units of study 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 units of study 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.

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

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

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

You should also note the following:

- you can take only units of study which do not have timetable clashes.
- most full-time students enrol in 4 (6 credit point) Junior units of study in each semester of their first year.
- you may not enrol in more than 28 credit points in any one semester.
- before being permitted to enrol in a unit of study, you have to meet any prerequisites and corequisites for that unit of study.
- you may not enrol in more than 48 credit points of Senior units of study in a single Science Discipline Area.
- if you wish to major in History and Philosophy of Science, you must have another major in a single Science Discipline Area.
- you may not enrol in more than 32 credit points of Intermediate units of study in a single Science Discipline Area.
- you may not enrol in more than 16 credit points of Intermediate units of study and no more than 24 credit points of Senior units of study in the Science Discipline Areas of Anatomy and Histology, Cell Pathology, Pharmacology and Physiology. This means that no

more than 40 credit points from units of study in these areas may be counted towards your degree.

- you may not enrol in more than 16 credit points of Intermediate units of study in Engineering Science.
- you may not enrol in more than 28 credit points of units of study not in Science Discipline Areas unless you are enrolled in a specially designated degree program (e.g., BSc (Environmental)).
- Advanced units of study are indicated by a 9 (or 8) as the second digit of the unit of study number. Entry to these units of study is limited (details can be obtained from Departments).

Plans of study

It is important when choosing units of study at any stage of your university career that you consider your overall degree program. Consultation with a Faculty adviser is always recommended.

Studying part-time

Most students study full-time (i.e., in any semester, take units of study with a total of 18 or more credit points). If you wish to study part-time you will have to indicate this when enrolling. Day-time attendance at lectures and laboratory classes is required for most science units of study.

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 units of study, prizes and scholarships. For Regulations relating to discontinuation, see the University's *Calendar 1996, Vol. 1, 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 units of study' below.

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 of study

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

Senior Agricultural Chemistry units of study

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

Intermediate Geography units of study

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

Intermediate Geology units of study

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

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.

Regulations

Resolutions of the Senate²

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 *unit of study* shall consist of such lectures, tutorial instruction, essays, exercises, or practical and field work as may be prescribed.

(ii) Each unit of study shall be designated as a *Junior, Intermediate, Senior or Honours* level unit of study. In addition certain units of study may be designated as *Advanced or Special Studies Program* units of study.

(iii) Junior, Intermediate, Senior and Honours units of study are indicated by unit of study level designations 1000-1999, 2000-2999, 3000-3999 and 4000-4999 respectively; a Junior unit of study is one for which the qualifying units of study, prerequisites or assumed knowledge are non-tertiary qualifications or the co-requisites are other Junior units of study; an Intermediate unit of study is one for which the qualifying units of study or prerequisites are Junior or Intermediate units of study or the corequisites are other Intermediate units of study; a Senior unit of study is one for which the qualifying units of study or prerequisites are Intermediate or Senior units of study or the corequisites are other Senior units of study.

(iv) Except for Honours units of study, each unit of study shall be confined to one semester in duration, with assessment being completed during that semester.

(v) Except as provided in sections 4(1)(xi), 4(1)(xii), 12 and 13, each unit of study 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
- Anatomy and Histology
- Biochemistry
- Biology
- Cell Pathology
- Chemistry
- Computer Science
- Engineering Science
- Geography
- Geology
- Geophysics
- History and Philosophy of Science
- Marine Science
- Mathematics
- Microbiology
- Pharmacology
- Physics
- Physiology
- Psychology
- Soil Science
- Statistics

² In 1994 the unit of study General Pure Mathematics 1 was renamed Mathematics 1 (Life Sciences). Any references to Mathematics 1 (Life Science) in these Resolutions shall be deemed to apply equally to General Pure Mathematics 1.

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

each unit of study shall be of 4, 6, 8, or 12 credit points value; a unit of study may be comprised of modules of smaller credit point value which shall be taken in various combinations as determined by the Head of the Department concerned.

(2) To "*complete a unit of study*" 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 unit of study.

(3) A *qualifying unit of study* means a unit of study 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 unit of study for which it qualifies.

(4) A *prerequisite unit of study* means a unit of study other than a qualifying unit of study 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 unit of study for which it is a prerequisite.

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

Units of study for Pass degree

3. Units of study 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 credit point values, and

(5) have such qualifying, prerequisite and corequisite units of study 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 units of study giving credit for a total of at least 144 credit points, where:

(i) at least 12 credit points are from units of study in the Science Discipline Areas of Mathematics and Statistics;

(ii) at least 36 credit points are from Junior units of study in Science Discipline Areas;

(iii) except as provided in section 13, at least 72 credit points are from Intermediate and Senior units of study in Science Discipline Areas;

(iv) except as provided in section 12, at least 24 credit points are from Senior units of study in a single Science Discipline Area other than History & Philosophy of Science;

(v) at least 16 credit points are from Intermediate or Senior units of study in a single Science Discipline Area other than that used to satisfy the requirement in section 4(1)(iv);

(vi) no more than 32 credit points are from Intermediate units of study which belong to a single Science Discipline Area;

(vii) no more than 48 credit points are from Senior units of study which belong to a single Science Discipline Area;

(viii) no more than 16 credit points are from Intermediate units of study and no more than 24 credit points are from Senior units of study which belong to the Science Discipline Areas of Anatomy and Histology, Cell Pathology, Pharmacology, and Physiology;

(ix) no more than 16 credit points are from Intermediate units of study which belong to the Science Discipline Area of Engineering Science;

(x) no more than 28 credit points are from units of study in which the grade of Concessional Pass was awarded;

(xi) no more than 28 credit points are from units of study not in Science Discipline Areas, including all first year units of study offered by the Faculties of Arts and Economics but excluding those units of study which the Faculty has deemed to be mutually exclusive with units of study offered for the Bachelor of Science degree;

(xii) except as provided in section 12, no more than 12 credit points are from units of study in the Faculty of Arts designated B101 or ABI01.

(2) No unit of study may be credited more than once for the degree.

(3) No credit points may be credited for the degree from more than one of such units of study 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 unit of study which has substantial content in common with another unit of study 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 unit of study previously completed, in which case the candidate shall receive credit only for the number of credit points appropriate to the work performed.

(4) Where a candidate enrolls in a unit of study which is the same as, or has substantial content in common with, a unit of study which was previously attempted but was not completed satisfactorily, the Head of the Department concerned may exempt the candidate from certain of the unit of study 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 units of study with a total number of credit points in excess of 28.

(2) The choice of units of study made by a candidate shall be limited by the exigencies of the timetable provided that candidates who have completed at least 36 credit points of Junior units of study and who seek to enrol in two units of study which are given wholly or partly at the same time may be granted, by the Heads of the Departments concerned, permission to attend equivalent units of study or parts of units of study given at another time.

Enrolment in units of study not in Table I

6. (1) A candidate of merit may, under special circumstances and with the permission of the Faculty, enrol in a unit of study other than those specified in Table I associated with section 3. Credit points will be counted from such a unit of study towards the maximum of 28 credit points 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 units of study 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 credit points, which will be designated by the Dean as Junior, Intermediate or Senior. Such credit points shall count towards the number of credit points required for the degree in accordance with section 4(1).

Upgrade of units of study

7. (1) A candidate may not enrol in a unit of study which was previously completed with a grade of Pass or better.
- (2) Candidates who have been awarded a Concessional Pass in any unit of study may enrol in that unit of study again. On completion of that unit of study such candidates will not be credited with any further credit points for that unit of study unless the unit of study is completed at least at Pass level and the credit points 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 units of study with a total credit point value of more than 17 credit points.

Unit of study 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 units of study 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 unit of study 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 unit of study 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 unit of study shall, unless

exempted by the Faculty, again attend lectures and other classes and complete the prescribed written and other work in all such units of study in which they are permitted to re-enrol.

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

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

Credit for other units of study

10. (1) Subject to the limitations on total credit given in section 10(2), candidates may be given credit for a unit of study which they have completed in another recognised program provided that:
- the unit of study was completed not more than nine years before admission to candidature in the Faculty;
 - the unit of study was completed with a result equivalent to Pass or better (not Concessional Pass);
 - if the unit of study 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
 - the unit of study content was material not taught in any corresponding unit of study at the University of Sydney, or
 - the candidate was unable for good reason to attend a corresponding unit of study at the University of Sydney;
 - where the unit of study is considered by the Faculty to be equivalent to a unit of study listed in the Tables associated with section 3, section 12 or section 13, then credit shall be given for that equivalent unit of study, and the candidate shall be regarded as having completed that equivalent unit of study for the purposes of these Resolutions;
 - where the unit of study is considered by the Faculty as appropriate, but no unit of study 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 credit points and with such a result as the Faculty may determine in order to provide fair comparison with units of study listed in Table I. Credit points 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 units of study shall be limited such that:
- the total credit point value which is credited to a candidate in accordance with section 10(1) from units of study in another recognised program, including those for which credit has been abandoned, may not exceed 96;
 - the total credit point value which is credited to a candidate in accordance with section 10(1), from units of study for which either the candidate maintains credit in some other recognised program, or a degree has been conferred, may not exceed 48;
 - in satisfying the requirements of section 4, a candidate must have been credited with at least 48 credit points, of which at least 24 are Senior credit points, from units of study 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 or the Advanced Mathematics Degree Program.
- (2) To qualify for the award of the BSc degree in the Advanced Degree Program or the Advanced Mathematics Degree Program, candidates shall pass all units of study at the first attempt and,

except with the permission of the Faculty, shall:

- (i) complete units of study to a value of at least 48 credit points in each year of enrolment;
 - (ii) complete at least 96 credit points from Intermediate and Senior units of study
 - (iii) qualify for admission to an Honours unit of study under Section 16.
- (3) Candidates wishing to graduate in the BSc (Advanced) degree Program shall:
- (i) include, in the Junior units of study taken, at least 24 credit points from units of study designated as Advanced and/or from studies at Junior level taken under the Faculty's Talented Student Program, as approved from time to time by the Dean under Resolution 6(2);
 - (ii) include, in the Intermediate units of study taken, at least 16 credit points from units of study designated as Advanced and/or from studies at Intermediate level taken under the Faculty's Talented Student Program, as approved from time to time by the Dean under Resolution 6(2);
 - (iii) complete at least 48 credit points from Senior units of study, including at least 24 credit points from units of study designated as Advanced and/or from studies at Senior level taken under the Faculty's Talented Student Program, as approved from time to time by the Dean under Resolution 6(2); and
- (4) Candidates wishing to graduate in the BSc (Advanced Mathematics) degree program shall:
- (i) include, in the Junior units of study taken, at least 24 credit points from units of study designated as Advanced and/or from studies at Junior level taken under the Faculty's Talented Student Program, as approved from time to time by the Dean under Resolution 6(2), including at least 12 credit points from Junior units of study in the Science Discipline Areas of Mathematics and Statistics;
 - (ii) include, in the Intermediate units of study taken, at least 24 credit points in the Science Discipline Areas of Mathematics and Statistics, including at least 12 credit points from units of study designated as Advanced and/or from studies at Intermediate level taken under the Faculty's Talented Student Program, as approved from time to time by the Dean under Resolution 6(2);
 - (iii) complete at least 48 credit points from Senior units of study, including at least 24 credit points in the Science Discipline Areas of Mathematics and Statistics including at least 12 credit points from units of study designated as Advanced and/or from studies at Senior level taken under the Faculty's Talented Student Program, as approved from time to time by the Dean under Resolution 6(2);

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 units of study as set out in the Tables associated with this section as follows:

- | | |
|----------------------------------|-----------|
| (1) Bioinformatics | Table II |
| (2) Environmental | Table III |
| (3) Molecular Biology & Genetics | Table IV |

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 48 credit points in respect of the units of study set out in Table V associated with this section for the Bachelor of Science degree³, 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 units of study of a total credit point value exceeding that specified in section 5(1);
- (ii) with the exception of units of study in Table V, only units of study from Science Discipline Areas may be credited towards the BSc degree;
- (iii) in addition to the 48 credit points of units of study set out in Table V, such a candidate shall complete at least 60 credit points from Intermediate and Senior units of study 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 units of study in Table V until they have completed the units of study Legal Institutions I and Law, Lawyers and Justice in Australian Society.

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 Faculty.³

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 Surgery⁴;
- (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 Faculties³.

Admission to Honours units of study

16. (1) In order to qualify for admission to an Honours unit of study 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 unit of study.

(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 units of study:

- (i) Pass graduates in Science of the Faculty of Science.
- (ii) Pass graduates holding Bachelor of Science 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 unit of study 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 unit of study which they are qualified to enter.

³ See 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.

⁴ This combined program relates to the MBBS old Resolutions only.

Honours units of study

17. (1) Candidates for the Honours degree shall complete an Honours unit of study, full-time over one year.
- (2) On the recommendation of the Head of Department concerned the Faculty may permit a candidate to undertake an Honours unit of study half-time over two consecutive years. This permission will be granted only if the Faculty is satisfied that the candidate is unable to attempt the unit of study on a full-time basis.
- (3) There shall be an Honours unit of study 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 unit of study 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 units of study 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 credit points.

Honours units of study

The Regulations governing Honours units of study 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) or 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 credit points of Senior units of study 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 Department may apply additional guidelines. The Head of Department will determine the availability of half-time Honours units of study 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)(1)(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 unit of study 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 unit of study.

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 unit of study without having taken the Senior unit of study when previous training is suitable. For example, it is permissible to study Biophysics in Biology Honours without having taken Intermediate and Senior Biology units of study if Physics or Physical Chemistry have been taken instead. Similarly Honours in Geophysics may be taken in certain circumstances without having taken Senior Geophysics units of study.

Where an Honours unit of study 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 credit point values of the units of study taken in the pre-Honours years and then dividing by the sum of the weighted credit point values. Note that all attempts at units of study are included in the calculation except where units of study are discontinued with permission. The formula used is as follows:

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

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

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 units of study. The Faculty recognises, however, that the Senate Resolutions concerning medals relate the award of a medal to the Honours units of study 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 units of study, 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]

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corerequisites (C)	Additional Information / May not be counted with	When Offered
A. Junior Units of Study					
Biology					
BIOL 1001	Concepts in Biology	6	Akn Biology section of the HSC 3-unit Science course	May not be counted with Biology 1901	February
BIOL 1002	Living Systems	6	Akn HSC 2 unit Biology or Biology 1001 or 1901 or equivalent	May not be counted with Biology 1902	July
BIOL 1003	Human Biology	6	Akn HSC 2 unit Biology or Biology 1001 or 1901 or equivalent	Not a prerequisite for all Intermediate units of study in Biology. See prerequisites listed under Intermediate units of study. May not be counted with Biology 1903	July
BIOL 1901	Concepts in Biology (Advanced)	6	Akn Biology section of the HSC 3-unit Science course; by invitation	May not be counted with Biology 1001. Students must first enrol in Biology 1001. Subsequently, selected students may be invited to enrol in this unit of study where they will participate in a more demanding alternative component	February
BIOL 1902	Living Systems (Advanced)	6	Akn HSC 2 unit Biology or Biology 1001 or 1901 or equivalent; by invitation	May not be counted with Biology 1002 Students must first enrol in Biology 1002. Subsequently, selected students may be invited to enrol in this unit of study where they will participate in a more demanding alternative component	July
BIOL 1903	Human Biology (Advanced)	6	Akn HSC 2 unit Biology or Biology 1001 or 1901 or equivalent; by invitation	May not be counted with Biology 1003 Students must first enrol in Biology 1003. Subsequently, selected students may be invited to enrol in this unit of study where they will participate in a more demanding alternative component	July
Chemistry					
CHEM 1001	Introductory Chemistry 1A	6	Akn There is no assumed knowledge of chemistry for this unit of study	May not be counted with Chemistry 1101 or 1901 or 1903	February
CHEM 1002	Introductory Chemistry 1B	6	Prereq Chemistry 1001 or equivalent	May not be counted with Chemistry 1102 or 1902 or 1904	July

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corequisites (C)	Additional Information / May not be counted with	When Offered
CHEM 1101	Chemistry 1A	6	Akn HSC Mathematics 2 unit course; and the Chemistry component of the 4-unit or 3-unit HSC Science course, or 2-unit Chemistry	May not be counted with Chemistry 1001 or 1901 or 1903 Recommended concurrent unit of study: Preferred — Mathematics 1701 or 1791; otherwise — Mathematics 1711	February & July
CHEM 1102	Chemistry IB	6	Prereq Chemistry 1101 or a Distinction in Chemistry 1001 or equivalent; Chemistry 1101 may be taken as a corequisite	May not be counted with Chemistry 1002 or 1902 or 1904 Recommended concurrent unit of study: Preferred — Mathematics 1702 or 1703 or 1792 or 1793; otherwise — Mathematics 1704 or 1712	July
CHEM 1901	Chemistry 1A (Advanced)	6	Prereq TER of at least 88 and at least 75% in HSC 2-unit Chemistry or equivalent; by invitation	May not be counted with Chemistry 1001 or 1101 or 1903 Recommended concurrent unit of study: Preferred — Mathematics 1701 or 1791; otherwise — Mathematics 1711	February
CHEM 1902	Chemistry IB (Advanced)	6	Qual Chemistry 1901 or 1903 or Distinction in Chemistry 1101 or equivalent; by invitation	May not be counted with Chemistry 1002 or 1102 or 1904 Recommended concurrent unit of study: Preferred — Mathematics 1702 or 1703 or 1792 or 1793, otherwise — Mathematics 1712 or 1704	July
CHEM 1903	Chemistry 1A (Special Studies Program)	6	Prereq TER of at least 98 and at least 85% in HSC 2-unit Chemistry or equivalent. Entry is by invitation	May not be counted with Chemistry 1001 or 1101 or 1901 Recommended concurrent unit of study: Preferred — Mathematics 1701 or 1791; otherwise — Mathematics 1711 Students in the Faculty of Science Talented Students Program are automatically eligible. For the purpose of Resolution 11 this unit of study is deemed to be designated as an Advanced unit of study	February
CHEM 1904	Chemistry IB (Special Studies Program)	6	Prereq Chemistry 1903; by invitation	May not be counted with Chemistry 1002 or 1102 or 1902 Recommended concurrent unit of study: Preferred — Mathematics 1002 or 1003 or 1792 or 1793; otherwise — Mathematics 1712 or 1704	July
Computer Science					
COMP 1000	Information Technology Tools	6			February & July

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corerequisites (C)	Additional Information / May not be counted with	When Offered
COMP 1001	Introductory Programming	6	Akn HSC 3-unit Mathematics	May not be counted with Computer Science 1901 Students intending to major in Computer Science are advised to enrol in Mathematics 1703 or 1704 or 1793 or 1794 in their first year	February and July
COMP 1901	Introductory Programming (Advanced)	6	Akn HSC 3-unit Mathematics (Requires permission by the Head of Department)	May not be counted with Computer Science 1001	February and July
COMP 1002	Introductory Computer Science	6	Prereq Computer Science 1001 or 1901	May not be counted with Computer Science 1902	July
COMP 1902	Introductory Computer Science (Advanced)	6	Prereq Distinction in Computer Science 1901 or 1001	May not be counted with Computer Science 1002	July
Geography					
GEOG 1001	Physical Geography	6			February
GEOG 1002	Environmental and Human Geography	6			July
Geology					
GEOL1001	Earth and Its Environment	6	No previous knowledge of Geology assumed	See prerequisites for Intermediate Geology	February
GEOL 1002	Earth Processes and Resources	6	No previous knowledge of Geology assumed		July
Mathematics					
MATH 1701	Differential Calculus and Linear Algebra	6	Akn HSC 3-unit Mathematics	May not be counted with Mathematics 1711 or 1791	February
MATH 1702	Integral Calculus and Statistics	6	Akn HSC 4-unit Mathematics or Mathematics 1701	May not be counted with Mathematics 1712 or 1792 or 1793 or 1794 or 1703 or 1704	July
MATH 1703	Integral Calculus and Discrete Mathematics	6	Akn HSC 4-unit Mathematics or Mathematics 1701	May not be counted with Mathematics 1702 or 1704 or 1712 or 1792 or 1793 or 1794	July

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corerequisites (C)	Additional Inform May not be count	
MATH 1704	Statistics and Discrete Mathematics	6	Akn HSC 3-unit Mathematics	May not be counted with Mathematics 1702 or 1703 or 1712 or 1792 or 1793 or 1794	July
MATH 1711	Life Sciences Mathematics A	6	Akn HSC 2-unit Mathematics	May not be counted with Mathematics 1701 or 1791 May not be counted by students enrolled in the BSc/BCom combined degree program	February
MATH 1712	Life Sciences Mathematics B	6	Akn HSC 2-unit Mathematics	May not be counted with Mathematics 1702 or 1703 or 1704 or 1792 or 1793 or 1794 May not be counted by students enrolled in the BSc/BCom combined degree program	July
MATH 1791	Differential Calculus and Linear Algebra (Advanced)	6	Akn HSC 4-unit or top decile 3-unit Mathematics	May not be counted with Mathematics 1701 or 1711	February
MATH 1792	Integral Calculus and Statistics (Advanced)	6	Akn HSC 4-unit Mathematics or Mathematics 1791	May not be counted with Mathematics 1702 or 1703 or 1704 or 1712 or 1793 or 1794	July
MATH 1793	Integral Calculus and Discrete Mathematics (Advanced)	6	Akn HSC 4-unit Mathematics or Mathematics 1791	May not be counted with Mathematics 1702 or 1703 or 1704 or 1712 or 1792 or 1794	July
MATH 1794	Statistics and Discrete Mathematics (Advanced)	6	Akn HSC 4-unit or top decile 3-unit Mathematics	May not be counted with Mathematics 1702 or 1703 or 1704 or 1712 or 1792 or 1793	July
Physics					
PHYS 1001	Physics (Regular)	6	Akn HSC Physics or HSC 4-unit Science	May not be counted with Physics 1002 or 1901 See prerequisites for Intermediate Physics units of study. Recommended concurrent unit of study: Mathematics 1701 or 1791	February
PHYS 1002	Physics (Fundamentals)	6	Akn no assumed knowledge of Physics	May not be counted with Physics 1001 or 1901 See prerequisites for Intermediate Physics units of study. Recommended concurrent unit of study: Mathematics 1701 or 1791	February
PHYS 1003	Physics (Technological)	6	Akn HSC 2-unit Physics or HSC 4-unit Science of Physics 1001 or 1002 or 1902 or equivalent* ♦Subject to Senate/Faculty approval	May not be counted with Physics 1004 or 1902 See prerequisites for Intermediate Physics units of study. Recommended concurrent unit of study: Mathematics 1702 or 1792	July

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corerequisites (C)	Additional Information / May not be counted with	When Offered
PHYS 1004	Physics (Environmental and Life' Sciences)	6	Akn HSC 2-unit Physics or HSC 4-unit Science of Physics 1001 or 1002 or 1902 or equivalent* *Subject to Senate/Faculty approval	May not be counted with Physics 1003 or 1902 See prerequisites for Intermediate Physics units of study. Recommended concurrent unit of study: Mathematics 1702 or 1792	July
PHYS 1500	Astronomy	6	No assumed knowledge of Physics		July
PHYS 1901	Physics (Advanced) A	6	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	May not be counted with Physics 1001 or 1002 See prerequisites for Intermediate Physics units of study. Recommended concurrent unit of study: Mathematics 1701 or 1791	February
PHYS 1902	Physics (Advanced) B	6	Prereq TER at least that for acceptance into BSc(Advanced) and HSC 2-unit Physics or HSC 4-unit Science or Physics 1901 or grade of Distinction or better in Physics 1001* *Subject to Senate/Faculty approval	May not be counted with Physics 1003 or 1004 See prerequisites for Intermediate Physics units of study. Recommended concurrent unit of study: Mathematics 1702 or 1792	July

Psychology

PSYC 1001	Psychology 1001	6			February
PSYC 1002	Psychology 1002	6			July

B. Intermediate Units of Study

Agricultural Chemistry

AGCH 2001	Molecular Processes in Ecosystems	8	Qual Chemistry 1002 or equivalent Prereq Biology 1002 or 1902 Students who have not satisfied the prerequisites in Biology may enrol with Soil Science 2001 as a corequisite	May not be counted with any Intermediate unit of study in Biochemistry.	February
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Anatomy and Histology

AN AT 2001	Principles of Histology*	4	Prereq 12 credit points of Junior Biology or Junior Psychology	* Subject to Faculty/Senate approval	February
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Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corerequisites (C)	Additional Information / May not be counted with	When Offered
ANAT 2002	Comparative Primate Anatomy	4	Prereq 12 credit points of Junior Biology or Junior Psychology* *Subject to Faculty/Senate approval		July
Biochemistry					
BCHM 2001	Genes and Proteins	8	Qual 6 credit points of Junior Chemistry which must include one of Chemistry 1101, 1102, 1901, 1902, 1903, 1904 or, with the permission of the Head of Department, exceptional performance in Chemistry 1001 or 1002	May not be counted with Agricultural Chemistry 2001 or Biochemistry 2101 or 2901	February
BCHM 2002	Molecules, Metabolism and Cells	8	Qual Biochemistry 2001 or 2901	May not be counted with Agricultural Chemistry 2001 or Biochemistry 2102 or 2902	July
BCHM 2101	Genes and Proteins Theory	4	Qual 6 credit points of Junior Chemistry which must include one of Chemistry 1101, 1102, 1901, 1902, 1903, 1904 or, with the permission of the Head of Department, exceptional performance in Chemistry 1001 or 1002	May not be counted with Agricultural Chemistry 2001 or Biochemistry 2001 or 2901	February
BCHM 2102	Molecules, Metabolism and Cells Theory	4	Qual Biochemistry 2001, 2101 or 2901	May not be counted with Agricultural Chemistry 2001 or Biochemistry 2002 or 2902	July
BCHM 2901	Genes and Proteins (Advanced)	8	Qual 6 credit points of Junior Chemistry which must include one of Chemistry 1101, 1102, 1901, 1902, 1903, 1904 or, with the permission of the Head of Department, exceptional performance in Chemistry 1001 or 1002	May not be counted with Agricultural Chemistry 2001 or Biochemistry 2101 or 2001	February
BCHM 2902	Molecules, Metabolism and Cells (Advanced)	8	Qual Biochemistry 2001 or 2901 (selected students)	May not be counted with Agricultural Chemistry 2001 or Biochemistry 2102 or 2002	July
Biology					
BIOL 2001	Animals A	8	Qual 12 credit points of Junior Biology including Biology 1002 or 1902 Prereq Chemistry 1102 or 1902 or 1904 or (with the permission of the Head of School) exceptional performance in Chemistry 1002	May not be counted with Biology 2101 or 2901 See prerequisites for Senior units of study Biology	February

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corerequisites (C)	Additional Information / May not be counted with	When Offered
BIOL 2901	Animals A (Advanced)	8	Qual 12 credit points of Junior Biology including Biology 1002 or 1902 Prereq Chemistry 1102 or 1902 or 1904 or (with the permission of the Head of School) exceptional performance in Chemistry 1002; by invitation	May not be counted with Biology 2001 or 2101 Students must first enrol in Biology 2001 Subsequently, students may be invited to enrol in this unit of study where they will participate in a more demanding alternative component See prerequisites for Senior units of study in Biology	February
BIOL 2101	Animals A — Theory	4	Qual 12 credit points of Junior Biology including Biology 1002 or 1902	May not be counted with Biology 2001 or 2901 Not a prerequisite for Senior units of study in Biology	February
BIOL 2002	Animals B	8	Qual 12 credit points of Junior Biology including Biology 1002 or 1902 Prereq Chemistry 1102 or 1902 or 1904 or (with the permission of the Head of School) exceptional performance in Chemistry 1002	May not be counted with Biology 2902 See prerequisites for Senior units of study in Biology	July
BIOL 2902	Animals B (Advanced)	8	Qual 12 credit points of Junior Biology including Biology 1002 or 1902 Prereq Chemistry 1102 or 1902 or 1904 or (with the permission of the Head of School) exceptional performance in Chemistry 1002; by invitation	May not be counted with Biology 2002 or 2102 Students must enrol in Biology 2002 Subsequently, students may be invited to enrol in this unit of study where they will participate in a more demanding alternative component See prerequisites for Senior units of study in Biology	July
BIOL 2102	Animals B — Theory	4	Qual 12 credit points of Junior Biology, including Biology 1002 or 1902	May not be counted with Biology 2002 or 2902 Not a prerequisite for Senior units of study in Biology	July
BIOL 2003	Plant Anatomy and Physiology	8	Qual 12 credit points of Junior Biology including Biology 1002 or 1902	May not be counted with Biology 2903 See prerequisites for Senior units of study in Biology	February
BIOL 2903	Plant Anatomy and Physiology (Advanced)	8	Qual 12 credit points of Junior Biology including Biology 1002 or 1902; by invitation	May not be counted with Biology 2003 Students must enrol in Biology 2003 Subsequently, students may be invited to enrol in this unit of study where they will participate in a more demanding alternative component See prerequisites for Senior units of study in Biology	February
BIOL 2004	Plant Ecology and Diversity	8	Qual 12 credit points of Junior Biology including Biology 1002 or 1902	May not be counted with Biology 2904 See prerequisites for Senior units of study in Biology	July

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corerequisites (C)	Additional Information / May not be counted with	When Offered
BIOL 2904	Plant Ecology and Diversity (Advanced)	8	Prereq 12 credit points of Junior Biology including Biology 1002 or 1902; by invitation	May not be counted with Biology 2004 Students must enrol in Biology 2004 Subsequently, students may be invited to enrol in this unit of study where they will participate in a more demanding alternative component See prerequisites for Senior units of study in Biology	July
BIOL 2005	Molecular and General Genetics	8	Qual 12 credit points of Junior Biology Prereq Chemistry 1102 or 1902 or 1904 or (with the permission of the Head of School) exceptional performance in Chemistry 1002. Biochemistry 2001 or 2901 and Biology 2006 or 2906 are highly recommended	May not be counted with Biology 2105 or 2905 See prerequisites for Senior units of study in Biology	July
BIOL 2905	Molecular and General Genetics (Advanced)	8	Qual 12 credit points of Junior Biology Prereq Chemistry 1102 or 1902 or 1904 or (with the permission of the Head of School) exceptional performance in Chemistry 1002. Biochemistry 2001 or 2901 and Biology 2006 or 2906 are highly recommended; by invitation	May not be counted with Biology 2005 or 2105 Students must enrol in Biology 2005 Subsequently, students may be invited to enrol in this unit of study where they will participate in a more demanding alternative component See prerequisites for Senior units of study in Biology	July
BIOL 2105	Molecular and General Genetics — Theory	4	Qual 12 credit points of Junior Biology Prereq Chemistry 1102 or 1902 or 1904 or (with permission of the Head of School) exceptional performance in Chemistry 1002	May not be counted with Biology 2005 or 2905 Not a prerequisite for Senior units of study in Biology	July
BIOL 2006	Cell Biology	8	Qual 12 credit points of Junior Biology Prereq Chemistry 1102 or 1902 or 1904 or (with the permission of the Head of School) exceptional performance in Chemistry 1002	May not be counted with Biology 2106 or 2906 See prerequisites for Senior units of study in Biology	February
BIOL 2906	Cell Biology (Advanced)	8	Qual 12 credit points of Junior Biology Prereq Chemistry 1102 or 1902 or 1904 or (with the permission of the Head of School) exceptional performance in Chemistry 1002; by invitation	May not be counted with Biology 2006 Students must first enrol in Biology 2006 Subsequently, students may be invited to enrol in this unit of study where they will participate in a more demanding alternative component See prerequisites for Senior units of study in Biology	February
BIOL 2106	Cell Biology — Theory	4	Qual 12 credit points of Junior Biology Prereq Chemistry 1102 or 1902 or 1904 or (with the permission of the Head of School) exceptional performance in Chemistry 1002	May not be counted with Biology 2006 or 2906 Not a prerequisite for Senior units of study in Biology	February

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corerequisites (C)	Additional Information / May not be counted with	When Offered
BIOL 2007	Introductory Entomology	8	Qual 12 credit points of Junior Biology Prereq Chemistry 1102 or 1902 or 1904 or (with the permission of the Head of School) exceptional performance in Chemistry 1002.		July
Chemistry					
CHEM 2001	Chemistry 2 (Life Sciences)	8	Qual Chemistry 1102 or 1902 or 1904 Prereq 6 credit points of Junior Mathematics	May not be counted with Chemistry 2101 or 2201 or 2301 or 2502 or 2901	February
CHEM 2101	Chemistry 2 (Environmental)	8	Qual Chemistry 1102 or 1902 or 1904 and Prereq 6 credit points of Junior Mathematics	May not be counted with Chemistry 2001 or 2201 or 2301 or 2502 or 2901	February
CHEM 2202	Chemistry 2 (Principles)	8	Prereq Chemistry 2001 or 2101 or 2201 or 2301 or 2502	May not be counted with Chemistry 2302 or 2902	July
CHEM 2301	Chemistry 2A	8	Qual Chemistry 1102 or 1902 or 1904 Prereq 6 credit points of Junior Mathematics	May not be counted with Chemistry 2001 or 2101 or 2201 or 2502 or 2901	February
CHEM 2302	Chemistry 2B	8	Prereq Chemistry 2001 or 2101 or 2201 or 2301 or 2502	May not be counted with Chemistry 2202 or 2902	July
CHEM 2502	Chemistry 2 (Forensic)	8	Qual Chemistry 1102 or 1902 or 1904 Prereq 6 credit points of Junior Mathematics	May not be counted with Chemistry 2001 or 2101 or 2201 or 2301 or 2901	February & July
CHEM 2901	Chemistry 2A (Advanced)	8	Qual WAM greater than 80 and Distinction average in Chemistry 1101 or 1901 or 1903 and in Chemistry 1102 or 1902 or 1904 Prereq 6 credit points of Junior Mathematics; by invitation	May not be counted with Chemistry 2001 or 2101 or 2201 or 2301 or 2502 Entry to this unit of study is by invitation. Students in the Faculty of Science Talented Students Program are automatically eligible	February
CHEM 2902	Chemistry 2B (Advanced)	8	Prereq Chemistry 2901, but see Additional information below; by invitation	May not be counted with Chemistry 2202 or 2302	July
Computer Science					
COMP 2001	Computer Systems	4	Qual Computer Science 1002 or 1902	May not be counted with Computer Science 2901 See prerequisites for Senior Computer Science units of study. Consult Departmental Handbook	February
COMP 2901	Computer Systems (Advanced)	4	Qual Distinction in Computer Science 1902 or 1002	May not be counted with Computer Science 2001	February
COMP 2002	Design and Data Structures	4	Qual Computer Science 1002 or 1902	May not be counted with Computer Science 2902 See prerequisites for Senior Computer Science units of study. Consult Departmental Handbook	February

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corerequisites (C)	Additional Information / May not be counted with	When Offered
COMP 2902	Design and Data Structures (Advanced)	4	Qual Distinction in Computer Science 1902 or 1002	May not be counted with Computer Science 2002	February
COMP2003	Languages and Logic	4	Qual Computer Science 1002 or 1902 Prereq Computer Science 2002 or 2902 and Mathematics 1703 or 1704 or 1793 or 1794	May not be counted with Computer Science 2903 See prerequisites for Senior Computer Science units of study. Consult Departmental Handbook	July
COMP 2903	Languages and Logic (Advanced)	4	Qual Distinction in Computer Science 1902 or 1002 Prereq Computer Science 2902 or 2002 (with sufficient merit) and Mathematics 1703 or 1704 or 1793 or 1794	May not be counted with Computer Science 2003	July
COMP 2004	Programming Practice	4	Qual Computer Science 1002 or 1902 Prereq Computer Science 2002 or 2902	May not be counted with Computer Science 2904 See prerequisites for Senior Computer Science units of study. Consult Departmental Handbook	July
COMP 2904	Programming Practice (Advanced)	4	Qual Distinction in Computer Science 1902 or 1002 Prereq Computer Science 2902 or 2002 (with sufficient merit)		July
Engineering Science - Civil and Chemical					
ENGS 2201	Civil Engineering Science 2A	12	Prereq Chemistry 1102 or 1902 or 1904 or 12 credit points of Junior Physics or 12 credit points of Junior Mathematics		February
ENGS 2202	Civil Engineering Science 2B	4	Prereq Chemistry 1102 or 1902 or 1904 or 12 credit points of Junior Physics or 12 credit points of Junior Mathematics		July
ENGS 2601	Chemical Engineering 2A	8			February
ENGS 2602	Chemical Engineering 2B	8			July
ENGS 2611	Chemical Engineering Science 2A Auxiliary	4	Prereq Chemistry 1102 or 1902 or 1904 or 12 credit points of Junior Physics or 12 credit points of Junior Mathematics Coreq Chemistry 2202 or 2902		February
ENGS 2612	Chemical Engineering Science 2B Auxiliary	4	Prereq Engineering Science 2601		July

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corerequisites (C)	Additional Information / May not be counted with	When Offered
Geography					
GEOG 2001	Megascale Physical Environments	8	Prereq Geography 1001 or Environmental Science 1002	A candidate who has completed 12 Junior credit points of Mathematics and 12 Junior credit points of Physics or Chemistry and who has not taken Geography 1001 or 1002 may apply under Section 1(4) for permission to enrol in any Intermediate Geography unit of study. The Department of Geography is not normally prepared to support applications under Section 1(4) to enrol in Intermediate Geography units of study from persons other than those who, in their first year of studies, have completed four Junior units of study above the concessional pass grade and have not subsequently failed in any Intermediate unit of study.	February
GEOG 2002	Geomorphology of Fluvial and Coastal Environments	8	Prereq Geography 1001 or Environmental Science 1002	As for Geography 2001	July
GEOG 2101	Environmental Change and Human Response	8	Prereq Geography 1001 or 1002 or Environmental Science 1002	As for Geography 2001	February
GEOG 2102	Environmental Management	8	Prereq Geography 1001 or 1002 or Environmental Science 1002	As for Geography 2001	July
GEOG 2201	Social and Cultural Geography	8	Prereq Geography 1002 or Environmental Science 1002	As for Geography 2001	February
GEOG 2202	Geography of Restructuring	8	Prereq Geography 1002 or Environmental Science 1002	As for Geography 2001	July
Geology and Geophysics					
GEOL 2001	Plate Tectonics and Materials	8	Prereq Geology 1002 or Environmental Science 1001	A candidate who has completed 24 credit points of Junior units of study in Physics and Chemistry and who has not taken Junior Geology or Environmental Science 1001, may apply under section 1 (4) for permission to enrol in Geology 2001	February
GEOL 2002	Resource Exploration	4	Prereq Geology 2001		July

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corerequisites (C)	Additional Information / May not be counted with	When Offered
GEOL 2003	Fossils and Time	4	Prereq 24 credit points of Science units of study		July
GEOL 2004	Environmental Geology: Hazards	4	Prereq 24 credit points of Science units of study	See prerequisites for Senior Geology	February
GEOL 2005	Environmental Geology: Resources	4	Prereq 24 credit points of Science units of study	See prerequisites for Senior Geology	July
History and Philosophy of Science					
HPSC 2001	Introductory Philosophy of Science	4	Prereq 24 credit points of Junior Science units of study	This is a qualifying unit of study for Senior History and Philosophy of Science units of study	July
HPSC 2002	Introductory History of Science	4	Prereq 24 credit points of Junior Science units of study	This is a qualifying unit of study for Senior History and Philosophy of Science units of study	February
Marine Sciences					
MARS 2001	Introductory Marine Science A	4	Prereq 24 credit points of Junior units of study from Science Discipline Areas	This is a qualifying unit of study for Marine Science 3001 and 3002. Some options in Senior Marine Science have additional prerequisites	February
MARS 2002	Introductory Marine Science B	4		As for Marine Science 2001	July
Mathematics					
MATH 2001	Vector Calculus and Complex Variables	4	Prereq Mathematics 1702 or 1703 or 1792 or 1793	May not be counted with Mathematics 2901	February
MATH 2002	Matrix Applications	4	Prereq Mathematics 1701 or 1791 or Distinction in Mathematics 1711	May not be counted with Mathematics 2902	February
MATH 2003	Introduction to Mathematical Computing	4	Prereq Mathematics 1702 or 1703 or 1792 or 1793	May not be counted with Mathematics 2903	February
MATH 2004	Lagrangian Dynamics	4	Prereq Mathematics 2001 or 2901	May not be counted with Mathematics 2904	July
MATH 2005	Fourier Series and Differential Equations	4	Prereq Mathematics 2001 or 2901	May not be counted with Mathematics 2905	July
MATH 2006	Introduction to Nonlinear Systems and Chaos	4	Prereq Mathematics 1702 or 1703 or 1792 or 1793 or Distinction in Mathematics 1712	May not be counted with Mathematics 2906	February

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corerequisites (C)	Additional Information / May not be counted with	When Offered
MATH 2007	Analysis	4	Prereq Mathematics 1702 or 1703 or 1792 or 1793, or Distinction average in Mathematics 1711 and 1712	May not be counted with Mathematics 2907	July
MATH 2008	Introduction to Modern Algebra	4	Prereq Mathematics 2002 or 2902	May not be counted with Mathematics 2908	July
MATH 2009	Graph Theory	4	Prereq Mathematics 1701 or 1702 or 1703 or 1704 or 1791 or 1792 or 1793 or 1794, or Distinction in Mathematics 1711		February
MATH 2010	Optimisation	4	Prereq Mathematics 1702 or 1703 or 1792 or 1793 (strongly advise Mathematics 2002 or 2902)	May not be counted with Econometrics 3510 Operations Research A The combination of this unit of study with Mathematics 2002 or 2902 is highly recommended.	July
MATH 2901	Vector Calculus and Complex Variables (Advanced)	4	Prereq Mathematics 1792 or 1793 or Credit in either Mathematics 1702 or 1703	May not be counted with Mathematics 2001	February
MATH 2902	Linear Algebra (Advanced)	4	Prereq (Mathematics 1791 or Credit in 1701) and Mathematics 1792 or 1793 or 1794 or Credit in one of 1702 or 1703 or 1704	May not be counted with Mathematics 2002	February
MATH 2903	Introduction to Mathematical Computing (Advanced)	4	Prereq Mathematics 1792 or 1793 or Credit in either Mathematics 1702 or 1703	May not be counted with Mathematics 2003	February
MATH 2904	Lagrangian Dynamics (Advanced)	4	Prereq Mathematics 2901 or Credit in Mathematics 2001	May not be counted with Mathematics 2004	July
MATH 2905	Mathematical Methods (Advanced)	4	Prereq Mathematics 2901 or Credit in Mathematics 2001	May not be counted with Mathematics 2005	July
MATH 2906	Introduction to Nonlinear Systems and Chaos (Advanced)	4	Prereq Mathematics 1792 or 1793, or Credit in Mathematics 1702 or 1703	May not be counted with Mathematics 2006	February
MATH 2907	Analysis (Advanced)	4	Prereq Mathematics 2901 or Credit in Mathematics 2001	May not be counted with Mathematics 2007	July
MATH 2908	Differential Equations and Group Theory (Advanced)	4	Prereq Mathematics 2902	May not be counted with Mathematics 2008	July

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corerequisites (C)	Additional Information / May not be counted with	When Offered
Engineering Science - Mechanical					
MECH 2200	Thermo-fluids	6	Prereq 12 credit points each of Junior Mathematics and Junior Physics	May not be counted with MECH 2201 Thermodynamics	February
MECH 2400	Mechanical Design 1	6	Prereq 12 credit points each of Junior Mathematics and Junior Physics		July
MECH 2500	Engineering Dynamics 1	4			July
Microbiology					
MICR 2001	Introductory Microbiology	8	Qual 12 credit points of Junior Biology Prereq Chemistry 1102 or 1902 or 1904 and Mathematics 1701 or 1711 or 1791 and one of Mathematics 1702 or 1704 or 1712 or 1792 or 1794	May not be counted with Microbiology 2003 or 2901	February
MICR 2002	Applied Microbiology	8	Prereq Microbiology 2001 or 2901	May not be counted with Microbiology 2004 or 2902	July
MICR 2003	Theoretical Microbiology A	4	Qual 12 credit points of Junior Biology Prereq Chemistry 1102 or 1902 or 1904 and Mathematics 1701 or 1711 or 1791 and one of Mathematics 1702 or 1704 or 1712 or 1792 or 1794	May not be counted with Microbiology 2001 or 2901	February
MICR 2004	Theoretical Microbiology B	4	Prereq Microbiology 2001 or 2003 or 2901	May not be counted with Microbiology 2002 or 2902	July
MICR 2901	Introductory Microbiology (Advanced)	8	Qual Credit or better in Biology 1002 or 1003 or 1902 or 1903 and at least a pass in Chemistry 1102 or 1902 or 1904 Prereq Mathematics 1701 or 1711 or 1791 and Mathematics 1702 or 1704 or 1712 or 1792 or 1794	May not be counted with Microbiology 2001 or 2003 Credit average or better is required in either Junior Biology or Chemistry	February
MICR 2902	Applied Microbiology (Advanced)	8	Qual Credit or better in Microbiology 2001 or in the equivalent components in Microbiology 2901	May not be counted with Microbiology 2002 or 2004	July
Pharmacology					
PCOL 2001	Pharmacology Fundamentals	4	Prereq 12 credit points of Junior Chemistry (including Chemistry 1102 or 1902) and 24 credit points of units of study from other Science Discipline Areas	This is a qualifying unit of study for Pharmacology 3001 or 3002. Students are strongly advised to complete Junior units of study in Biology before enrolling in Pharmacology 2001	February

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corerequisites (C)	Additional Information / May not be counted with	When Offered
PCOL 2002	Pharmacology — Drugs and People	4	Prereq 12 credit points of Junior Chemistry (including Chemistry 1102 or 1902) and 24 credit points of units of study from other Science Discipline Areas	This is a qualifying unit of study for Pharmacology 3001 or 3002. Students are strongly advised to complete Junior units of study in Biology before enrolling in Pharmacology 2002	July
Physics					
PHYS 2001	Physics (Technological) A	8	Qual 12 credit points of Junior Physics or Physics IE Prereq 12 credit points of Junior Mathematics other than Mathematics 1711 and 1712 or Credit or better in Mathematics 1711 and 1712	May not be counted with Physics 2101 or 2103 or 2901 This is a qualifying unit of study for Senior Physics	February
PHYS 2002	Physics (Technological) B	8	Qual 12 credit points of Junior Physics or Physics IE Prereq 12 credit points of Junior Mathematics other than Mathematics 1711 and 1712 or Credit or better in Mathematics 1711 and 1712	May not be counted with Physics 2102 or 2104 or 2902 This is a qualifying unit of study for Senior Physics	July
PHYS 2101	Physics (Environmental) A	8	Qual 12 credit points of Junior Physics or Physics IE Prereq 12 credit points of Junior Mathematics other than Mathematics 1711 and 1712 or Credit or better in Mathematics 1711 and 1712	May not be counted with Physics 2001 or 2103 or 2901 This is a qualifying unit of study for Senior Physics	February
PHYS 2102	Physics (Environmental) B	8	Qual 12 credit points of Junior Physics or Physics IE Prereq 12 credit points of Junior Mathematics other than Mathematics 1711 and 1712 or Credit or better in Mathematics 1711 and 1712	May not be counted with Physics 2002 or 2104 or 2902 This is a qualifying unit of study for Senior Physics	July
PHYS 2103	Introduction to Environmental Physics	4	Qual 12 credit points of Junior Physics or Physics IE Prereq 12 credit points of Junior Mathematics other than Mathematics 1711 and 1712 or Credit or better in Mathematics 1711 and 1712	May not be counted with Physics 2001 or 2101 or 2901 This is not a qualifying unit of study for Senior Physics	February
PHYS 2104	Applications of Environmental Physics	4	Qual 12 credit points of Junior Physics or Physics IE Prereq 12 credit points of Junior Mathematics other than Mathematics 1711 and 1712 or Credit or better in Mathematics 1711 and 1712	May not be counted with Physics 2002 or 2102 or 2902 This is not a qualifying unit of study for Senior Physics	July

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corerequisites (C)	Additional Information / May not be counted with	When Offered
PHYS 2901	Physics (Advanced) A	8	Qual Physics 1901 and 1902 or 12 credit points of other Junior Physics units of study with an average of a Credit or better Prereq 12 credit points of Junior Mathematics other than Mathematics 1711 and 1712 or Credit or better in Mathematics 1711 and 1712	May not be counted with Physics 2001 or 2101 or 2103 This is a qualifying unit of study for Senior Physics	February
PHYS 2902	Physics (Advanced) B	8	Qual Physics 1901 and 1902 or 12 credit points of other Junior Physics units of study with an average of a Credit or better Prereq 12 credit points of Junior Mathematics other than Mathematics 1711 and 1712 or Credit or better in Mathematics 1711 and 1712	May not be counted with Physics 2002 or 2102 or 2104 This is a qualifying unit of study for Senior Physics	July
Physiology					
PHSI 2001	Introductory Physiology A	4	Prereq 12 Junior credit points each of Chemistry and Mathematics, and 12 Junior credit points of two of Biology, Computer Science, Physics or Psychology		February
PHSI 2002	Introductory Physiology B	4	Prereq Physiology 2001	This is a qualifying unit of study for Senior Physiology units of study	July
Psychology					
PSYC 2001	Psychology 2001	8	Prereq Psychology 1001 and 1002		February
PSYC 2002	Psychology 2002	8	Prereq Psychology 1001 and 1002 and either 2001 or 2101 or, with permission, equivalent Statistics content		July
PSYC 2101	Psychology 2101	4	Prereq Psychology 1002 Coreq Psychology 1001	May not be counted with Psychology 2001	February
PSYC 2102	Psychology 2102	4	Prereq Psychology 2002 and 2101	May not be counted with Psychology 2001	February
Soil Science					
SOIL 2001	Soil Properties and Processes	8	Prereq Chemistry 1002 or equivalent and 12 credit points of Junior Mathematics or Physics 1003 or 1004		February

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corerequisites (C)	Additional Information / May not be counted with	When Offered
SOIL 2002	Soil Resources and Conservation	8	Prereq Soil Science 2001 or Geology 1002 or Geology 2004 or Geography 1001 or Natural Environmental Systems 2001	May not be counted with Geography 3002	July

Statistics

STAT 2001	Probability and Distribution Theory	4	Prereq Mathematics 1702 or 1792 or Mathematics 1712 and a Credit in Mathematics 1711	May not be counted with Statistics 2901	February
STAT 2002	Data Analysis	4	Prereq Mathematics 1702 or 1704 or 1792 or 1794 or 1712		February
STAT 2003	Estimation Theory	4	Prereq Statistics 2001 or 2901	May not be counted with Statistics 2903	July
STAT 2004	Hypothesis Testing	4	Prereq Statistics 2002		July
STAT 2901	Introduction to Probability (Advanced)	4	Prereq Mathematics 1792 or Credit in Mathematics 1702	May not be counted with Statistics 2001	February
STAT 2903	Estimation Theory (Advanced)	4	Prereq Statistics 2901 or Credit in Statistics 2001	May not be counted with Statistics 2003	July

C. Senior Units of Study

Agricultural Chemistry

AGCH 3001	Chemistry and Biochemistry of Ecosystems	12	Prereq Agricultural Chemistry 2001 or Chemistry 2001 or 2101 or 2202 or 2301 or 2302 or 2902 or Biochemistry 2002 or 2902	May not be counted with Agricultural Chemistry 3002	February
AGCH 3002	Environmental Plant and Soil Chemistry	12	Qual Agricultural Chemistry 2001 or Chemistry 2001 or 2101 or 2202 or 2301 or 2302 or 2902 or Biochemistry 2002 or 2902	May not be counted with Agricultural Chemistry 3001	February
AGCH 3003	Agricultural Biochemistry	12	Qual Agricultural Chemistry 2001 or Biochemistry 2002 or 2902		July

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corerequisites (C)	Additional Information / May not be counted with	When Offered
Anatomy and Histology					
ANAT 3001	Microscopy and Histochemistry	12	Qual Anatomy and Histology 2001		February
ANAT 3002	Cells and Development	12	Akn (i) an understanding of the basic structure of the vertebrates; (ii) an understanding of elementary biochemistry and genetics Qual Anatomy and Histology 2001 Prereq at least 8 credit points of Intermediate Biochemistry	May not be counted with Anatomy and Histology 3003	July
ANAT 3003	Transmission and Scanning Electron Microscopy	12	Qual Anatomy and Histology 2001	May not be counted with Anatomy and Histology 3002	July
ANAT 3004	Cranial and Cervical Anatomy	6	Qual Anatomy and Histology 2002		July
ANAT 3006	Forensic Osteology	6	Prereq Anatomy 2001 and Anatomy 2002		February
Biochemistry					
BCHM 3001	Molecular Biology and Structural Biochemistry	12	Qual Biochemistry 2002 or 2902, or with permission of Head of Department, Biology 2005 or 2905 or good performance in Biochemistry 2001 or 2901 with a suitable Intermediate Chemistry unit of study	May not be counted with Biochemistry 3901	February
BCHM 3002	Metabolic and Medical Biochemistry	12	Qual Biochemistry 2002 or 2902	May not be counted with Biochemistry 3902	July
BCHM 3901	Molecular Biology and Structural Biochemistry (Advanced)	12	Qual Biochemistry 2002 or 2902 or, with permission of Head of Department, Biology 2005 or 2901, or good performance in Biochemistry 2001 or 2901 with suitable Intermediate Chemistry	May not be counted with Biochemistry 3001	February

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corerequisites (C)	Additional Information / May not be counted with	When Offered
BCHM 3902	Metabolic and Medical Biochemistry (Advanced)	12	Qual Biochemistry 2002 or 2902 (selected students)	May not be counted with Biochemistry 3002	July
Biology					
BIOL 3101	Ecophysiology	12	Qual 16 credit points of Intermediate Biology including Biology 2002 or 2003 or 2006 or 2902 or 2903 or 2906	Some modules have specific prerequisites; consult list of modules; students are advised to consult the School	February
BIOL 3102	Evolution and Diversity of the Australian Biota (MS)	12	Qual 16 credit points on Intermediate Biology, including Biology (2001 or 2901) and (2002 or 2902) or Biology 2003 or 2903 and 2004 or 2904; or Biology 2001 or 2901 and 2002 or 2902 and 2007	Some modules have specific prerequisites; consult list of modules; students are advised to consult the School Marine Science 3001 students may take the Evolutionary Core without taking a module, or Marine Biology module without Core	February
BIOL 3103	Molecular Genetics and Recombinant DNA Technology	12	Qual 16 credit points of Intermediate Biology including Biology 2005 or 2905	May not be counted with Biology 3903	February
BIOL 3201	Cellular and Systems Physiology	12	Qual 16 credit points on Intermediate Biology, including Biology (2001 or 2901) and (2002 or 2902) or Biology 2003 or 2006 or 2903 or 2906	Some modules have specific prerequisites; consult list of modules; students are advised to consult the School	July
BIOL 3202	Ecology (MS)	12	Qual Biology 2001 or 2901 and 2002 or 2902 or 16 credit points of Intermediate Biology, including Biology 2004 or 2904	Some modules have specific prerequisites; consult list of modules; students are advised to consult the School	July
BIOL 3203	Eukaryotic Genetics and Development	12	Qual 16 credit points of Intermediate Biology including Biology 2005 or 2905	May not be counted with Biology 3904	July
BIOL 3903	Molecular Genetics and Recombinant DNA Technology (Advanced)	12	Prereq 16 credit points of Intermediate Biology, including Biology 2005 or 2905; by invitation	May not be counted with Biology 3103 Students must first enrol in Biology 3103 Subsequently, students may be invited to enrol in this unit of study where they will participate in a more demanding alternative component.	February
BIOL 3904	Eukaryotic Genetics and Development (Advanced)	12	Prereq 16 credit points of Intermediate Biology, including Biology 2005 or 2905; by invitation	May not be counted with Biology 3203 Students must first enrol in Biology 3203 Subsequently, students may be invited to enrol in this unit of study where they will participate in a more demanding alternative component.	July

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corerequisites (C)	Additional Information / May not be counted with	When Offered
Cell Pathology					
CPAT 3001	Cell Pathology A	12	Prereq Anatomy and Histology 2002 or Biochemistry 2002 or 2902, or Biology 2005 or 2006 or 2905 or 2906, or both Pharmacology 2001 and 2002, or Physiology 2002	Students must contact the Department before enrolling. Only a small number of students can be accommodated in the laboratory facilities.	February
CPAT 3002	Cell Pathology B	12	Qual Cell Pathology 3001		July
Chemistry					
CHEM 3101	Chemistry 3A	12	Qual Chemistry 2202 or 2302 or 2902	May not be counted with Chemistry 3901 but may be counted with Chemistry 3201	February
CHEM 3102	Chemistry 3B	12	Qual Chemistry 2202 or 2302 or 2902	May not be counted with Chemistry 3902 (but may be counted with Chemistry 3202)	July
CHEM 3201	Chemistry 3A Additional	12	Qual Chemistry 2202 or 2302 or 2902 Prereq or Coreq Chemistry 3101 or 3901		February
CHEM 3202	Chemistry 3B Additional	12	Qual Chemistry 2202 or 2302 or 2902 Prereq or Coreq Chemistry 3102 or 3902		July
CHEM 3901	Chemistry 3A (Advanced)	12	Qual Distinction average in Chemistry 2001 or 2101 or 2201 or 2301 or 2901 and in Chemistry 2202 or 2302 or 2902; by invitation	May not be counted with Chemistry 3101 (but may be counted with Chemistry 3201) The number of places in this unit of study 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	February
CHEM 3902	Chemistry 3B (Advanced)	12	Qual Distinction or better in Chemistry 3901; by invitation	May not be counted with Chemistry 3102 The number of places in this unit of study is limited and entry is by invitation. Students in the Faculty of Science Talented Student Program are automatically eligible	July
Computer Science					
COMP 3001	Algorithms	4	Qual Computer Science 2002 or 2902 Prereq Mathematics 1703 or 1704 or 1793 or 1794 and 8 credit points in Intermediate Mathematics and/or Statistics and/or Econometrics	May not be counted with Computer Science 3901	February

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corerequisites (C)	Additional Information / May not be counted with	When Offered
COMP 3002	Artificial Intelligence	4	Qual Computer Science 2004 or 2904 Prereq Computer Science 2002 or 2902 and 2003 or 2903 and 8 credit points in Intermediate Mathematics and/or Statistics and/or Econometrics	May not be counted with Computer Science 3902	February
COMP 3003	Computer Architecture	4	Qual Computer Science 2001 or 2901 Prereq Computer Science 2002 or 2902 and 2003 or 2903	May not be counted with Computer Science 3903	July -
COMP 3004	Computer Graphics	4	Qual Computer Science 2004 or 2904 Prereq Computer Science 2002 or 2902 and Mathematics 1701 or 1791 and 8 credit points in Intermediate Mathematics and/or Statistics and/or Econometrics	May not be counted with Computer Science 3904	July
COMP 3005	Database Systems	4	Qual Computer Science 2002 or 2902	May not be counted with Computer Science 3905	July
COMP 3006	Logic Programming	4	Qual Computer Science 2003 or 2903 Prereq Computer Science 2002 or 2902 and 8 credit points in Intermediate Mathematics and/or Statistics and/or Econometrics	May not be counted with Computer Science 3906	February
COMP 3007	Networked Systems	4	Qual Computer Science 2004 or 2904 Prereq Computer Science 2001 or 2901 and 2002 or 2902	May not be counted with Computer Science 3907	February
COMP 3008	Object-Oriented Systems	4	Qual Computer Science 2004 or 2904 Prereq Computer Science 2002 or 2902	May not be counted with Computer Science 3908	February
COMP 3009	Operating Systems	4	Qual Computer Science 2004 or 2904 Prereq Computer Science 2001 or 2901 and 2002 or 2902	May not be counted with Computer Science 3909	February
COMP 3100	Software Engineering	4	Qual Computer Science 2002 or 2902 Prereq Computer Science 2004 or 2904	May not be counted with Computer Science 3800	February
COMP 3101	Theory of Computation	4	Qual Computer Science 2003 or 2903 Prereq 8 credit points in Intermediate Mathematics and/or Statistics and/or Econometrics	May not be counted with Computer Science 3801	July
COMP 3102	User Interfaces Design and Programming	4	Qual Computer Science 2004 or 2904 Prereq Computer Science 2002 or 2902 and 2003 or 2903	May not be counted with Computer Science 3802	July
COMP 3201	Algorithmic Systems Project	4	Prereq Computer Science 3001	Students intending to major in Computer Science are advised to enrol in one of Computer Science 3201, 3202, 3203, 3204 or 3205	February and July

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corerequisites (C)	Additional Information / May not be counted with	When Offered
COMP 3202	Computer Systems Project	4	Prereq Computer Science 3009	Students intending to major in Computer Science are advised to enrol in one of Computer Science 3201, 3202, 3203, 3204 or 3205	February and July
COMP 3203	Intelligence Systems Project	4	Prereq Computer Science 3002	Students intending to major in Computer Science are advised to enrol in one of Computer Science 3201, 3202, 3203, 3204 or 3205	February and July
COMP 3204	Large-Scale Software Project	4	Prereq Computer Science 3100	Students intending to major in Computer Science are advised to enrol in one of Computer Science 3201, 3202, 3203, 3204 or 3205	February and July
COMP 3205	Product Development Project	4	Prereq Computer Science 3008	Students intending to major in Computer Science are advised to enrol in one of Computer Science 3201, 3202, 3203, 3204 or 3205	February and July
COMP 3206	Bioinformatics Project	4	Qual: Computer Science 2004 or 2904 Prereq 8 credit points of Senior Computer Science (including Computer Science 3008/3100/3908/3800) and 16 credit points of Intermediate Biology, Biochemistry and/or Pharmacology		July
COMP 3800	Software Engineering (Advanced)	4	Qual Computer Science 2002 or 2902 Prereq 16 credit points of Intermediate or Senior Computer Science with Distinction average and Computer Science 2004 or 2904	May not be counted with Computer Science 3100	February
COMP 3801	Theory of Computation (Advanced)	4	Qual Computer Science 2003 or 2903 Prereq 16 credit points of Intermediate or Senior Computer Science with Distinction average and 8 credit points of Intermediate Mathematics and/or Statistics and/or Econometrics	May not be counted with Computer Science 3101	July
COMP 3802	User Interfaces (Advanced)	4	Qual Computer Science 2004 or 2904 Prereq 16 credit points of Intermediate or Senior Computer Science with Distinction average and Computer Science 2002 or 2902 and 2003 or 2903	May not be counted with Computer Science 3102	July
COMP 3809	Software Project (Advanced)	4	Prereq 16 credit points of Intermediate or Senior Computer Science, with Distinction average Coreq 8 credit points of Senior Computer Science		February and July

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corerequisites (C)	Additional Information / May not be counted with	When Offered
COMP 3901	Algorithms (Advanced)	4	Qual Computer Science 2002 or 2902 Prereq 16 credit points of Intermediate or Senior Computer Science with Distinction average and Mathematics 1703 or 1704 or 1793 or 1794 and 8 credit points of Intermediate Mathematics and/or Statistics and/or Econometrics	May not be counted with Computer Science 3001	February
COMP 3902	Artificial Intelligence (Advanced)	4	Qual Computer Science 2002, or 2902 Prereq 16 credit points of Intermediate or Senior Computer Science with Distinction average and 8 credit points of Intermediate Mathematics and/or Statistics and/or Econometrics	May not be counted with Computer Science 3002	February
COMP 3903	Computer Architecture (Advanced)	4	Qual Computer Science 2001 or 2901 Prereq 16 credit points of Intermediate or Senior Computer Science with Distinction average and Computer Science 2002 or 2902 and 2003 or 2903	May not be counted with Computer Science 3003	July
COMP 3904	Computer Graphics (Advanced)	4	Qual Computer Science 2004 or 2904 Prereq 16 credit points of Intermediate or Senior Computer Science with Distinction average and Computer Science 2002 or 2902 and Mathematics 1701 or 1791 and 8 credit points of Intermediate Mathematics and/or Statistics and/or Econometrics	May not be counted with Computer Science 3004	July
COMP 3905	Database Systems (Advanced)	4	Qual Computer Science 2002 or 2902 Prereq 16 credit points of Intermediate or Senior Computer Science with Distinction average	May not be counted with Computer Science 3005	July
COMP 3906	Logic Programming (Advanced)	4	Qual Computer Science 2003 or 2903 Prereq 16 credit points of Intermediate or Senior Computer Science with Distinction average and Computer Science 2002 or 2902 and 8 credit points of Intermediate Mathematics and/or Statistics and/or Econometrics	May not be counted with Computer Science 3006	February
COMP 3907	Networked Systems (Advanced)	4	Qual Computer Science 2004 or 2904 Prereq 16 credit points of Intermediate or Senior Computer Science with Distinction average and Computer Science 2001 or 2901 and 2002 or 2902	May not be counted with Computer Science 3007	February

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corequisites (C)	Additional Information / May not be counted with	When Offered
COMP 3908	Object-Oriented Systems (Advanced)	4	Qual Computer Science 2004 or 2904 Prereq 16 credit points of Intermediate or Senior Computer Science with Distinction average and Computer Science 2002 or 2902	May not be counted with Computer Science 3008	February
COMP 3909	Operating Systems (Advanced)	4	Qual Computer Science 2004 or 2904 Prereq 16 credit points of Intermediate or Senior Computer Science with Distinction average and Computer Science 2001 or 2901 and 2002 or 2902	May not be counted with Computer Science 3009	February
Geography					
GEOG 3001	Coastal Environments and Dynamics	12	Prereq Geography 2001 or 2002 or 2101 or Marine Science 2001		February
GEOG 3002	Environmental Geomorphology	12	Prereq Geography 2001 or 2002 or 2101		July
GEOG 3101	Fluvial Environments	12	Prereq Geography 2001 or 2002 or 2101		February
GEOG 3102	Coastal Environmental Management and GIS	12	Prereq Geography 2001 or 2002 or 2101 or Marine Science 2001		July
GEOG 3201	Socio-Economic Development in the Asia-Pacific Rim	12	Prereq Geography 2102 or 2201 or 2202		February
GEOG 3202	Urban and Regional Change in Australasia	12	Prereq Geography 2102 or 2201 or 2202		July
Geology and Geophysics					
GEOG 3001	Petrology, Basins and Structure	12	Prereq Geology 2001 and 2002		February
GEOG 3002	Stratigraphy, Resources and Australian Geology	8	Prereq Geology 3001		July

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corerequisites (C)	Additional Information / May not be counted with	When Offered
GEOL 3003	Mineral Exploration	8			February
			Coreq Geology 3001		
GEOL 3004	Paleobiology	4	Prereq Geology 2003 or 8 credit points of Intermediate Biology		February
GEOL 3005	Geochemistry and Structure	12	Prereq Geology 3001		July
GEOL 3006	Petroleum Exploration	4	Prereq Geology 3001 Coreq Geophysics 3004		July
GEOP 3001	Geophysical Signal Processing	4	Prereq 6 credit points of Physics and 16 credit points of Intermediate Science units of study		February
GEOP 3002	Geodynamics	4	Prereq 6 credit points of Physics and 16 credit points of Intermediate Science units of study		February
GEOP 3003	Geophysical Exploration A	4	Prereq 6 credit points of Physics and 16 credit points of Intermediate Science units of study		February
GEOP 3004	Petroleum Geophysics	4	Prereq Geology 3001 Coreq Geology 3006		July
GEOP 3005	Environmental Geophysics	4	Prereq 6 credit points of Physics and 16 credit points of Intermediate Science units of study		July
GEOP 3006	Geophysical Exploration B	4	Prereq Geophysics 3003		July
History and Philosophy of Science					
HPSC 3001	History of Physical Sciences	6	Qual History and Philosophy of Science 2001 and 2002	Candidates taking this unit of study must complete at least 24 credit points at Senior level in another Science Discipline Area in order to satisfy the requirements for the BSc degree *Subject to approval by Faculty/Senate	July*

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corerequisites (C)	Additional Information / May not be counted with	When Offered
HPSC 3002	History of Biological Sciences	6	Qual History and Philosophy of Science 2001 and 2002	As for History and Philosophy of Science 3001	February
HPSC 3003	Social Relations of Science A	4	Qual History and Philosophy of Science 2001 and 2002	As for History and Philosophy of Science 3001	February
HPSC 3004	Social Relations of Science B	4	Qual History and Philosophy of Science 2001 and 2002 Prereq History and Philosophy of Science 3003	As for History and Philosophy of Science 3001	July
HPSC 3005	History and Philosophy of Medical Science	4	Qual History and Philosophy of Science 2001 and 2002	As for History and Philosophy of Science 3001	February
HPSC 3006	Scientific Controversies	4	Qual History and Philosophy of Science 2001 and 2002	As for History and Philosophy of Science 3001	February
HPSC 3007	Science and Ethics	4	Qual History and Philosophy of Science 2001 and 2002	As for History and Philosophy of Science 3001	July
HPSC 3008	The Nature of Experiment	4	Qual History and Philosophy of Science 2001 and 2002	As for History and Philosophy of Science 3001	July
HPSC 3100	Contemporary Issues A	4*	Qual History and Philosophy of Science 2001 and 2002 Coreq None*	May not be counted with History and Philosophy of Science 3005 or 3006 if there is significant overlap; consult Department Handbook As for History and Philosophy of Science 3001 *Subject to Faculty/Senate approval	February
HPSC 3101	Contemporary Issues B	4*	Qual History and Philosophy of Science 2001 and 2002 Coreq None*	May not be counted with History and Philosophy of Science 3007 or 3008 or 3009 if there is significant overlap; consult Department Handbook As for History and Philosophy of Science 3001 *Subject to Faculty/Senate approval	July
Marine Sciences					
MARS 3001	Marine Science A	12	Prereq Marine Science 2002 Prereq There are prerequisites for some options, see options entries		February
MARS 3002	Marine Science B	12	Prereq Marine Science 2002 Prereq There are prerequisites for some options, see option entries		July
Mathematics					
MATH 3001	Topology	4	Prereq 8 credit points of Intermediate Mathematics	May not be counted with Mathematics 3901	February

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corerequisites (C)	Additional Information / May not be counted with	When Offered
MATH 3002	Rings and Fields	4	Prereq 8 credit points of Intermediate Mathematics (strongly advise 2002 or 2902, with 2008 or 2908)	May not be counted with Mathematics 3902	February
MATH 3003	Ordinary Differential Equations	4	Prereq 8 credit points of Intermediate Mathematics (strongly advise 2002 or 2902, with 2001 or 2901)		February
MATH 3004	History of Mathematical Ideas	4	Prereq 8 credit points of Intermediate Mathematics		February
MATH 3005	Logic	4	Prereq (for all but BCST students) 8 credit points of Intermediate Mathematics Prereq (for BCST students) 8 credit points of Intermediate Mathematics or 12 credit points of Junior Mathematics at Advanced level		February
MATH 3006	Geometry	4	Prereq 8 units of Intermediate Mathematics (strongly advise 1701)		July
MATH 3007	Coding Theory	4	Prereq 8 credit points of Intermediate Mathematics (strongly advise 2002 or 2902)		July
MATH 3008	Real Variables	4	Prereq 8 credit points of Intermediate Mathematics (strongly advise 2001 or 2007 or 2901 or 2907)		July
MATH 3009	Number Theory	4	Prereq 8 credit points of Intermediate Mathematics		July
MATH 3010	Information Theory	4	Prereq 8 credit points of Intermediate Mathematics (strongly advise 2001 or 2901 and some probability theory)		July
MATH 3011	Lagrangian Dynamics	4	Prereq Mathematics 2005 or 2905	May not be counted with Mathematics 2904	February
MATH 3015	Financial Mathematics	4	Prereq 8 credit points of Intermediate Mathematics (strongly advise 2010 and some probability theory) and one of Mathematics 1702 or 1703 or 1792 or 1793		July
MATH 3016	Mathematical Computing I	4	Prereq 8 credit points of Intermediate Mathematics and one of Mathematics 1702 or 1703 or 1792 or 1793	May not be counted with Mathematics 3916	February
MATH 3018	Partial Differential Equations and Waves	4	Prereq Mathematics 2005 or 2905		July
MATH 3019	Signal Processing	4	Prereq Mathematics 2005 or 2905		February

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corerequisites (C)	Additional Information / May not be counted with	When Offered
MATH 3020	Nonlinear Systems and Biomathematics	4	Prereq 8 credit points of Intermediate Mathematics (strongly advise 2908 or 3003) and one of Mathematics 1702 or 1703 or 1792 or 1793		July
MATH 3901	Metric Spaces (Advanced)	4	Prereq 12 credit points of Intermediate Mathematics (strongly advise Mathematics 2907)	May not be counted with Mathematics 3001	February
MATH 3902	Algebra I (Advanced)	4	Prereq 12 credit points of Intermediate Mathematics (strongly advise Mathematics 2902)	May not be counted with Mathematics 3002	February
MATH 3903	Differential Geometry (Advanced)	4	Prereq 12 credit points of Intermediate Mathematics (strongly advise 2001 or 2901, with Mathematics 3001 or 3901)		February
MATH 3904	Complex Variable (Advanced)	4	Prereq 12 credit points of Intermediate Mathematics (strongly advise Mathematics 2001 or 2901, with Mathematics 3001 or 3901)		February
MATH 3905	Categories and Computer Science (Advanced)	4	Prereq 12 credit points of Intermediate Mathematics		February
MATH 3906	Group Representation Theory (Advanced)	4	Prereq 12 credit points of Intermediate Mathematics (strongly advise Mathematics 3902)		July
MATH 3907	Algebra II (Advanced)	4	Prereq 12 credit points of Intermediate Mathematics (strongly advise Mathematics 3002 or 3902)		July
MATH 3908	Nonlinear Analysis (Advanced)	4	Prereq 12 credit points of Intermediate Mathematics (strongly advise Mathematics 3901)		July
MATH 3909	Lebesgue Integration and Fourier Analysis (Advanced)	4	Prereq 12 credit points of Intermediate Mathematics (strongly advise Mathematics 2907 and Mathematics 3901)		July
MATH 3911	Differential Analysis (Advanced)	4	Prereq 12 credit points of Intermediate Mathematics (strongly, advise Mathematics 2901 and 3902)		July
MATH 3912	Combinatorics (Advanced)	4	Prereq 12 credit points of Intermediate Mathematics		July
MATH 3913	Computational Algebra (Advanced)	4	Prereq 12 credit points of Intermediate Mathematics (strongly advise Mathematics 3002 or 3902)		July

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corerequisites (C)	Additional Information / May not be counted with	When Offered
MATH 3914	Fluid Dynamics (Advanced)	4	Prereq Mathematics 2905 or Credit in Mathematics 2005		February
MATH 3915	Mathematical Methods (Advanced)	4	Prereq Mathematics 2905 or Credit in Mathematics 2005		February
MATH 3916	Mathematical Computing I (Advanced)	4	Prereq 8 units of Intermediate Mathematics and one of Mathematics 1792 or 1793 or Credit in Mathematics 1702 or 1703	May not be counted with Mathematics 3016	February
MATH 3917	Hamiltonian Dynamics (Advanced)	4	Prereq Mathematics 2904, or Credit in Mathematics 3011		July
MATH 3918	Mathematical Computing II (Advanced)	4	Prereq Mathematics 3016 or Engineering Mathematics 2052		July
MATH 3919	Signal Processing (Advanced)	4	Prereq Mathematics 2905 or Credit in Mathematics 2005	May not be counted with Mathematics 3019	February
MATH 3920	Nonlinear Systems and Biomathematics (Advanced)	4	Prereq 8 credit points of Intermediate Mathematics (strongly advise 2908 or 3003) and one of Mathematics 1792 or 1793 or Credit in Mathematics 1702 or 1703	May not be counted with Mathematics 3020	July
Microbiology					
MICR 3001	General and Medical Microbiology	12	Qual Microbiology 2002 or 2902 or both Microbiology 2001 and 2004 or both Microbiology 2004 and 2901 Prereq Biochemistry 2001 or 2101 or 2901 or Agricultural Chemistry 2001 or Biology 2005 or 2905	May not be counted with Microbiology 3901	February
MICR 3002	Molecular and Environmental Microbiology	12	Qual Microbiology 2002 or 2902 or both Microbiology 2001 and 2004 or both Microbiology 2004 and 2901 Prereq Biochemistry 2001 or 2101 or 2901 or Agricultural Chemistry 2001 or Biology 2005 or 2905	May not be counted with Microbiology 3902	July
MICR 3901	General and Medical Microbiology (Advanced)	12	Qual Microbiology 2002 or 2902 or both Microbiology 2001 and 2004 or both Microbiology 2004 and 2901 Prereq Biochemistry 2001 or 2101 or 2901 or Agricultural Chemistry 2001 or Biology 2005 or 2905	May not be counted with Microbiology 3001 Credit or better is required in Microbiology 2001 or 2002 or 2004 or the equivalent components of Microbiology 2901 or 2902	February

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corerequisites (C)	Additional Information / May not be counted with	When Offered
MICR 3902	Molecular and Environmental Microbiology (Advanced)	12	Qual Microbiology 2002 or 2902 or both Microbiology 2001 and 2004 or both Microbiology 2004 and 2901 Prereq Biochemistry 2001 or 2101 or 2901 or Agricultural Chemistry 2001 or Biology 2005 or 2905)	May not be counted with Microbiology 3002 Credit or better is required in Microbiology 2001 or 2002 or 2004 or the equivalent components of Microbiology 2901 or 2902	July
Pharmacology					
PCOL 3001	Molecular Pharmacology and Toxicology	12	Qual Pharmacology 2001 and 2002	Students are strongly advised to consider Intermediate units of study in Biochemistry and/or Chemistry together with Physiology 2001 and 2002 if they wish to undertake Pharmacology 3001	February
PCOL 3002	Neuro- and Cardiovascular Pharmacology	12	Qual Pharmacology 2001 and 2002	Students are strongly advised to consider Intermediate units of study in Biochemistry and/or Chemistry together with Physiology 2001 and 2002 if they wish to undertake Pharmacology 3002	July
PCOL 3101	Toxicology and Computer-aided Drug Design	12	Qual Pharmacology 2001 and 2002 Coreq Pharmacology 3001		February
PCOL 3102	Advanced Pharmacodynamics	12	Qual Pharmacology 2001 and 2002 Coreq Pharmacology 3002		July
Physics					
PHYS 3003	Quantum Mechanics and Relativity	4	Qual 16 credit points of Intermediate Physics Prereq 8 credit points of Intermediate Mathematics	May not be counted with Physics 3903 or 3200	February
PHYS 3004	Condensed Matter Physics and Photonics	4	Qual 16 credit points of Intermediate Physics Prereq 8 credit points of Intermediate Mathematics	May not be counted with Physics 3904	February
PHYS 3005	Topics in Modern Physics A	4	Qual 16 credit points of Intermediate Physics Prereq 8 credit points of Intermediate Mathematics	May not be counted with Physics 3905	July
PHYS 3006	Topics in Modern Physics B	4	Qual 16 credit points of Intermediate Physics Prereq 8 credit points of Intermediate Mathematics	May not be counted with Physics 3906	July
PHYS 3007	Computational Physics	4	Qual 16 credit points of Intermediate Physics Prereq 8 credit points of Intermediate Mathematics	May not be counted with Physics 3907	February

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corerequisites (C)	Additional Information / May not be counted with	When Offered
PHYS 3008	Experimental Physics A	4	Qual 16 credit points of Intermediate Physics Prereq 8 credit points of Intermediate Mathematics	May not be counted with Physics 3908 or 3009 or 3909	February
PHYS 3009	Experimental Physics B	8	Qual 16 credit points of Intermediate Physics Prereq 8 credit points of Intermediate Mathematics	May not be counted with Physics 3008 or 3908 or 3909	February
PHYS 3101	Experimental Physics C	4	Qual 16 credit points of Intermediate Physics Prereq 8 credit points of Intermediate Mathematics	May not be counted with Physics 3102 or 3801 or 3802	July
PHYS 3102	Experimental Physics D	8	Qual 16 credit points of Intermediate Physics Prereq 8 credit points of Intermediate Mathematics	May not be counted with Physics 3101 or 3801 or 3802	July
PHYS 3103	Special Project A	4	Qual 16 credit points of Intermediate Physics Prereq 16 credit points of Intermediate Mathematics	May not be counted with Physics 3104 or 3803 or 3804 (This unit of study will be available from 1999)	February
PHYS 3104	Special Project B	4	Qual 16 credit points of Intermediate Physics Prereq 8 credit points of Intermediate Mathematics	May not be counted with Physics 3103 or 3803 or 3804	July
PHYS 3301	Scientific Computing	4	Prereq 16 credit points of Intermediate units of study in Chemistry, Computer Science, Mathematics, Physics or Statistics		February
PHYS 3302	Advanced Measurement Instrumentation and Control	4	Prereq 16 credit points of Intermediate units of study in Biochemistry, Chemistry, Computer Science, Geology, Mathematics, Physics or Statistics	(This unit of study will be available from 1999)	February
PHYS 3303	Scientific Visualisation	4	Prereq Physics 3301		July
PHYS 3801	Experimental Physics C (Advanced)	4	Qual Physics 2901 and 2902, or Credit or better in Physics 2001 or 2101 and Credit or better in Physics 2002 or 2102 Prereq 16 credit points of Intermediate Mathematics	May not be counted with Physics 3101 or 3102 or 3802	July
PHYS 3802	Experimental Physics D (Advanced)	8	Qual Physics 2901 and 2902, or Credit or better in Physics 2001 or 2101 and Credit or better in Physics 2002 or 2102 Prereq 16 credit points of Intermediate Mathematics	May not be counted with Physics 3101 or 3102 or 3801	July
PHYS 3803	Special Project A (Advanced)	4	Qual Physics 2901 and 2902, or Credit or better in Physics 2001 or 2101 and Credit or better in Physics 2002 or 2102 Prereq 16 credit points of Intermediate Mathematics	May not be counted with Physics 3103 or 3104 or 3804 (This unit of study will be available from 1999)	February

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corerequisites (C)	Additional Information / May not be counted with	When Offered
PHYS 3804	Special Project B (Advanced)	4	Qual Physics 2901 and 2902, or Credit or better in Physics 2001 or 2101 and Credit or better in Physics 2002 or 2102 Prereq 16 credit points of Intermediate Mathematics	May not be counted with Physics 3103 or 3104 or 3803	July
PHYS 3903	Quantum Mechanics and Relativity (Advanced)	4	Qual Physics 2901 and 2902 or Credit or better in Physics 2001 or 2101 and Credit or better in Physics 2002 or 2102 Prereq 16 credit points of Intermediate Mathematics	May not be counted with Physics 3003 or 3200	February
PHYS 3904	Condensed Matter Physics and Photonics (Advanced)	4	Qual Physics 2901 and 2902 or Credit or better in Physics 2001 or 2101 and Credit or better in Physics 2002 or 2102 Prereq 16 credit points of Intermediate Mathematics	May not be counted with Physics 3004	February
PHYS 3905	Topics in Modern Physics A (Advanced)	4	Qual Physics 2901 and 2902 or Credit or better in Physics 2001 or 2101 and Credit or better in Physics 2002 or 2102 Prereq 16 credit points of Intermediate Mathematics	May not be counted with Physics 3005	July
PHYS 3906	Topics in Modern Physics B (Advanced)	4	Qual Physics 2901 and 2902, or Credit or better in Physics 2001 or 2101 and Credit or better in Physics 2002 or 2102 Prereq 16 credit points of Intermediate Mathematics	May not be counted with Physics 3006	July
PHYS 3907	Computational Physics (Advanced)	4	Qual Physics 2901 and 2902, or Credit or better in Physics 2001 or 2101 and Credit or better in Physics 2002 or 2102 Prereq 16 credit points of Intermediate Mathematics	May not be counted with Physics 3007	February
PHYS 3908	Experimental Physics A (Advanced)	4	Qual Physics 2901 and 2902, or Credit or better in Physics 2001 or 2101 and Credit or better in Physics 2002 or 2102 Prereq 16 credit points of Intermediate Mathematics	May not be counted with Physics 3008 or 3009 or 3909	February
PHYS 3909	Experimental Physics B (Advanced)	8	Qual Physics 2901 and 2902, or Credit or better in Physics 2001 or 2101 and Credit or better in Physics 2002 or 2102 Prereq 16 credit points of Intermediate Mathematics	May not be counted with Physics 3008 or 3009 or 3908	February
PHYS 3105	Astrophysics	4	Qual 16 credit points of Intermediate Physics Prereq 8 credit points of Intermediate Mathematics	(May not be available every year - check with the Senior Physics coordinator)	July

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corerequisites (C)	Additional Information / May not be counted with	When Offered
PHYS 3106	Plasma Physics	4	Qual 16 credit points of Intermediate Physics Prereq 8 credit points of Intermediate Mathematics	(May not be available every year - check with the Senior Physics coordinator)	July
PHYS 3107	Modern Optics	4	Qual 16 credit points of Intermediate Physics Prereq 8 credit points of Intermediate Mathematics	(May not be available every year - check with the Senior Physics coordinator)	July
PHYS 3108	Nuclear and Particle Physics	4	Qual 16 credit points of Intermediate Physics Prereq 8 credit points of Intermediate Mathematics	(May not be available every year - check with the Senior Physics coordinator)	July
PHYS 3109	Acoustics and Ultrasonics	4	Qual 16 credit points of Intermediate Physics Prereq 8 credit points of Intermediate Mathematics	(May not be available every year - check with the Senior Physics coordinator)	July
PHYS 3200	Quantum Physics	4	Qual 16 credit points of Intermediate Physics Prereq 8 credit points of Intermediate Mathematics	May not be counted with Physics 3003 or 3903	February
Physiology					
PHSI 3001	Neuroscience	12	Qual Physiology 2002 or Anatomy and Histology 2002 Prereq Biochemistry (2001 and 2002) or (2101 and 2102) and an additional 8 or more credit points from any Intermediate unit/s of study 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 2002 plus at least one other Intermediate unit of study similar to one of the above prerequisites may be permitted to enrol by the unit of study Supervisor	February
PHSI 3002	Neuroscience — Cellular and Integrative	12	Qual Physiology 3001		July
PHSI 3003	Heart and Circulation	12	Qual Physiology 2002 Prereq Biochemistry (2001 and 2002) or (2101 and 2102) and an additional 8 or more credit points from any Intermediate unit(s) of study 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 2002 plus at least one other Intermediate course similar to one of the above prerequisites may also be permitted to enrol	July
Psychology					
PSYC 3001	Psychology 3001	12	Qual Psychology 2001 (or 2101 and 2102) and Psychology 2002		February

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corerequisites (C)	Additional Information / May not be counted with	When Offered
PSYC 3002	Psychology 3002	12	Qual Psychology 2001 and 2002. History and Philosophy II module requires History and Philosophy I		July
Soil Science					
SOIL 3001	Environmental Soil Science A	12	Qual Soil Science 2001		February
SOIL 3002	Environmental Soil Science B	12	Qual Soil Science 2001 Prereq Agricultural Chemistry 2001 or Chemistry 2001 or 2101 or 2202 or 2301 or 2302 or Biochemistry 2002 or 2902		July
Statistics					
STAT 3001	Distribution Theory and Inference	4	Prereq Mathematics 2001 or 2901 and Statistics 2103 or 2903 (given in 1997)	May not be counted with Statistics 3901	February
STAT 3002	Applied Linear Models	4	Prereq Statistics 2102 or 2103 or 2903 (given in 1997)	May not be counted with Statistics 3902	February
STAT 3003	Time Series Analysis	4	Prereq Statistics 2103 or 2903 (given in 1997)		February
STAT 3004	Design of Experiments	4	Prereq Statistics 3002 or 3902		July
STAT 3005	Applied Stochastic Processes	4	Prereq Statistics 2101 or 2901 (given in 1997) or 2001 or 2901 (given in 1998) and Mathematics 2001 or 2901	May not be counted with Statistics 3905	July
STAT 3006	Sampling Theory and Categorical Data	4	Prereq Statistics 2102 or 2103 or 2903 (given in 1997)		July
STAT 3901	Statistical Theory (Advanced)	4	Prereq Mathematics 2001 or 2901 and Statistics 2903	May not be counted with Statistics 3001	February
STAT 3902	Linear Models (Advanced)	4	Prereq Statistics 2903 or Credit in 2103 (given in 1997) and Mathematics 2002 or 2902	May not be counted with Statistics 3002	February
STAT 3905	Markov Processes (Advanced)	4	Prereq Statistics 2903 (given in 1997) and Mathematics 2001 or 2901 and Mathematics 2002 or 2902	May not be counted with Statistics 3005	July
STAT 3907	Multivariate Analysis (Advanced)	4	Prereq Statistics 3902 and either 3001 or 3901	Not available in 1998	July

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corerequisites (C)	Additional Information / May not be counted with	When Offered
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Study in other Faculties

A total of 28 credit points of units of study from non-Science discipline areas may be counted towards the BSc degree, including units of study 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 units of study offered by departments in these faculties. Students may not enrol in General Statistical Methods I or General Statistical Methods II or Econometrics I A or Econometrics IB or any other unit of study deemed to be mutually exclusive with units of study listed in this Table. Students enrolled in the combined BSc/BCom program may enrol in Econometrics I A and/or Econometrics IB but they may not enrol in Mathematics 1711 or 1712.

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 units of study.

A total of 144 credit points is required for the degree. These must include:

- 48 credit points from Senior units of study
- 48 credit points from Intermediate units of study

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

Units of study taken must include 12 credit points of Mathematics.

All students in the Bachelor of Science (Advanced) must complete at least 24 credit points of Junior units of study, at least 16 credit points of Intermediate units of study and at least 24 credit points of Senior units of study, these 64 credit points 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 units of study 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 unit of study entrance requirements.

Bachelor of Science (Advanced Mathematics) degree program

Summary of Requirements

The Bachelor of Science (Advanced Mathematics) 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 Mathematics) degree program is by accumulation of credit points gained by completing units of study. A total of 144 credit points is required for the degree.

The Resolutions of the Senate governing candidature for the degree of Bachelor of Science also govern the Bachelor of Science (Advanced Mathematics) degree program. Students should refer to Table I for complete details, including prerequisite, corequisite and excluded units of study. In addition, the following conditions apply:

A. Junior Units of Study

Candidates are required to enrol in and complete at least 12 credit points of Junior units of study at the Advanced level chosen from the Science Discipline Areas of Mathematics and Statistics.

B. Intermediate Units of Study

Candidates are required to enrol in and complete at least 24 credit points of Intermediate units of study at the Advanced level chosen from the Science Discipline Areas of Mathematics and Statistics.

C. Senior Units of Study

Candidates are required to enrol in and complete at least 24 credit points of Senior units of study at the Advanced level chosen from the Science Discipline Areas of Mathematics and Statistics.

A minimum requirement for progression in the Bachelor of Science (Advanced Mathematics) will be set annually and will be based on the student's WAM.

HSC Aggregate

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

Transferring into the BSc (Advanced Mathematics) degree program.

Students are permitted to transfer from other degrees offered by the Faculty of Science into the Bachelor of Science (Advanced Mathematics). To transfer into the Bachelor of Science (Advanced Mathematics) students must achieve a WAM of at least 75 and must meet Departmental unit of study entrance requirements.

Bachelor of Science (Bioinformatics) degree program

The Bachelor of Science (Bioinformatics) degree program requires three years of full-time study (or equivalent). An Honours program is available and requires a further year of full-time study. Progression is by accumulating credit points gained by completing units of study. A total of 144 credit points is required. These must include 12 credit points at Junior level in each of Biology, Chemistry, Computer Science and Mathematics; 16 credit points at Intermediate level in Biology, Biochemistry and/or Pharmacology (including either BCHM 2001 or BIOL 2005); 12 credit points at Intermediate level in Computer Science; 24 credit points at Senior level in Biology, Biochemistry and/or Pharmacology and 24 credit points at Senior level in Computer Science (including COMP 3206)

HSC Aggregate

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

Transferring into the BSc(Bioinformatics) degree program

Students are permitted to transfer from other degrees offered by the Faculty into the BSc(Bioinformatics) degree program.

Table II: [see section 12] [Bachelor of science (Biointormatics)]

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corerequisites (C)	Additional Information / May not be counted with	When Offered
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For details of course content, assumed knowledge, prerequisites, corequisites and qualifying courses see also Table I (Bachelor of Science)

A. Junior Units of Study

Candidates are required to enrol in and complete:

- (i) at least 12 credit points from Junior units of study in the Science discipline areas of Mathematics and Statistics.
- (ii) at least 12 credit points from Junior units of study in the Science discipline areas of Computer Science, Biology and Chemistry.

B. Intermediate Units of Study

Candidates are required to complete:

- i) at least 12 credit points from Intermediate units of study in the Science discipline areas of Computer Science.
- (ii) at least 8 credit points from Intermediate units of study in the Science discipline areas of Biochemistry, Biology or Pharmacology.
- (iii) 8 credit points from the following units of study: BCHM2001, BCHM2901, BIOL2005, BIOL2905.

C. Senior Units of Study

Students are required to enrol in and complete:

- (i) Computer Science 3206
- (ii) at least an additional 20 credit points from other Senior units of study in the Science discipline area of Computer Science.
- (iii) at least 24 credit points from other Senior units of study in the Science discipline areas of Biochemistry, Biology or Pharmacology.

COMP 3206	Bioinformatics Project	4	Qual: Computer Science 2004 or 2904 Prereq: 8 Credit points of Senior Computer Science units of study, including Computer Science 3008 or 3100 or 3908 or 3800 Prereq: 16 Credit points of Intermediate Biology, Biochemistry or Pharmacology		
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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 a unit of study. A total of 144 credit points is required for the degree.

All students must study:

First Year 12 credit points of Junior Biology
12 credit points of Junior Chemistry
6 credit points of Junior Mathematics (1004)
6 credit points of Physics
EN VI 1001, 1002

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

Second Year Choice of at least 16 Intermediate credit points*

ENVI 2001, 2002
ENVI 2101, 2102

* 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 programme.

Third Year Choice of 24 senior credit points**

ENVI 3001, 3002

** Choices must be in a relevant discipline, defined to be Agricultural Chemistry, Biology, Chemistry, Geography, Geology, Microbiology and Soil Science.

The Resolutions of the Senate governing candidature for the degree of Bachelor of Science listed in this chapter also govern the BSc (Environmental) degree program. Table III (below) is the Table of units of study 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)

Students will be permitted to transfer from other degrees offered by the Faculty of Science into the BSc (Environmental), with the permission of the Dean.

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corequisites (C)	Additional Information / May not be counted with	When Offered
For details of unit of study content, assumed knowledge, prerequisite, corequisite and qualifying units of study see also Table I [Bachelor of Science					
A. Junior Units of Study					
Candidates are required to enrol in and complete:					
(i) Global Geology 1001 and Geomorphic Environments and Change 1002					
(ii) Biology 1001 or 1901 and either Biology 1002 or 1902					
(iii) Chemistry 1101 or 1901 or 1903 and either 1102 or 1902 or 1904					
(iv) Physics 1001 or 1002					
(v) Mathematics 1704					
ENVI1001	Global Geology	6	Coreq Biology 1001 or 1901 and Chemistry 1101 or 1901 or 1903 and Physics 1001 or 1002		February
ENVI 1002	Geomorphic Environments and Change*	6	Prereq Global Geology 1001 Coreq Biology 1002 or 1902 and Chemistry 1102 or 1902 or 1904 and Mathematics 1704	*Subject to Faculty/Senate approval	July

B. Intermediate Units of Study

Candidates are required to enrol in and complete :

(I) Natural Environmental Systems 2001 and Anthropogenic Impacts on Environment 2002

(ii) Environmental Science BI 2101 and Environmental Science B2 2102

(iii) 16 Intermediate units from the following courses: AGCH 2001, BIOL 2001, BIOL 2002, BIOL 2003, BIOL 2004, BIOL 2901, BIOL 2920, BIOL 2903, BIOL 2904, CHEM 2001, CHEM 2101, CHEM 2202, CHEM 2301, CHEM 2302, CHEM 2901, CHEM 2902, GEOG 2001, GEOG 2002, GEOG 2101, GEOG 2102, GEOG 2201, GEOG 2202, GEOL 2001, GEOL 2002, GEOL 2003, GEOL 2004, GEOL 2005, MICR 2001, MICR 2901, SOIL 2001, SOIL 2002.

ENVI 2001	Natural Environmental Systems	8	Prereq Global Geology 1001 and Geomorphic Environments and Change 1002 and Biology 1002 or 1902 and Chemistry 1102 or 1902 or 1904 and Mathematics 1702 or 1703 or 1704 or 1792 or 1793 or 1794 (or Mathematics 1711 and 1712) Coreq Environmental Science BI 2101 and 8 credit points from the approved list of units of study (consult the Chair of the Committee for BSc(Environmental))		February
ENVI 2002	Anthropogenic Impacts on Environment	8	Prereq Natural Environmental Systems 2001 and Environmental Science BI 2101 Coreq Environmental Science B2 2102		July

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corerequisites (C)	Additional Information / May not be counted with	When Offered
ENVI 2101	Environmental Science B1	8	Prereq As for Natural Environmental Systems 2001 Coreq Natural Environmental Systems 2001 and 8 credit points from the approved list of units of study (consult the Chair of the Committee for BSc(Environmental))		February
ENVI 2102	Environmental Science B2	8	Prereq Natural Environmental Systems 2001 and Environmental Science B1 2101 Coreq Anthropogenic Impacts on Environment 2002		July
C. Senior Units of Study					
Candidates are required to enrol in and complete:					
(i) Environmental Law and Planning 3001 and Environmental Assessment 3002 (Details of relevant options should be obtained before enrolment from either the Environmental Science Office or Dr Julia James in the School of Chemistry, Fl 1).					
(ii) 24 Senior credit points from the following Science Discipline Areas: Agricultural Chemistry, Biology, Chemistry, Geography, Geology, Microbiology, Soil Science.					
ENVI 3001	Environmental Law and Planning	12	Prereq Anthropogenic Impacts on Environment 2002 and Environmental Science B2 2102 and approved Intermediate units of study to a minimum worth of 16 credit points Coreq Senior units of study from approved Science Discipline Areas (Agricultural Chemistry, Biology, Chemistry, Geography, Geology, Microbiology or Soil Science) totalling a minimum of 12 credit points		February
ENVI 3002	Environmental Assessment	12	Prereq Environmental Law and Planning 3001 Coreq Senior units of study from approved Science Discipline Areas (Agricultural Chemistry, Biology, Chemistry, Geography, Geology, Microbiology or Soil Science) totalling a minimum of 12 credit points		July
CHEM 3601	Chemistry 3A (Environmental)	4	Prereq Chemistry 1102 or 1902 and Anthropogenic Impacts on Environments 2002	May not be counted with Chemistry 3101 or 3201 or 3901 or 3102 or 3202, or 3902 or 3903	February
CHEM 3602	Chemistry 3B (Environmental)	4	Prereq Chemistry 1102 or 1902 and Anthropogenic Impacts on Environments 2002	May not be counted with Chemistry 3101 or 3201 or 3901 or 3102 or 3202 or 3902 or 3903	July
PHYS 3600	Energy and the Environment	4	Prereq Environmental Science 2102 or 12 credit points of Junior Physics		February

Bachelor of Science (Molecular Biology and Genetics) degree program

The course offers an integrated and comprehensive coverage of aspects of modern molecular biology and genetics. This is an Advanced program. Students will have the opportunity to develop a full understanding (at the chemical and physical levels) of the structure, information content and replication of the genetic material (DNA, RNA), the organisation and 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 a broad 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 units of study. A total of 144 credit points is required for the degree. These must include:

- 48 credit points from Senior units of study
- 48 credit points from Intermediate units of study

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

Units of study taken must include 12 credit points of Junior Mathematics and 12 credit points each of Biology and Chemistry.

All students in the Bachelor of Science (Molecular Biology and Genetics) must complete at least 24 credit points of Junior units of study, at least 16 credit points of Intermediate units of study and at least 24 credit points of Senior units of study, these 64 credit points 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 IV (below) and to the Table of units of study for the BSc.

Sequence of study

First Year

BIOL 1901 and (1904 or 1905)

CHEM (1903 and 1904) or (1905 and 1906)

12 credit points of Mathematics (excluding MATH 1711 and 1712)*

12 credit points of other Junior units of study from the BSc

Table of units of study

It is recommended that the extra 12 credit points be selected from Junior units of study in Physics or in Computer Science.

*The combination MATH 1703/1793 is not recommended in this degree program. Students wishing to study Statistics/Calculus are advised to select MATH (1702/1792) or MATH 1712.

Second Year

BCHM 2901 and 2902

BIOL 2905 and 2906

CHEM 2903

MICR 2005 and 2906

Third Year

Core (S1):

BCHM 3901

BIOL 3903

Option (S2): Two of—

BIOL 3905

BCHM 3903

CHEM 3903

MICR 3004

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 2902 and Biology 2905.

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

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corerequisites (C)	Additional Information / May not be counted with	When Offered
A. Junior Units of Study					
Students are required to enrol in and complete:					
(i) Biology 1901 and either 1904 or 1905					
(ii) Chemistry 1902 or 1904 and 1905 or 1906					
(iii) 12 credit points in the Science Discipline Area of Mathematics (excluding Mathematics 1711 and 1712)					
(iv) Any other 12 credit points from Junior Bachelor of Science units of study, from other Science Discipline Areas. It is recommended that these units of study include Physics or Computer Science.					
BIOL 1904	Living Systems Molecular (Advanced)	6	Akn 2-unit Biology or Biology 1901 or equivalent	May not be counted with Biology 1002 or 1003 or 1902 or 1905 Students must be enrolled in the Molecular Biology and Genetics Degree Program.	July
BIOL 1905	Human Biology Molecular (Advanced)	6	Akn 2-unit Biology or Biology 1901 or equivalent	May not be counted with Biology 1002 or 1003 or 1902 or 1904 Students must be enrolled in the Molecular Biology and Genetics Degree Program.	July
CHEM 1905	Chemistry 1A Molecular (Advanced)	6	Prereq TER of at least 88 and at least 75% in HSC 2-unit Chemistry or equivalent	May not be counted with Chemistry 1001 or 1101 or 1901 or 1903 or 1906	February
CHEM 1906	Chemistry 1A Molecular (Special Studies Program)	6	Prereq TER of at least 98 and at least 85% in HSC 2-unit Chemistry or equivalent	May not be counted with Chemistry 1001 or 1101 or 1901 or 1903 or 1905	February
B. Intermediate Units of Study					
Students are required to enrol in and complete:					
(i) Biochemistry 2901 and 2902					
(ii) Biology 2905 and 2906					
(iii) Chemistry 2903 and Microbiology 2005 and 2906					
CHEM 2903	Chemistry Life Sciences (Advanced)	8	Qual Chemistry 1902 or 1904 Prereq 12 credit points of Junior Mathematics	May not be counted with Chemistry 2001 or 2101 or 2201 or 2301 or 2901 or 2502	February
MICR 2005	Fundamental Microbiology	4	Qual Biology 1901 and Biology 1904 or 1905 and Chemistry 1902 or 1904		February
MICR 2906	Microbiological Applications and Biotechnology (Advanced)	4	Qual Microbiology 2005 and Biology 1901 and (1904 or 1905) and Chemistry 1902 or 1904		July

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corerequisites (C)	Additional Information / May not be counted with	When Offered
C. Senior Units of Study					
At least 24 credit points must be completed from Senior Advanced units of study. These include:					
(i) February Semester Core Units of Study					
(a) Biochemistry 3901; (b) Biology 3903					
(ii) July Semester Elective Units of Study					
Select two options from (a), (b), (c) and (d) below:					
(a) Biochemistry 3904;					
(b) Biology 3905;					
(c) Chemistry 3903;					
(d) Microbiology 3004					
BCHM 3904	Metabolic and Medical Biochemistry Molecular (Advanced)	12	Qual Biochemistry 2002 or 2902	May not be counted with Biochemistry 3002 or 3902	July
BIOL 3905	Eukaryotic Genetics and Development Molecular (Advanced)	12	Qual 16 credit points of Biology including Biology 2905	May not be counted with Biology 3203 or 3904	July
CHEM 3903	Chemistry 3 Life Sciences (Advanced)	12	Qual Chemistry 2903	May not be counted with Chemistry 3102 or 3902	July
MICR 3004	Molecular Biology of Pathogens Molecular	12	Qual Microbiology 2005 or 2906		July

D. Honours Units of Study

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/LLB

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 48 credit points of Law subjects, comprising Legal Institutions and Law, Lawyers and Justice in Australian Society (6 credit points each) and five units of study as specified below towards the Science degree. No other units of study 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 units of study 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 credit points of Science Junior units of study and the units of study Legal Institutions and Law, Lawyers and Justice in Australian Society.
- (ii) in the second year of attendance the student will take 32 credit points of Science Intermediate units of study, from at least two Science Discipline Areas and Contracts (8 credit points) and Criminal Law (8 credit points).
- (iii) in the third year of attendance the student will take Federal Constitutional Law (10 credit points), Torts (10 credit points) and Administrative Law (8 credit points). In addition the student will take Science units of study which will include at least 24 credit points of Senior units of study from a single Science Discipline Area and any other units of study required to give the student a minimum of 56 credit points of Science units of study at Intermediate and Senior level, and at least the minimum of 144 credit points required for the BSc degree.
- (iv) A unit of study 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 units of study 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 Secretary to the Faculty of Science.

Honours units of study

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 unit of study 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 unit of study for the degree of Bachelor of Laws. Graduation with Honours in Law requires a high standard of performance in all units of study for the LLB degree. Some of these units of study are taken during the first three years of the combined course while the student is completing the Science segment of the course.

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corerequisites (C)	Additional Information / May not be counted with	When Offered
LAWS 1006	Legal Institutions	6			February, 1998
LAWS 1007	Law, Lawyers and Justice in Australian Society	6	Legal Institutions		July, 1998
LAWS 2000	Contracts	8	Legal Institutions I & II		February, 1998
LAWS 2001	Criminal Law	8	Legal Institutions; Law, Lawyers and Justice in Australian Society		July, 1998
LAWS 3000	Federal Constitutional Law	10	Legal Institutions; Law, Lawyers and Justice in Australian Society		February, 1998
LAWS 3001	Torts	10	Legal Institutions, Law, Lawyers and Justice in Australian Society		July, 1998
LAWS 3200	Administrative Law	8	Legal Institutions I & II; Constitutional Law; Torts		February, 1998

Combined Arts/Science degrees BA/BSc Resolutions of the Faculty

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 credit points including:
 - (i) at least 12 credit points from the Science Discipline Areas of Mathematics and Statistics;
 - (ii) 24 credit points from Junior units of study in Science Discipline Areas;
 - (iii) (a) at least 72 Senior credit points from Part A of the Table of Units of study for the BA including a major; and
(b) at least 72 credit points from Senior and Intermediate units of study 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 credit points (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, unit of study 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 unit of study 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.

BSc/BA Resolutions of the Faculty

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

1. Candidature for the combined program is full-time.
2. Candidates qualify for the combined degrees by completing 240 credit points from Science Discipline Areas and from Part A of the Table of units of study for the BA degree including, in the first three years of enrolment:
 - (i) at least 12 credit points from the Science Discipline Areas of Mathematics and Statistics.
 - (ii) at least 24 credit points from Junior units of study in Science Discipline Areas.
 - (iii) at least 72 Senior and Intermediate credit points from units of study in Science Discipline Areas taken in accordance with the Resolutions for the degree of Bachelor of Science; and
 - (iv) at least 24 credit points from Part A of the Table of units of study for the Bachelor of Arts with the exception of those from the Science Discipline Areas of Mathematics, Statistics, Psychology, Computer Science and Geography.
3. Over the five years of the program candidates must complete at least 72 Senior credit points from Part A of the Table of units of study for the Bachelor of Arts degree including a major.
4. Candidates will qualify for the award of the degree of Bachelor of Science after having successfully completed 144 credit points in accordance with Section 2 of these Resolutions.

5. 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 unit of study for the Honours year.
6. 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 these degrees.
7. In the first three years of enrolment the Dean of Science shall exercise authority in any matter concerning the combined degree program not otherwise dealt with in the Resolutions of Senate for these Resolutions. Thereafter the Dean of Arts shall exercise authority.

Combined Science/Engineering degrees BSc/BE Resolutions of the Faculty

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 credit points if of two years' standing in that Faculty, or not less than 108 credit points 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 units of study attempted in the Faculty of Engineering at their first examination, including at least 32 credit points of Intermediate units of study which are equivalent to units of study available to candidates in the BSc, of which at least 16 credit points must be offered by Departments of the Faculty of Science, and
 - (3) must have completed units of study which meet the prerequisites for at least 24 Senior credit points 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, units of study listed in Table I of the BSc Resolutions totalling at least 48 credit points subject to the provisos:
 - (1) that at least 40 credit points shall be for Intermediate or Senior units of study, and at least 24 credit points shall be for Senior units of study in a single Science Discipline Area other than Engineering Science; and
 - (2) that, except with the permission of the Dean, the 48 credit points shall not include any credit points:
 - (i) for units of study taught by Departments in the Faculties of Arts or Economics or Engineering
 - (ii) for units of study regarded by the Faculty as equivalent to those already completed within the Faculty of Engineering.

Permission will be given to include in these 48 credit points units of study taught in the Faculty of Engineering only if the total number of Engineering Science credit points counted toward the BSc, including those counted as credit points 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 units of study, 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 credit points 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 units of study 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 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 units of study 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 units of study in the Faculty of Science so that credit for/exemption from all or most of the Junior and Intermediate core unit of study 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 units of study.

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 units of study are required. Prospective candidates are advised to consult the relevant Engineering Department about the Science units of study required and the standards of performance necessary.

Combined Science/Medicine degrees

BSc/MB BS Resolutions of the Faculty

This course is no longer available for new enrolments. The relevant Resolutions of the Faculty can be consulted in the *Faculty of Science Handbook, 1997*.

Combined Science/Commerce degree

BSc/BComm Joint Resolutions of the Faculties of Science and Economics

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 credit points including:
 - (i) in the first three years of enrolment, 12 Junior credit points in each of Accounting, Econometrics and Economics and 12 credit points from the Science Discipline Areas of Mathematics and Statistics;
 - (ii) at least 72 Senior and Intermediate credit points from units of study in the BSc taken in accordance with the Regulations for the degree of Bachelor of Science;
 - (iii) at least 72 Senior credit points from the subject areas specified in the BCom Regulations including two majors.
3. Candidates may not enrol in any unit of study which is substantially the same as one they have already passed or in which they are

concurrently enrolled².

4. Candidates will be under the general supervision of the Faculty of Science until the end of the year in which they complete 144 credit points. 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, unit of study 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 credit points of units of study from the Table of units of study 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 Liberal Studies

Summary of requirements

In the Bachelor of Liberal Studies students will undertake a broad liberal education which emphasises communication and problem-solving skills. The degree is jointly administered by the Faculties of Arts and Science. To qualify for the Bachelor of Liberal Studies students will complete 192 credit points over a minimum of four years. These 192 credit points will include:

- at least 120 credit points from units of study at the Senior and Intermediate levels.
- at least one major in each of Arts and Science.
- at least 28 credit points (16 of which must be from Intermediate or Senior level units of study) from subject areas in one language other than English.
- a six credit point unit of study in communication and analytical skills or in other academic skills as prescribed.
- a minimum of six credit points from units of study in Mathematics or Statistics.

An Arts major generally consists of 32 Senior credit points from Part A of the Table of units of study as described in the regulations for the Bachelor of Arts degree. A Science major consists of a minimum of 8 Intermediate and 24 Senior credit points from a single Science Discipline Area.

Units of study available in the Bachelor of Liberal Studies are selected from those available in the Bachelor of Arts and those available in the Bachelor of Science. In addition, up to 28 credit points from units of study offered by the Faculties of Architecture, Economics and Education and the Boards of Study in Music and Social Work, the Sydney College of the Arts and the Conservatorium of Music may be counted towards the degree.

Resolutions of the Senate

Joint Resolutions of The Faculties of Arts And Science For The Bachelor of Liberal Studies Degree General requirements for the award of the degree

1. (a) Candidates qualify for the degree of Bachelor of Liberal Studies by completing units of study during 8 semesters.

² For details of units of study which cannot be counted, see the notes in column (e) of the Table of units of study associated with section 3 of the BSc Resolutions.

(b) To qualify for the degree candidates must complete 192 credit points from the Tables of units of study for the degrees of Bachelor of Arts and Bachelor of Science including:

- (i) at least 120 Intermediate or Senior credit points;
 - (ii) at least one Arts major and one Science major;
 - (iii) at least 28 credit points, including 16 Intermediate or Senior credit points, from units of study in one language subject-area other than English from Part A of the Table of units of study for the degree of Bachelor of Arts;
 - (iv) a 6 credit point unit of study in communication and analytical skills or in other academic skills as may be prescribed from time to time;
 - (v) a minimum of 6 credit points from units of study in Mathematics or Statistics.
- (c) The credit point value of a unit of study shall be that designated by the Faculty which offers the unit.

The major

2. (a) Unless otherwise defined, a major shall consist of units of study taken in a single subject-area from Part A of the Table of units of study for the degree of Bachelor of Arts or from Table I of the Table of units of study for the degree of Bachelor of Science.
- (b) The number and level of the credit points constituting an Arts major is as defined in the Resolutions for the Bachelor of Arts.
- (c) A Science major consists of at least 32 credit points from a single Science Discipline Area, including a minimum of 8 credit points from Intermediate units of study and 24 credit points from Senior units of study.
- (d) Candidates shall nominate their choice of majors no later than the beginning of the fifth semester of candidature, but with the permission of the Dean of Arts or Science as appropriate, may change the majors during the candidature.
- (e) The majors successfully completed shall be named on the testamur.

Transfer to candidature for the Bachelor of Arts or the Bachelor of Science

3. (a) Candidates who at the end of at least four semesters of candidature have completed at least 96 credit points in total, and who intend to satisfy the requirements for entry to a Fourth Year Honours unit of study or joint Honours unit of study for the Bachelor's degrees in Arts or Science, may apply to transfer to candidature for one of these degrees.
- (b) Candidates who at the end of at least six semesters of candidature have completed units of study which correspond to the entry requirements for Fourth Year Honours for the Bachelor's degrees in Arts or Science may apply to transfer to candidature for one of these degrees.
- (c) Candidates for the degree may, with the permission of the Faculty concerned, transfer to candidature for the pass degrees of Bachelor of Arts or Bachelor of Science no later than the end of the fourth semester of candidature.
- (d) If a candidate for the degree has completed the normal requirements for the pass degree of Bachelor of Arts, Bachelor of Arts (Asian Studies) or Bachelor of Science, he or she may apply to take one of these degrees provided that candidature for the Bachelor of Liberal Studies is abandoned.

Other conditions of candidature

4. (a) Unless otherwise specified, the regulations regarding definitions and entry requirements for units of study taken from the Table of units of study for the degree of Bachelor of Arts shall be those applying to the degree of Bachelor of Arts, and the regulations regarding definitions and entry requirements for units of study taken from Table I of units of study for the degree of Bachelor of Science shall be those applying to the degree of Bachelor of Science.

(b) Unless otherwise specified, the regulations regarding examination rules, variations of entry requirements, grades of degree, satisfactory progress, credit for previous courses, credit for courses taken concurrently at other institutions, restrictions, time limits, suspension and variation of requirements for the degree shall be those applying to the degree of Bachelor of Arts.

Authority of the Deans

5. The Deans of Arts and Science shall jointly exercise authority in any matter concerning the Bachelor of Liberal Studies degree not otherwise dealt with in the Resolutions of Senate or these resolutions.

Units of study from other programs

6. With the permission of the Deans of Arts and Science, candidates may count towards the degree a maximum of 28 credit points from units of study (other than those listed in the Tables of units of study for the degrees of Bachelor of Science and Bachelor of Arts) offered by the Faculties of Architecture, Economics and Education, the Boards of Study in Music and Social Work, the Sydney College of the Arts and the Conservatorium of Music.

Award of the degree with High Distinction or Distinction

7. (a) A weighted average mark (WAM) will be calculated for each candidate as an overall measure of performance in the degree; the WAM is calculated by summing the products of the marks achieved and the weighted credit point values of the units of study taken in the degree and then dividing by the sum of the weighted credit point values, with all attempts at units of study being included in the calculation, except where units of study are discontinued with permission; the formula used is as follows:

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

where Wc is the weighted credit point value i.e., the product of the credit point value and level of weighting of 1 for 1000-1999 units of study or 3 for 2000-2999 units of study and 3000-3999 units of study; and where Mc is the greater of 45 or the mark out of 100 for the unit of study.

(b) The degree will be awarded with the following grades, as determined by the Deans of Arts and Science on the basis of the WAM:

- (i) High Distinction
- (ii) Distinction
- (iii) Pass

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 unit of study 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.

Overview of degree structure.

A full-time student usually takes units of study worth 24 credit points each semester; however you may choose to do a few more or less at

various times during your course. Graduation requires 144 credit points.

In first year, students take units of study in the two core subject areas: Computer Science (take either COMP 1001 or 1901 in first semester, and either COMP 1002 or 1902 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 one of MATH 1701 or 1711 or 1791 in first semester, and one of MATH 1703 or 1704 or 1793 or 1794 in second semester; these cover Discrete Mathematics and some other topics such as either Calculus or Statistics). You must also choose 12 credit points of elective units of study depending on your career goal as described below.

In second year, all students study a core of Computer Science (COMP (2001 or 2901) and (2002 or 2902) and (2003 or 2903) and (2004 or 2904); 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; units of study related to computing will usually occupy at least 75% of your time, and at least 50% of the year must actually be spent studying units of study 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 credit points of Junior units of study, including 12 credit points of Computer Science units of study from COMP 1001, 1002, 1901, 1902 with an average grade of Credit (65%) or better, and 12 credit points of Mathematics units of study from MATH 1701, 1703, 1704, 1711, 1791, 1793, 1794 with an average grade of Pass (50%) or better, may apply for transfer into the Intermediate year of the BCST degree. Application from University of Sydney students should be made through the Department. Other students should apply through UAC. Selection is on academic merit and is subject to a quota determined by the Dean.

Plans of units of study

It is important when choosing units of study at any stage of your university career that you should consider your overall degree program. The BCST is designed as a flexible degree program which enables students with a strong interest in computing to combine a core of fundamental computer science topics with a wide range of subjects in the first two years, and the possibility of a double major, combining computer science with another computationally based discipline.

Below we describe 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 units of study (those described with a second digit of 8 or 9) is usually limited to students who did well in previous units of study. A student's talents and interests and the prerequisites for any later units of study should be considered when selecting units of study. 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 backgrounds 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 unit of study choices. *In all cases, the core of COMP 1001/1901 and 1002/1902 (Junior year) 2001/2901 and 2002/2902 and 2003/2903 and 2004/2904 (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 units of study emphasising hardware and system software as well as units of study taught by the Electrical Engineering Department. Here is a sensible pattern of units of study.

Junior year MATH (1701/1791, 1703/1793), ENGS 1501, PHYS (1001/1901, 1003/1902)

Intermediate year MATH (2001/2901, 2002/2902/2003/2903, 2005/2905, 2007/2907), ELEC (2101, 2601, 2401, 2501).

Senior year COMP (3003, 3007, 3008, 3009, 3102, 3202). At least 12 of the extra 24 credit points from 3000-level units of study in Computer Science and/or related topics .

Programmer for Commercial Applications

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

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

Junior year MATH (1701/1791, 1703/1793), Macroeconomics, Microeconomics, Accounting IA, Accounting IB.

Intermediate year COMP 3005, MATH (2002/2902, 2009, 2100), Accounting (201, 202).

Senior year COMP (3007, 3008, 3100, 3102, 3204), MATH 3105. At least 12 of the extra 24 credit points from 3000-level units of study in Computer Science and/or related topics .

The second pattern provides a broad introduction to business topics rather than a deep study of Accounting. Note that STAT (2106, 2108) satisfies the prerequisite of first year Econometrics for 2000-level Commerce units of study.

Junior year MATH (1711/1701/1791, 1704/1794), Financial Accounting Concepts/Accounting IA, Management Accounting Concepts/Accounting IB, Macroeconomics, Microeconomics.

Intermediate year COMP (1000, 3005), MATH 2009, STAT (2106, 2108), either (Macro Industrial Relations, Micro Industrial Relations) or Commercial Transactions (A,B).

Senior year COMP (3007, 3008, 3100, 3102, 3204), STAT 3200. At least 12 of the necessary additional 24 credit points from 3000-level units of study in Computer Science and/or related topics (perhaps also include one of Finance 201, Foundations of Management or Marketing 201).

Programmer for Scientific Applications

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

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

Junior year MATH (1701/1791, 1703/1793), PHYS (1701/1702/1791, 1703/1704/1792), CHEM (1101/1901/1903, 1102/1902/1904).

Intermediate year MATH (2002/2902, 2003/2903, 2005/2905, 2100), either PHYS (2001/2101/2901, 2002/2102/2902) or CHEM 2001/2101/2201 /2301/2901, 2202/2302/2902).

Senior year COMP (3001, 3002, 3004, 3008, 3102, 3205), PHYS (3201, 3202), MATH 3102 and 12 other credit points.

Programmer for Bioinformatics

Involves Computer Science units of study emphasising data storage and analysis and units of study on Biochemistry or Genetics. Here is a sensible pattern of units of study.

Junior year MATH (1701/1791, 1704/1794), CHEM 1101/1901/1903, 1102/1902/1904), BIOL (1001/ 1901, 1002/1902).

Intermediate year COMP 3005, MATH 2009, STAT (2106, 2108),

BCHM 2001/2901, and BCHM 2002/2902 or BIOL 2005/2905.

Senior year COMP (3001, 3004, 3008, 3102, 3250), STAT 3200, BCHM 3001 or BIOL 3103, and 12 more credit points in second semester (such as BIOL 3203/3904/3103/3903).

Programmer for Geographic Information Systems

Involves Computer Science units of study emphasising data storage and analysis as well as units of study on Geography. Here is a sensible pattern of units of study.

Junior year COMP 1000 (in second semester), MATH (1701/1791, 1703/1793), GEOG (1001, 1002), and 6 credit points of electives in first semester (GEOL 1001 is suggested).

Intermediate year MATH (2002/2902, 2003/2903, 2005/2905, 2100), GEOG (2101, 2102).

Senior year COMP (3001, 3002, 3005, 3008, 3102, 3205), GEOG 3102, and 12 more credit points in first semester.

Computer Scientist with interest in Mathematics

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

Involves Computer Science units of study emphasising theoretical aspects as well as units of study in Mathematics.

Junior year MATH (1701/1791, 1703/1793/1704/1794) and 24 credit points of electives in other fields. COMP 1000 would be useful as extra units if desired or as a substitute for one semester as an elective.

Intermediate year MATH (2001/2901, 2002/2902, 2003/2903, 2005/2905, 2007/2907, 2008/2908, 2009, 2100).

Senior year COMP (3001, 3002, 3004, 3006, 3101, 3201), and 24 credit points from 3000-level units of study in Computer Science and Mathematics (including some of the following: MATH (3005, 3007, 3100, 3102, 3103, 3105, 3802, 3803, 3806, 3905).

Computer Software Specialist

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

The first spreads the electives more evenly among the semesters.

Junior year COMP 1000, MATH (1701/1791, 1703/1793) and 18 credit points of electives.

Intermediate year COMP 3005, MATH (2002/2902, 2003/2903, 2009, 2100) and between 8 and 12 credit points of electives.

Senior year 48 credit points of 3000-level COMP units of study, including two of the project modules (COMP 3201, 3202, 3203, 3204, 3205).

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

Junior year MATH (1711/1701, 1704) and 24 credit points of electives.

Intermediate year COMP (1000 (in second semester), 3005), MATH 2009, STAT (2106, 2108) and at least 10 credit points of electives, mostly in first semester.

Senior year 44 credit points of 3000-level Computer Science units of study including two of the project modules (COMP 3201, 3202, 3203, 3204, 3205), and also STAT 3200.

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 units of study.

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 units of study' below.

Regulations

Definitions

1. For the purposes of the Resolutions:

(1) (i) A *unit of study* shall consist of such lectures, tutorial instruction, essays, exercises, or practical and field work as may be prescribed.

(ii) Each unit of study shall be designated as a *Junior, Intermediate, Senior* or *Honours* level unit of study. In addition certain units of study may be designated as *Advanced* or *Special Studies Program* units of study.

(iii) Junior, Intermediate, Senior and Honours units of study are indicated by unit of study level designations 1000-1999, 2000-2999, 3000-3999 and 4000-4999 respectively, placed immediately after the name of the course.

(iv) Candidates who have completed a unit of study shall have credit points credited towards the completion of a degree in accordance with the value of the unit of study as described in Resolutions governing the degree.

(2) To "*complete a unit of study*" 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 unit of study.

(3) A *qualifying unit of study* means a unit of study 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 unit of study for which it qualifies.

(4) A *prerequisite unit of study* means a unit of study other than a qualifying unit of study 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 unit of study for which it is a prerequisite.

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

Units of study for Pass degree

3. Units of study for the degree shall include all units of study available for the degrees of BSc, BA, BEd, as well as those units of study listed in Table VI(i) associated with this section. Each unit of study will

(1) have such names,

(2) be in such subjects,

(3) be in such Discipline Areas,

(4) have such credit point values, and

(5) have such qualifying, prerequisite and corequisite units of study as are determined in the Resolutions of the corresponding degree or listed in Table VI(i). Note that for a unit of study available in the BA or BEd degree, the Discipline Area is called the "subject area" in the corresponding Resolutions of that degree, while for a unit of study 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 units of study giving credit for a total of at least 144 credit points, where:
 - (i) at least 12 credit points are from Junior units of study which are offered in the BSc in the Discipline area of Computer Science;
 - (ii) at least 16 credit points are from Intermediate units of study which are offered in the BSc in the Discipline Area of Computer Science;
 - (iii) at least 24 credit points are from Senior units of study which are offered in the BSc in the Discipline Area of Computer Science, including at least 4 credit points which are from the units of study listed in Table VI(ii) associated with these Resolutions;
 - (iv) at least 26 credit points are from units of study which are offered in the BSc in the Discipline Areas of Mathematics and/or Statistics of which at least 12 credit points must be at Intermediate or Senior level;
 - (v) either
 - (a) at least 12 credit points, in addition to those used to satisfy the requirement of section 4(1)(iii), are from Senior units of study each of which is either offered in the BSc in the Discipline Area of Computer Science, or is listed in Table VI(iii) associated with this section, or
 - (b) at least 12 credit points are from Senior units of study all of which are offered in the BSc in a single Discipline Area other than Computer Science;
 - (vi) at least 72 credit points are from Intermediate and Senior units of study;
 - (vii) no more than 40 credit points are from units of study which are offered in the BSc in the Discipline Areas of Anatomy and Histology, Cell Pathology, Pharmacology, and Physiology;
 - (viii) no more than 28 credit points are from units of study in which the grade of Concessional Pass was awarded;
- (2) No unit of study may be credited more than once for the degree.
- (3) No credit points may be credited for the degree from more than one of such units of study 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 unit of study which has substantial content in common with another unit of study 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 unit of study previously completed or concurrently taken, in which case the candidate on completing the unit of study shall receive credit only for the number of credit points appropriate to the work performed.
- (4) Where a candidate enrolls in a unit of study which is the same as, or has substantial content in common with, a unit of study which was previously attempted but was not completed satisfactorily, the Head of the Department concerned may exempt the candidate from certain of the unit of study 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 units of study with a total number of credit points in excess of 28.

- (2) The choice of units of study made by a candidate shall be limited by the exigencies of the timetable provided that candidates who have completed at least 36 credit points of Junior units of study and who seek to enrol in two units of study which are given wholly or partly at the same time may be granted, by the Heads of the Departments concerned, permission to attend equivalent units of study or parts of units of study given at another time.

Enrolment in units of study 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 unit of study 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 units of study 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 credit points, which will be designated by the Dean as Junior, Intermediate or Senior. Such credit points shall count towards the number of credit points required for the degree in accordance with section 4(1).

Upgrade of units of study

7. (1) A candidate may not enrol in a unit of study which was previously completed with a grade of Pass or better.
- (2) Candidates who have been awarded a Concessional Pass in any unit of study may enrol in that unit of study again. On completion of that unit of study such candidates will not be credited with any further credit points for that unit of study unless the unit of study is completed at least at Pass level and the credit points 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 units of study with a total credit point value of more than 17 credit points.

Unit of study 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 unit of study.

- (2) In all units of study 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 unit of study 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 unit of study 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 unit of study shall, unless exempted by the Faculty, again attend lectures and other classes and complete the prescribed written and other work in all such units of study in which they are permitted to re-enrol.
- (6) Candidates who repeat any unit of study shall not be eligible for any prize or scholarship awarded in connection with the examination for such a unit of study.
- (7) Subject to the provisions of section 4(1)(viii), the award of a Concessional Pass in a unit of study entitles the candidate to be credited with the full number of credit points for that unit of study.

Credit for other units of study

10. (1) Subject to the limitations on total credit given in section 10(2), candidates may be given credit for a unit of study which they have completed in another recognised program provided that:
 - (i) the unit of study was completed not more than nine years before admission to candidature in the Faculty;
 - (ii) the unit of study was completed with a result equivalent to Pass or better (not Concessional Pass);
 - (iii) if the unit of study 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 unit of study content was material not taught in any corresponding unit of study at the University of Sydney, or
 - (b) the candidate was unable for good reason to attend a corresponding unit of study at the University of Sydney;
 - (iv) where the unit of study is considered by the Faculty to be equivalent to a unit of study described in section 3, then credit shall be given for that equivalent course, and the candidate shall be regarded as having completed that equivalent unit of study for the purposes of these Resolutions;
 - (v) where the unit of study is considered by the Faculty as appropriate, but no unit of study described in section 3 is considered equivalent, then the candidate shall be given credit for such number of credit points and with such a result as the Faculty may determine in order to provide fair comparison with units of study described in section 3. Credit points 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 units of study shall be limited such that:
 - (i) the total credit point value which is credited to a candidate in accordance with section 10(1) from units of study in another recognised program, including those for which credit has been abandoned, may not exceed 96;
 - (ii) the total credit point value which is credited to a candidate in accordance with section 10(1), from units of study 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 credit points, of which at least 24 are Senior credit points which are in the Discipline Area of Computer Science or are listed in Table VI(ii) associated with section 4, from units of study which are taken at the University of Sydney.

Admission to Honours units of study

11. (1) In order to qualify for admission to an Honours unit of study 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 unit of study.
 - (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 units of study:
 - (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 unit of study 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 unit of study which they are qualified to enter.

Honours units of study

12. (1) Candidates for the Honours degree shall complete an Honours unit of study, full-time over one year or half-time over two consecutive years.
 - (2) There shall be an Honours unit of study in Computer Science. With permission of the Faculty, candidates may be allowed to complete an Honours unit of study 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 unit of study 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 units of study 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 of section 8, candidates who first enrolled for the degree prior to 1997 may qualify for the degree by completing 140 credit points.

Table vi: [see section 3 j [uacneior OT computer science and Technology]

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corerequisites (C)	Additional Information / May not be counted with	When Offered
A. Junior Units of Study VI (i)					
ELEC1101	Science, Technology and Engineering	6	AKn HSC Mathematics 3-unit course and the Physics section of the Science 3-unit or 4-unit course or 2-unit Physics Coreq Mathematics 1701 or 1791 and 1703 or 1793 and Computer Science 1001 or 1901 and 1002 or 1902		February
ELEC1102	Introductory Electronic Circuits	6	Prereq Mathematics 1701 and Electrical Engineering 1101		July
B. Intermediate Units of Study					
ELEC 2101	Electrical and Digital Systems	4	Prereq Electrical Engineering 1102 Introductory Electronic Circuits and Computer Science 1002 or 1902		February
ELEC 2401	Electronic Devices and Circuits	4	Prereq Electrical Engineering 1102		July
ELEC 2501	Signals and Communications	4	Prereq Mathematics 1701 and 1703, and Electrical Engineering 1102		July
ELEC 2601	Microcomputer Systems	4	Prereq Electrical Engineering 1102 Introductory Electronic Circuits		February
C. Senior Units of Study (ii)					
COMP 3201	Algorithmic Systems Project	4	Prereq Computer Science 3001	Students intending to major in Computer Science are advised to enrol in one of Computer Science 3201, 3202, 3203, 3204 or 3205	February and July
COMP 3202	Computer Systems Project	4	Prereq Computer Science 3009	Students intending to major in Computer Science are advised to enrol in one of Computer Science 3201, 3202, 3203, 3204 or 3205	February and July
COMP 3203	Intelligence Systems Project	4	Prereq Computer Science 3002	Students intending to major in Computer Science are advised to enrol in one of Computer Science 3201, 3202, 3203, 3204 or 3205	February and July
COMP 3204	Large-Scale Software Project	4	Prereq Computer Science 3100	Students intending to major in Computer Science are advised to enrol in one of Computer Science 3201, 3202, 3203, 3204 or 3205	February and July

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corequisites (C)	Additional Information / May not be counted with	When Offered
COMP 3205	Product Development Project	4	Prereq Computer Science 3008	Students intending to major in Computer Science are advised to enrol in one of Computer Science 3201, 3202, 3203, 3204 or 3205	February and July
COMP 3206	Bioinformatics Project	4	Qual: Computer Science 2004 or 2904 Prereq 8 credit points of Senior Computer Science (including Computer Science 3008/3100/3908/3800) and 16 credit points of Intermediate Biology, Biochemistry and/or Pharmacology		July
C. Senior Units of Study VI (iii)					
EMCT 3510	Operations Research A			See Economics information	
EMCT 3520	Operations Research B			See Economics information	
GEOG3102	Coastal Environmental Management and GIS	12	Prereq Geography 2001 or 2002 or 2101 or Marine Science 2001		July
MATH 3005	Logic	4	Prereq (for all but BCST students) 8 credit points of Intermediate Mathematics Prereq (for BCST students) 8 credit points of Intermediate Mathematics or 12 credit points of Junior Mathematics at Advanced level		February
MATH 3007	Coding Theory	4	Prereq 8 credit points of Intermediate Mathematics (strongly advise 2002 or 2902)		July
MATH 3010	Information Theory	4	Prereq 8 credit points of Intermediate Mathematics (strongly advise 2001 or 2901 and some probability theory)		July
MATH 3016	Mathematical Computing I	4	Prereq 8 credit points of Intermediate Mathematics and one of Mathematics 1702 or 1703 or 1792 or 1793	May not be counted with Mathematics 3916	February
MATH 3019	Signal Processing	4	Prereq Mathematics 2005 or 2905		February
MATH 3020	Nonlinear Systems and Biomathematics	4	Prereq 8 credit points of Intermediate Mathematics (strongly advise 2908 or 3003) and one of Mathematics 1702 or 1703 or 1792 or 1793		July
MATH 3905	Categories and Computer Science (Advanced)	4	Prereq 12 credit points of Intermediate Mathematics		February

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corequisites (C)	Additional Information / May not be counted with	When Offered
MATH 3912	Combinatorics (Advanced)	4	Prereq 12 credit points of Intermediate Mathematics		July
MATH 3913	Computational Algebra (Advanced)	4	Prereq 12 credit points of Intermediate Mathematics (strongly advise Mathematics 3002 or 3902)		July
MATH 3916	Mathematical Computing I (Advanced)	4	Prereq 8 units of Intermediate Mathematics and one of Mathematics 1792 or 1793 or Credit in Mathematics 1702 or 1703	May not be counted with Mathematics 3016	February
PHYS 3301	Scientific Computing	4	Prereq 16 credit points of Intermediate units of study in Chemistry, Computer Science, Mathematics, Physics or Statistics		February
PHYS 3302	Advanced Measurement Instrumentation and Control	4	Prereq 16 credit points of Intermediate units of study in Biochemistry, Chemistry, Computer Science, Geology, Mathematics, Physics or Statistics	(This unit of study will be available from 1999)	February
PHYS 3303	Scientific Visualisation	4	Prereq Physics 3301		July
STAT 3004	Design of Experiments	4	Prereq Statistics 3002 or 3902		July

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 units of study. A total of 144 credit points is required for the degree. This must include:

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

Students are required to pass all components of the core units of study in order to progress in the degree. It is possible for students to "carry" their 8 credit point 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 units of study, students should note that the units of study BCHM 2101 and 2102 have no laboratory components. Students selecting these units of study must choose another 8 credit points from Biology or History and Philosophy of Science units of study.

The combination MATH 1703/1793 is not recommended in this degree. Students wishing to study Statistics/Calculus are advised to select MATH 1702/1792 or 1712.

Entry to first year

A quota will apply for entry into the BMedSc degree in first year.

Transferring into the BMedSc degree program

A limited number of students may be permitted to transfer into the BMedSc course at the beginning of the Intermediate year from other degrees offered by the Faculty, from other degrees offered by the University of Sydney or from other institutions. In order to transfer students must achieve a Pass or better in all of the qualifying units of study, or units of study deemed equivalent by the Faculty. Selection is based solely on performance in the first year subjects. Applicants should anticipate a WAM of about 75 would be necessary to gain admission. Students who wish to transfer must apply for admission to the BMedSc course through the Universities Admission Centre.

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 unit of study 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 credit points from subjects taught by Departments in the Faculty of Medicine devolved unit. Such students may find it necessary to complete additional Intermediate units of study in the Faculty of Science before undertaking Senior units of study.

Regulations

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) (i) A *unit of study* shall consist of such lectures, tutorial instruction, essays, exercises, or practical and field work as may be prescribed.
(ii) Each unit of study shall be designated as a *Junior, Intermediate, Senior* or *Honours* level unit of study. In addition certain units of study may be designated as *Advanced* or *Special Studies Program* units of study.
(iii) Junior, Intermediate, Senior and Honours units of study are indicated by unit of study level designations 1000-1999, 2000-2999, 3000-3999 and 4000-4999 respectively, placed immediately after the name of the unit of study.
(iv) Except as provided in section 7, candidates who have completed a unit of study shall have credit points credited towards the completion of a degree in accordance with the credit point value of the unit of study as described in section 3 of these Resolutions.
- (2) To '*complete a unit of study*' and derivative expressions mean:
 - (i) to attend the lectures and the meetings for tutorial instructions, if any; to complete satisfactorily the essays, exercises and the practical and field work, if any; and
 - (ii) to pass the examination of the unit of study.
- (3) *Qualifying unit of study* means a unit of study which must be completed with a result of Pass or better [not a Concessional Pass - see sections 7(2) and 9(7)].
- (4) *Prerequisite unit of study* means a unit of study other than a qualifying unit of study 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 unit of study for which it is a prerequisite.
- (5) *Corequisite unit of study* means a unit of study which unless previously completed or except with the permission of the Head of Department concerned, must be taken concurrently with the unit of study 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.

Units of study for Pass degree

3. Units of study for the degree shall—
 - (1) have such names,
 - (2) be in such subjects,
 - (3) have such credit point values, and
 - (4) have such qualifying, prerequisite and corequisite units of study as are set out in Table VII 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 credit points from Junior units of study, 48 credit points from Intermediate units of study including 40 credit points of core units of study and 8 credit points of elective units of study, and 48 credit points from Senior units of study including 12 credit points of core units of study and 36 credit points of elective units of study, as set out in Table VII in section 3;
 - (2) gain credit totalling at least 144 credit points, not more than 16 credit points of which shall be credited from units of study in which Concessional Passes have been awarded; and
 - (3) not have any units of study 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 unit of study until they have completed all the Junior units of study prescribed by the

Faculty as qualifying units of study as set out in section 3.

- (2) Except with the permission of the Faculty, candidates may not take a Senior unit of study—
 - (i) until they have gained credit for the 40 core credit points in the Intermediate program, and
 - (ii) until they have completed the Intermediate units of study, if any, prescribed as prerequisites for the Senior unit of study, 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 units of study may be limited by the exigencies of the timetable and some Senior elective units of study may also be subject to a quota.
- (4) No credit points may be credited for the degree from more than one of such units of study as the Faculty may deem to be mutually exclusive (listed in column (e) of Table VII associated with section 3), except that where a candidate enrolls in a unit of study which has substantial content in common with another unit of study 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 unit of study previously completed, in which case the candidate shall receive credit only for the number of credit points appropriate to the work performed.
- (5) Where a candidate enrolls in a unit of study which is the same as, or has substantial content in common with, a unit of study which was previously attempted but was not completed satisfactorily, the Head of the Department concerned may exempt the candidate from certain of the unit of study requirements, on receipt of evidence that the student has previously demonstrated competence to perform those requirements.

Enrolment in units of study 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 units of study specified in Table VII 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 credit points for these studies which will be designated by the Dean as Junior, Intermediate or Senior. Such credit points shall count towards the number of credit points required for the degree in accordance with section 3.

Upgrade of units of study

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

Unit of study 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 unit of study.
- (2) In all units of study, 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 unit of study 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 unit of study 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 unit of study shall, unless exempted by the Faculty, again attend lectures and other classes and complete the prescribed written and other work in all such units of study in which they are permitted to re-enrol.
- (6) Candidates who repeat any unit of study shall not be eligible for any prize or scholarship awarded in connection with the examination for such a unit of study.
- (7) Subject to the provisions of section 4(2), the award of a Concessional Pass in a unit of study entitles the candidate to be credited with the full number of credit points for that unit of study.

Credit for other units of study

10. (1) Subject to the limitations on total credit given in section 10(2), candidates may be given credit for a unit of study which they have completed in another recognised program provided that:
 - (i) the unit of study was completed not more than nine years before admission to candidature in the Faculty;
 - (ii) the unit of study was completed with a result equivalent to Pass or better (not Concessional Pass);
 - (iii) if the unit of study 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 unit of study at the University of Sydney;
 - (iv) where the unit of study is considered by the Faculty to be equivalent to a unit of study listed in the Tables associated with section 3, then credit shall be given for that equivalent unit of study, and the candidate shall be regarded as having completed that equivalent unit of study for the purposes of these Resolutions.
- (2) Award of credit for units of study shall be limited such that:
 - (i) the total credit point value which is credited to a candidate in accordance with section 10(1) from units of study in another recognised program, including those for which

credit has been abandoned, may not exceed 96;

(ii) the total credit point value which is credited to a candidate in accordance with section 10(1), from units of study 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 credit points, of which at least 24 are Senior credit points, from units of study which are listed in Table VII 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 units of study listed in Table VII associated with section 3 may be given unspecified credit and shall be regarded as having completed such Junior units of study in the Table for the purposes of these Resolutions.

Admission to Honours units of study

11. (1) In order to qualify for admission to an Honours unit of study 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 unit of study.

(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 units of study:

(i) Pass graduates in Medical Science of the Faculty of Science;

(ii) Pass graduates holding Bachelor 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 unit of study 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 unit of study which they are qualified to enter.

Honours units of study

12. (1) Candidates for the Honours degree shall complete an Honours unit of study, 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 unit of study 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 unit of study on a full-time basis.

(3) There shall be an Honours unit of study 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 unit of study shall, if deemed to be of sufficient merit by the Faculty, receive a bronze medal.

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

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corerequisites (C)	Additional Information / May not be counted with	When Offered
A. Junior Units of Study					
Biology					
BIOL 1001	Concepts in Biology	6	Akn Biology section of the HSC 3-unit Science course	May not be counted with Biology 1901	February
BIOL 1002	Living Systems	6	Akn HSC 2-unit Biology or Biology 1001 or 1901 or equivalent	May not be counted with Biology 1902	July
BIOL 1003	Human Biology	6	Akn HSC 2-unit Biology or Biology 1001 or 1901 or equivalent	Not a prerequisite for all Intermediate units of study in Biology. See prerequisites listed under Intermediate units of study. May not be counted with Biology 1903	July
BIOL 1901	Concepts in Biology (Advanced)	6	Akn Biology section of the Hsc 3-unit Science course; by invitation	May not be counted with Biology 1001. Students must first enrol in Biology 1001. Subsequently, selected students may be invited to enrol in this unit of study where they will participate in a more demanding alternative component	February
BIOL 1902	Living Systems (Advanced)	6	Akn HSC 2-unit Biology or Biology 1001 or 1901 or equivalent, by invitation	May not be counted with Biology 1002. Students must first enrol in Biology 1002. Subsequently, selected students may be invited to enrol in this unit of study where they will participate in a more demanding alternative component	July
BIOL 1903	Human Biology (Advanced)	6	Akn HSC 2-unit Biology or Biology 1001 or 1901 or equivalent, by invitation	May not be counted with Biology 1003. Students must first enrol in Biology 1003. Subsequently, selected students may be invited to enrol in this unit of study where they will participate in a more demanding alternative component	July
Chemistry					
CHEM 1101	Chemistry 1A	6	Akn HSC Mathematics 2 unit course; and the Chemistry component of the 4-unit or 3-unit HSC Science course, or 2-unit Chemistry	May not be counted with Chemistry 1001 or 1901 or 1903 Recommended concurrent unit of study: Preferred — Mathematics 1701 or 1791; otherwise — Mathematics 1711	February & July
CHEM 1102	Chemistry IB	6	Prereq Chemistry 1101 or a Distinction in Chemistry 1001 or equivalent; Chemistry 1101 may be taken as a corequisite	May not be counted with Chemistry 1002 or 1902 or 1904 Recommended concurrent unit of study: Preferred — Mathematics 1702 or 1703 or 1792 or 1793; otherwise — Mathematics 1704 or 1712	July

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corerequisites (C)	Additional Information / May not be counted with	When Offered
CHEM 1901	Chemistry 1A (Advanced)	6	Prereq TER of at least 88 and at least 75% in HSC 2-unit Chemistry or equivalent; by invitation	May not be counted with Chemistry 1001 or 1101 or 1903 Recommended concurrent unit of study: Preferred — Mathematics 1701 or 1791; otherwise — Mathematics 1711	February
CHEM 1902	Chemistry IB (Advanced)	6	Qual Chemistry 1901 or 1903 or Distinction in Chemistry 1101 or equivalent; by invitation	May not be counted with Chemistry 1002 or 1102 or 1904 Recommended concurrent unit of study: Preferred — Mathematics 1702 or 1703 or 1792 or 1793, otherwise — Mathematics 1712 or 1704	July
CHEM 1903	Chemistry 1A (Special Studies Program)	6	Prereq TER of at least 98 and at least 85% in HSC 2-unit Chemistry or equivalent. Entry is by invitation	May not be counted with Chemistry 1001 or 1101 or 1901- Recommended concurrent unit of study: Preferred — Mathematics 1701 or 1791; otherwise — Mathematics 1711 Students in the Faculty of Science Talented Students Program are automatically eligible. For the purpose of Resolution 11 this unit of study is deemed to be designated as an Advanced unit of study	February
CHEM 1904	Chemistry IB (Special Studies Program)	6	Prereq Chemistry 1903; by invitation	May not be counted with Chemistry 1002 or 1102 or 1902 Recommended concurrent unit of study: Preferred — Mathematics 1002 or 1003 or 1792 or 1793; otherwise — Mathematics 1712 or 1704	July
Computer Science					
COMP 1001	Introductory Programming	6	Akn HSC 3-unit Mathematics	May not be counted with Computer Science 1901 Students intending to major in Computer Science are advised to enrol in Mathematics 1703 or 1704 or 1793 or 1794 in their first year	February and July
COMP 1002	Introductory Computer Science	6	Prereq Computer Science 1001 or 1901	May not be counted with Computer Science 1902	July
COMP 1901	Introductory Programming (Advanced)	6	Akn HSC 3-unit Mathematics (Requires permission by the Head of Department)	May not be counted with Computer Science 1001	February and July
COMP 1902	Introductory Computer Science (Advanced)	6	Prereq Distinction in Computer Science 1901 or 1001	May not be counted with Computer Science 1002	July

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corerequisites (C)	Additional Information / May not be counted with	When Offered
Mathematics					
MATH 1701	Differential Calculus and Linear Algebra	6	Akn HSC 3-unit Mathematics	May not be counted with Mathematics 1711 or 1791	February
MATH 1702	Integral Calculus and Statistics	6	Akn HSC 4-unit Mathematics or Mathematics 1701	May not be counted with Mathematics 1712 or 1792 or 1793 or 1794 or 1703 or 1704	July
MATH 1703	Integral Calculus and Discrete Mathematics	6	Akn HSC 4-unit Mathematics or Mathematics 1701	May not be counted with Mathematics 1702 or 1704 or 1712 or 1792 or 1793 or 1794	July
MATH 1704	Statistics and Discrete Mathematics	6	Akn HSC 3-unit Mathematics	May not be counted with Mathematics 1702 or 1703 or 1712 or 1792 or 1793 or 1794	July
MATH 1711	Life Sciences Mathematics A	6	Akn HSC 2-unit Mathematics	May not be counted with Mathematics 1701 or 1791 May not be counted by students enrolled in the BSc/BCom combined degree program	February
MATH 1712	Life Sciences Mathematics B	6	Akn HSC 2-unit Mathematics	May not be counted with Mathematics 1702 or 1703 or 1704 or 1792 or 1793 or 1794 May not be counted by students enrolled in the BSc/BCom combined degree program	July
MATH 1791	Differential Calculus and Linear Algebra (Advanced)	6	Akn HSC 4-unit or top decile 3-unit Mathematics	May not be counted with Mathematics 1701 or 1711	February
MATH 1792	Integral Calculus and Statistics (Advanced)	6	Akn HSC 4-unit Mathematics or Mathematics 1791	May not be counted with Mathematics 1702 or 1703 or 1704 or 1712 or 1793 or 1794	July
MATH 1793	Integral Calculus and Discrete Mathematics (Advanced)	6	Akn HSC 4-unit Mathematics or Mathematics 1791	May not be counted with Mathematics 1702 or 1703 or 1704 or 1712 or 1792 or 1794	July
MATH 1794	Statistics and Discrete Mathematics (Advanced)	6	Akn HSC 4-unit or top decile 3-unit Mathematics	May not be counted with Mathematics 1702 or 1703 or 1704 or 1712 or 1792 or 1793	July
Physics					
PHYS 1001	Physics (Regular)	6	AKn HSC Physics or HSC 4-unit Science	May not be counted with Physics 1002 or 1901 See prerequisites for Intermediate Physics units of study. Recommended concurrent unit of study: Mathematics 1701 or 1791	February

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corerequisites (C)	Additional Information / May not be counted with	When Offered
PHYS 1002	Physics (Fundamentals)	6	AKn no assumed knowledge of Physics	May not be counted with Physics 1001 or 1901 See prerequisites for Intermediate Physics units of study. Recommended concurrent unit of study: Mathematics 1701 or 1791	February
PHYS 1003	Physics (Technological)	6	Akn HSC 2-unit Physics or HSC 4-unit Science of Physics 1001 or 1002 or 1902 or equivalent* *Subject to Senate/Faculty approval	May not be counted with Physics 1004 or 1902 See prerequisites for Intermediate Physics units of study. Recommended concurrent unit of study: Mathematics 1702 or 1792	July
PHYS 1004	Physics (Environmental and Life Sciences)	6	Akn HSC 2-unit Physics or HSC 4-unit Science of Physics 1001 or 1002 or 1902 or equivalent* *Subject to Senate/Faculty approval	May not be counted with Physics 1003 or 1902 See prerequisites for Intermediate Physics units of study. Recommended concurrent unit of study: Mathematics 1702 or 1792	July
PHYS 1901	Physics (Advanced) A	6	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	May not be counted with Physics 1001 or 1002 See prerequisites for Intermediate Physics units of study. Recommended concurrent unit of study: Mathematics 1701 or 1791	February
PHYS 1902	Physics (Advanced) B	6	Prereq TER at least that for acceptance into BSc(Advanced) and HSC 2-unit Physics or HSC 4-unit Science or Physics 1901 or grade of Distinction or better in Physics 1001* *Subject to Senate/Faculty approval	May not be counted with Physics 1003 or 1004 See prerequisites for Intermediate Physics units of study. Recommended concurrent unit of study: Mathematics 1702 or 1792	July
Psychology					
PSYC 1001	Psychology 1001	6			February
PSYC 1002	Psychology 1002	6			July
B. Intermediate Units of Study					
Core Units of Study					
BMED 2001	Human Life Sciences	24	Qual 12 credit points of Junior Mathematics, 12 credit points of Junior Chemistry, 12 credit points of Junior Physics, and 12 credit points of Junior Biology or 12 credit points of Junior Computer Science or 12 credit		February

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corerequisites (C)	Additional Information / May not be counted with	When Offered
Biochemistry					
BCHM 2101	Genes and Proteins Theory	4	Qual 6 credit points of Junior Chemistry which must include one of Chemistry 1101, 1102, 1901, 1902, 1903, 1904 or, with the permission of the Head of Department, exceptional performance in Chemistry 1001 or 1002	May not be counted with Agricultural Chemistry 2001 or Biochemistry 2001 or 2901	February
BCHM 2102	Molecules, Metabolism and Cells Theory	4	Qual Biochemistry 2001, 2101 or 2901	May not be counted with Agricultural Chemistry 2001 or Biochemistry 2002 or 2902	July
Pharmacology					
PCOL 2001	Pharmacology Fundamentals	4	Prereq 12 credit points of Junior Chemistry (including Chemistry 1102 or 1902) and 24 credit points of units of study from other Science Discipline Areas	This is a qualifying unit of study for Pharmacology 3001 or 3002. Students are strongly advised to complete Junior units of study in Biology before enrolling in Pharmacology 2001	February
PCOL 2002	Pharmacology — Drugs and People	4	Prereq 12 credit points of Junior Chemistry (including Chemistry 1102 or 1902) and 24 credit points of units of study from other Science Discipline Areas	This is a qualifying unit of study for Pharmacology 3001 or 3002. Students are strongly advised to complete Junior units of study in Biology before enrolling in Pharmacology 2002	July
Elective Units of Study (Select one subject)					
Biochemistry					
BCHM 2001	Genes and Proteins	8	Qual 6 credit points of Junior Chemistry which must include one of Chemistry 1101, 1102, 1901, 1902, 1903, 1904 or, with the permission of the Head of Department, exceptional performance in Chemistry 1001 or 1002	May not be counted with Agricultural Chemistry 2001 or Biochemistry 2101 or 2901	February
BCHM 2002	Molecules, Metabolism and Cells	8	Qual Biochemistry 2001 or 2901	May not be counted with Agricultural Chemistry 2001 or Biochemistry 2102 or 2902	July
BCHM 2901	Genes and Proteins (Advanced)	8	Qual 6 credit points of Junior Chemistry which must include one of Chemistry 1101, 1102, 1901, 1902, 1903, 1904 or, with the permission of the Head of Department, exceptional performance in Chemistry 1001 or 1002	May not be counted with Agricultural Chemistry 2001 or Biochemistry 2101 or 2001	February

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corerequisites (C)	Additional Information / May not be counted with	When Offered
BCHM 2902	Molecules, Metabolism and Cells (Advanced)	8	Qual Biochemistry 2001 or 2901 (selected students)	May not be counted with Agricultural Chemistry 2001 or Biochemistry 2102 or 2002	July
Biology					
BIOL 2005	Molecular and General Genetics	8	Qual 12 credit points of Junior Biology Prereq Chemistry 1102 or 1902 or 1904 or (with the permission of the Head of School) exceptional performance in Chemistry 1002. Biochemistry 2001 or 2901 and Biology 2006 or 2906 are highly recommended	May not be counted with Biology 2105 or 2905 See prerequisites for Senior units of study in Biology	July
History and Philosophy of Science					
HPSC 2001	Introductory Philosophy of Science	4	Prereq 24 credit points of Junior Science units of study	This is a qualifying unit of study for Senior History and Philosophy of Science units of study	July
HPSC 2002	Introductory History of Science	4	Prereq 24 credit points of Junior Science units of study	This is a qualifying unit of study for Senior History and Philosophy of Science units of study	February
C. Senior Units of Study					
Senior Core Units of Study - February semester					
BMED 3001	Human Life Sciences	4	Qual Human Life Sciences 2001 Prereq Pharmacology 2001 and 2002, and Biochemistry 2101 and 2102 or Biochemistry 2001 and 2002 or Biochemistry 2901 and 2902		February
BMED 3002	Microbiology and Immunology	8	Qual Human Life Sciences 2001 Prereq Pharmacology 2001 and 2002, and Biochemistry 2101 and 2102 or Biochemistry 2001 and 2002 or Biochemistry 2901 and 2902		February
Elective Units of Study - February semester					
Anatomy and Histology					
ANAT 3001	Microscopy and Histochemistry	12	Qual Anatomy and Histology 2001		February

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corequisites (C)	Additional Information / May not be counted with	When Offered
Biochemistry					
BCHM 3001	Molecular Biology and Structural Biochemistry	12	Qual Biochemistry 2002 or 2902, or with permission of Head of Department, Biology 2005 or 2905 or good performance in Biochemistry 2001 or 2901 with a suitable Intermediate Chemistry unit of study	May not be counted with Biochemistry 3901	February
BCHM 3901	Molecular Biology and Structural Biochemistry (Advanced)	12	Qual Biochemistry 2002 or 2902 or, with permission of Head of Department, Biology 2005 or 2901, or good performance in Biochemistry 2001 or 2901 with suitable Intermediate Chemistry	May not be counted with Biochemistry 3001	February
Biology					
BIOL 3103	Molecular Genetics and Recombinant DNA Technology	12	Qual 16 credit points of Intermediate Biology including Biology 2005 or 2905	May not be counted with Biology 3903	February
BIOL 3903	Molecular Genetics and Recombinant DNA Technology (Advanced)	12	16 credit points of Intermediate Biology including Biology 2005 or 2905; by invitation	May not be counted with Biology 3103 Students must first enrol in Biology 3103 Subsequently, students may be invited to enrol in this unit of study where they will participate in a more demanding alternative component.	February
Cell Pathology					
CPAT 3001	Cell Pathology A	12	Prereq Anatomy and Histology 2002 or Biochemistry 2002 or 2902, or Biology 2005 or 2006 or 2905 or 2906, or both Pharmacology 2001 and 2002, or Physiology 2002	Students must contact the Department before enrolling. Only a small number of students can be accommodated in the laboratory facilities.	February
History and Philosophy of Science					
HPSC 3102	History of the Biomedical Sciences	12	Qual History and Philosophy of Science 2001 and 2002		February
Pharmacology					
PCOL 3001	Molecular Pharmacology and Toxicology	12	Qual Pharmacology 2001 and 2002	Students are strongly advised to consider Intermediate units of study in Biochemistry and/or Chemistry together with Physiology 2001 and 2002 if they wish to undertake Pharmacology 3001	February

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corerequisites (C)	Additional Information / May not be counted with	When Offered
Physiology					
PHSI 3001	Neuroscience	12	Qual Physiology 2002 or Anatomy and Histology 2002 Prereq Biochemistry (2001 and 2002) or (2101 and 2102) and an additional 8 or more credit points from any Intermediate unit/s of study 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 2002 plus at least one other Intermediate unit of study similar to one of the above prerequisites may be permitted to enrol by the unit of study Supervisor	February
Elective Units of Study - July semester					
BMED 3003	Immunology	12	Qual Human Life Sciences 2001 Prereq Pharmacology 2001 and 2002, and Biochemistry 2101 and 2102 or Biochemistry 2001 and 2002 or Biochemistry 2901 and 2902		July
BMED 3004	Infectious Diseases	12	Qual Human Life Sciences 2001 Prereq Pharmacology 2001 and 2002, and Biochemistry 2101 and 2102 or Biochemistry 2001 and 2002 or Biochemistry 2901 and 2902 Coreq Microbiology 3003		July
Anatomy and Histology					
ANAT3002	Cells and Development	12	Akn(i) an understanding of the basic structure of the vertebrates; (ii) an understanding of elementary biochemistry and genetics Qual Anatomy and Histology 2001 Prereq at least 8 credit points of Intermediate Biochemistry	May not be counted with Anatomy and Histology 3003	July
ANAT 3005	Topographical Anatomy	12	Qual Human Life Sciences 2001		July
Biochemistry					
BCHM 3002	Metabolic and Medical Biochemistry	12	Qual Biochemistry 2002 or 2902	May not be counted with Biochemistry 3902	July

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corequisites (C)	Additional Information / May not be counted with	When Offered
BCHM 3902	Metabolic and Medical Biochemistry (Advanced)	12	Qual Biochemistry 2002 or 2902 (selected students)	May not be counted with Biochemistry 3002	July
Biology					
BIOL 3203	Eukaryotic Genetics and Development	12	Qual 16 credit points of Intermediate Biology including Biology 2005 or 2905	May not be counted with Biology 3904	July
BIOL 3904	Eukaryotic Genetics and Development (Advanced)	12	16 credit points of Intermediate Biology including Biology 2005 or 2905; by invitation	May not be counted with Biology 3203 Students must first enrol in Biology 3203 Subsequently, students may be invited to enrol in this unit of study where they will participate in a more demanding alternative component.	July
Cell Pathology					
CPAT 3002	Cell Pathology B	12	Qual Cell Pathology 3001		July
Microbiology					
MICR 3003	Molecular Biology of Pathogens	12		Students are advised not to attempt this unit of study if they have not performed well in BMED 3002 Microbiology and Immunology	July
Pharmacology					
PCOL 3002	Neuro- and Cardiovascular Pharmacology	12	Qual Pharmacology 2001 and 2002	Students are strongly advised to consider Intermediate units of study in Biochemistry and/or Chemistry together with Physiology 2001 and 2002 if they wish to undertake Pharmacology 3002	July
Physiology					
PHSI 3002	Neuroscience — Cellular and Integrative	12	Qual Physiology 3001		July
PHSI 3003	Heart and Circulation	12	Qual Physiology 2002 Prereq Biochemistry (2001 and 2002) or (2101 and 2102) and an additional 8 or more credit points from any Intermediate unit(s) of study 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 2002 plus at least one other Intermediate course similar to one of the above prerequisites may also be permitted to enrol	July

Degree of Bachelor of Pharmacy

NOTE: The Senate has approved the following Resolutions for the Bachelor of Pharmacy. These Resolutions took effect for new enrolments from 1997. The candidatures of students first enrolled before 1997 will continue to be governed by the pre-1997 Resolutions. The pre-1977 Resolutions are contained in the 1996 Faculty of Science Handbook and can be consulted at the Faculty Office or via the Faculty of Science pages at the University of Sydney Web site (<http://www.scifac.usyd.edu.au>).

Candidates should note that section 15 of these 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 credit 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 credit points by completing the units of study 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 credit points by completing the units of study prescribed for the degree (see section 11 of the following Resolutions).

During the first year of attendance candidates enrol in First Year units of study 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 units of study will be taught on the assumption that students have reached the standard specified in Part A of Table VIII 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 units of study, students must have completed the qualifying unit of study, if any, and the prerequisite unit(s) of study, if any. Any corequisite unit(s) of study 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, NSW 2010, tel. (02) 9281 7736, fax (02) 9281 2924. Postal Address: Locked Bag 2, Haymarket, NSW 2000.

Resolutions of Senate

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 *unit of study* shall consist of lectures together with such tutorial instruction, essays, exercises, or practical work as may be prescribed.
- (ii) Each unit of study shall be designated as a First Year unit

of study, a Second Year unit of study, a Third Year unit of study or a Fourth Year unit of study.

(iii) First Year, Second Year, Third Year or Fourth Year units of study 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 unit of study*' 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 unit of study.
- (3) A *prerequisite unit of study* means a unit of study which, except with the permission of the Head of the Department concerned, must have been completed prior to a candidate taking a unit of study for which the Faculty has declared it to be a prerequisite.
- (4) A *corequisite unit of study* means a unit of study which unless previously completed must, except with the permission of the Head of Department concerned, be taken concurrently with the unit of study 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.

Units of study for Pass degree

3. Units of study for the degree shall—
 - (1) be in such subjects,
 - (2) have such credit point values, and
 - (3) have such prerequisite and corequisite units of study as are set out in Table VIII associated with these Resolutions.

Qualification for Pass degree

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

Enrolment in units of study

5. (1) In the first year of attendance candidates, unless granted credit in accordance with section 8, shall enrol in all the First Year units of study listed in Table VIII 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 units of study for which they are qualified, provided that they may not take units of study totalling in excess of 52 credit points.

Restrictions on enrolment

6. (1) Except with the permission of the Faculty, candidates may not take a Second Year unit of study—
 - (i) until they have gained credit for at least 32 credit points in First Year units of study, and
 - (ii) until they have completed the First Year units of study, if any, prescribed by the Faculty as prerequisites for the Second Year unit of study, as set out in section 3.
- (2) Except with the permission of the Faculty candidates may not take a Third Year unit of study—
 - (i) until they have gained credit for at least 32 credit points derived from Second Year units of study, and
 - (ii) until they have completed all the First Year and Second Year units of study, if any, prescribed as prerequisites for the Third Year unit of study as set out in section 3.

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

Unit of study 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 unit of study.
- (2) In all units of study 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 unit of study 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 unit of study shall, unless exempted by the Dean, again attend lectures and other classes and complete the prescribed written and other work in all such units of study in which they are permitted to re-enrol.
- (5) Candidates who present themselves for re-examination in any unit of study shall not be eligible for any prize or scholarship awarded in connection with such examination.

Credit for units of study

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

in the Tables, in accordance with section 9(1), shall be regarded as having completed such units of study for the purposes of these Resolutions.

Units of study for Honours degree

10. (1) Units of study for the degree shall—
 - (i) be in such subjects,
 - (ii) have such credit point values, and
 - (iii) have such prerequisite and corequisite units of study 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 credit points by completing units of study 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 unit of study.
- (2) Candidates may not take Honours units of study 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, additional Honours units of study 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 units of study listed in Table VIIIB and other units of study 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 unit of study specified in those Resolutions is discontinued the Faculty may permit the candidate to substitute a unit of study or units of study 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 VIII: [Bachelor of Pharmacy - Pass and Honours degrees]

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corerequisites (C)	Additional Information / May not be counted with	When Offered
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Table VIII A: Pharmacy (Pass degree) - 1997 Resolutions (see section 3)

First Year Units of Study

BIOL 1601	Biology (Pharmacy)	12	AKn Biology section of the HSC 3-unit Science course. See also footnote 1.		February
CHEM 1602	Chemistry (Pharmacy)	12	AKn HSC Chemistry 2-unit or the chemistry component of the 3/4-unit Science course and the 2-unit Mathematics course. See also footnote 1.		February
PHAR 1603	Introductory Pharmacy	6	AKn HSC 2-unit Chemistry or equivalent and see below. See also footnote 1.		July
MATH 1604	Mathematics/Statistics (Pharmacy)	6	AKn HSC 2-unit Mathematics or equivalent (Students without this assumed knowledge are advised to attend a bridging course in February)		February
PSYC 1605	Psychology (Pharmacy)	12	See also footnote 1.		February

Second Year Units of Study

BCHM 2601	Biochemistry 2 (Pharmacy)	6	Prereq Chemistry (Pharmacy) 1602		February
PCOL 2602	Pharmacology 2 (Pharmacy)	4	Prereq Chemistry 1 for Pharmacy Coreq Biochemistry 2 for Pharmacy, Pharmacy Practice 2		July
PHSI 2603	Physiology (Pharmacy)	6	Prereq Biology (Pharmacy) 1601		February
PHAR 2604	Medicinal Chemistry	10	Prereq Chemistry (Pharmacy) 1602, Introductory Pharmacy 1603 Coreq Biochemistry (Pharmacy) 2601, Pharmacology (Pharmacy) 2602		February
MICR 2605	Microbiology (Pharmacy)	3	Prereq Biology (Pharmacy) 1601		February
PHAR 2607	Pharmaceutical Microbiology	4	Prereq Introductory Pharmacy 1603 Coreq Microbiology (Pharmacy) 2605		July

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corerequisites (C)	Additional Information / May not be counted with	When Offered
PHAR 2606	Pharmacy Practice	5	Prereq Psychology (Pharmacy) 1605, Introductory Pharmacy 1603 Coreq Pharmacology (Pharmacy) 2602		February
PHAR 2608	Physical Pharmaceutics	10	Prereq Chemistry (Pharmacy) 1602 and Introductory Pharmacy 1603		February
Third Year Units of Study					
PHAR 3601	Dispensing	4	Prereq Physical Pharmaceutics 2608, Microbiology (Pharmacy) 2605 and Pharmaceutical Microbiology 2607 Coreq Formulation 3603		February
PHAR 3603	Formulation	5	Prereq Pharmaceutical Microbiology 2607 and Physical Pharmaceutics 2608 Coreq Dispensing 3601		February
PHAR 3604	Medicinal Chemistry	12	Prereq Biochemistry (Pharmacy) 3602 Coreq Pharmacology (Pharmacy) 3602 and Pharmacy Practice 3606		February
PHAR 3605	Pharmacokinetics	6	Prereq Physical Pharmaceutics 2608		February
PCOL 3602	Pharmacology (Pharmacy)	8	Prereq Physiology (Pharmacy) Coreq Medicinal Chemistry 3604 and Pharmacy Practice 3606		February
PHAR 3606	Pharmacy Practice	13	Coreq Pharmacology (Pharmacy) 3602, Pharmacokinetics 3605		February
Fourth Year Units of Study					
PHAR 4601	Integrated Dispensing	4	Prereq Dispensing Practice 3601 and Pharmacy Practice 3606		February
PHAR 4602	New Drug Technologies	4	Prereq Medicinal Chemistry 3604		February
PHAR 4603	Pharmaceutics Workshop	4	Prereq Pharmacokinetics 3605 and Formulation 3603		February

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corerequisites (C)	Additional Information / May not be counted with	When Offered
PHAR 4604	Pharmacotherapeutics	12	Prereq Pharmacy Practice 3606, Pharmacology (Pharmacy) 3602 and Pharmacokinetics 3605 Coreq Clinical Practice 4605, Integrated Dispensing 4601, Clinical Information/Technology 4606 and Clinical Pathology 4607		February
PHAR 4605	Clinical Practice	12	Prereq Pharmacy Practice 3606, Pharmacology (Pharmacy) 3602 and Pharmacokinetics 3605 Coreq Pharmacotherapeutics 4604, Integrated Dispensing 4601, Clinical Information and Technology 4606 and Clinical Pathology 4607		February
PHAR 4606	Clinical Information/Technology	2	Prereq Pharmacy Practice 3606, Pharmacology (Pharmacy) 3602 and Pharmacokinetics 3605 Coreq Pharmacotherapeutics 4604, Integrated Dispensing 4601, Clinical Practice 4605 and Clinical Pathology 4607		July
PHAR 4607	Clinical Pathology	4	Prereq Pharmacy Practice 3606 and Medicinal Chemistry 3604 Coreq New Drug Technologies 4602, Pharmacotherapeutics 4604, Clinical Practice 4605, Integrated Dispensing 4601 and Clinical Information/Technology 4606		July
PHAR 4608	Ethics and History of Pharmacy	2	Coreq Pharmaceutical Management 4609		July
PHAR 4609	Pharmaceutical Management	4	Coreq Ethics and History of Pharmacy 4608 and Pharmaceutics Workshop 4603		July

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corerequisites (C)	Additional Information / May not be counted with	When Offered
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Table VIII (B) Courses for Pharmacy - (Honours degree) - see 1997 Resolutions (Section 11)

First Year Units of Study

All first year courses set out in Table A

Second Year Units of Study

All first year courses set out in Table A

Third Year Units of Study

All first year courses set out in Table A, and:

PHAR 3701	Pharmacy (Honours)	5	Prereq All first and second year Pharmacy units of study Coreq All third year Pharmacy pass degree units of study		February
And one of the following:					
PHAR 3706	Pharmaceutical Chemistry (Honours)	5	Prereq All first and second year Pharmacy units of study Coreq All third year Pharmacy pass degree units of study		February
PHAR 3707	Pharmaceutics (Honours)	5	Prereq All first and second year Pharmacy units of study Coreq All third year Pharmacy pass degree units of study		July
POOL 3708	Pharmacology (Honours)	5			July
PHAR 3709	Pharmacy Practice (Honours)	5	Prereq All first and second year Pharmacy units of study Coreq All third year Pharmacy pass degree units of study		July

Fourth Year Units of Study

PHAR 4601	Integrated Dispensing	4	Prereq Dispensing Practice 3601 and Pharmacy Practice 3606		February
PHAR 4602	New Drug Technologies	4	Prereq Medicinal Chemistry 3604		February
PHAR 4603	Pharmaceutics Workshop	4	Prereq Pharmacokinetics 3605 and Formulation 3603		February
PHAR 4604	Pharmacotherapeutics	12	Prereq Pharmacy Practice 3606, Pharmacology (Pharmacy) 3602 and Pharmacokinetics 3605 Coreq Clinical Practice 4605, Integrated Dispensing 4601, Clinical Information/Technology 4606 and Clinical Pathology 4607		February

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corerequisites (C)	Additional Information / May not be counted with	When Offered
PHAR 4605	Clinical Practice	12	Prereq Pharmacy Practice 3606, Pharmacology (Pharmacy) 3602 and Pharmacokinetics 3605 Coreq Pharmacotherapeutics 4604, Integrated Dispensing 4601, Clinical Information and Technology 4606 and Clinical Pathology 4607		February
And one of the following:					
PHAR 4706	Pharmaceutical Chemistry (Honours)	29	Prereq All third year Pharmacy pass degree units of study and Pharmacy (Honours) 3701		February
PCOL4708	Pharmacology (Pharmacy Honours)	29			February
PHAR 4707	Pharmaceutics (Honours)	29	Prereq All third year pass degree units of study and Pharmacy (Honours) 3701		February
PHAR 4709	Pharmacy Practice (Honours)	29	Prereq All third year pass degree units of study and Pharmacy (Honours) 3701		February
Note that candidates enrolled in the Honours Degree must normally complete all prescribed courses at the end of each year in a single year.					February

Degree of Bachelor of Psychology

Summary of requirements

Candidature is by full time study only.

The units of study 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 credit points, and by achieving an average grade of Credit or better over all units of study 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 Bachelor of Psychology with Honours, candidates must be selected to enter the 4th year Honours unit of study and obtain a grade of Honours in that year. Candidates who do not gain entry to the fourth year of the programme may qualify for admission to the degree of BSc.

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 homepage (<http://www.scifac.usyd.edu.au>).

There are the following constraints on enrolment in units of study:

- Only those combinations of units of study permitted by the timetable can be taken.
- Candidates will enrol in 48 credit points of Junior units of study 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 units of study with a total number of credit points in excess of 28. Candidates may not enrol in a Junior unit of study unless they are enrolled in any corequisite course.
- Candidates may not enrol in any Intermediate units of study before they have completed 48 credit points of Junior units of study.
- Candidates may not enrol in a Senior unit of study before they have completed 40 credit points of Intermediate units of study.
- Candidates may not enrol in Intermediate or Senior units of study unless they have completed the prerequisite units of study and are enrolled in any corequisite units of study.
- Candidates may not enrol in Psychology 4001 until the requirements for the completion of the third year have been met.

The combination MATH 1703/1793 is not recommended in this degree. Students wishing to study Statistics/Calculus are advised to select MATH (1702/1792) or 1712.

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, BCST or BA degree who has completed a minimum of 48 credit points of Junior units of study with minimum grades of Pass, including 12 credit points of Psychology with an average grade of Distinction (75%) 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.

Regulations

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:

- (i) *A unit of study shall consist of lectures together with such tutorial instruction, essays, exercises, or practical work as may be prescribed.*
 - (ii) Each unit of study shall be designated as a 'Junior' unit of study, an 'Intermediate' unit of study, a 'Senior' unit of study or an 'Honours' unit of study.
 - (iii) Candidates who have completed a unit of study shall have credit points credited towards the completion of a degree in accordance with the following: each unit of study shall be of 4, 6, 8, or 12 credit points value; a unit of study may be comprised of modules of smaller credit point value which shall be taken in various combinations as determined by the Head of the Department concerned.
 - (iv) Junior, Intermediate, Senior and Honours units of study are indicated by unit of study level designations 1000-1999, 2000-2999, 3000-3999 and 4000-4999, respectively, placed immediately after the name of the unit of study.
 - (v) Except for Honours units of study, each unit of study shall be confined to one semester in duration, with assessment being completed during that semester.
- (2) To '*complete a unit of study*' 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 work, if any; and
 - (iii) to pass the examinations of the unit of study.
- (3) A *qualifying unit of study* means a unit of study 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 unit of study for which it qualifies.
- (4) A *prerequisite unit of study* means a unit of study other than a qualifying unit of study 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 unit of study for which it is a prerequisite.
- (5) A *corequisite unit of study* means a unit of study which, unless previously completed, or except with the permission of the Head of the Department concerned, must be taken concurrently with the unit of study for which it is a corequisite.

Grades of Award

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

Units of study for degree

3. Units of study for the degree shall, except as provided under section 4, 'Requirements for degree' and section 6, 'Enrolment in units of study 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 credit point values, and
- (5) have such qualifying, prerequisite and corequisite units of study, as are determined from time to time by the Faculty, and are set out in Table IX associated with this section.

Requirements for degree

4. Candidates for the degree shall:

- (1) In their first year complete units of study, to a total credit point value of 48, in the following Science Discipline Areas:
 - (i) 12 credit points from Junior units of study in Psychology
 - (ii) 12 credit points from Junior units of study in Mathematics
 - (iii) At least 12 credit points from Junior units of study in Biology, Chemistry, Computer Science or Physics.
 - (iv) 12 Junior credit points selected from units of study listed within Table I of the BSc degree Regulations. For the purposes of this Resolution the units of study selected shall be from a Single Science Discipline Area, or, in the case of units of study 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 units of study in the Science Discipline Area of Psychology and a minimum grade of Pass in at least 30 credit points of other completed Junior units of study in order to qualify for progression to second year.
- (3) In their second year, attempt 48 credit points, being:
 - (i) 16 credit points of Intermediate units of study in the Science Discipline Area of Psychology, and
 - (ii) 16 credit points selected from Intermediate units of study 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 credit points selected from units of study in (ii) above, not already selected, or from Intermediate units of study in Sociology, Anthropology, Linguistics or Philosophy.
- (4) Achieve a minimum average grade of Credit in Intermediate units of study in the Science Discipline Area of Psychology, and a minimum grade of Pass in at least 24 credit points of other Intermediate units of study and to have an accumulated total of 88 credit points in order to qualify for progression to third year.
- (5) In their third year, complete 48 credit points being:
 - (i) 24 Senior credit points in the Science Discipline Area of Psychology,
 - (ii) either an additional 24 Senior credit points in the Science Discipline Area of Psychology or 12 Senior credit points in the Science Discipline Area of Psychology plus 12 credit points in any Intermediate or Senior unit of study 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 credit points of Senior units of study in the Science Discipline Area of Psychology, an accumulated total of at least 144 credit points and a SCrWAM of at least 65.
- (7) Not have any unit of study credited more than once for the degree.
- (8) Not have credited for the degree credit points derived from more than one of such units of study as the Faculty may deem to be mutually exclusive.³
- (9) When enrolled in a unit of study, a non-optional part of which is similar in content to part of (i) a unit of study previously completed or (ii) another unit of study 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 unit of study which is similar in content to part of a unit of study concurrently being taken or

previously completed.

- (11) Count towards the degree no more than 48 credit points from Junior units of study, nor more than 16 credit points from units of study 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 unit of study:
 - (i) until they have completed 48 credit points of Junior units of study, as specified in section 4, 'Requirements for Degree'.
 - (ii) until they have completed the Junior units of study, prescribed by the Faculty as prerequisites for the Intermediate unit of study.
- (2) Except with the permission of the Faculty candidates may not take a Senior unit of study:
 - (i) until they have completed Intermediate units of study with a total credit point value of at least 40.
 - (ii) until they have completed the Intermediate and Junior units of study, if any, prescribed by the Faculty as prerequisites for the Senior unit of study as set out in section 3, 'Units of study for Degree'.
- (3) Except with the permission of the Faculty, candidates may not take, in any one semester, units of study with a total number of credit points in excess of 28.
- (4) The choice of units of study made by candidates shall be limited by the exigencies of the timetable. However, candidates who have completed at least 48 credit points may seek to enrol in two units of study 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 units of study or parts of units of study given at another time.

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

Unit of study 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 units of study 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 unit of study 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 unit of study 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.

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

- (5) Candidates who repeat any unit of study 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 unit of study entitles a candidate to be credited with the full number of credit points for that course.

Credit for other units of study

8. (1) Candidates who have previously completed studies which are considered by the Faculty to be equivalent to any unit of study listed in the Tables associated with these or the BSc Resolutions may be given credit for that unit of study providing that:
 - (i) the total unit-value of the units of study 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 units of study in another tertiary program without the degree being conferred and who have abandoned credit in that program for the units of study on the basis of which credit is sought, any number of units of study may be credited.
- (2) Candidates who have been given credit for units of study listed in the Tables in accordance with section 8(1), shall be regarded as having completed such units of study 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 unit of study listed in the Tables associated with section 3 of these or with the BSc Resolutions, may be given credit for such number of credit points, to be designated by the Faculty as Junior, Intermediate or Senior, as the Faculty may determine. Such credit points shall count towards the number of credit points required for the degree in accordance with section 4, 'Requirements for degree'.

Admission to Honours units of study

9. In order to qualify for admission to the Honours unit of study candidates shall have completed all specified requirements for Junior, Intermediate and Senior units of study 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 I there shall be two Divisions, namely Division 1 and Division 2.
- (2) A candidate with an outstanding performance in the Honours unit of study 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 units of study 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 units of study

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 credit points 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 a minimum grade of Credit in Intermediate units of study and an average minimum grade of Credit in Senior units of study 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 credit point values of the units of study taken in the pre-Honours years and then dividing by the sum of the weighted credit point values. Note that all attempts at units of study are included in the calculation *except where units of study are discontinued with permission*.

The formula used is as follows:

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

where Wc is the weighted credit point value—i.e. credit point 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 unit of study.

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 units of study. The Faculty recognises, however, that the Senate Resolutions concerning medals relate the award of a medal to the Honours units of study 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 units of study, 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 programme 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.

The Faculty offers a special program of study for exceptionally gifted

Table IX: [Bachelor of Psychology]

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corerequisites (C)	Additional Information / May not be counted with	When Offered
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A. Junior Units of Study

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

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

PSYC 1001	Psychology 1001	6			February
PSYC 1002	Psychology 1002	6			July

B. Intermediate Units of Study

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

Candidates are required to enrol in and complete:

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

PSYC 2001	Psychology 2001	8	Prereq Psychology 1001 and 1002		February
PSYC 2002	Psychology 2002	8	Prereq Psychology 1001 and 1002 and either 2001 or 2101 or, with permission, equivalent Statistics content		July
PSYC 2101	Psychology 2101	4	Prereq Psychology 1002 Coreq Psychology 1001	May not be counted with Psychology 2001	February
PSYC 2102	Psychology 2102	4	Prereq Psychology 2002 and 2101	May not be counted with Psychology 2001	February

C. Senior Units of Study

In order to proceed to the Senior year, candidates for the BPsych must achieve at least an average grade of Credit in Intermediate Psychology and achieve a minimum grade of Pass in at least 24 credit points of other Intermediate units of study, and have accumulated at least 88 credit points.

Students are required to enrol in and complete:

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

Alpha & Num. codes	Unit of Study Name	Credit Point Value	Assumed Knowledge (AK) Prerequisites (P) Corerequisites (C)	Additional Information / May not be counted with	When Offered
PSYC 3001	Psychology 3001	12	Qual Psychology 2001 (or 2101 and 2102) and Psychology 2002		February
PSYC 3002	Psychology 3002	12	Qual Psychology 2001 and 2002. History and Philosophy II module requires History and Philosophy I		July
PSYC 3003	Psychology 3003	12	Coreq Psychology 3001	This unit of study is available only to students in the BPsych degree	February
PSYC 3004	Psychology 3004	12	Coreq Psychology 3002	This unit of study is available only to students in the BPsych degree	July
D. FOURTH YEAR (Psychology Honours)					
PSYC 4001	Psychology Honours	48	Prereq Average of Credit or better in Psychology 2001 and 2002, and also in 3001 and 3002; specified options in Psychology 3001 and 3002		February

4. Talented Student Program

students in the Talented Student Program (TSP) which operates mainly for those students in the BSc degree. The program is offered in the BSc, BCST, BMedSc and BPsych degrees and is not available for the BPharm degree. 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 first 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 units of study or in combinations of units of study not normally available within the degree. For example, a student who takes Psychology 3001 and 3002 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 unit of study consisting of combinations of parts of existing units of study.

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 Clerk, Faculty of Science.

Examples of programs available for 1998

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: Dr Brace Lyon

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

Chemistry 1903,1904

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 1 (SSP) is by invitation only, and is limited to 20 students each year. TSP students are automatically eligible.

Chemistry 2901, 2902

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 3901,3902

Coordinator: Professor Hans Freeman

The Senior Chemistry TSP program consists of Chemistry 3 A 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: Associate Professor Christopher Durrant

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

- additional options from units of study in Mathematics and Statistics either in lieu of, or in addition to, other courses of study
- a combination of additional options from units of study 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: Professor 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: Professor 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: Professor 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: Professor Stephen Touyz

The program is available in Intermediate and Senior Psychology.

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

- additional options in Psychology either in lieu of, or in addition to, other units of study in Science (e.g. students may take an additional 4 options in Psychology 3001 and 3002 and receive 12 credit points in Psychology for these units of study in lieu of 12 credit points from another unit of study or in addition to credit points in another unit of study)
- 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. Units of Study

Bachelor of Science

Department of Agricultural Chemistry and Soil Science

Agricultural Chemistry

Units of study 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 units of study available are Agricultural Chemistry 2001 (8 credit points Intermediate), Agricultural Chemistry 3001, 3002 and 3003 (12 credit points Senior), and Agricultural Chemistry Honours.

AGCH 2001 Molecular Processes in Ecosystems 8 credit points

Teacher/Coordinator: Coordinator Dr Caldwell
Dr Lees, Dr Caldwell

Prerequisite: Qual Chemistry 1002 or equivalent
Prereq Biology 1002 or 1902

Students who have not satisfied the prerequisites in Biology may enrol with Soil Science 2001 as a corequisite

Additional information: May not be counted with any Intermediate unit of study in Biochemistry.

When Offered: February

Classes: 3 lec & 5 prac/wk

Assessment: One 3hr exam, prac, assignments

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

Practical Work:

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.

Textbooks:

To be advised at the commencement of the unit of study.

AGCH 3001 Chemistry and Biochemistry of Ecosystems

12 credit points

Teacher/Coordinator: Coordinator Prof. Kennedy

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

Prerequisite: Agricultural Chemistry 2001 or Chemistry 2001 or 2101 or 2202 or 2301 or 2302 or 2902 or Biochemistry 2002 or 2902

Additional information: May not be counted with Agricultural Chemistry 3002

When Offered: February

Classes: 3 lec, 1 tut & 8hr of prac work/week

Assessment: One 3hr exam, prac, assignment

This is a unit of study in environmental chemistry for students with interests in environmental aspects of agricultural science. It cannot be taken with Agricultural Chemistry 3002. The specific objectives of the unit of study 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.

Practical Work:

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.

Textbooks:

To be advised at the commencement of the unit of study

AGCH 3002 Environmental Plant and Soil Chemistry

12 credit points

Teacher/Coordinator: Coordinator Prof. Kennedy

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

Prerequisite: Qual Agricultural Chemistry 2001 or Chemistry 2001 or 2101 or 2202 or 2301 or 2302 or 2902 or Biochemistry 2002 or 2902

Additional information: May not be counted with Agricultural Chemistry 3001

When Offered: February

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

Assessment: One 3hr exam, prac, assignments, field trip report

This interdisciplinary unit of study 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 3001. 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 unit of study 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 auto trophy 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.

Practical Work:

Field work

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 (HD, 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.

Textbooks:

Reference books

Manahan, S.E. Environmental Chemistry (5th edn), Lewis Publisher, 1991
Kennedy, I.R. Acid Soil and Acid Rain, Wiley Research Studies Press, 1992

Tan, K.H. Environmental Soil Science, Marcel Dekker, 1994

AGCH 3003 Agricultural Biochemistry

12 credit points

Teacher/Coordinator: *Coordinator Assoc. Prof. Copeland
Assoc. Prof. Copeland, Dr Lees, Dr Caldwell*

Prerequisite: *Qual Agricultural Chemistry 2001 or Biochemistry 2002 or 2902*

When Offered: *My*

Classes: *3 lec, 1 tut & 8hrprac/wk*

Assessment: *One 3hr exam, prac, assignments*

This is a unit of study in agricultural biochemistry with emphasis on foods and fibres. The unit of study 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 (iii) 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, antinutritional and toxic constituents of cereal and legume grains and oil seeds; characteristics of constituents in relation to end use and quality of products; solution properties of biological macromolecules; natural fibrous and gel-forming macromolecules, uses in foods and other commercial products, chemistry of breadmaking.

Practical Work:

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.

Textbooks:

To be advised at the commencement of the unit of study

AGCH 4001 Agricultural Chemistry Honours

48 credit points

When Offered: *February*

The fourth year unit of study in Agricultural Chemistry aims to: provide students with problem-solving and communication skills required by professional chemists in enterprises concerned with agricultural production and processing, foods and beverages, and environmental science; enable students to learn to work independently in a laboratory environment; familiarise students with the research literature and methodology of biological chemistry; and provide a basis for students who wish to proceed to postgraduate research.

Candidates should consult the Department as soon as possible after results in Senior unit of study are obtained. The unit of study consists of a research project (with submission of a dissertation), two essays, an oral presentation and attendance at specialist lectures and seminars in agricultural, biological and environmental chemistry. The essays and oral presentation are selected from a list of topics in basic and applied biological and environmental chemistry, and food science. Projects are usually available in one of the following areas of current research interest in the Department: carbohydrate and nitrogen metabolism in plants, biological nitrogen fixation in legumes and associated with wheat, insect metabolism, the biochemistry and environmental chemistry of pesticides and herbicides, acidification of ecosystems including the mechanism of aluminium phytotoxicity, residue analysis in foods and other aspects of food science, cereal chemistry and biochemistry.

Soil Science

The Soil Science units of study 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 unit of study is particularly relevant for students interested in the environmental and geological sciences and in land-use management.

SOIL 2001 Soil Properties and Processes

8 credit points

Teacher/Coordinator: Prof. McBratney, Mr Geering, Dr Cattle

Prerequisite: Chemistry 1002 or equivalent and 12 credit points of Junior Mathematics or Physics 1003 or 1004

When Offered: February

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

Assessment: One 3hr exam, coursework, andprac report

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

SOIL 2002 Soil Resources and Conservation

8 credit points

Teacher/Coordinator: Coordinator Mr Geering

Prof. McBratney, Mr Geering, Dr Cattle, staff from the Geography Department

Prerequisite: Soil Science 2001 or Geology 1002 or Geology 2004 or Geography 1001 or Natural Environmental Systems 2001

Additional information: May not be counted with Geography 3002

When Offered: July

Classes: 4 lec & 3hr prac/wk; 5 days in the field in the week prior to the commencement of the July Semester

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 unit of study.

PracticalWork:

Thirty-six hours of laboratory work involves routine physical, chemical and statistical analyses of samples taken in the field relevant to assessment of the land-use potential and the quantification of the soil variability and soil degradation at the survey site.

SOIL 3001 Environmental Soil Science A

12 credit points

Teacher/Coordinator: Coordinator Prof. McBratney

Prof. McBratney, Dr Cattle

Prerequisite: Qual Soil Science 2001

When Offered: February

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

Assessment: Two 2hr exams, field andprac 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 unit of study covers physics and pedology.

Physics

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

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

Pedology

The main part of this unit of study 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 unit of study includes a weathering study which traces the changes from a rock parent material up through the soil profile. Thin sections of the rock and profile are examined and the main features identified and quantified. The data from micromorphological investigations and clay mineral assessments are used to provide an understanding of the pedogenesis of the particular soil. A field trip to study the variety of soil types in their environmental setting is made 2 weeks prior to the beginning of the February Semester.

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

Textbooks:

Reference books

FitzPatrick, E.A. Soils, Longman, 1980

FitzPatrick, E.A. Micromorphology of Soils, Chapman & Hall, 1984

Kirkman, D. and Powers, W.L. Advanced Soil Physics, Wiley 1972

Loveday, J. (ed.) Methods for Analysis of Irrigated Soils, C.A.B., 1974

Richler, J. The Soil as a Reactor, Catena Verlag, 1987

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 3002 Environmental Soil Science B

12 credit points

Teacher/Coordinator: Coordinator Mr Geering

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

Prerequisite: Qual Soil Science 2001

Prereq Agricultural Chemistry 2001 or Chemistry 2001 or 2101 or 2202 or 2301 or 2302 or Biochemistry 2002 or 2902

When Offered: July

Classes: 3 lec, 1 tut & 8hrprac/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 unit of study 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 soilmoisture content, gamma and neutron probe methods for field measurements of moisture content and bulk density and time-domain reflectometry. Measurement of oxidation-reduction status, oxygen diffusion rate and oxygen, carbon dioxide 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.

Textbooks:

Reference books

Barber, S.A. Soil Nutrient Bioavailability, Wiley, 1984

FitzPatrick, E.A. Soils, Longman, 1980

Greenland, D.J. & Hayes, M.H.B. The Chemistry of Soil Constituents, Wiley 1978

Loveday, J. (ed.) Methods for Analysis of Irrigated Soils, C.A.B., 1974

Nye, P.H. & Tinker, P.B. Solute Movement in the Soil Root System, BlackweU Scientific, 1977

Richler, J. The Soil as a Reactor, Catena Verlag, 1987

Sposito, G. The Chemistry of Soils, Oxford, 1989

SOIL 4001 Soil Science Honours

48 credit points

When Offered: February

This unit of study consists of several parts:

- (i) Supplementary lectures and seminars.
- (ii) Unit of study selected from Agricultural Chemistry, Biometry, Botany, Geology, Physical Chemistry, Mathematics, Soil Mechanics, Soil Microbiology, etc.
- (iii) A small amount of field work performed under direction.
- (iv) A project in one branch of soil science.

Department of Anatomy and Histology

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

Location

The Department is in the Anderson Stuart Building. The Department Office is on the 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 units of study and enrolment

Students wishing to enrol in units of study in Anatomy and Histology must consult the Departmental advisers in the Enrolment Centre during re-enrolment week prior to enrolling in the units of study. Information will be available at this time on the units of study offered by the Department and on the advisability of various combinations of subjects.

Registration

All students should register with the Department. Please consult the Departmental noticeboards for details.

Vaccinations

All students studying gross anatomy or neurosciences who may also be exposed to human tissues or fluids should contact the University Health Service regarding vaccinations.

Protective Clothing

All students studying gross anatomy or neurosciences must wear a laboratory coat or gown in tutorial rooms and a gown in dissection rooms and must wear gloves when handling cadaveric material.

ANAT 2001 Principles of Histology*

4 credit points

Teacher/Coordinator: Dr Byrne

Prerequisite: 12 credit points of Junior Biology or Junior Psychology

Additional information: * Subject to Faculty/Senate approval

When Offered: February

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

Assessment: One 1hr exam, one 1hrprac exam, one 2000w essay

This unit of study covers the principles of cell biology and study of the structure of cells, tissues and organ systems at the light and electron microscopic levels. Instruction will also focus on practical applications of histological techniques and analysis for research.

Textbooks:

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

Histology Practical Book (consult Departmental noticeboards)

Reference Books:

Gilbert, Scott F. Developmental Biology (4th edn), Sinauer, 1994

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

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

ANAT 2002 Comparative Primate Anatomy

4 credit points

Teacher/Coordinator: Dr Donlon

Prerequisite: 12 credit points of Junior Biology or Junior Psychology*

*Subject to Faculty/Senate approval

When Offered: July

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

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

This unit of study covers the musculo-skeletal anatomy of the human body with particular emphasis on human evolution and comparisons with apes and fossil hominids. The topics covered include the versatility of the hand in manipulation and locomotion, bipedalism, climbing and brachiation in apes, and the changes in pelvic anatomy associated with bipedalism and their obstetric consequences.

Textbooks:

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

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

ANAT 3001 Microscopy and Histochemistry

12 credit points

Teacher/Coordinator: Assoc. Prof. Murphy, Ms Arnold

Prerequisite: Qual Anatomy and Histology 2001

When Offered: February

Classes: 4hr lec & 8hr lab/wk

Assessment: 5hr theory exam, 2hrprac exam practical reports and/or essays

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

Textbooks:

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

ANAT 3002 Cells and Development

12 credit points

Teacher/Coordinator: Dr Mc/woy

Prerequisite: Qual Anatomy and Histology 2001

Prereq at least 8 credit points of Intermediate Biochemistry

Assumed Knowledge: (i) an understanding of the basic structure of the vertebrates; (ii) an understanding of elementary biochemistry and genetics

Additional information: May not be counted with Anatomy and Histology 3003

When Offered: July

Classes: 12hr/wk

Assessment: Theory exam and practical assignments

The main emphasis of this unit of study concerns the mechanisms that control animal development. Fertilization, cleavage, gastrulation and the formation of the primary germ layers are examined in a range of animals, mainly vertebrates. The parts played by inductive cell and tissue

interactions in differentiation, morphogenesis and pattern formation are studied at cellular and molecular levels. The unit of study also covers the design of experimental procedures using appropriate molecular and cellular techniques to answer developmental questions.

Textbooks:

Gilbert, S F Developmental Biology, 4th Edition, Sinauer Associates Inc., Sunderland, Mass., 1994.

ANAT 3003 Transmission and Scanning Electron Microscopy

12 credit points

Teacher/Coordinator: Ms Arnold

Prerequisite: Qual Anatomy and Histology 2001

Additional information: May not be counted with Anatomy and Histology 3002

When Offered: July

Classes: 4hr lec & 8hr lab/wk

Assessment: Exam, prac reports and/or project and/or essay

This unit of study 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 unit of study also covers special methods in electron microscopy such as environmental SEM, scanning transmission electron microscopy (STEM), ultrastructural cytochemistry, cryo-ultramicrotomy and electron diffraction.

Textbooks:

Bozzola, J.J. & Russell, L.D. Electron Microscopy, Jones & Bartlett, 1992

Reference books

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

ANAT 3004 Cranial and Cervical Anatomy

6 credit points

Teacher/Coordinator: Dr Provis

Prerequisite: Qual Anatomy and Histology 2002

When Offered: July

Classes: 1 lec, 2hr dissection, 3hrprac/tut

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

This unit of study 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

ANAT 3006 Forensic Osteology

6 credit points

Teacher/Coordinator: Dr Donlon

Prerequisite: Anatomy and Histology 2001 and 2002

When Offered: February

Classes: 2 lec, 2hr tut & 2hrprac/week

Assessment: Exam, literature review, case study

This unit of study aims to introduce students to the area of forensic osteology which is the study of human skeletal remains within the legal context. Thus the unit of study aims to help students learn about human morphology and variation through the investigation and identification of human bones. It will also help students gain skills in observation and rigorous record taking and in analysis and interpretation. Production of case reports and practice in acting as 'expert witness' will improve students written and oral skills. An additional objective will be to assist students in learning to deal with legal and ethical issues.

Textbook:

Bass, W. M. 1987 Human Osteology: A laboratory and field manual (Third edition) Missouri Archaeological Society, Missouri.

ANAT 4001 Anatomy Honours and Graduate Diploma

48 credit points

This unit of study provides the opportunity for the student to do research on a project supervised by a member of staff. Assessment is based on a thesis summarising the results of the years research. To qualify for this unit of study the student must obtain an appropriate standard in Senior Anatomy or Histology or Neuroscience.

ANAT 4002 Histology Honours and Graduate Diploma

48 credit points

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

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 2001 (8 credit points) and Biochemistry 2002 (8 credit points), together provide a basic program for (a) students who wish to do only one year's study in the unit of study area and (b) for students who wish to continue on to the Senior units of study, Biochemistry 3001 (12 credit points) and Biochemistry 3002 (12 credit points). Advanced units of study based on the four one-semester units of study, Biochemistry 2901, 2902, 3901 and 3902 are available to selected students. An Honours unit of study designed for those wishing to enter research or to undertake work leading to a higher degree is conducted in the fourth year.

Additional Intermediate units of study in Biochemistry are Biochemistry 2101 (4 credit points) and Biochemistry 2102 (4 credit points).

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 2001 and 2002 laboratory 380
(both 8 credit points)

Biochemistry 2901 and 2902 laboratory 302
(both 8 credit points)

Biochemistry 3001 and 3001 laboratory 400
(both 12 credit points)

Registration

All Senior Year students (including those repeating a unit of study, 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 particular practical classes.

Advice on units of study

Students are strongly urged to discuss unit of study choices with members of staff present among faculty advisers during the enrolment period. This applies even to students enrolling in Junior units of study and who are contemplating taking Biochemistry in a subsequent year. Certain Junior units of study are recommended depending upon the 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 2001/2901 and Biology 2005/2905 in their Intermediate year. A major in Molecular Biology or Genetics would comprise two Senior (one semester) units of study in these areas, of which one could be, for example, Biochemistry 3001/3901. Departmental advisers listed in the handbook are available in the Department during the period prior to enrolment and during orientation.

BCHM 2001 Genes and Proteins

8 credit points

Teacher/Coordinator: Dr Denyer, Biochemistry staff

Prerequisite: Qual 6 credit points of Junior Chemistry which must include one of Chemistry 1101,1102,1901,1902,1903,1904 or, with the permission of the Head of Department, exceptional performance in Chemistry 1001 or 1002

Additional information: May not be counted, with Agricultural Chemistry 2001 or Biochemistry 2101 or 2901

When Offered: February

Classes: 3 lec & 5prac/wk

Assessment: One 3hr exam, one 2hr theory ofprac exam, prac tasks

The lectures in this unit of study introduce the main principles of biochemistry i.e. the molecular basis of life. In the beginning, the unit of study 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 unit of study 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 unit of study will describe how these processes are put together in a whole organism in order to maintain life. Particular emphasis will be put on the anabolism and catabolism of fuels under normal conditions and under conditions of feeding, starvation or exercise.

Practical Work:

The practical component complements the theory component of BCHM 2001 by exposing students to experiments which investigate the regulation of gene expression, the manipulation of DNA molecules, the purification of proteins and the manipulation of 3-D protein images using computer graphics software.

During the unit of study, students will acquire a wide range of generic skills; including computing skills, communication and articulation skills (written and oral), criticism and data analysis/evaluation skills, experimental design and hypothesis testing skills. Students perform practical sessions in small groups and, therefore, problem solving and team work form an integral part of each activity.

In addition to the generic skills, students will learn important laboratory/technical abilities with an emphasis on the equipment used in molecular biology and protein chemistry research.

Textbooks:

To be advised

BCHM 2002 Molecules, Metabolism and Cells

8 credit points

Teacher/Coordinator: Dr Denyer, Biochemistry staff

Prerequisite: Qual Biochemistry 2001 or 2901

Additional information: May not be counted with Agricultural Chemistry 2001 or Biochemistry 2102 or 2902

When Offered: July

Classes: 3 lec & 5pracAvh

Assessment: One 3hr exam, one 2hr theory ofprac exam, prac tasks

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

Cellular Metabolism

How cells extract energy from fuel molecules like fatty acids and carbohydrates. Theregulationof 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.

Practical Work:

The practical component complements the theory component of BCHM 2002 by exposing students to experiments which investigate the effects of diet on the constituents of urine, the diagnosis of chronic disease using blood enzyme patterns, the measurement of glucose metabolism using radioactive tracers and the design of biochemical assays.

During the unit of study, the generic skills developed in the practical component of BCHM 2001 will be nurtured by frequent use of computers and problem solving activities. However, student exposure to generic skills will be extended by the introduction of exercises designed to teach oral communication, instruction writing and feedback articulation skills,

The techniques of radioisotope handling, enzyme and metabolite assay design, spectrophotometry and metabolic flux measurement will be taught as well as the basic laboratory abilities mastered in BCHM 2001.

Textbooks:

To be advised

BCHM 2101 Genes and Proteins Theory

4 credit points

Teacher/Coordinator: Dr Denyer, Biochemistry staff

Prerequisite: Qual 6 credit points of Junior Chemistry which must include one of Chemistry 1101,1102,1901,1902,1903,1904 or, with the permission of the Head of Department, exceptional performance in Chemistry 1001 or 1002

Additional information: May not be counted with Agricultural Chemistry 2001 or Biochemistry 2001 or 2901

When Offered: February

Classes: 3 lec /wk

Assessment: One 3hr exam

This unit of study comprises just the lecture component of Biochemistry 2001.

Textbooks:

To be advised

BCHM 2102 Molecules, Metabolism and Cells Theory

4 credit points

Teacher/Coordinator: Dr Denyer, Biochemistry staff

Prerequisite: Qual Biochemistry 2001, 2101 or 2901

Additional information: May not be counted with Agricultural Chemistry 2001 or Biochemistry 2002 or 2902

When Offered: July

Classes: 3 lec/wk

Assessment: One 3hr exam

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

Textbooks:

To be advised

BCHM 2901 Genes and Proteins (Advanced)

8 credit points

Teacher/Coordinator: Dr Denyer, Biochemistry staff

Prerequisite: Qual 6 credit points of Junior Chemistry which must include one of Chemistry 1101,1102,1901,1902,1903,1904 or, with the permission of the Head of Department, exceptional performance in Chemistry 1001 or 1002

Additional information: May not be counted with Agricultural Chemistry 2001 or Biochemistry 2001 or 2101

When Offered: February

Classes: 3 lec & 5prac/wk

Assessment: One 3hr & one 1hr theory exam, one 2hr theory ofprac exam, prac tasks, assignments

The lecture and practical components are the same as for Biochemistry 2001. Selected students will be set special advanced assignments, and attend tutorials on these assignments during the practical class.

Textbooks:

To be advised

BCHM 2902 Molecules, Metabolism and Cells (Advanced)

8 credit points

Teacher/Coordinator: Dr Denyer, Biochemistry staff

Prerequisite: Qual Biochemistry 2001 or 2901 (selected students)

Additional information: May not be counted with Agricultural Chemistry 2001 or Biochemistry 2002 or 2102

When Offered: July

Classes: 3 lec & 5 prac/wk

Assessment: One 3hr & one 1hr theory exam, one 2hr theory ofprac exam, prac tasks, special assignments

The lecture and practical components are the same as for Biochemistry 2002. Selected students will be set special advanced assignments, and attend tutorials on these assignments during the practical classes.

Textbooks:

To be advised

BCHM 3001 Molecular Biology and Structural Biochemistry

12 credit points

Teacher/Coordinator: Dr Easterbrook-Smith, Mrs Johnston, Dr Weiss, Biochemistry staff

Prerequisite: Qual Biochemistry 2002 or 2902, or with permission of Head of Department, Biology 2005 or 2905 or good performance in Biochemistry 2001 or 2901 with a suitable Intermediate Chemistry unit of study

Additional information: May not be counted with Biochemistry 3901

When Offered: February

Classes: 4 lec & 8prac/wk

Assessment: One 3hr & one 2hr theory exam, one 1.5hr theory of prac exam, prac work

This unit of study is designed to build on the units of study Biochemistry 2001 and Biochemistry 2002. It provides comprehensive training in molecular biology (with emphasis on eukaryotic systems) and structural biochemistry. The lecture series 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 series 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 into two topic 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

There are two 6-lecture option series. Option topics available in molecular biology include medical molecular biology, applied medical molecular biology, transcription and molecular cloning. Option topics available in structural biochemistry include protein engineering and drug design, macromolecular interactions and biophysical techniques.

Textbooks:

To be advised

BCHM 3002 Metabolic and Medical Biochemistry

12 credit points

Teacher/Coordinator: Dr Easterbrook-Smith, Mrs Johnston, Professor Kuchel, Biochemistry staff

Prerequisite: Qual Biochemistry 2002 or 2902

Additional information: May not be counted with Biochemistry 3902

When Offered: July

Classes: 4 lec & 8prac/wk

Assessment: One 3hr & one 2hr theory exam, one 1.5hr theory of prac exam, prac work

This unit of study is designed to extend the overall metabolic picture presented in Biochemistry 2002 and involves the integration of basic knowledge in Biochemistry and Molecular Biology to give an understanding at the molecular level, of the function of cells and the body as a whole. The lecture series 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 series and to provide students with experience in a wide range of techniques used in modern biochemistry laboratories.

Core lectures

The core lectures are divided into several topic areas. The Metabolism and Disease section deals with metabolite exchange between various

compartments in the mammalian cell and how changes in this can lead to disease. Changes in transport and metabolism that affect the whole body are exemplified by diabetes, so this disease is dealt with in considerable detail. The Cell Growth and Cancer and Signal Transduction sections deal with the regulation of cell growth and how the failure of this control leads to cancer; so intracellular chemical signalling and how it is involved in cancer are treated in depth. The Chemical Immunology and Sub-bacterial Organisms section deals with important aspects of modern biotechnology and medical diagnosis of disease, including some contemporary immunological methods; immunological surveillance and evasion of attack by viruses is paramount to our survival in the biosphere, so some aspects of virus biochemistry are discussed, as are the 'new' infective agents, the prions.

Option lectures

There are two 6-lecture option series. Option topics available in metabolism and disease include the biochemistry of exercise, receptors, cellular signalling, in vivo NMR spectroscopy. Option topics available in nutrition include vitamins, lipoproteins, macronutrients, xenobiotics.

Practical Work:

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

Textbooks:

To be advised

BCHM 3901 Molecular Biology and Structural Biochemistry (Advanced)

12 credit points

Teacher/Coordinator: Dr Easterbrook-Smith, Mrs Johnston, Dr Weiss, Biochemistry staff

Prerequisite: Qual Biochemistry 2002 or 2902 or, with permission of Head of Department, Biology 2005 or 2901, or good performance in Biochemistry 2001 or 2901 with suitable Intermediate Chemistry

Additional information: May not be counted with Biochemistry 3001

When Offered: February

Classes: 4 lec & 8prac/wk

Assessment: One 3hr, one 2hr & one 1hr theory exam, one 1.5hr theory of prac exam, prac work

The lecture and practical components of this unit of study are the same as for Biochemistry 3001. Selected students will be set special advanced assignments related to the topics covered in the core lectures in this unit of study, and attend tutorials on these assignments during the practical class.

Textbooks:

To be advised

BCHM 3902 Metabolic and Medical Biochemistry (Advanced)

12 credit points

Teacher/Coordinator: Dr Easterbrook-Smith, Mrs Johnston, Professor Kuchel, Biochemistry staff

Prerequisite: Qual Biochemistry 2002 or 2902 (selected students)

Additional information: May not be counted with Biochemistry 3002

When Offered: July

Classes: 4 lec & 8prac/wk

Assessment: One 3hr, one 2hr & one 1hr theory exam, one 1.5hr theory of prac exam, prac work

The lecture and practical components of this unit of study are the same as for Biochemistry 3002. Selected students will be set special advanced assignments related to the topics covered in the core lectures in this unit of study, and attend tutorials on these assignments during the practical class.

Textbooks:

To be advised

When Offered: February

The unit of study 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 units of study students are invited to apply for permission to enrol in the Honours unit of study and are provided with a list of possible research projects. Potential research topics currently offered to students include:
Anticancer drugs: synthesis and mechanism of action. Biochemistry of cellular signal transduction

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 unit of study is a pass at the Credit level in 12 credit points of Senior Biochemistry units of study. 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 unit of study 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 unit of study 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.

School of Biological Sciences

Advice on units of study

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

Assistance during semester

The offices of Junior year Biology staff are on the 5th floor of Carslaw. Students can make appointments by signing the form on the door of the offices of members of the academic staff members. Students are strongly advised to get acquainted with the staff and to use this service.

Junior Biology Units of Study

BIOL 1001 Concepts in Biology

6 credit points

Assumed Knowledge: *Biology section of the HSC 3-unit Science course*

Additional information: *May not be counted with Biology 1901*

When Offered: February

Classes: 3 lec & 3prac/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. It is recommended that this unit of study be taken before all other Junior units of study in Biology.

Textbooks:

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

BIOL 1901 Concepts in Biology (Advanced)

6 credit points

Teacher/Coordinator: *Prof ID Hume, Dr RLOverall, Dr GMWardle*
Assumed Knowledge: *Biology section of the HSC 3-unit Science course; by invitation*

Additional information: *May not be counted with Biology 1001. Students must first enrol in Biology 1001. Subsequently, selected students may be invited to enrol in this unit of study where they will participate in a more demanding alternative component*

When Offered: February

Classes: 3 lec & 3prac/wk

Assessment: *One 2hr exam, assignments, classwork*

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

BIOL 1002 Living Systems

6 credit points

Assumed Knowledge: *HSC 2 unit Biology or Biology 1001 or 1901 or equivalent*

Additional information: *May not be counted with Biology 1902*

When Offered: July

Classes: 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 unit of study includes lectures and laboratory classes on the physiology of nutrition and growth, basic physiological processes of animals and plants, the ways in which organisms control and integrate their activities, and their reproduction. Finally applications of knowledge of genetics and ecology to practical problems in medicine, agriculture and conservation are introduced. It is recommended that Concepts in Biology be taken before this unit of study. Enrolment may be restricted by the availability of places. This unit of study provides entry to all Intermediate units of study in biology in the School of Biological Sciences.

Textbooks:

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

BIOL 1902 Living Systems (Advanced)

6 credit points

Teacher/Coordinator: Prof ID Hume, DrRL Overall, DrGM Wardle
Assumed Knowledge: HSC 2 unit Biology or Biology 1001 or 1901 or equivalent, by invitation

Additional information: May not be counted with Biology 1002

Students must first enrol in Biology 1002. Subsequently, selected students may be invited to enrol in this unit of study where they will participate in a more demanding alternative component

When Offered: July

Classes: 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 Living Systems. The content and nature of this component will be determined each year. Details and selection criteria are announced in the first semester.

BIOL 1003 Human Biology

6 credit points

Assumed Knowledge: HSC 2 unit Biology or Biology 1001 or 1901 or equivalent

Additional information: Not a prerequisite for all Intermediate units of study in Biology. See prerequisites listed under Intermediate units of study. May not be counted with Biology 1903

When Offered: July

Classes: 3 lec & 3 prac/wk

Assessment: One 2hr exam, assignments, classwork

This unit of study provides an introduction to human evolution and ecology, cell biology, physiology and anatomy, through both lectures and practical work. It begins with human evolution, human population dynamics and the impact of people on the environment. The unit of study includes human nutrition, distribution of essential requirements to and from the cells, control of body functions and defence mechanisms. After discussion of reproduction and development, it concludes with some controversial aspects of human genetics. It is recommended that Concepts in Biology be taken before this unit of study. Enrolment may be restricted by the availability of places. This unit of study provides entry to Intermediate units of study in genetics and cell biology in the School of Biological Sciences, but not to the School's other Intermediate units of study.

Textbooks:

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

BIOL 1903 Human Biology (Advanced)

6 credit points

Teacher/Coordinator: Prof ID Hume, DrRL Overall, DrG M Wardle

Assumed Knowledge: HSC 2 unit Biology or Biology 1001 or 1901 or equivalent; by invitation

Additional information: May not be counted with Biology 1003

Students must first enrol in Biology 1003. Subsequently, selected students may be invited to enrol in this unit of study where they will participate in a more demanding alternative component

When Offered: July

Classes: 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 Human Biology. The content and nature of this component will be determined each year. Details and selection criteria are announced in the first semester.

Intermediate Biology Units of Study

Students who wish to take Intermediate Biology units of study should obtain Information for Students Considering Intermediate Biology Units of Study from Carlsaw Lecture Room 3 A during the Faculty of Science enrolment period or from the School Office (Room 234, Macleay Building, A12) after the enrolment period. Students should discuss their preferences, together with the other units of study they propose to study, with a Biology staff member when enrolling.

The following Intermediate units of study are offered:

Semester 1

Group 1

BIOL 2001 Animals A

BIOL 2101 Animals A — Theory

BIOL 2901 Animals A (Advanced)

Group 2

BIOL 2003 Plant Anatomy and Physiology

BIOL 2903 Plant Anatomy and Physiology (Advanced)

Group 3

BIOL 2006 Cell Biology

BIOL 2106 Cell Biology — Theory

BIOL 2906 Cell Biology (Advanced)

Semester 2

Group 4

BIOL 2002 Animals B

BIOL 2102 Animals B — Theory

BIOL 2902 Animals B (Advanced)

Group 5

BIOL 2004 Plant Ecology and Diversity

BIOL 2904 Plant Ecology and Diversity (Advanced)

Group 6

BIOL 2005 Molecular and General Genetics

BIOL 2105 Molecular and General Genetics — Theory

BIOL 2905 Molecular and General Genetics (Advanced)

Group 7

BIOL 2007 Introductory Entomology

Not more than one unit of study may be taken from each group, and a maximum of 32 credit points of Intermediate Biology may be counted towards the award course. Qualifying units of study for certain Senior Biology units of study are defined as combinations of two, 8 credit point, Intermediate Biology units of study (see the Senior unit of study descriptions or Information for Students booklets) and all require 16 credit points of Intermediate Biology.

BIOL 2001 Animals A

8 credit points

Teacher/Coordinator: Biological Sciences staff

Prerequisite: Qual 12 credit points of Junior Biology including Biology 1002 or 1902

Prereq Chemistry 1102 or 1902 or 1904 or (with the permission of the Head of School) exceptional performance in Chemistry 1002

Additional information: May not be counted with Biology 2101 or 2901

See prerequisites for Senior units of study Biology

When Offered: February

Classes: 3 lec, 1 discussion group & 3prac/wk or 4 lec & 3 prac/wk

Assessment: One 3hr exam, 1 prac exam, 1 essay, quizzes

This unit of study provides a thorough grounding in the diversity of animals by lectures and detailed laboratory classes, which include dissections and demonstrations of the functional anatomy of invertebrates. 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 biodiversity and provide opportunity to develop communication skills. The unit of study is designed to be taken in conjunction with Biology 2002 Animals B; the two units of study together provide complete coverage of the diversity of animals at the level of phylum. This unit of study may be taken alone, but when taken with Biology 2002 Animals B provides entry into animal modules in Senior Biology units of study.

BIOL 2901 Animals A (Advanced)

8 credit points

Teacher/Coordinator: Coordinator Biology 2001 Executive Officer

Prerequisite: Qual 12 credit points of Junior Biology including Biology 1002 or 1902

Prereq Chemistry 1102 or 1902 or 1904 or (with the permission of the Head of School) exceptional performance in Chemistry 1002; by invitation

Additional information: May not be counted with Biology 2001 or 2101. Students must first enrol in Biology 2001. Subsequently, students may be invited to enrol in this unit of study where they will participate in a more demanding alternative component

See prerequisites for Senior units of study in Biology

When Offered: February

Selected students may be invited to participate in alternative components of Biology 2001 Animals A. The content and nature of these components may vary from year to year. Students must enrol in Biology 2001 Animals A and selection criteria and details will be announced in the first week of semester.

BIOL 2101 Animals A — Theory

4 credit points

Teacher/Coordinator: Biological Sciences staff

Prerequisite: Qual 12 credit points of Junior Biology including Biology 1002 or 1902

Additional information: May not be counted with Biology 2001 or 2901

Not a prerequisite for Senior units of study in Biology

When Offered: February

Classes: 3 lec & 1 prac/wk

Assessment: One 3hr exam, quizzes

This unit of study provides a broad background to the diversity of animals through lectures and museum-style displays. The material is presented within the conceptual framework of evolution and the principles and use of phylogeny and classification. It is suitable for students who are majoring in other areas of biology or other subjects

but who wish to acquire an introduction to animal biology. The unit of study is designed to be taken with Biology 2102 Animals B — Theory. The diversity, morphology and evolution of most invertebrate phyla are presented.

BIOL 2002 Animals B

8 credit points

Teacher/Coordinator: Dr M.B. Thompson, and other Biological Sciences staff

Prerequisite: Qual 12 credit points of Junior Biology including Biology 1002 or 1902

Prereq Chemistry 1102 or 1902 or 1904 or (with the permission of the Head of School) exceptional performance in Chemistry 1002

Additional information: May not be counted with Biology 2902

See prerequisites for Senior units of study in Biology

When Offered: July

Classes: 3 lec, 1 discussion group & 3 prac/wk or 4 lectures & 3 prac/wk & one field trip

Assessment: One 3hr exam, 1 prac exam, field report, 1 exam, quizzes

This unit of study completes the grounding in the diversity of animals at the level of phylum introduced in Biology 2001 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 unit of study complements Biology 2001 Animals A and should preferably be taken after that unit of study. It is a prerequisite for most animal modules in senior Biology.

BIOL 2902 Animals B (Advanced)

8 credit points

Teacher/Coordinator: Coordinator Biology 2002 Executive Officer

Prerequisite: Qual 12 credit points of Junior Biology including Biology 1002 or 1902

Prereq Chemistry 1102 or 1902 or 1904 or (with the permission of the Head of School) exceptional performance in Chemistry 1002; by invitation

Additional information: May not be counted with Biology 2002 or 2102

Students must enrol in Biology 2002. Subsequently, students may be invited to enrol in this unit of study where they will participate in a more demanding alternative component

See prerequisites for Senior units of study in Biology

When Offered: July

Selected students may be invited to participate in alternative components of Biology 2002 Animals B. The content and nature of these components may vary from year to year. Students must enrol in Biology 2002 Animals B, and selection criteria and details will be announced in the first week of semester.

BIOL 2102 Animals B — Theory

4 credit points

Teacher/Coordinator: Dr M B Thompson and other Biological Sciences staff

Prerequisite: Qual 12 credit points of Junior Biology, including Biology 1002 or 1902

Additional information: May not be counted with Biology 2002 or 2902

Not a prerequisite for Senior units of study in Biology

When Offered: July

Classes: 3 lec & 1 prac/wk

Assessment: One 3hr exam, quizzes

This unit of study provides an introduction to the diversity of animals at the level of phylum. It provides a broad background in the diversity of animals and an introduction to phylogeny through lectures and demonstration material in laboratory classes. It focuses on vertebrates and invertebrate phyla not covered in Biology 2101 Animals A — Theory. This unit of study is designed to be taken with Biology 2101 Animals A—Theory and should preferably be taken after that unit of study. It is suitable for students who are concentrating on other areas of biology or other units of study but who wish to acquire a background in animal biology.

BIOL 2003 Plant Anatomy and Physiology

8 credit points

Teacher/Coordinator: Assoc. Prof. Allaway, Dr McGee, Dr Overall, Dr Quinnell

Prerequisite: Qual 12 credit points of Junior Biology including Biology 1002 or 1902

Additional information: May not be counted with Biology 2903
See prerequisites for Senior units of study in Biology

When Offered: February

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

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

The unit of study explores basic concepts in structure-function relationships in plants and their component organs, tissues and cells. It covers fundamental processes in plant growth and development including photosynthesis, translocation, water transport, nutrition, responses to light and gravity, and the role of plant hormones. Special attention is given to the anatomy and physiology of the Australian flora. Lectures and self-instructional audiovisual study are augmented by group discussions and laboratory experiments. This unit of study complements Biology 2004 and leads up to advanced plant modules in Senior Biology.

BIOL 2903 Plant Anatomy and Physiology (Advanced)

8 credit points

Teacher/Coordinator: Coordinator Biology 2003 Executive Officer

Prerequisite: Qual 12 credit points of Junior Biology including Biology 1002 or 1902; by invitation

Additional information: May not be counted with Biology 2003
Students must enrol in Biology 2003. Subsequently, students may be invited to enrol in this unit of study where they will participate in a more demanding alternative component

See prerequisites for Senior units of study in Biology

When Offered: February

Selected students may be invited to participate in alternative components of Biology 2003. The content and nature of these components may vary from year to year. Students must enrol in Biology 2003 and selection criteria and details will be announced in the first week of semester.

BIOL 2004 Plant Ecology and Diversity

8 credit points

Teacher/Coordinator: Dr Kenwood Prof. Larkum, Dr McGee, Dr Marc, Dr Quinnell, Dr Wardle

Prerequisite: Qual 12 credit points of Junior Biology including Biology 1002 or 1902

Additional information: May not be counted with Biology 2904
See prerequisites for Senior units of study in Biology

When Offered: July

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

Assessment: One 3hr exam, 1 prac exam, one 1000w essay, classwork

The unit of study 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 unit of study complements Biology 2003 and leads up to plant modules in Senior Biology.

BIOL 2904 Plant Ecology and Diversity (Advanced)

8 credit points

Teacher/Coordinator: Coordinator Biology 2004 Executive Officer

Prerequisite: 12 credit points of Junior Biology including Biology 1002 or 1902; by invitation

Additional information: May not be counted with Biology 2004
Students must enrol in Biology 2004. Subsequently, students may be invited to enrol in this unit of study where they will participate in a more demanding alternative component

See prerequisites for Senior units of study in Biology

When Offered: July

Selected students may be invited to participate in alternative components of Biology 2004. The content and nature of these components may vary from year to year. Students must enrol in Biology 2004 and selection criteria and details will be announced in the first week of semester.

BIOL 2005 Molecular and General Genetics

8 credit points

Teacher/Coordinator: Biological Sciences staff

Prerequisite: Qual 12 credit points of Junior Biology
Prereq Chemistry 1102 or 1902 or 1904 or (with the permission of the Head of School) exceptional performance in Chemistry 1002. Biochemistry 2001 or 2901 and Biology 2006 or 2906 are highly recommended

Additional information: May not be counted with Biology 2105 or 2905
See prerequisites for Senior units of study in Biology

When Offered: July

Classes: 3 lec, 1 tut & 4 prac/wk

Assessment: One 3hr exam, one 2hr theory of prac exam, assignments, pracs

A unit of study 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 is the qualifying unit of study for Biology 3103 and Biology 3203. The combination of this unit of study with Biology 2006 and Biochemistry 2001 is recommended.

BIOL 2905 Molecular and General Genetics (Advanced)

8 credit points

Teacher/Coordinator: Coordinator Biology 2005 Executive Officer

Prerequisite: Qual 12 credit points of Junior Biology
Prereq Chemistry 1102 or 1902 or 1904 or (with the permission of the Head of School) exceptional performance in Chemistry 1002. Biochemistry 2001 or 2901 and Biology 2006 or 2906 are highly recommended; by invitation

Additional information: May not be counted with Biology 2005 or 2105

Students must enrol in Biology 2005. Subsequently, students may be invited to enrol in this unit of study where they will participate in a more demanding alternative component

See prerequisites for Senior units of study in Biology

When Offered: July

Selected students may be invited to participate in alternative components of Biology 2005 Molecular and General Genetics. The content and nature of these components may vary from year to year. Students must enrol in Biology 2005 and selection criteria and details will be announced in the first week of semester. This is a core Intermediate unit of study in the BSc (Molecular Biology and Genetics) program.

BIOL 2105 Molecular and General Genetics — Theory **4 credit points**

Teacher/Coordinator: Biological Sciences staff

Prerequisite: Qual 12 credit points of Junior Biology

Prereq Chemistry 1102 or 1902 or 1904 or (with permission of the Head of School) exceptional performance in Chemistry 1002

Additional information: May not be counted with Biology 2005 or 2905

Not a prerequisite for Senior units of study in Biology

When Offered: July

Classes: 3 lec, 1 tut/wk

Assessment: One 3hr exam, assignments

This unit of study 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 unit of study is presented in the form of lectures and tutorials only; there are no practical classes. It is not suitable for students wishing to continue with genetics in their Senior year, for which Biology 2005 or Biology 2905 are appropriate.

BIOL 2006 Cell Biology **8 credit points**

Teacher/Coordinator: Biological Sciences staff

Prerequisite: Qual 12 credit points of Junior Biology

Prereq Chemistry 1102 or 1902 or 1904 or (with the permission of the Head of School) exceptional performance in Chemistry 1002

Additional information: May not be counted with Biology 2106 or 2906

See prerequisites for Senior units of study in Biology

When Offered: February

Classes: 3 lec, 1 tut & 3-4prac hrs/wk

Assessment: One 3hr theory exam, one 2hr theory ofprac exam, pracs & assignments

A unit of study on cell biology and developmental 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 unit of study is given by means of lectures, tutorials, discussion groups and laboratory classes. It leads into Cell Biology and Physiology modules in Senior Biology, and it is designed to complement Biology 2005. Students intending to specialise in areas of genetics, cell biology or development are advised to take this combination.

BIOL 2906 Cell Biology (Advanced)

8 credit points

Teacher/Coordinator: Coordinator Biology 2906 Executive Officer

Prerequisite: Qual 12 credit points of Junior Biology

Prereq Chemistry 1102 or 1902 or 1904 or (with the permission of the Head of School) exceptional performance in Chemistry 1002; by invitation

Additional information: May not be counted with Biology 2006

Students must first enrol in Biology 2006. Subsequently, students may be invited to enrol in this unit of study where they will participate in a more demanding alternative component

See prerequisites for Senior units of study in Biology

When Offered: February

Selected students may be invited to participate in alternative components of Biology 2006. The content and nature of these components may vary from year to year. Students must enrol in Biology 2006 and selection criteria and details will be announced in the first week of semester.

BIOL 2106 Cell Biology — Theory

4 credit points

Teacher/Coordinator: Biological Sciences staff

Prerequisite: Qual 12 credit points of Junior Biology

Prereq Chemistry 1102 or 1902 or 1904 or (with the permission of the Head of School) exceptional performance in Chemistry 1002

Additional information: May not be counted with Biology 2006 or 2906

Not a prerequisite for Senior units of study in Biology

When Offered: February

Classes: 3 lec & 1 tut/wk

Assessment: One 3hr theory exams, assignments

This unit of study 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. It is presented in the form of lectures and tutorials only; there are no practical classes. This unit of study is not suitable for students continuing with genetics, cell biology or development options in Senior year, for which Biology 2006 or Biology 2906 are appropriate.

BIOL 2007 Introductory Entomology

8 credit points

Teacher/Coordinator: Dr Meats, Dr Rose

Prerequisite: Qual 12 credit points of Junior Biology

Prereq Chemistry 1102 or 1902 or 1904 or (with the permission of the Head of School) exceptional performance in Chemistry 1002.

When Offered: July

Classes: 2 lec, 1-2 tut & 4prac/1wk

Assessment: One 3hr theory exam, assignment, insect collection

A general but comprehensive introduction to Insect Biology, this unit of study develops understanding of the scientific approach to insect structural diversity, identification, life histories, development, physiology, ecology, biogeography, principles of control, toxicology of insecticides and biology of major economic pests in NSW. Practicals give a working knowledge of major orders of insects economically important species, principles of collection, preservation and identification. Entomological data bases are introduced, and students do a library assignment and make and present a small collection of insects. Leads into the Entomology module in Senior Biology.

Senior Biology Units of Study

Students who intend to proceed from Intermediate to Senior Biology must:

(a) obtain Information for Students Considering Senior Biology Units of Study from the School Office (Room 234, Macleay Building, A12). This booklet gives detailed synopses of all Senior units of study and modules.

(b) discuss their choice of units of study with a Biology staff member when enrolling.

(c) register in Room 227 (Building A08) during the first week of first semester.

Six 12 credit point units of study are available. They are arranged in three compatible timetables.

Timetable 1

BIOL 3101F Ecophysiology February Semester

Ecophysiology core

Animal Ecophysiology module

Plant and Fungal Ecophysiology module

BIOL 3201S Cellular and Systems Physiology July Semester

Cellular and Systems Physiology core

Animal Physiology module

Plant Cells and Molecules module

Timetable 2

BIOL 3102F Evolution and Diversity of the Australian Biota February Semester (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 3202S Ecology July Semester (MS)

Ecology core (MS)

Marine Ecology module (MS)

Terrestrial Ecology module

Plant Ecology module

Timetable 3

BIOL 3103F Molecular Genetics and Recombinant DNA Technology February Semester

BIOL 3903F Molecular Genetics and Recombinant DNA Technology (Advanced) February Semester

BIOL 3203S Eukaryotic Genetics and Development July Semester

BIOL 3904S Eukaryotic Genetics and Development (Advanced) July Semester

Locations of lectures and practical classes are given in the booklet Information for Students Considering Senior Biology Units of Study.

A unit of study may involve an obligatory core and *one* associated module. Any combination of units of study may be chosen subject to timetable and prerequisite constraints. Modules in any unit of study are only available if the core part 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 credit points 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.

Units of study, 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 credit points of Marine Science but are allowed to include from 6 to a maximum of 18 credit points of Biology (from those marked MS) as part of Marine Science. If these credit points are taken as part of Marine Science they may not also be counted towards Senior Biology units of study.

Selecting Unit of Study options

Select your core and associated modules after (a) checking that you have passed the qualifying units of study 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, including details of quotas, in the booklet Information for Students Considering Senior Biology Units of Study, available from the School Office in Room 234, Building A12.

Textbooks:

A list of textbooks and reference books is provided in the booklet Information for Students Considering Senior Biology Units of Study obtainable from the School Office in Room 234, Building A12.

BIOL 3101 Ecophysiology

12 credit points

Teacher/Coordinator: Prof. I. D. Hume and other Biological Sciences staff

Prerequisite: Qual 16 credit points of Intermediate Biology including Biology 2002 or 2003 or 2006 or 2902 or 2903 or 2906

Additional information: Some modules have specific prerequisites; consult list of modules; students are advised to consult the School

When Offered: February

Classes: 4 lec and 8 prac/wk, one 3-day field trip. Timetable 1

Assessment: One 3hr exam, field trip quiz, 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 2001 or 2901 and 2002 or 2902

Classes February Semester: (4 lec and 8 prac)/wk. Timetable 1

Assessment one 1.5hr 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 work.

Plant and Fungal Ecophysiology module

Assoc. Prof. Allaway, Prof. Larkum, Dr McGee and others

Qual 16 credit points of Intermediate Biology including Biology 2003 or 2903 or 2006 or 2906

Classes February Semester: (4 lec and 8 prac)/wk. Timetable 1

Assessment one 1.5hr exam, lab assignments, 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 in plant growth and development.

BIOL 3201 Cellular and Systems Physiology **12 credit points**

Teacher/Coordinator: Assoc. Prof. Allaway and other Biological Sciences staff

Prerequisite: Qual 16 credit points of Intermediate Biology, including Biology (2001 or 2901) and (2002 or 2902) or Biology 2003 or 2006 or 2903 or 2906

Additional information: Some modules have specific prerequisites; consult list of modules; students are advised to consult the School

When Offered: July

Classes: 4 lec & 4prac/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 (2001 or 2901) and (2002 or 2902)

The module 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, Prof. Larkum, Dr Marc, Dr Overall

Prereq 16 credit points of Intermediate Biology including Biology 2003 or 2903 or 2006 or 2906

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 phytochrome, 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 3102 Evolution and Diversity of the Australian Biota (MS)

12 credit points

Teacher/Coordinator: Dr M. Henwood and other Biological Sciences staff

Prerequisite: Qual 16 credit points of Intermediate Biology, including Biology 2001 or 2901 and 2002 or 2902 or Biology 2003 or 2903 and 2004 or 2904; or Biology 2001 or 2901 and 2002 or 2902 and 2007

Additional information: Some modules have specific prerequisites; consult list of modules; students are advised to consult the School Marine Science 3001 students may take the Evolutionary Core without taking a module, or Marine Biology module without Core

When Offered: February

Classes: 4 lec and 8prac/wk Timetable 2

Assessment: One 3hr exam, assignments, projects

Evolution and Diversity of the Australian Biota (MS) Core

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 unit of study. 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 credit points of Intermediate Biology including Biology 2004 or 2904

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 2001 or 2901 and 2002 or 2902

Classes February Semester: (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 work 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)

Assoc. Prof. Hinde, Dr Hoegh-Guldberg, Dr Kingsford, Prof. Patterson

Qual Biology (2001 or 2901) and (2002 or 2902); or Biology (2003 or 2903) and (2004 or 2904)

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

Staffing to be notified

Qual Biology 2001 or 2901 and 2002 or 2902 and 2007

Classes February Semester: (4 lec & 8 prac)/wk

Assessment core assessment plus one 1.5hr theory exam, prac exam

This module 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, and 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 3202 Ecology (MS)

12 credit points

Teacher/Coordinator: *Dr Meats and other Biological Sciences staff*

Prerequisite: *Qual Biology 2001 or 2901 and 2002 or 2902 or 16 credit points of Intermediate Biology, including Biology 2004 or 2904*

Additional information: *Some modules have specific prerequisites; consult list of modules; students are advised to consult the School*

When Offered: *July*

Classes: *4 lec & 8 prac/wk, one 8-day field trip in vacation before July Semester. Timetable 2*

Assessment: *see above*

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)

Dr Connell, Dr Kingsford

Qual Biology (2001 or 2901) and (2002 or 2902)

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 2001 or 2901 and 2002 or 2902 or 16 credit points in Intermediate Biology including Biology 2004 or 2904

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 credit points of Intermediate Biology including Biology 2004 or 2904

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 3103 Molecular Genetics and Recombinant DNA Technology

12 credit points

Teacher/Coordinator: *Dr Lyon, Dr Raphael, Prof. Skurray and others*

Prerequisite: *Qual 16 credit points of Intermediate Biology including Biology 2005 or 2905*

Additional information: *May not be counted with Biology 3903*

When Offered: *February*

Classes: *4 lec & 8prac/wk. Timetable 3*

Assessment: *One 3hr exam, one 1.5hr prac exam, prac reports, seminar, project*

A unit of study 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 may include 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 3903 Molecular Genetics and Recombinant DNA Technology (Advanced)

12 credit points

Teacher/Coordinator: *Coordinator Biology 3103 Executive Officer*

Prerequisite: *16 credit points of Intermediate Biology including Biology 2005 or 2905; by invitation*

Additional information: *May not be counted with Biology 3103*

Students must first enrol in Biology 3103

Subsequently, students may be invited to enrol in this unit of study where they will participate in a more demanding alternative component.

When Offered: *February*

Selected students may be invited to participate in alternative components of the Biology 3103 Molecular Genetics and Recombinant DNA Technology. The content and nature of these components may vary from year to year. Students must enrol in Biology 3103 and selection criteria and details will be announced in the first week of semester.

BIOL 3203 Eukaryotic Genetics and Development

12 credit points

Teacher/Coordinator: Assoc. Prof. Gillies, Dr Oldroyd, Dr Raphael, Assoc. Prof. Armati and others

Prerequisite: Qual 16 credit points of Intermediate Biology including Biology 2005 or 2905

Additional information: May not be counted with Biology 3904

When Offered: July

Classes: 4 lec & 8prac/wk, one 2-day excursion. Timetable 3

Assessment: One 3hr exam, one 1.5hr prac exam, prac reports, seminars

A series of lectures, seminars and practicals which concentrates on the application of molecular genetics to the understanding of eukaryotic genetics, animal development and differentiation, and evolutionary and population biology. Lectures cover molecular and ultrastructural arrangement of DNA sequences and genes in eukaryotic genomes and chromosomes, eukaryotic gene organisation and expression, forensic and behavioural genetics, linkage and mapping, genetics of early animal development, nerve cell differentiation and growth, MHC function and the 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 3904 Eukaryotic Genetics and Development (Advanced)

12 credit points

Teacher/Coordinator: Coordinator Biology 3203 Executive Officer

Prerequisite: 16 credit points of Intermediate Biology including Biology 2005 or 2905; by invitation

Additional information: May not be counted with Biology 3203

Students must first enrol in Biology 3203

Subsequently, students may be invited to enrol in this unit of study where they will participate in a more demanding alternative component.

When Offered: July

Selected students may be invited to participate in alternative components of Biology 3203 Eukaryotic Genetics and Development. The content and nature of these components may vary from year to year. Students must enrol in Biology 3203 and selection criteria and details will be announced in the first week of semester.

BIOL 4001 Biology Honours

48 credit points

When Offered: February

A single Honours program in Biology accommodates students who have completed 24 credit points of Senior Biology or equivalent. Information about qualifications for entry into Honours is available from the School Office (Room 234 Macleay Building A12).

During the Honours year the principles established in the first three years of the undergraduate award course are further developed, and students are introduced to a wider field of biology and biological techniques. Students may elect to specialise in any of the aspects of biology that are studied in the School.

Students who have signified their intention of entering Honours will be notified of acceptance shortly after the publication of the second semester Senior examination results. Honours students are expected to start their academic year at the beginning of February. There may be the possibility of mid-year entry.

With the permission of the Head of School and the Faculty of Science, students who have qualified to take Honours and passed 12 credit points

of Junior Biology may take Biology Honours without having taken Intermediate or Senior Biology units of study. The concession is intended for students who have majored in physics, chemistry or biochemistry and wish to study biophysics or plant physiology; they should first discuss their qualifications with Dr R. L. Overall.

The Honours unit of study comprises:

- a project in which the student investigates a problem and presents oral and written accounts of his or her research.
- coursework units chosen from a program offered by the School.
- instruction in experimental design, and other technical instruction.

The assessment will be made on the basis of:

- written assignments and essays from coursework units.
- marks awarded for a thesis on the subject of the project.

Cell Pathology

Enrolment requirements

Prerequisites for these units of study are set out in Chapter 3. Students interested in these units of study 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 unit of study and superior performance in Junior and Intermediate units of study will be essential to ensure success in either Cell Pathology 3001 or 3002. The Department of Pathology is located on Level 5 of the Blackburn Building (tel. 9351 2414).

CPAT 3001 Cell Pathology A

12 credit points

Teacher/Coordinator: Prof. Hunt, Dr Gibbins, Dr Hambly, Dr King
Prerequisite: Anatomy and Histology 2002 or Biochemistry 2002 or 2902, or Biology 2005 or 2006 or 2905 or 2906, or both Pharmacology 2001 and 2002, or Physiology 2002

Additional information: Students must contact the Department before enrolling. Only a small number of students can be accommodated in the laboratory facilities.

When Offered: February

Classes: 1 tut & 11 prac/wk

Assessment: One 2.15hr exam, 6prac reports

The units of study Cell Pathology A and Cell Pathology B are designed to be taken together. They are particularly suited to those interested in subsequently doing research in a challenging area of biology. These units of study will provide students with insight into alterations in cellular processes in disease and injury and equip them to apply the concepts and methods of cell biology to the study of pathology. Subjects studied include inflammation, immunopathology, cellular immunology, molecular pathophysiology and cancer biology. The units of study 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 this area will be used. These include flow cytometry, tissue culture, molecular biology and microscopy.

CPAT 3002 Cell Pathology B

12 credit points

Teacher/Coordinator: Prof. Hunt, Dr Gibbins, Dr Hambly, Dr King

Prerequisite: Qual Cell Pathology 3001

When Offered: July

Classes: 1 tut & 11 prac/wk

Assessment: One 1.5h exam, 5 prac reports, one project report

The units of study Cell Pathology A and Cell Pathology B are designed to be taken together. They are particularly suited to those interested in subsequently doing research in a challenging area of biology. The units of study will provide students with insight into alterations in cellular processes in disease and injury and equip them to apply the concepts and methods of cell biology to the study of pathology. Areas studied include inflammation, immunopathology, cellular immunology, molecular pathophysiology and cancer biology. These units of study 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 this area will be used. These include flow cytometry, tissue culture, molecular biology and microscopy.

In Cell Pathology 3002 each student will undertake a project designed to try to answer a question (preferably of their own asking) that has evolved in the earlier work in this unit of study. Performance in this project will be part of the assessment of the suitability of a student to proceed to Honours.

CPAT 4001 Cell Pathology Honours

48 credit points

When Offered: February

Civil Engineering Science

The Department of Civil Engineering is part of the Faculty of Engineering. In addition to providing professional training in this branch of engineering, it provides a 16 credit point unit of study, Civil Engineering Science 2, in the Faculty of Science.

The unit of study is available as an Intermediate unit of study 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 unit of study 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 unit of study 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.

Tutorials and laboratories

All students are required to undertake the tutorial and laboratory work associated with these units of study, details of which are set out in the timetables. The experimental and tutorial work is designed as an integral part of the unit of study 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.

ENGS 2201 Civil Engineering Science 2A

12 credit points

Prerequisite: Chemistry 1102 or 1902 or 1904 or 12 credit points of Junior Physics or 12 credit points of Junior Mathematics

When Offered: February

See Faculty of Engineering handbook for unit description.

ENGS 2202 Civil Engineering Science 2B

4 credit points

Prerequisite: Chemistry 1102 or 1902 or 1904 or 12 credit points of Junior Physics or 12 credit points of Junior Mathematics

When Offered: July

See Faculty of Engineering handbook for unit description.

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 units of study in the Faculty of Science, namely Chemical Engineering Science 2, a 16 credit point unit of study and Chemical Engineering Science 2 Auxiliary, an 8 credit point unit of study.

These units of study are available as Intermediate units of study 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 units of study are intended to give a science student some insight into the principles which control the design and performance of large scale industrial processing plants.

Conversion course

The Department of Chemical Engineering also offers a two year award course by which the holder of a Bachelor of Science degree may obtain a degree in Chemical Engineering provided that units of study equivalent to 16 credit points of Intermediate Chemistry, 16 credit points 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 units of study

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 unit of study and, in addition, considers the basic principles of heat, momentum and mass transfer in large-scale operations.

Tutorials and laboratories

All students are required to undertake the tutorial and laboratory work associated with these units of study, details of which are set out in the timetables. The experimental and tutorial work is designed as an integral part of the unit of study to complement the lecture material.

ENGS 2601 Chemical Engineering 2A

8 credit points

When Offered: February

See Faculty of Engineering handbook for unit description.

ENGS 2602 Chemical Engineering 2B

8 credit points

When Offered: July

See Faculty of Engineering handbook for unit description.

ENGS 2611 Chemical Engineering Science 2A: Auxiliary

4 credit points

Prerequisite: Chemistry 1102 or 1902 or 1904 or 12 credit points of Junior Physics or 12 credit points of Junior Mathematics

Corequisite: Chemistry 2202 or 2902

When Offered: February

Classes: 4 lec, one 1hr tut & one 2hr tut/wk; and three 3hr prac/semester

Assessment: One 3hr exam, project and lab assessment

See Faculty of Engineering handbook for unit description.

Textbooks:

As for Chemical Engineering Science Auxiliary; and

Hewitt, Shire and Bott Process Heat Transfer, CRC Press, Bege House, 1994

Others as advised during classes

ENGS 2612 Chemical Engineering Science 2B: Auxiliary

4 credit points

Prerequisite: Engineering Science 2601

When Offered: July

See Faculty of Engineering handbook for unit description.

School of Chemistry

Junior Chemistry Units of Study

The School of Chemistry offers a number of 6 credit point units of study to cater for the differing needs of students. These units of study are:

CHEM 1001 Introductory Chemistry IA

CHEM 1002 Introductory Chemistry IB

CHEM 1101 Chemistry IA

CHEM 1102 Chemistry IB

CHEM 1901 Chemistry IA (Advanced)

CHEM 1902 Chemistry IB (Advanced)

CHEM 1903 Chemistry IA (Special Studies Program)

CHEM 1904 Chemistry IB (Special Studies Program)

Fully detailed information about all units of study, prescribed textbooks and reference books is available from the School of Chemistry and is contained in a booklet, Information for Students, distributed at the time of enrolment.

Exercises are issued and tutorials are held at regular intervals for all units of study.

CHEM 1001 Introductory Chemistry 1A

6 credit points

Prerequisite: Akn There is no assumed knowledge of chemistry for this unit of study

Additional information: May not be counted with Chemistry 1101 or 1901 or 1903

When Offered: February

Classes: 3 lec & 1 tut/wk & 3hrsprac/wk for 10 wks.

Assessment: A theory examination is held at the end of the semester. Students are advised at the beginning of the semester about other factors contributing to assessment in the unit of study.

The aim of the unit of study is to provide those students whose chemical background is weak (or non-existent) with a good grounding in fundamental chemical principles together with an overview of the relevance of chemistry. There is no prerequisite or assumed knowledge for entry to this unit of study.

Lectures

A series of 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 booklist is contained in the booklet Information for Students distributed at enrolment. Further information can be obtained from the School.

CHEM 1002 Introductory Chemistry 1B

6 credit points

Prerequisite: Chemistry 1001 or equivalent

Additional information: May not be counted with Chemistry 1102 or 1902 or 1904

When Offered: July

Classes: 3 lec & 1 tut/wk & 3hrs prac/wk for 10 wks

Assessment: A theory examination is held at the end of the semester. Students are advised at the beginning of the semester about other factors contributing to assessment in the unit of study.

Chemistry 1002 builds on Chemistry 1001 to provide a sound coverage of inorganic and organic chemistry.

Lectures

A series 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 booklist is contained in the booklet Information for Students distributed at enrolment. Further information can be obtained from the School.

CHEM 1101 Chemistry 1A

6 credit points

Prerequisite: Akn HSC Mathematics 2 unit course; and the Chemistry component of the 4-unit or 3-unit HSC Science course, or 2-unit Chemistry

Additional information: May not be counted with Chemistry 1001 or 1901 or 1903

Recommended concurrent unit of study: Preferred — Mathematics 1701 or 1791; otherwise — Mathematics 1711

When Offered: February & July

Classes: 3 lec & 1 tut/wk & 3hrsprac/wk for 10 wks

Assessment: A theory examination is held at the end of the semester.

Students are advised at the beginning of the semester about other factors contributing to assessment in the unit of study,

Chemistry 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

A series 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 booklist is contained in the booklet Information for Students distributed at enrolment. Further information can be obtained from the School.

CHEM 1102 Chemistry 1B

6 credit points

Prerequisite: Chemistry 1101 or a Distinction in Chemistry 1001 or equivalent;

Chemistry 1101 may be taken as a corequisite

Additional information: May not be counted with Chemistry 1002 or 1902 or 1904

Recommended concurrent unit of study: Preferred—Mathematics 1702 or 1703 or 1792 or 1793; otherwise—Mathematics 1704 or 1712

When Offered: July

Classes: 3 lec & 1 tut/wk & 3hrs prac/wk for 10 wks

Assessment: A theory examination is held at the end of the semester. Students are advised at the beginning of the semester about other factors contributing to assessment in the unit of study.

Chemistry IB 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 units of study.

Lectures

A series 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 booklist is contained in the booklet Information for Students distributed at enrolment. Further information can be obtained from the School.

CHEM 1901 Chemistry 1A (Advanced)

6 credit points

Prerequisite: TER of at least 88 and at least 75% in HSC 2-unit Chemistry or equivalent; by invitation

Additional information: May not be counted with Chemistry 1001 or 1101 or 1903

Recommended concurrent unit of study: Preferred — Mathematics 1701 or 1791; otherwise — Mathematics 1711

When Offered: February

Classes: 3 lec & 1 tut/wk & 3hrsprac/wk for 10 wks

Assessment: A theory examination is held at the end of the semester. Students are advised at the beginning of the semester about other factors contributing to assessment in the unit of study.

Chemistry 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 unit of study is more advanced, presupposing a very good grounding in the subject at secondary level. Chemistry IA (Advanced) covers chemical theory and physical chemistry.

Lectures

A series 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 booklist is contained in the booklet Information for Students distributed at enrolment. Further information can be obtained from the School.

CHEM 1902 Chemistry 1B (Advanced)

6 credit points

Prerequisite: Qual Chemistry 1901 or 1903 or Distinction in Chemistry 1101 or equivalent; by invitation

Additional information: May not be counted with Chemistry 1002 or 1102 or 1904

Recommended concurrent unit of study: Preferred — Mathematics 1702 or 1703 or 1792 or 1793, otherwise — Mathematics 1712 or 1704

When Offered: July

Classes: 3 lec & 1 tut/wk & 3hrs prac/wk for 10 wks

Assessment: A theory examination is held at the end of the semester. Students are advised at the beginning of the semester about other factors contributing to assessment in the unit of study.

Chemistry 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 units of study.

Lectures

A series 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 booklist is contained in the booklet Information for Students distributed at enrolment. Further information can be obtained from the School.

CHEM 1903 Chemistry 1A (Special Studies Program)

6 credit points

Prerequisite: TER of at least 98 and at least 85% in HSC 2-unit Chemistry or equivalent. Entry is by invitation

Additional information: May not be counted with Chemistry 1001 or 1101 or 1901

Recommended concurrent unit of study: Preferred — Mathematics 1701 or 1791; otherwise — Mathematics 1711

Students in the Faculty of Science Talented Students Program are automatically eligible. For the purpose of Resolution 11 this unit of study is deemed to be designated as an Advanced unit of study

When Offered: February

Classes: (3 lec, 1 tut & 3hrs 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 series 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 unit of study 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 1904 Chemistry 1B (Special Studies Program) 6 credit points

Prerequisite: *Chemistry 1903; by invitation*

Additional information: *May not be counted with Chemistry 1002 or 1102 or 1902*

Recommended concurrent unit of study: *Preferred—Mathematics 1002 or 1003 or 1792 or 1793; otherwise—Mathematics 1712 or 1704*

When Offered: *July*

Classes: *(3 lec, 1 tut & 3hrsprac)/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 series 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 unit of study details are the same as those for Chemistry IB (Advanced).

Chemistry IB (Special Studies Program) is an acceptable prerequisite for entry into Intermediate Chemistry units of study.

Intermediate Chemistry Units of Study

The School of Chemistry offers a number of units of study to cater for the differing needs of students. The following units of study are offered:

CHEM 2001 Chemistry 2 (Life Sciences)	8 credit points
CHEM 2101 Chemistry 2 (Environmental)	8 credit points
CHEM 2202 Chemistry 2 (Principles)	8 credit points
CHEM 2301 Chemistry 2A	8 credit points
CHEM 2302 Chemistry 2B	8 credit points
CHEM 2502 Chemistry 2 (Forensic)	8 credit points
CHEM 2901 Chemistry 2A (Advanced)	8 credit points
CHEM 2902 Chemistry 2B (Advanced)	8 credit points

The units of study Chemistry 2001 (Life Sciences), 2101 (Environmental), and 2502 (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 units of study including textbooks is available from the School of Chemistry.

CHEM 2001 Chemistry 2 (Life Sciences) 8 credit points

Prerequisite: *Qual Chemistry 1102 or 1902 or 1904*

Prereq 6 credit points of Junior Mathematics

Additional information: *May not be counted with Chemistry 2101 or 2201 or 2301 or 2502 or 2901*

When Offered: *February*

Classes: *4 lec & 4hrsprac/wk*

Assessment: *Exam (67%), lab exercises (33%)*

Lectures and tutorials

In addition to the core, the remaining 20 lectures are distinct for this unit of study 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.

Additional information

The aim of this unit of study is to provide students interested in life sciences with the chemical knowledge required for an understanding of the subject.

Practical 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.

Textbooks:

To be advised

CHEM 2101 Chemistry 2 (Environmental) 8 credit points

Prerequisite: *Qual Chemistry 1102 or 1902 or 1904 and*

Prereq 6 credit points of Junior Mathematics

Additional information: *May not be counted with Chemistry 2001 or 2201 or 2301 or 2502 or 2901*

When Offered: *February*

Classes: *4 lec & 4hrsprac/wk*

Assessment: *Exam (67%), lab exercises (33%)*

Lectures

In addition to the core, the remaining 20 lectures are distinct for this unit of study and apply the core knowledge to chemical problems in Environmental Science.

Additional information

The aim of this unit of study is to provide students interested in environmental science with the chemical knowledge required for an understanding of the area.

Practical Work:

As for Chemistry 2001

Textbooks:

To be advised

CHEM 2202 Chemistry 2 (Principles) 8 credit points

Prerequisite: *Chemistry 2001 or 2101 or 2201 or 2301 or 2502*

Additional information: *May not be counted with Chemistry 2302 or 2902*

When Offered: *July*

Classes: *4 lec & 4hrsprac/wk*

Assessment: *Exam (67%), lab exercises (33%)*

Lectures

This unit of study 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.

Additional information

Chemistry Principles is designed for students who wish to continue to Senior chemistry units of study after taking the more descriptive Intermediate units in the February semester.

Practical Work:

As for Chemistry 2001

CHEM 2301 Chemistry 2A

8 credit points

Prerequisite: Qual Chemistry 1102 or 1902 or 1904

Prereq 6 credit points of Junior Mathematics

Additional information: May not be counted with Chemistry 2001 or 2101 or 2201 or 2502 or 2901

When Offered: February

Classes: 4 lec & 4hrprac/wk

Assessment: Exam (67%), lab exercises (33%)

Lectures and tutorials

A series 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.

Additional information

This is the main chemistry unit of study for students expecting to major in chemistry.

Practical Work:

As for Chemistry 2001

Textbooks:

To be advised

CHEM 2302 Chemistry 2B

8 credit points

Prerequisite: Chemistry 2001 or 2101 or 2201 or 2301 or 2502

Additional information: May not be counted with Chemistry 2202 or 2902

When Offered: July

Classes: 4 lec & 4hrprac/wk

Assessment: Exam (67%), lab exercises (33%)

Lectures

This unit of study 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.

Additional information

Main chemistry unit of study for students expecting to major in chemistry.

Practical Work:

As for Chemistry 2001

Textbooks:

To be advised

CHEM 2502 Chemistry 2 (Forensic)

8 credit points

Prerequisite: Qual Chemistry 1102 or 1902 or 1904

Prereq 6 credit points of Junior Mathematics

Additional information: May not be counted with Chemistry 2001 or 2101 or 2201 or 2301 or 2901

When Offered: February & July

Classes: 4 lec & 4hrprac/wk

Assessment: Exam (67%), lab exercises (33%)

Lectures

In addition to the core, the remaining 20 lectures are distinct for this unit of study and apply the core knowledge to chemical problems in Forensic Science. This unit of study is available in both the February and July semesters

Additional information

The aim of this unit of study is to provide students interested in forensic science with the chemical knowledge required for an understanding of the area.

Practical Work:

As for Chemistry 2001

Textbooks:

To be advised

CHEM 2901 Chemistry 2A (Advanced)

8 credit points

Prerequisite: Qual WAM greater than 80 and Distinction average in Chemistry 1101 or 1901 or 1903 and in Chemistry (1102 or 1902 or 1904)

Prereq 6 credit points of Junior Mathematics; by invitation

Additional information: May not be counted with Chemistry 2001 or 2101 or 2201 or 2301 or 2502

Entry to this unit of study is by invitation. Students in the Faculty of Science Talented Students Program are automatically eligible

When Offered: February

Classes: 5 lec & 3hrprac/wk

Assessment: Exam (67%), lab exercises (33%)

Lectures and tutorials

Lectures and tutorials in Chemistry 2901 (Advanced) comprise two sets: Four lectures per week in common with any other Intermediate Chemistry unit of study and one lecture per week of advanced lectures on topics that are complementary to the other units of study.

Additional information

The number of places in Chemistry 2901 (Advanced) is limited. Applications are invited from students with a high WAM and an excellent record in a Junior Chemistry unit of study. Places are restricted to students enrolled in the Faculty of Science except by permission of the Head of the School of Chemistry. Students in the Faculty of Science Talented Student Program who are enrolled in the BSc or BSc(Adv) degree are automatically eligible. Students enrolled in other Advanced degree programs within the Faculty are not normally admitted because of timetabling.

Practical 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 unit of study; for 6 weeks special advanced project-oriented exercises are offered.

Textbooks:

To be advised

CHEM 2902 Chemistry 2B (Advanced)

8 credit points

Prerequisite: Chemistry 2901, but see Additional information below; by invitation

Additional information: May not be counted with Chemistry 2202 or 2302

When Offered: July

Classes: 5 lec & 3hrprac/wk

Assessment: Exam (67%), lab exercises (33%)

Lectures and tutorials

Lectures and tutorials in Chemistry 2902 (Advanced) comprise two sets: 4 lectures and 1 tutorial per week in common with any other Intermediate Chemistry unit of study; and 1 lecture per week of advanced lectures on topics that are complementary to the other units of study.

Additional information

The number of places in Chemistry 2902 (Advanced) is limited. Normally entry to this unit of study is restricted to those students enrolled in Chemistry 2901. However, a student who has performed particularly well in another February semester Chemistry unit of study may be invited by the Head of School to enrol in Chemistry 2902 (Advanced). See the Intermediate Chemistry Unit of Study Coordinator for further information.

Practical 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 unit of study; for 4 weeks, special advanced project-oriented exercises are offered.

Textbooks:

To be advised

Senior Chemistry Units of Study

The School of Chemistry offers a number of units of study to cater for the differing needs of students. The following units of study are offered:

CHEM 3101	Chemistry 3 A	12 credit points
CHEM 3102	Chemistry 3B	12 credit points
CHEM 3901	Chemistry 3A (Advanced)	12 credit points
CHEM 3902	Chemistry 3B (Advanced)	12 credit points
CHEM 3201	Chemistry 3 A Additional	12 credit points
CHEM 3202	Chemistry 3B Additional	12 credit points

Advice on units of study

A fully detailed information booklet on the units of study and textbooks is available from the School of Chemistry. All students who intend to take Senior Chemistry units of study must register in the School of Chemistry during either the Wednesday or Thursday of the orientation period. Registration includes selection of Senior Chemistry modules, completion of a registration card and the taking of an I.D. photograph.

Textbooks:

See the Senior Chemistry handbook available from the School of Chemistry

CHEM 3101 Chemistry 3A

12 credit points

Prerequisite: Qual Chemistry 2202 or 2302 or 2902

Additional information: May not be counted -with Chemistry 3901 but may be counted with Chemistry 3201

When Offered: February

Classes: 4 lec & 8hrprac/wk

Assessment: 45min exam per module andprac 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 the February Semester 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 3101 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

Main group chemistry and materials

Organometallic chemistry

Catalysis

Aquatic chemistry

Organic chemistry modules

Stereochemistry in organic chemistry

Natural products

Aromaticity

Organic reaction mechanisms

Bioorganic chemistry 1: amino acids and polypeptides

Organometallic reagents in organic synthesis

Physical/Theoretical chemistry modules

Quantum chemistry — fundamentals

Surface chemistry

Applications of symmetry

Intermolecular forces

Colloid chemistry

Atmosphere photochemistry

Radiation chemistry

*This is the list of modules that were offered in the February Semester in 1997. There may be some interchange of modules between Chemistry 3101 and Chemistry 3102 in 1998. 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. Details can be obtained from the School of Chemistry.

Textbooks:

See the Senior Chemistry handbook available from the School of Chemistry.

CHEM 3102 Chemistry 3B

12 credit points

Prerequisite: Qual Chemistry 2202 or 2302 or 2902

Additional information: May not be counted with Chemistry 3902 (but may be counted with Chemistry 3202)

When Offered: July

Classes: 4.5 lec & 7.5 hrprac/average wk

Assessment: 45min exam per module andprac 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 the July Semester is given below*. Each student must take 9 modules. The common module Chemistry Laboratory Practices is compulsory for all Chemistry 3102 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 module

Chemistry Laboratory Practices

Inorganic chemistry modules

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
 Modern methods of organic synthesis
 Heterocyclic chemistry 2
 Advanced NMR spectroscopy
 Bioorganic chemistry 2: the chemistry of DNA and carbohydrates
 Supramolecular chemistry
 Photochemical and thermal organic reactions
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

*This is the list of modules that were offered in the July Semester in 1997. There may be some interchange of modules between Chemistry 3101 and Chemistry 3102 in 1998. As well, some modules may not be offered.

Practical Work:

As for Chemistry 3101, but the last seven week compromise a workshop in one of the divisions.

Textbooks:

See the Senior Chemistry handbook available from the School of Chemistry

CHEM 3901 Chemistry 3A (Advanced)

12 credit points

Prerequisite: *Qual Distinction average in Chemistry 2001 or 2101 or 2201 or 2301 or 2901 and in Chemistry 2202 or 2302 or 2902; by invitation*

Additional information: *May not be counted with Chemistry 3101 (but may be counted with Chemistry 3201) The number of places in this unit of study 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*

When Offered: *February*

Classes: *5 lec & 8hrprac/wk*

Assessment: *As for Chemistry 3101, 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*

Lectures

The requirements for Chemistry 3901 are identical with those for Chemistry 3101, 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.

Advanced modules offered in February semester 1997 were:

'Does Australia need a replacement for the HIFAR reactor at Lucas Heights?'

'Can Chemistry conquer the AIDS virus?'

Practical Work:

As for Chemistry 3101

Textbooks:

See the Senior Chemistry handbook available from the School of Chemistry

CHEM 3902 Chemistry 3B (Advanced)

12 credit points

Prerequisite: *Qual Distinction or better in Chemistry 3901; by invitation*

Additional information: *May not be counted with Chemistry 3102 The number of places in this unit of study is limited and entry is by invitation. Students in the Faculty of Science Talented Student Program are automatically eligible*

When Offered: *July*

Classes: *5.5 lec & 7.5hrprac/wk*

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.*

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.

Advanced modules offered in second semester 1997 were:

'An investigation of a consumer product to determine how it is made from its raw materials.'

'What effect does a decrease in the atmospheric ozone have on UV radiation at the Earth's surface, and what are the possible biological consequences?'

Practical Work:

As for Chemistry 3102

Textbooks:

See the Senior Chemistry handbook available from the School of Chemistry

CHEM 3201 Chemistry 3A Additional

12 credit points

Prerequisite: *Qual Chemistry 2202 or 2302 or 2902 Prereq or Coreq Chemistry 3101 or 3901*

When Offered: *February*

Classes: *4 lec & 8hrprac/wk*

Assessment: *45min exam per module andprac assessment*

Students taking this unit of study must be concurrently enrolled in or have previously completed either Chemistry 3101 or Chemistry 3901. The modules will be chosen from the modules listed for Chemistry 3101 and the same selection rules as applicable to Chemistry 3101 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 3101 or 3102.

Practical Work:

As for Chemistry 3101

Textbooks:

See the Senior Chemistry handbook available from the School of Chemistry

CHEM 3202 Chemistry 3B Additional

12 credit points

Prerequisite: Qual Chemistry 2202 or 2302 or 2902

Prereq or Coreq Chemistry 3102 or 3902

When Offered: July

Classes: 4 lec & 8hrprac/wk

Assessment: 45min exam per module andprac assessment

Students taking this unit of study must be concurrently enrolled in or have previously completed either Chemistry 3102 or Chemistry 3902. The modules will be chosen from the modules listed for Chemistry 3102 and the same selection rules as applicable to Chemistry 3102 will apply to the selection of the additional 8 modules. Students cannot take modules already counted towards Chemistry 3101 or 3102.

Practical Work:

As for Chemistry 3101, but the last seven weeks comprise a workshop in one of the Divisions

Textbooks:

See the Senior Chemistry handbook available from the School of Chemistry

CHEM 4001 Inorganic Chemistry Honours

48 credit points

When Offered: February

Students of sufficient merit may be admitted to Honours in Inorganic Chemistry. They are required to:

- carry out research work under the direction of a supervisor;
- submit a report in the form of a thesis on this work;
- attend such lectures, colloquia, etc., as directed; and
- 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 from whom information about higher degree requirements can also be obtained.

CHEM 4002 Organic Chemistry Honours

48 credit points

When Offered: February

Students of sufficient merit may be admitted to Honours in Organic Chemistry. They are required to:

- carry out research work under the direction of a supervisor;
- submit a report in the form of a thesis on this work;
- attend such lectures, colloquia, etc., as directed; and
- 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 from whom information about higher degree requirements can also be obtained.

CHEM 4003 Physical Chemistry Honours

48 credit points

When Offered: February

Students of sufficient merit may be admitted to Honours in Physical Chemistry. They are required to:

- carry out research work under the direction of a supervisor;
- submit a report in the form of a thesis on this work;
- attend such lectures, colloquia, etc., as directed; and
- 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 from whom information about higher degree requirements can also be obtained.

CHEM 4004 Theoretical Chemistry Honours

48 credit points

When Offered: February

Students of sufficient merit may be admitted to Honours in Theoretical Chemistry. They are required to:

- carry out research work under the direction of a supervisor;
- submit a report in the form of a thesis on this work;
- attend such lectures, colloquia, etc., as directed; and
- 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 from whom information about higher degree requirements can also be obtained.

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 unit of study. Students who complete 16 credit points of Intermediate units of study (unit of study numbers starting with the digit '2') and 24 credit points of Senior units of study (unit of study numbers starting with the digit '3'), including among them a 'project unit of study' (unit of study 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 units of study.

The units of study 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 units of study, 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 Units of Study

COMP 1000 Information Technology Tools

6 credit points

When Offered: February & July

Classes: 1 lec, 1 tut & 4prac/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 this unit of study will be the application of critical thinking to the problems of fool 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 credentials in Computer Science should enrol in COMP 1001 in their first semester, and in COMP 1002 in their second semester. If they wish they may also enrol in COMP 1000.

COMP 1001 Introductory Programming

6 credit points

Prerequisite: Akn HSC 3-unit Mathematics

Additional information: May not be counted with Computer Science 1901

Students intending to major in Computer Science are advised to enrol in Mathematics 1703 or 1704 or 1793 or 1794 in their first year

When Offered: February and July

Classes: 3 lec, 1 tut & 2 prac/wk

Assessment: Assessment assignments, written exam, prac exam

This unit of study 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 1901 Introductory Programming (Advanced)

6 credit points

Prerequisite: Akn HSC 3-unit Mathematics (Requires permission by the Head of Department)

Additional information: May not be counted with Computer Science 1001

When Offered: February and July

Classes: 3 lec, 1 tut & 2 prac/wk

Assessment: Assessment assignments, written exam, prac exam

This unit of study is the advanced alternative to Computer Science 1001. 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 1002 Introductory Computer Science

6 credit points

Prerequisite: Computer Science 1001 or 1901

Additional information: May not be counted with Computer Science 1902

When Offered: July

Classes: 3 lec, 1 tut & 2 prac/wk

Assessment: Assessment assignments, written exam, prac exam

This unit of study is a continuation of Computer Science 1001. Advanced features of the programming language Blue 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 1902 Introductory Computer Science (Advanced)

6 credit points

Prerequisite: Distinction in Computer Science 1901 or 1001

Additional information: May not be counted with Computer Science 1002

When Offered: July

Classes: 3 lec, 1 tut & 2 prac/wk

Assessment: Assessment assignments, written exam, prac exam

This unit of study is the advanced alternative to Computer Science 1002. 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 Units of Study

COMP 2001 Computer Systems

4 credit points

Prerequisite: Qual Computer Science 1002 or 1902

Additional information: May not be counted with Computer Science 2901

See prerequisites for Senior Computer Science units of study. Consult Departmental Handbook

When Offered: February

Classes: 2 lec, 2 prac/wk

Assessment: Assessment assignments, written exam

An overview of the aspects of computer hardware that are important for understanding the function and performance of software. The unit of study 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. Performance estimation is a unifying theme. Throughout the unit of study, we emphasise generic skills such as report writing and transfer of concepts to new situations.

COMP 2901 Computer Systems (Advanced)

4 credit points

Prerequisite: Qual Distinction in Computer Science 1902 or 1002

Additional information: May not be counted with Computer Science 2001

When Offered: February

Classes: 2 lec, 2 prac/wk

Assessment: Assessment assignments, written exam

This unit of study is the advanced alternative to Computer Science 2001. Topics in Computer Systems are covered at an advanced and more challenging level.

COMP 2002 Design and Data Structures

4 credit points

Prerequisite: Qual Computer Science 1002 or 1902

Additional information: May not be counted with Computer Science 2902

See prerequisites for Senior Computer Science units of study. Consult Departmental Handbook

When Offered: February

Classes: 2 lec & 1 tut/wk

Assessment: 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 unit of study 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.

CO MP 2902 Design and Data Structures (Advanced) 4 credit points

Prerequisite: *Qual Distinction in Computer Science 1902 or 1002*
Additional information: *May not be counted with Computer Science 2002*
When Offered: *February*
Classes: *2 lec & 1 tut/wk*
Assessment: *Assessment assignments, written exam*

This unit of study is the advanced alternative to Computer Science 2002. Topics in Data Structures are covered at an advanced and more challenging level.

COMP 2003 Languages and Logic 4 credit points

Prerequisite: *Qual Computer Science 1002 or 1902*
Prereq Computer Science 2002 or 2902 and Mathematics 1703 or 1704 or 1793 or 1794
Additional information: *May not be counted with Computer Science 2903*
See prerequisites for Senior Computer Science units of study. Consult Departmental Handbook
When Offered: *July*
Classes: *2 lec & 1 tut/wk*
Assessment: *Assessment assignments, written exam*

All communication requires a language. People communicate with each other in a natural language such as English; they communicate with computers in a formal language such as Pascal. This unit of study looks at two important kinds of formal languages (called regular and context-free), and the algorithms, or automata, that are used to recognise them. On the theoretical side, several ways to represent languages are presented, and their capabilities and limitations discovered; on the practical side, sound and indeed foolproof methods are derived for writing programs to recognise formal languages such as 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 2903 Languages and Logic (Advanced) 4 credit points

Prerequisite: *Qual Distinction in Computer Science 1902 or 1002*
Prereq Computer Science 2902 or 2002 (with sufficient merit) and Mathematics 1703 or 1704 or 1793 or 1794
Additional information: *May not be counted with Computer Science 2003*
When Offered: *July*
Classes: *2 lec & 1 tut/wk*
Assessment: *Assessment assignments, written exam*

This unit of study is the advanced alternative to Computer Science 2003. Topics in Languages and Logic are covered at an advanced and more challenging level.

COMP 2004 Programming Practice 4 credit points

Prerequisite: *Qual Computer Science 1002 or 1902*
Prereq Computer Science 2002 or 2902
Additional information: *May not be counted with Computer Science 2904*
See prerequisites for Senior Computer Science units of study. Consult Departmental Handbook
When Offered: *My*
Classes: *2 lec & 1 tut/wk*
Assessment: *Assessment assignments, written exam*

In this unit of study 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 unit of study 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 2904 Programming Practice (Advanced) 4 credit points

Prerequisite: *Qual Distinction in Computer Science 1902 or 1002*
Prereq Computer Science 2902 or 2002 (with sufficient merit)
When Offered: *July*
Classes: *2 lec & 1 tut/wk*
Assessment: *Assessment assignments, written exam*

This unit of study is the advanced alternative to Computer Science 2004. Topics in Programming Practice are covered at an advanced and more challenging level.

Senior Computer Science Units of Study

Students are advised that doing less than 6 Senior units of study 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 3001 Algorithms 4 credit points

Prerequisite: *Qual Computer Science 2002 or 2902*
Prereq Mathematics 1703 or 1704 or 1793 or 1794 and 8 credit points in Intermediate Mathematics and/or Statistics and/or Econometrics
Additional information: *May not be counted with Computer Science 3901*
When Offered: *February*
Classes: *2 lec & 1 tut/wk*
Assessment: *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 unit of study 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 3901 Algorithms (Advanced)

4 credit points

Prerequisite: *Qual Computer Science 2002 or 2902*

Prereq 16 credit points of Intermediate or Senior Computer Science with Distinction average and Mathematics 1703 or 1704 or 1793 or 1794 and 8 credit points of Intermediate Mathematics and/or Statistics and/or Econometrics

Additional information: *May not be counted with Computer Science 3001*

When Offered: *February*

Classes: *2 lec & 1 tut/wk*

Assessment: *Written and programming assignments; written exam*

An advanced alternative to Computer Science 3001; covers material at an advanced and challenging level.

COMP 3002 Artificial Intelligence

4 credit points

Prerequisite: *Qual Computer Science 2004 or 2904*

Prereq Computer Science 2002 or 2902 and 2003 or 2903 and 8 credit points in Intermediate Mathematics and/or Statistics and/or Econometrics

Additional information: *May not be counted with Computer Science 3902*

When Offered: *February*

Classes: *2 lec & 1 tut/wk*

Assessment: *Assessment assignments, written exam*

Artificial Intelligence is all about programming computers to perform tasks normally associated with intelligent behaviour. Classical AI programs have played games, proved theorems, discovered patterns in data, planned complex assembly sequences and so on. Most of these activities depend on general or 'weak' methods, primarily search. AI also addresses issues related to the representation and use of the knowledge of human experts. This unit of study will explore topics from selected areas of AI. Students who complete it will have an understanding of some of the fundamental methods and algorithms of AI, and an appreciation of how they can be applied to interesting problems. The unit of study will involve a practical component in which some simple problems are solved using standard AI techniques.

COMP 3902 Artificial Intelligence (Advanced)

4 credit points

Prerequisite: *Qual Computer Science 2002, or 2902*

Prereq 16 credit points of Intermediate or Senior Computer Science with Distinction average and 8 credit points of Intermediate Mathematics and/or Statistics and/or Econometrics

Additional information: *May not be counted with Computer Science 3002*

When Offered: *February*

Classes: *2 lec & 1 tut/wk*

Assessment: *Written and programming assignments; written exam*

An advanced alternative to Computer Science 3002; covers material at an advanced and challenging level.

COMP 3003 Computer Architecture

4 credit points

Prerequisite: *Qual Computer Science 2001 or 2901*

Prereq Computer Science 2002 or 2902 and 2003 or 2903

Additional information: *May not be counted with Computer Science 3903*

When Offered: *July*

Classes: *2 lec, 1 tut & 2prac/wk*

Assessment: *Assessment assignments, written exam*

In this unit of study we design and build simple computers. A major focus of the unit of study 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 3903 Computer Architecture (Advanced)

4 credit points

Prerequisite: *Qual Computer Science 2001 or 2901*

Prereq 16 credit points of Intermediate or Senior Computer Science with Distinction average and Computer Science 2002 or 2902 and 2003 or 2903

Additional information: *May not be counted with Computer Science 3003*

When Offered: *July*

Classes: *2 lec, 1 tut & prac/wk*

Assessment: *Written and programming assignments; written exam*

An advanced alternative to Computer Science 3003; covers material at an advanced and challenging level.

COMP 3004 Computer Graphics

4 credit points

Prerequisite: *Qual Computer Science 2004 or 2904*

Prereq Computer Science 2002 or 2902 and Mathematics 1701 or 1791 and 8 credit points in Intermediate Mathematics and/or Statistics and/or Econometrics

Additional information: *May not be counted with Computer Science 3904*

When Offered: *July*

Classes: *2 lec & 1 tut/wk*

Assessment: *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 unit of study 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 3904 Computer Graphics (Advanced)

4 credit points

Prerequisite: *Qual Computer Science 2004 or 2904*

Prereq 16 credit points of Intermediate or Senior Computer Science with Distinction average and Computer Science 2002 or 2902 and Mathematics 1701 or 1791 and 8 credit points of Intermediate Mathematics and/or Statistics and/or Econometrics

Additional information: *May not be counted with Computer Science 3004*

When Offered: *July*

Classes: *2 lec & 1 tut/wk*

Assessment: *Written and programming assignments; written exam*

An advanced alternative to Computer Science 3004; covers material at an advanced and challenging level.

CO MP 3005 Database Systems

4 credit points

Prerequisite: Qual Computer Science 2002 or 2902

Additional information: May not be counted with Computer Science 3905

When Offered: July

Classes: 2 lec & 1 tut/wk

Assessment: 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 unit of study 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 unit of study. The other half of the unit of study will concentrate on datamodeling. Object-Oriented Database Management Systems, considered by many as the next generation DBMSs, will also be presented at the end of this unit of study.

CO MP 3905 Database Systems (Advanced)

4 credit points

Prerequisite: Qual Computer Science 2002 or 2902

Prereq 16 credit points of Intermediate or Senior Computer Science with Distinction average

Additional information: May not be counted with Computer Science 3005

When Offered: July

Classes: 2 lec & 1 tut/wk

Assessment: Written and programming assignments; written exam

An advanced alternative to Computer Science 3005; covers material at an advanced and challenging level.

COMP 3006 Logic Programming

4 credit points

Prerequisite: Qual Computer Science 2003 or 2903

Prereq Computer Science 2002 or 2902 and 8 credit points in Intermediate Mathematics and/or Statistics and/or Econometrics

Additional information: May not be counted with Computer Science 3906

When Offered: February

Classes: 2 lec & 1 tut/wk

Assessment: 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 unit of study, 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 3906 Logic Programming (Advanced)

4 credit points

Prerequisite: Qual Computer Science 2003 or 2903

Prereq 16 credit points of Intermediate or Senior Computer Science

with Distinction average and Computer Science 2002 or 2902 and 8 credit points of Intermediate Mathematics and/or Statistics and/or Econometrics

Additional information: May not be counted with Computer Science 3006

When Offered: February

Classes: 2 lect & 1 tut/wk

Assessment: Written and programming assignments; written exam

An advanced alternative to Computer Science 3006; covers material at an advanced and challenging level.

COMP 3007 Networked Systems

4 credit points

Prerequisite: Qual Computer Science 2004 or 2904

Prereq Computer Science 2001 or 2901 and 2002 or 2902

Additional information: May not be counted with Computer Science 3907

When Offered: February

Classes: 2 lec & 2 prac/wk

Assessment: Assessment assignments, written exam

This unit of study deals with various aspects of communications and distribution systems. 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 unit of study 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). Emphasis, however, is placed on the Internet and TCP/IP protocol suite. Students are expected to be able to write distributed applications based on the client/server model using Remote Procedure Call (RPC).

Practical Work:

The practical aspects of the unit of study are centred around a specially designed network laboratory. Experiments aim to provide hands-on experiences on many essential, but difficult aspects of networking. The unit of study offers a wide range of experiments, from the network physical layer (RS-232), managing Microsoft Windows Networks, basic Unix administration to programming with sockets, remote procedure calls, to writing client/server application, Simple Mail Transfer Protocol (SMTP) application.

COMP 3907 Networked Systems (Advanced)

4 credit points

Prerequisite: Qual Computer Science 2004 or 2904

Prereq 16 credit points of Intermediate or Senior Computer Science with Distinction average and Computer Science 2001 or 2901 and 2002 or 2902

Additional information: May not be counted with Computer Science 3007

When Offered: February

Classes: 2 lec & 2prac/wk

Assessment: Written and programming assignments; written exam

An advanced alternative to Computer Science 3007; covers material at an advanced and challenging level.

COMP 3008 Object-Oriented Systems

4 credit points

Prerequisite: Qual Computer Science 2004 or 2904

Prereq Computer Science 2002 or 2902

Additional information: May not be counted with Computer Science 3908

When Offered: February

Classes: 2 lec & 1 tut/wk

Assessment: Assessment assignments, written exam

Object-Orientation has recently become very popular in industry as a framework for organising software development. When done well, Object-Orientation can improve programmer productivity by a factor of 5 or more. This unit of study 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 3908 Object-Oriented Systems (Advanced)

4 credit points

Prerequisite: Qual Computer Science 2004 or 2904

Prereq 16 credit points of Intermediate or Senior Computer Science with Distinction average and Computer Science 2002 or 2902

Additional information: May not be counted with Computer Science 3008

When Offered: February

Classes: 2 lec & 1 tut/wk

Assessment: Written and programming assignments; written exam

An advanced alternative to Computer Science 3008; covers material at an advanced and challenging level.

COMP 3009 Operating Systems

4 credit points

Prerequisite: Qual Computer Science 2004 or 2904

Prereq Computer Science 2001 or 2901 and 2002 or 2902

Additional information: May not be counted with Computer Science 3909

When Offered: February

Classes: 2 lec & 1 tut/wk

Assessment: Assessment assignments, written exam

This unit of study provides an introduction to the design and construction of modern operating systems. The emphasis of the unit of study is design and the identification of high-level abstractions. However, the unit of study 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 unit of study 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 3909 Operating Systems (Advanced)

4 credit points

Prerequisite: Qual Computer Science 2004 or 2904

Prereq 16 credit points of Intermediate or Senior Computer Science with Distinction average and Computer Science 2001 or 2901 and 2002 or 2902

Additional information: May not be counted with Computer Science 3009

When Offered: February

Classes: 2 lec & 1 tut/wk

Assessment: Written and programming assignments; written exam

An advanced alternative to Computer Science 3009; covers material at an advanced and challenging level.

COMP 3100 Software Engineering

4 credit points

Prerequisite: Qual Computer Science 2002 or 2902

Prereq Computer Science 2004 or 2904

Additional information: May not be counted with Computer Science 3800

When Offered: February

Classes: 2 lec & 1 tut/wk

Assessment: Assessment assignments, written exam

Software Engineering is designed to equip 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 this unit of study 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 3800 Software Engineering (Advanced)

4 credit points

Prerequisite: Qual Computer Science 2002 or 2902

Prereq 16 credit points of Intermediate or Senior Computer Science with Distinction average and Computer Science 2004 or 2904

Additional information: May not be counted with Computer Science 3100

When Offered: February

Classes: 2 lec & 1 tut/wk

Assessment: Written and programming assignments; written exam

An advanced alternative to Computer Science 3100; covers material at an advanced and challenging level.

COMP 3101 Theory of Computation

4 credit points

Prerequisite: Qual Computer Science 2003 or 2903

Prereq 8 credit points in Intermediate Mathematics and/or Statistics and/or Econometrics

Additional information: May not be counted with Computer Science 3801

When Offered: July

Classes: 2 lec & 1 tut/wk

Assessment: 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 unit of study 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.

COMP 3801 Theory of Computation (Advanced)

4 credit points

Prerequisite: Qual Computer Science 2003 or 2903

Prereq 16 credit points of Intermediate or Senior Computer Science

with Distinction average and 8 credit points of Intermediate Mathematics and/or Statistics and/or Econometrics

Additional information: May not be counted with Computer Science 3101

When Offered: July

Classes: 2 lec & 1 tut/wk

Assessment: Written and programming assignments; written exam

An advanced alternative to Computer Science 3101; covers material at an advanced and challenging level.

COMP 3102 User Interfaces Design and Programming

4 credit points

Prerequisite: Qual Computer Science 2004 or 2904

Prereq Computer Science 2002 or 2902 and 2003 or 2903

Additional information: May not be counted with Computer Science 3802

When Offered: July

Classes: 2 lec & 1 tut/wk

Assessment: Assessment assignments, written exam

This unit of study 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 unit of study 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 3802 User Interfaces (Advanced)

4 credit points

Prerequisite: Qual Computer Science 2004 or 2904

Prereq 16 credit points of Intermediate or Senior Computer Science with Distinction average and Computer Science 2002 or 2902 and 2003 or 2903

Additional information: May not be counted with Computer Science 3102

When Offered: July

Classes: 2 lec & 1 tut/wk

Assessment: Written and programming assignments; written exam

An advanced alternative to Computer Science 3102; covers material at an advanced and challenging level.

COMP 3201 Algorithmic Systems Project

4 credit points

Prerequisite: Computer Science 3001

Additional information: Students intending to major in Computer Science are advised to enrol in one of Computer Science 3201, 3202, 3203, 3204 or 3205

When Offered: February and July

Classes: supervised project

Assessment: 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 unit of study 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 3202 Computer Systems Project

4 credit points

Prerequisite: Computer Science 3009

Additional information: Students intending to major in Computer Science are advised to enrol in one of Computer Science 3201, 3202, 3203, 3204 or 3205

When Offered: February and July

Classes: supervised project

Assessment: 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 3203 Intelligence Systems Project

4 credit points

Prerequisite: Computer Science 3002

Additional information: Students intending to major in Computer Science are advised to enrol in one of Computer Science 3201, 3202, 3203, 3204 or 3205

When Offered: February and July

Classes: supervised project

Assessment: 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 3204 Large-Scale Software Project

4 credit points

Prerequisite: Computer Science 3100

Additional information: Students intending to major in Computer Science are advised to enrol in one of Computer Science 3201, 3202, 3203, 3204 or 3205

When Offered: February and July

Classes: supervised project

Assessment: 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 unit of study 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 3205 Product Development Project

4 credit points

Prerequisite: *Computer Science 3008*

Additional information: *Students intending to major in Computer Science are advised to enrol in one of Computer Science 3201, 3202, 3203, 3204 or 3205*

When Offered: *February and July*

Classes: *supervised project*

Assessment: *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 unit of study 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 3206 Bioinformatics Project

4 credit points

Prerequisite: *Qual Computer Science 2004 or 2904*

Prereq 8 credit points of Senior Computer Science (including Computer Science 3008/3100/3908/3800) and 16 credit points of Intermediate Biology, Biochemistry and/or Pharmacology

When Offered: *July*

Classes: *weekly meeting with supervisor plus project work; 3-4 introductory lectures*

Assessment: *Quality of software and documentation produced; quality of process; student's written evaluation of outcome*

Students work in groups to design and develop software that will be useful to practitioners in biosciences.

COMP 3809 Software Project (Advanced)

4 credit points

Prerequisite: *16 credit points of Intermediate or Senior Computer Science, with Distinction average*

Corequisite: *8 credit points of Senior Computer Science*

When Offered: *February and July*

Classes: *30 mins/week meeting with project supervisor; 3-4 introductory talks; private work on the project*

Assessment: *Based on quality of the software and documentation produced, and the process by which it is produced, and the student's written reflections on the outcome.*

This unit of study involves students in producing innovative software to support activity in a research or advanced development project, either within the university or in industry.

COMP 4001 Computer Science Honours

48 credit points

Prerequisite: *Permission by the Faculty is required.*

Assessment: *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.

Department of Geography

Geography is a varied and versatile area of study covering a broad spectrum of knowledge. It was once concerned principally with the description of the earth, 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 units of study 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.

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 units of study, assignments contribute significantly to final marks.

Conducted field excursions

Students in Junior units of study are required to attend two one-day excursions to localities within about 150km of Sydney. In Intermediate and Senior units of study, 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, units of study, excursions, and other relevant material are contained in the Geography Handbook available from the Enquiry Office (room N421) in the Institute Building.

Note: Some units of study may be rescheduled to allow for expected staff changes.

Junior Geography Units of Study

Geography offers two Junior units of study: Geography 1001 in the February Semester and Geography 1002 in the July Semester. Both units of study consist of three lectures and three hours of laboratory work a week. Morning lectures are repeated in the afternoon. All students do the same unit of study.

GEOG 1001 Physical Geography

6 credit points

Teacher/Coordinator: Assoc. Prof. Short, Dr Gale

When Offered: February

Classes: 3 lec & 3hrprac/wk

Assessment: One 3hr exam, 1500w report, prac assignments

This unit of study is an introduction to the earth's physical environment. The unit of study 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 unit of study 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 and glacial systems.

Practical Work:

Field excursion one half day/sem

GEOG 1002 Environmental and Human Geography

6 credit points

Teacher/Coordinator: Assoc. Prof. Connell, Prof. E. Waddell

When Offered: July

Classes: 3 lec & 3hrprac/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 Units of Study

The Department offers six Intermediate units of study in 3 streams — namely geomorphology, environmental geography and human geography. The streams and their units of study are:

Geomorphology Geography 2001 and 2002

Environmental Geography 2101 and 2102

Human Geography 2201 and 2202

Each unit of study 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 unit of study which are held within the semester. Some units of study hold two to three such excursions.

Students who have completed the Junior Geography and Junior Environmental Science prerequisites may elect to do units of study in one or two of these streams.

To complete Intermediate Geography, a student must select two Intermediate Geography units of study. Each unit of study is 8 credit points. A student would normally select two sequential units of study from one of the three streams (Geomorphology, Environmental, Human). However, students may vary the sequence of units of study between streams and options within units of study with the permission of the Head of Department. Not all units of study may be offered in any given year.

Special Geography Sequence (Science students)

A candidate who has completed 12 Junior credit points of Mathematics and 12 Junior credit points of Physics or Chemistry and who has not taken Geography 1001 or 1002 may apply under Section 1(4) for permission to enrol in any Intermediate Geography unit of study.

The Department of Geography is not normally prepared to support applications under Section 1(4) to enrol in Intermediate Geography units of study from persons other than those who, in their first year of studies, have completed four Junior units of study above the concessional pass grade and have not subsequently failed in any Intermediate unit of study. Students are permitted to count only 16 credit points of Intermediate Geography units of study towards the BSc degree.

GEOG 2001 Megascale Physical Environments

8 credit points

Teacher/Coordinator: Coordinator Dr Cowell, Mr G Doyle

Prerequisite: Geography 1001 or Environmental Science 1002

Additional information: A candidate who has completed 12 Junior credit points of Mathematics and 12 Junior credit points of Physics or Chemistry and who has not taken Geography 1001 or 1002 may apply under Section 1(4) for permission to enrol in any Intermediate Geography unit of study.

The Department of Geography is not normally prepared to support applications under Section 1(4) to enrol in Intermediate Geography units of study from persons other than those who, in their first year of studies, have completed four Junior units of study above the concessional pass grade and have not subsequently failed in any Intermediate unit of study.

When Offered: February

Classes: 3 lec or 2 prac or field/wk

Assessment: One 3hr exam or 1500w essay or prac papers

Physical Geography stream

This unit of study is concerned with the geomorphology of global environments, as mega-landforms and the processes that shape them. The major focus is on continental-scale landforms and the long term processes which shape the physical platform which is the home, workplace and exploitation surface of humankind.

GEOG 2002 Geomorphology of Fluvial and Coastal Environments

8 credit points

Teacher/Coordinator: Coordinator Dr Dragovich, Lecturer to be determined

Prerequisite: Geography 1001 or Environmental Science 1002

Additional information: As for Geography 2001

When Offered: July

Classes: 3 lec or 2 prac orfield/wk

Assessment: One 3hr exam, 1500w essay or prac reports

Physical Geography stream

This unit of study focuses not on global, but meso- and micro-scales on two of the major morphostratigraphic systems, namely fluvial and coastal geomorphology. Both provide introductory analyses of rivers and coasts, so fundamental to understanding the physical environments which affect the sustainability of these regions.

GEOG 2101 Environmental Change and Human Response

8 credit points

Teacher/Coordinator: Dr Chapman, Dr Dragovich

Prerequisite: Geography 1001 or 1002 or Environmental Science 1002

Additional information: As for Geography 2001

When Offered: February

Classes: 3 lec & 2 prac &field/wk

Assessment: One 3hr exam, 1500w essay or prac reports

Environmental Geography stream

This unit of study considers in even greater detail geomorphological, biophysical and undulated environmental problems. Part of the unit of study 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 2102 Environmental Management

8 credit points

Teacher/Coordinator: DrHirsch, DrDavey

Prerequisite: Geography 1001 or 1002 or Environmental Science 1002

Additional information: As for Geography 2001

When Offered: July

Classes: 3 lec & 5hr tut or prac orfieldwork/wk

Assessment: One 3hr exam, 2000w essay, tut papers, prac and fieldwork report/s

Environmental Geography stream

This unit of study forms part of the Environmental Geography and Resource Management stream which is designed to evaluate human interaction with the biophysical environment and use of the earth's surface and its resources. Emphasis is upon human impacts on environments through social, economic and political processes and through deliberate decision making and management. Policy responses are considered at a range of scales. The unit of study examines the nature and characteristics of selected resource processes with reference to Australian (and, as appropriate, other national and international) contexts, and, on a more global and regional scale, focuses on the changing relationship between people and environments in tropical Asia and the Pacific.

GEOG 2201 Social and Cultural Geography

8 credit points

Teacher/Coordinator: Coordinator Assoc Prof Connell, Lecturer to be determined

Prerequisite: Geography 1002 or Environmental Science 1002

Additional information: As for Geography 2001

When Offered: February

Classes: 3 lec & 5hr tut or prac orfieldwork/wk

Assessment: One 3hr exam, 2000w essay, tut papers, prac and fieldwork reports

Human Geography stream

This unit of study has two components. The first deals with the significant role that society and culture play in influencing spatial structures. The unit of study 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 2202 Geography of Restructuring

8 credit points

Teacher/Coordinator: Lecturers to be determined

Prerequisite: Geography 1002 or Environmental Science 1002

Additional information: As for Geography 2001

When Offered: July

Classes: 3 lec & 5hr tut or prac orfieldwork/wk

Assessment: One 3hr exam, 2000w essay, tut papers, prac and fieldwork reports

Human Geography stream

This unit of study starts by examining urban processes and problems in developed and developing countries. For developed countries, the focus is on urban economies, suburbs, urban politics and the nature of the built environment. For developing countries, urbanisation trends and ideology of planning policies are considered, including governments' perception of and response to the informal sector, slums and rural-urban migration. The unit of study 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 unit of study discusses the major alternative theories in economic geography and their implications for policy and politics.

Senior Geography Units of Study

The Department offers seven Senior units of study in 3 streams — namely geomorphology, environmental geography and human geography. The streams and their units of study are:

Geomorphology Geography 3001 and 3002

Environmental Geography 3101 and 3102

Human Geography 3201 and 3202

Each unit of study consists of three lectures and the equivalent of nine hours assigned work (which may consist of tutorials, practicals, individual course work and/or field work) per week. All students are required to attend compulsory one to three day field excursions associated with each unit of study which are held within the semester. Some units of study hold two to three such excursions.

Students who have completed the Intermediate Geography prerequisites may elect to do units of study in one or two of these streams.

To complete Senior Geography, a student must select two units of study. Each unit of study is 12 credit points. A student would normally select two sequential units of study from one of the three streams (Geomorphology, Environmental and Human). However, students may vary the sequence of units of study between streams and options within units of study with the permission of the Head of Department. Not all units of study may be offered in any given year.

Geography Senior Unit of Study Combinations

(48 credit points)

Students may elect to do four Senior units of study (12 credit points each) in the one year, giving a total of 48 credit points. Such students will be required to enrol in two of the Senior Geography Streams, Geomorphology, Environmental or Human. Those who have passed at least two of the Senior Geography units of study at Honours level may proceed to an appropriate unit of study in Geography Honours. Those choosing physical topics must have majored in the Geomorphology stream units of study; they may elect to do either Geography or Geomorphology Honours.

Advanced Geomorphology Stream ■ Introduction

These units of study 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 3001 Coastal Environments and Dynamics

12 credit points

Teacher/Coordinator: Assoc. Prof. Short, Dr Cowell

Prerequisite: Geography 2001 or 2002 or 2101 or Marine Science 2001

When Offered: February

Classes: 3 lec & 6hrprac orfield/wk

Assessment: One 3hr exam, two 1500w essays, prac reports

Advanced Geomorphology stream

This unit of study 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, shoreface and estuaries. The field excursions are closely linked to the unit of study and practical work.

Practical Work:

Field excursion one 1-day, two 3-day

GEOG 3002 Environmental Geomorphology

12 credit points

Teacher/Coordinator: Coordinator Dr Dragovich, Lecturer to be determined

Prerequisite: Geography 2001 or 2002 or 2101

When Offered: July

Classes: 3 lec & 6prac orfield/wk

Assessment: One 3hr exam, two 1500w essays, prac and field reports

Advanced Geomorphology stream

This unit of study considers in even greater detail geomorphological, biophysical and related environmental problems. Part of the unit of study 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.

GEOG 3101 Fluvial Environments

12 credit points

Teacher/Coordinator: Assoc. Prof. Warner, Dr Gale

Prerequisite: Geography 2001 or 2002 or 2101

When Offered: February

Classes: 3 lec & 1 tut & 8 prac orfield/wk

Assessment: One 3hr exam, two 1500w essays

Advanced Environmental Geomorphology stream

This unit of study 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 3102 Coastal Environmental Management and GIS

12 credit points

Teacher/Coordinator: Dr Chapman, Dr Cowell

Prerequisite: Geography 2001 or 2002 or 2101 or Marine Science 2001

When Offered: July

Classes: 3 lec & 6prac orfield/wk

Assessment: One 3hr exam, two 1500w essay, prac or reports

Advanced Environmental Geomorphology stream

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 this unit of study will be determined by these concerns, with the application to the coastal zone providing the central unifying theme. The unit of study first addresses critical physical systems and natural hazards in the coastal zone, and the ways in which decisions are made about resources management. The unit of study 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.

Practical Work:

Field excursion one 2-day

GEOG 3201 Socio-Economic Development in the Asia-Pacific Rim

12 credit points

Teacher/Coordinator: Assoc. Prof. Connell, DrHirsch

Prerequisite: Geography 2102 or 2201 or 2202

When Offered: February

Classes: 3 lec & 9hr tut or prac orfieldwork/wk

Assessment: One 3 hr exam, two 2000w essays, tut papers, prac and fieldwork reports

Advanced Social and Economic Geography stream

This unit of study 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 unit of study. The unit of study builds on key human geographic principles from the sub-disciplines of economic, development, social and urban geography.

The unit of study contains three options. Two are taught sequentially within the semester by Assoc. Prof. Connell and Dr Hirsch. The third is a field study run by Dr Hirsch and held in South-East Asia before the commencement of the February Semester. Students who undertake the field option only take one of the other options within the semester.

GEOG 32Q2 Urban and Regional Change in Australasia

12 credit points

Teacher/Coordinator: Staff to be determined

Prerequisite: Geography 2102 or 2201 or 2202

When Offered: July

Classes: 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

Advanced Social and Economic Geography stream

This unit of study 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 unit of study 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.

GEOG 4001 Geography Honours

48 credit points

When Offered: February

Students contemplating Geography Honours will be invited to complete a preliminary registration form in the July Semester. Following the publication of the July semester Senior Geography unit of study results, those eligible students who have preregistered will be invited to formally enrol. They are required to consult the Head of 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 their first semester and to participate in seminars throughout the year as arranged. They will be required to study original problems, working as appropriate in the field, the laboratory, libraries, and in some instances in conjunction with other university or government departments. A dissertation of not more than 20 000 words must be submitted during the second semester, followed by an examination that may include both written and oral work.

GEOG 4101 Geomorphology Honours

48 credit points

When Offered: February

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 unit of study requirements are identical with those listed for Geography Honours.

Department of Geology and Geophysics

The Department offers units of study in geology and geophysics that provide the necessary qualifications for professional employment in these fields of earth science. Units of study 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 Fisher Library on Eastern Avenue. First year lectures and laboratories are held in the Carlaw Building.

Noticeboard

Information for Junior Geology students is posted on the noticeboard inside Carlaw 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 noticeboard 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 unit of study commences.

Structure of units of study

Entry into Junior units of study in Geology does not require any prior knowledge of the subject. The Junior units of study provide an introduction to the earth sciences. The Intermediate and Senior Geology units of study build on the preceding coursework to present a balanced and wide ranging coverage of the subject area. A degree of specialisation is built into the Senior units of study as they are designed especially for students majoring in geology and proposing to pursue a career in that profession.

Geophysics is a component of most of the units of study in Geology but it is also offered as autonomous Senior units of study.

Suitably qualified students may proceed to Honours units of study in either Geology or Geophysics

Textbooks

For details of prescribed textbooks, students should consult the pamphlets relating to various Departmental units of study. The pamphlets are available from the Enquiry Office in the Edgeworth David Building.

Examinations

These are held in June and November.

Junior Geology Units of Study

Students considering enrolling in these units of study should study the pamphlet entitled Junior Units of Study in Geology, which can be obtained from the Enquiry Office in the Edgeworth David Building. It gives details of content, text and reference books, staffing and other relevant matters.

GEOL 1001 Earth and Its Environment

6 credit points

Coordinator: Prof P Davies

Assumed Knowledge: No previous knowledge of Geology assumed

Additional information: See prerequisites for Intermediate Geology

When Offered: February

Classes: 3 lec & prac ortut/wk

Assessment: One 3hr exam, class and field work

The aim of this unit of study is to provide students with an understanding of how the Earth system works, its origin, plate tectonics, surface processes, evolution of life and geologic time. The crises in resources and fossil fuel and implications for our economy will be discussed and an assessment made of our own impact on the Earth together with the role of geologists in protecting and monitoring the environment. Students will learn techniques and types of observations used to decipher the history and evolution of the Earth, and dating sediments and rocks. Laboratory classes and a one day field trip in the Sydney region will involve exercises in observing and describing Earth materials and in interpreting Earth history from geological information, including fossils and maps.

GEOL 1002 Earth Processes and Resources

6 credit points

Coordinator: Dr Keene

Assumed Knowledge: No previous knowledge of Geology assumed

When Offered: July

Classes: 3 lec & prac ortut/wk

Assessment: One 3hr exam, class and fieldwork

The aim of this unit of study is to examine the chemical and physical processes involved in mineral formation, the interior of the Earth, volcanoes, and metamorphism. Lectures and laboratory sessions on mountain building processes and the formation of ore deposits will lead to an understanding of the driving forces in geology. Processes such as weathering, erosion and nature of sedimentary environments are related to the origin of the Australian landscape. In addition to laboratory classes there 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 on the Hunter Valley excursion.

Intermediate Geology Units of Study

Only part of geology can be learned from books and laboratory research, the rest has to be investigated in the field. Students enrolling in these units of study should obtain the pamphlet entitled Intermediate Units of Study in Geology, which can be obtained from the Enquiry Office in the Edgeworth David Building. It gives details of content, text and reference books, staffing and other relevant matters.

GEOL 2001 Plate Tectonics and Materials

8 credit points

Coordinator: Dr Klepeis

Prerequisite: Geology 1002 or Environmental Science 1001

Additional information: A candidate who has completed 24 credit points of Junior units of study in Physics and Chemistry and who has not taken Junior Geology or Environmental Science 1001, may apply under section 1 (4) for permission to enrol in Geology 2001

When Offered: February

Classes: 4 lec & 2prac ortut/wk

Assessment: Two 2hr theory, lab exam, class work, fieldwork

This unit of study introduces students to new practical techniques that provide a heightened understanding of the concepts introduced in the

Junior units of study in Geology. The unit of study will examine the geodynamic processes that control global plate tectonics, the analysis and interpretation of geological structures and the fundamental processes responsible for the origin and evolution of the main types of igneous and sedimentary rocks. Through the analysis of hand specimens and a theoretical practical introduction to the use of the polarising microscope, the unit will also provide an introduction to the methods of optical crystallography, optical mineralogy and mineral identification in common rocks. In addition to laboratory classes there will be a compulsory five day field trip to near Yass, where students will be instructed in methods of geological mapping and the identification of geological objects in the field. Students will be required to pay hostel accommodation for five nights.

GEOL 2002 Resource Exploration

4 credit points

Coordinator: Dr Birch

Prerequisite: Geology 2001

When Offered: July

Classes: 2 lec & 1 prac or tut/wk

Assessment: One 3hr exam, class work

Materials sourced from mining and fossil fuels are important to the Australian economy and essential parts of our everyday lives. Geological concepts developed in Geology 2001 are used as a basis to understand the basic physical, chemical and biological processes that formed metamorphic rocks, petroleum, coal and ore deposits in Australia. The unit of study also introduces students to geophysics and geophysical techniques used in resource exploration.

GEOL 2003 Fossils and Time

4 credit points

Coordinator: Dr Buick

Prerequisite: 24 credit points of Science units of study

When Offered: July

Classes: 2 lec & 1 prac ortut/wk

Assessment: One 3hr theory, class work

This palaeontology and stratigraphy unit of study is aimed at geoscientists, archaeologists, biologists, geographers, marine and environmental scientists who use fossils or stratigraphic data to determine ages, environments or evolutionary lineages. It provides an overview of fossil biodiversity, concentrating on invertebrate animals but also covering vertebrates, plants and microorganisms, with the emphasis on those groups that are most environmentally or stratigraphically useful. It also considers the main methods of stratigraphic correlation and age determination, concentrating on litho- and bio-stratigraphy but also covering the more modern techniques of chemo-, magneto- and sequence-stratigraphy as well as radiometric age dating.

GEOL 2004 Environmental Geology: Hazards

4 credit points

Coordinator: Dr Hughes

Prerequisite: 24 credit points of Science units of study

Additional information: See prerequisites for Senior Geology

When Offered: February

Classes: 3 lec/wk & fieldwork

Assessment: One 3hr exam, one field report

The Earth sciences provide the essential framework for understanding many of the natural and anthropogenic hazards that exist in the human environment. This unit of study begins by discussing the natural processes determining transport pathways for pollution in our environment. Principles of effective waste (including radioactive) management are presented as a means of mitigating pollution hazard.

The unit of study also examines a range of natural hazards that can impact on society, either at a nuisance level (slope erosion, land subsidence) or as a disaster (earthquakes, volcanic eruptions, meteor impact). The unit of study finishes with a number of case studies looking at the geological hazards faced by people living in some of the world's major cities.

GEOL 2005 Environmental Geology: Resources 4 credit points

Coordinator: Dr Birch
Prerequisite: 24 credit points of Science units of study
Additional information: See prerequisites for Senior Geology
When Offered: July
Classes: 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, the environmental impact of mining and mineral processing, site reclamation, recycling, ecologically sustainable development, global climate change and environmental law.

Senior Geology Units of Study

Most of the Senior units of study in Geology contain a field work component. For more details of this component than shown in the unit of study listings below consult the pamphlet entitled *Senior Units of Study in Geology*, which can be obtained from the Enquiry Office in the Edgeworth David Building.

GEOL 3001 Petrology, Basins and Structure 12 credit points

Coordinator: Dr Clarke
Prerequisite: Geology 2001 and 2002
When Offered: February
Classes: 12hroflec &prac/wk
Assessment: Two 2hr theory, lab exam, classwork, and field work

This unit of study consists of six sections, igneous petrology, metamorphic petrology, sedimentary environments, structures, tectonics and field mapping. 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 global tectonic theory. 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. Core logging skills are taught in laboratory sessions. A ten day field trip will be run between the February and July Semesters to areas near Broken Hill, where students will be instructed in methods of geological mapping and map interpretation in complexly deformed and metamorphosed terranes. Students will be required to pay hostel accommodation for five of the nights, and the field trip will involve camping.

GEOL 3002 Stratigraphy, Resources and Australian Geology

8 credit points

Coordinator: Dr Wilkins
Prerequisite: Geology 3001
When Offered: July
Classes: 8hroflec &prac/wk
Assessment: Two 2hr theory, lab exam, class work

This unit of study is designed to provide a practical training in specific aspects of resource exploration, and it covers skills used by geologists 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 3003 Mineral Exploration 8 credit points

Coordinator: Dr Wilkins
Corequisite: Geology 3001
When Offered: February
Classes: 8hroflec &prac/wk
Assessment: One 3hr exam, lab, field reports

This unit of study is designed to provide training in mineral exploration methods through the practical use of geochemical exploration.

Topics covered in geochemical exploration 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. In addition to laboratory classes there will be a five day field trip between the February and July Semesters to an area of known sub-surface mineralisation, close to active mining operations near Parkes. There, students will plan and execute basic geological, geochemical, magnetic, gravimetric, electromagnetic and electrical prospecting surveys. Data collected in the field will be examined and interpreted both on site and in the laboratory. Students will be required to pay hostel accommodation for five nights.

GEOL 3004 Paleobiology 4 credit points

Coordinator: Dr Buick
Prerequisite: Geology 2003 or 8 credit points of Intermediate Biology
When Offered: February
Classes: 4hroflec &prac/wk
Assessment: One 3000-5000w essay, class work, fieldwork

This unit of study is aimed at geoscientists, environmental scientists and biologists who are interested in the evolution of life and how it was constrained by environmental events and ecological interactions, and how it provides a basis for assessing modern environmental problems such as a nuclear winter, global warming, the ozone hole and biodiversity destruction. 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 unit of study is run in seminar style, emphasising critical reading of scientific papers, short oral presentations and group discussions. A weekend field excursion to examine a mass-extinction horizon is also included.

GEOL 3005 Geochemistry and Structure

12 credit points

Coordinator: Dr Klepeis

Prerequisite: Geology 3001

When Offered: July

Classes: 10hr of lec &prac/wk & fieldwork

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 an introduction to 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 will 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. Students will examine in detail techniques of strain analysis, kinematics and microstructural analysis using the petrographic microscope. The unit of study will involve a field excursion, which will concentrate on geochemical and structural features.

GEOL 3006 Petroleum Exploration

4 credit points

Coordinator: Dr Birch

Prerequisite: Geology 3001

Corequisite: Geophysics 3004

When Offered: July

Classes: 4hr of lec &prac/wk

Assessment: One 1hr exam, project

This unit of study 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, sourcerock evaluation and reservoir quality assessment. Problems of fluid migration and timing are examined in relation to source maturation. The unit of study culminates in a comprehensive project in which all the techniques discussed during the unit of study are used to solve a regional petroleum exploration problem.

GEOL 4001 Geology Honours

48 credit points

Coordinator: Dr Clarke

When Offered: February

Suitably qualified students may take Honours in Geology. They are required to undertake a research project under the direction of a supervisor, submit a thesis embodying the results of the investigation and undertake such coursework as may be prescribed.

Students not eligible to take Honours may be given permission to enrol in the Graduate Diploma in Science.

Further details are available from the Head of Department.

GEOP 3001 Geophysical Signal Processing

4 credit points

Coordinator: DrMuller

Prerequisite: 6 credit points of Physics and 16 credit points of Intermediate Science units of study

When Offered: February

Classes: 4he lec &prac/wk

Assessment: One 2hr exam, class work

Starting with a discussion of what signals are and how geophysical data are collected, this unit of study 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 unit of study concludes with a review of the processing of seismic reflection and refraction data.

GEOP 3002 Geodynamics

4 credit points

Coordinator: DrMuller

Prerequisite: 6 credit points of Physics and 16 credit points of Intermediate Science units of study

When Offered: February

Classes: 4he lec &prac/wk

Assessment: One 2hr exam, class work

This unit of study 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 3003 Geophysical Exploration A

4 credit points

Coordinator: Prof. Mason

Prerequisite: 6 credit points of Physics and 16 credit points of Intermediate Science units of study

When Offered: February

Classes: 3hr lec &prac/wk and field work

Assessment: One 2hr exam, lab work, field reports

This unit of study 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 unit of study 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 ofVSP and reservoir development.

GEOP 3004 Petroleum Geophysics

4 credit points

Coordinator: Prof. Mason

Prerequisite: Geology 3001

Corequisite: Geology 3006

When Offered: July

Classes: 4he lec &prac/wk

Assessment: Assessment project and lab exercises

This is a hands-on unit of study 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 fades, 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 unit of study 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 unit of study the teams submit competitive drilling proposals based on their structural interpretations.

GEOP 3005 Environmental Geophysics

4 credit points

Coordinator: Prof. Mason

Prerequisite: 6 credit points of Physics and 16 credit points of Intermediate Science units of study

When Offered: My

Classes: essentially field based

Assessment: One 1.5hr exam, lab exercises

This unit of study 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 unit of study 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 unit of study 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 3006 Geophysical Exploration B

4 credit points

Coordinator: Prof. Mason

Prerequisite: Geophysics 3003

When Offered: July

Classes: essentially field based

Assessment: One lab, field report

This is a practical unit of study 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 unit of study 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.

GEOP 4001 Geophysics Honours

48 credit points

When Offered: February

Suitably qualified students may take Honours in Geophysics. They are required to undertake a research project under the direction of a supervisor, submit a thesis embodying the results of the investigation and undertake such coursework as may be prescribed.

Students not eligible to take Honours may be given permission to enrol in the Graduate Diploma in Science.

Further details are available from the Head of Department.

History and Philosophy of Science

The History and Philosophy of Science units of study are intended to provide a broad, socially relevant appreciation of the scientific enterprise. The educational objective of the units of study 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 units of study 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 units of study

A member of staff will be available to advise on units of study during the enrolment and orientation periods, either in the enrolment centre or in the History and Philosophy of Science Office.

Handbook

Detailed information on units of study 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 semester.

HPSC 2001 Introductory Philosophy of Science

4 credit points

Teacher/Coordinator: Assoc. Prof. Chalmers

Prerequisite: 24 credit points of Junior Science units of study

Additional information: This is a qualifying unit of study for Senior History and Philosophy of Science units of study

When Offered: July

Classes: 2 lec & 2 tut/wk

Assessment: One take-home exam, tutorial assignments

HPSC 2002 Introductory History of Science

4 credit points

Teacher/Coordinator: To be arranged

Prerequisite: 24 credit points of Junior Science units of study

Additional information: This is a qualifying unit of study for Senior History and Philosophy of Science units of study

When Offered: February

Classes: 2 lec & 2 tut/wk

Assessment: One take-home exam, tutorial assignments

Senior History and Philosophy of Science Units of Study

Prerequisite: Qual History and Philosophy of Science 2001 and 2002
Assessment: see above

Up to 24 credit points of the following Senior units of study may be taken. However, no more than two of the units of study 3004, 3005, 3006, 3007, 3008 and 3009 may be taken together.

Note: Units of study 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 Unit of Study Information leaflet at the beginning of the year for up-to-date information.

HPSC 3001 History of Physical Sciences*

6 credit points

Teacher/Coordinator: Assoc. Prof. Chalmers

Prerequisite: Qual History and Philosophy of Science 2001 and 2002

Additional information: Candidates taking this unit of study must complete at least 24 credit points at Senior level in another Science Discipline Area in order to satisfy the requirements for the BSc degree

*Subject to approval by Faculty/Senate

When Offered: July*

Classes: two 1hr lec & one 2hr tut/wk

Assessment: One take-home exam, tutorial work

HPSC 3002 History of Biological Sciences

6 credit points

Teacher/Coordinator: To be arranged

Prerequisite: Qual History and Philosophy of Science 2001 and 2002

Additional information: As for History and Philosophy of Science 3001

When Offered: February

Classes: two 1hr lec & one 2hr tut/wk

Assessment: One take-home exam, tutorial work

HPSC 3003 Social Relations of Science A

4 credit points

Teacher/Coordinator: To be arranged

Prerequisite: Qual History and Philosophy of Science 2001 and 2002

Additional information: As for History and Philosophy of Science 3001

When Offered: February

Classes: 1 lec & 1 tut/wk

Assessment: One take-home exam, tutorial work

HPSC 3004 Social Relations of Science B

4 credit points

Teacher/Coordinator: To be arranged

Prerequisite: Qual History and Philosophy of Science 2001 and 2002

Prereq History and Philosophy of Science 3003

Additional information: As for History and Philosophy of Science 3001

When Offered: July

Classes: 1 lec & 1 tut/wk

Assessment: One take-home exam, tutorial work

HPSC 3005 History and Philosophy of Medical Science

4 credit points

Teacher/Coordinator: Dr Hardy

Prerequisite: Qual History and Philosophy of Science 2001 and 2002

Additional information: As for History and Philosophy of Science 3001

When Offered: February

Classes: 1 lec & 1 tut/wk

Assessment: Class work, essay

HPSC 3006 Scientific Controversies

4 credit points

Teacher/Coordinator: To be arranged

Prerequisite: Qual History and Philosophy of Science 2001 and 2002

Additional information: As for History and Philosophy of Science 3001

When Offered: February

Classes: 1 lec & 1 tut/wk

Assessment: Classwork, one 2500w essay

HPSC 3007 Science and Ethics

4 credit points

Teacher/Coordinator: To be arranged

Prerequisite: Qual History and Philosophy of Science 2001 and 2002

Additional information: As for History and Philosophy of Science 3001

When Offered: July

Classes: Thr/wk

Assessment: Classwork (50%), take-home exam (50%)

HPSC 3008 The Nature of Experiment

4 credit points

Teacher/Coordinator: Assoc. Prof. Keith Campbell

Prerequisite: Qual History and Philosophy of Science 2001 and 2002

Additional information: As for History and Philosophy of Science 3001

When Offered: July

Classes: 2hr/wk

Assessment: Classwork (50%), take-home exam (50%)

HPSC 3100 Contemporary Issues A*

4 credit points

Teacher/Coordinator: Dr Gaukroger

Prerequisite: Qual History and Philosophy of Science 2001 and 2002

Additional information: May not be counted with History and Philosophy of Science 3005 or 3006 if there is significant overlap; consult Department Handbook

As for History and Philosophy of Science 3001

*Subject to Faculty/Senate approval

When Offered: February

Classes: 2 lec/wk

Assessment: Classwork, take-home exam

HPSC 3101 Contemporary Issues B*

4 credit points

Teacher/Coordinator: To be arranged

Prerequisite: Qual History and Philosophy of Science 2001 and 2002

Additional information: May not be counted with History and Philosophy of Science 3007 or 3008 or 3009 if there is significant overlap; consult Department Handbook

As for History and Philosophy of Science 3001

*Subject to Faculty/Senate approval

When Offered: July

Classes: 2 lec/wk

Assessment: Classwork, take-home exam

HPSC 4001 History and Philosophy of Science Honours

48 credit points

When Offered: February

Students of sufficient merit may be admitted to Honours. 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 units of study including the assessment required;
- attend a fortnightly seminar.

Program

The requirements are four Options, together with a thesis of approximately 15 000 words on an approved topic, together with attendance at a fortnightly seminar on Research Methods. Students are advised to consult with the History and Philosophy of Science Unit concerning their Options.

Marine Sciences

The Marine Studies Centre offers Intermediate, Senior and Honours units of study 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.

MARS 2001 Introductory Marine Science A 4 credit points

Prerequisite: 24 credit points of Junior units of study from Science Discipline Areas

Additional information: This is a qualifying unit of study for Marine Science 3001 and 3002. Some options in Senior Marine Science have additional prerequisites

When Offered: February

Classes: 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 2002 Introductory Marine Science B 4 credit points

Additional information: As for Marine Science 2001

When Offered: July

Classes: 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 Units of Study

Prerequisite: See below

Assessment: See 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 unit of study in any other subject. No special requirement of junior units of study is laid down.

Internal structure

Students may enrol in either or both semesters (i.e. Marine Science 3001 or 3002 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 credit points

May not be counted with Geography 3001, students cannot also enrol in MS 67; comprises MS 1 and MS 2

MS 13 Coastal Depositional Environments and Physical Sedimentology

12 credit points

May not be counted with Geography 3001, comprises MS 1 and MS 3

MS 15 Coastal Depositional Environments and Marine Biology

12 credit points

May not be counted with Geography 3001, nor with Biology 3102; comprises MS 1 and MS 5

MS 42 Evolution and Diversity of Australian Biota and Coastal Morphodynamics

12 credit points

May not be counted with Geography 3001, nor with Biology 3102; comprises MS 2 and MS 4

MS 43 Evolution and Diversity of Australian Biota and Physical Sedimentology

12 credit points

May not be counted with Biology 3102; comprises MS 3 and MS 4

MS 45 Evolution and Diversity of Australian Biota and Marine Biology

12 credit points

May not be counted with Biology 312; comprises MS 4 and MS 5; students cannot also enrol in MS 10

MS 67 Coastal Zone Management and GIS

12 credit points

May not be counted with Geography 3102; comprises MS 6 and MS 7; students cannot also enrol in MS 12

MS 69 Coastal Zone Management and Palaeoceanography and Sedimentary Environment

12 credit points

May not be counted with Geography 3102; comprises MS 6 and MS 9

MS 87 Chemical Process in the Ocean and GIS

12 credit points

May not be counted with Geography 3102; comprises MS 7 and MS 8

MS 89 Chemical Processes in the Ocean and Palaeoceanography and Sedimentary

12 credit points

Comprises MS 8 and MS

MS 10 Marine Ecology

12 credit points

May not be counted with Biology 3202; 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.

Notes:

(a) Because of the limited facilities available for the marine biological units of study 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.

(b) All students intending to enrol in any of the marine biology options must consult the booklet Information for Students Considering Senior Biology Units of Study available from the School of Biological Sciences Office during the last few weeks of the academic year prior to this enrolment. Each student should also complete a preliminary enrolment form in the School of Biological Sciences before first semester commences

(c) 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 Coordinator (Assoc. Prof. Short in the Department of Geography). All enrolments must be approved by the Director of the Marine Studies Centre.

Summaries of options

Students should consult options as listed in the three contributing Departments/Schools (Biological Sciences, Geology and Geophysics, Geography).

Descriptions of Options

MS 1 Coastal Depositional Environments

Assoc. Prof. Short

Classes February Sem: Weeks 1-7: 3 lec & 1 3hrprac/wk, excursions (over 1 weekend, one 1 day)

Assessment assignments, 1.5hr exam

The aim of this option 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 option 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 February Sem: Weeks 8-14: 3 lec, 1 tut & 3hr prac/wk, excursion (over 1 weekend)

Assessment assignments, 1.5hr exam

Coastal Morphodynamics is an option in the modelling of complex environmental systems. Specifically, this option 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 option aims to provide: (1) skills in managing complex problems in general, (2) an analytical understanding of coastal processes in particular, and (3) experience in application of computer simulation programs and vocationally relevant, commercial software packages. Practical work involves extensive use of computers.

MS 3 Physical Sedimentology

Dr Hughes

Classes February Sem: Weeks 8-14: 3 lec, 1 tut & 6hr prac/wk, 1 day excursion

Assessment One 1.5hr exam, classwork

This option examines the physical processes responsible for sediment erosion, transport and deposition in the marine environment. The focus is on short time-scale processes and products. Both cohesionless

(sands) and cohesive (muds) sediment dynamics will be described for a variety of flow regimes including unidirectional ocean currents, bidirectional tides and waves, and turbidity currents. Generic aspects of fluid boundary layers and their modification by sediment transport and bedforms is emphasised. The option concludes with case studies of four marine environments: estuary, shoreface, continental shelf and slope. The case studies are used to illustrate the fluid-sediment interactions that combine to produce the seabed micromorphology (surface texture, bedforms and sediment structure) the characterises each of these environments. The practical classes aim to develop an analytical understanding of the theoretical concepts, and provide skills in data analysis/interpretation suitable for solving a range of applied problems. Field methods and instrumentation will be demonstrated during a field excursion.

MS 4 Evolution and Diversity of the Australian Biota (Core option)

Dr Henwood, Assoc. Prof. Hinde, Dr Hoegh-Guldberg, Dr Kingsford, Prof. Larkum, Prof. Patterson, Prof. Shine, Dr Taylor and others

Classes Feb Sem: 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 S Marine Biology Module

Qual Biology 2001 or 2901 and 2002 or 2902 or 16 credit points of Intermediate Biology including one of Biology 2003 or 2004 or 2903 or 2904

Assoc. Prof. Hinde, Dr Hoegh-Guldberg, Dr Kingsford, Prof. Larkum

Classes February Sem: 4 lec & 8hr prac/wk, field courses. Timetable 2

Assessment One 1.5hr exam, assignments, projects

See Marine Biology Module entry under School of Biological Sciences.

MS 6 Coastal Zone Management

Dr Chapman

Classes July Sem: Weeks 1-7: 3 lec, 1hrprac & 1 tut/wk, excursion (over 1 weekend)

Assessment assignments, 1.5hr exam

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 option 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 July Sem: Weeks 8-14: 3 lec, prac & 1 tut/wk, excursion (over 1 weekend)

Assessment assignments, 1.5hr exam

Principles involved in computer based geographic information systems are applied to environmental assessment and management of coastal drainage catchments. The option 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 option 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*

Prereq 12 credit points of Chemistry

Dr Isern

Classes July Sem: Weeks 1-6: 4 lec, 1 tut & 2hr prac/wk

Assessment One 1.5hr exam, classwork

This option 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 Sedimentary Environments*

Dr Keene

Classes July Sem: Weeks 8-14: 4 lec, 1 tut & 2hr prac/wk

Assessment One 1.5hr exam, classwork

This option covers the processes of erosion and deposition which have shaped the sea floor of planet Earth. It examines the interaction of physical, chemical and biological processes. A variety of continental margins will be compared together with analysis of features on the deep sea floor. The Great Barrier Reef and the role of plants and animals in carbonate sedimentation will form the second half of this option. How and why ocean basin sedimentary deposits have changed through time, particularly the past 100 million years, will be examined.

The aim of this option is to provide the student with skills to analyse sea floor environments and interpret a variety of geological, geophysical, oceanographic and biological data. Laboratory work will emphasise both techniques of sediment analysis and interpretation of data from direct sampling (Tasman Sea, Deep Sea Drilling Project and the Ocean Drilling Program). Students will develop skills to interpret remote sensing images in the form of side scab sonar, swath mapping of the sea floor and seismic reflection profiling. Includes a one day excursion on Sydney Harbour.

MS 10 *Marine Ecology*

Qual Biology 2001 or 2901 and 2002 or 2902

Dr Dickman, Dr Kingsford, Dr Meats, Prof. Underwood and others

Classes July Sem: 4 lec & 8hr prac/wk, one 8-day field course in vacation before the July Sem. Timetable 2

Assessment One 3hr exam, class work

Students enrol in Core Ecology, including its field course and the Marine Ecology Module. See entry under School of Biological Sciences.

MARS 3001 Marine Science A

12 credit points

Prerequisite: *Marine Science 2002. There are prerequisites for some options, see options entries*

When Offered: *February*

Classes: *See options*

Assessment: *Assessment see individual options*

See individual option descriptions.

MARS 3002 Marine Science B

12 credit points

Prerequisite: *Marine Science 2002. There are prerequisites for some options, see option entries*

When Offered: *July*

Classes: *see individual options*

Assessment: *See individual options*

See individual option descriptions.

MARS 4001 Marine Sciences Honours

48 credit points

When Offered: *February*

The structure of Honours will be about one third formal coursework, seminars and reading, and about two thirds devoted to preparation of a thesis on a topic with a clear marine or estuarine orientation. The formal coursework may comprise units of study mainly chosen from existing Honours options offered in the Department of the student's principal interest. Background study in a subsidiary field of interest may be required. Thesis work will commence in February and continue to November.

In general, a Credit average or better in Senior Marine Sciences units of study and at least a Pass in another Senior unit of study are required for entry. A minimal WAM score is usually set for entry into Honours in Marine Sciences, preferably during the July semester of the Senior program and otherwise as soon as possible after publication of the Senior units of study examination results. Arrangements for the supervision and Department of primary location of students will be made in the light of their proposed thesis topic. Joint supervision involving staff of more than one Department may be arranged if a thesis topic is deemed to be transdisciplinary. Upon acceptance, students should register formally with the Director of the Marine Studies Centre.

School of Mathematics and Statistics

The School of Mathematics and Statistics offers units of study in Applied Mathematics, Mathematical Statistics and Pure Mathematics. The *Junior units of study* cover a range of topics in mathematics and statistics and are offered at three levels, viz. Life Sciences, Normal and Advanced, to suit various levels of previous knowledge.

Intermediate, Senior and Honours units of study are mostly provided within one of the subject areas of Applied Mathematics, Mathematical Statistics and Pure Mathematics.

Applied Mathematics is concerned with the development of mathematical and computing methods and their application in particular contexts which may arise in the natural sciences, engineering, economics or the social sciences. Units of study are designed to give training to students who will specialise in other subjects, and also for training applied mathematicians. While mathematical rigour is not neglected, particular emphasis is given to questions such as the treatment of observational models which are relevant to particular contexts.

Mathematical Statistics is concerned with the theory of probability and the mathematical methods of statistics applied to such problems as statistical inference, the design of experiments and sample surveys, and all problems of data analysis. The major units of study are designed to train those who wish to become professional statisticians, tertiary teachers and research workers, but there are units of study which provide knowledge of statistical methods and techniques for students specialising in other fields.

Pure Mathematics units of study have two main aims. One of these is to equip students with the background of mathematical knowledge, understanding and skill necessary for units of study in many branches

of science. The other is the provision of training in pure mathematics necessary for those who wish to make a career in mathematics. This might be either in teaching or research or in one of the many avenues where highly developed mathematical ability and a thorough knowledge of modern mathematical techniques are required, such as computing, operations research, management, finance and economics.

Junior Mathematics Units of Study

Various combinations of Junior units of study may be taken, subject to the prerequisites listed. However, only one Junior unit of study per semester may be counted towards a degree.

Before deciding on a particular combination of Junior units of study, students are advised to check carefully the prerequisites relating to mathematics for all units of study.

Life Science Units of Study

Life Sciences units of study are designed to provide students with an overview of the necessary mathematical and statistical background for studies in the life sciences. They are provided for students in the Faculty of Science whose major interest lies outside mathematics. Each unit of study uses both computers and graphics calculators as aids to the development of mathematical ideas.

There are comprehensive details in the Junior Mathematics Handbook, available from the School at the time of enrolment.

Assumed knowledge

Knowledge equivalent to the HSC 2-unit Mathematics course is assumed. Students who do not have this knowledge are strongly advised to attend a bridging course conducted jointly by the School and the Mathematics Learning Centre in February.

Relation to other units of study and recommendations

The Life Science units of study together give 12 credit points of mathematics, which is the minimum required by the BSc degree regulations. They may not be counted together with any other Junior mathematics unit of study offered in the same semester. Students obtaining a Distinction in MATH 1711 are encouraged to enrol in normal level units of study in subsequent semesters. Only students obtaining a Distinction or better in MATH 1711 may proceed to Intermediate units of study in the Mathematics Discipline Area. Students with a Credit or better in MATH 1711 and a Pass or better in MATH 1712 may proceed to Intermediate units of study in the statistics discipline area. Students with a Pass in only MATH 1712 are limited to the Intermediate statistics units of study STAT 2002 and STAT 2004 and the Senior statistics units of study STAT 3002 and STAT 3004.

MATH 1711 Life Sciences Mathematics A

6 credit points

Assumed Knowledge: HSC 2-unit Mathematics

Additional information: May not be counted with Mathematics 1701 or 1791

May not be counted by students enrolled in the BSc/BCom combined degree program

When Offered: February

Classes: 4 lec & 2 tut/wk

Assessment: Two 2hr exams, assignments, computer project, class quizzes

This unit of study has two strands. The calculus strand looks at the fitting of data to various functions, introduced finite difference methods, and demonstrates the use of calculus in optimisation problems. It extends differential calculus to functions of two variables and develops integral calculus, including the definite integral and multiple integrals. The finite mathematics strand introduces matrices, systems of linear equations and linear programming, counting techniques and numerical integration.

MATH 1712 Life Sciences Mathematics B

6 credit points

Assumed Knowledge: HSC 2-unit Mathematics

Additional information: May not be counted with Mathematics 1702 or 1703 or 1704 or 1792 or 1793 or 1794

May not be counted by students enrolled in the BSc/BCom combined degree program

When Offered: July

Classes: 4 lec & 2 tut/wk

Assessment: Two 2hr exams, assignments, computer project, class quizzes

This unit of study also has two strands. The equations strand looks at the solution of equations by bisection and iteration, first and second order difference equations where chaos is met, and examples of modelling using simple first and second order differential equations. The statistics strand offers a comprehensive first introduction to data analysis, probability and sampling, and inference including confidence intervals, chi-squared tests and goodness of fit.

Mathematics and Statistics - Junior Normal Units of Study

Normal units of study are designed for students who have both the necessary background and the interest in mathematics and who need to study mathematics beyond Junior units of study in order to satisfy their own aspirations or degree requirements.

There are comprehensive details of these units of study in the Junior Mathematics Units of Study Handbook, available from the School at the time of enrolment.

Assumed knowledge

Knowledge equivalent to the HSC 3-unit Mathematics course is assumed. In MATH 1702 and MATH 1703 some knowledge from MATH 1701 or HSC 4-unit mathematics is assumed. Students who have a very good result in the equivalent of the HSC 2-unit course are encouraged to enrol in the Normal units of study but should discuss their plans with a Mathematics adviser.

Relation to other units of study and recommendations

Students should take one unit of study in each semester in order to meet the minimum requirement of 12 credit points of mathematics in the BSc degree. These units of study may not be counted with any other Junior mathematics units of study offered in the same semester. Passes in Junior units of study at this level qualify students to proceed to Intermediate units of study in mathematics and statistics. Students should note however that some Intermediate units of study in both mathematics and statistics require specific Junior units of study to be passed as prerequisites. Students obtaining a Distinction or better in Normal units of study are encouraged to enrol in other Advanced units of study.

MATH 1701 Differential Calculus and Linear Algebra

6 credit points

Assumed Knowledge: HSC 3-unit Mathematics

Additional information: May not be counted with Mathematics 1711 or 1791

When Offered: February

Classes: 4 lec, 2 tut & 1 optional computer lab/wk

Assessment: Two 2hr exams, assignments, class quizzes

This unit of study has two strands. The calculus strand looks at functions of a single variable, limits and continuity, vector functions and functions of two variables. Differential calculus is extended to functions of two variables. Integral calculus concentrates on methods of integration. The parallel linear algebra strand introduces vectors and vector algebra, complex numbers and linear algebra, including matrices, determinants, linear transformations and eigenvectors.

MATH 1702 Integral Calculus and Statistics

6 credit points

Assumed Knowledge: HSC 4-unit Mathematics or Mathematics 1701

Additional information: May not be counted with Mathematics 1712 or 1792 or 1793 or 1794 or 1703 or 1704

When Offered: July

Classes: 4 lec, 2 tut & 1 optional computer lab/wk

Assessment: Two 2hr exams, assignments, class quizzes

This unit of study also has two strands. The integral calculus strand first develops the idea of the definite integral from Riemann sums, leading to the Fundamental Theorem of Calculus. Infinite series are introduced with emphasis on Taylor series. The second part is an introduction to the use of first and second order differential equations to model a variety of scientific phenomena. The treatment includes both the graphical and symbolic interpretation of differential equations. The content of the parallel statistics strand follows that of Mathematics 1712.

MATH 1703 Integral Calculus and Discrete Mathematics

6 credit points

Assumed Knowledge: HSC 4-unit Mathematics or Mathematics 1701

Additional information: May not be counted with Mathematics 1702 or 1704 or 1712 or 1792 or 1793 or 1794

When Offered: July

Classes: 4 lec, 2 tut & 1 optional computer lab/wk

Assessment: Two 2hr exams, assignments, class quizzes

The integral calculus strand of this unit is identical to that of Mathematics 1702. The other strand provides an introduction to fundamental aspects of discrete mathematics, which deals with 'things that come in chunks that can be counted'. It focuses on the enumeration of a set of numbers, viz. Catalan numbers. Topics include sets and functions, counting principles, Boolean expressions, mathematical induction, generating functions and linear recurrence relations, graphs and trees.

MATH 1704 Statistics and Discrete Mathematics

6 credit points

Assumed Knowledge: HSC 3-unit Mathematics

Additional information: May not be counted with Mathematics 1702 or 1703 or 1712 or 1792 or 1793 or 1794

When Offered: July

Classes: 4 lec, 2 tut & 1 optional computer lab/wk

Assessment: Two 2hr exams, assignments, class quizzes

This unit of study combines the statistics strand of [Mathematics 1702](#) with the discrete mathematics strand of Mathematics 1703.

Mathematics and Statistics Junior Advanced Units of Study

Advanced units of study are designed for students who have a strong background and a keen interest in mathematics and who need to study mathematics at a higher level to satisfy their own aspirations or degree requirements. All students aiming for high achievement, such as an Honours degree or postgraduate study, are advised to enrol in Advanced units of study.

Content

The unit of study content is similar in outline to that of the Normal units of study above but proceeds at a faster rate and covers more difficult material.

There are comprehensive details of these units of study in the Junior Mathematics Units of Study Handbook, available from the School at the time of enrolment.

Assumed knowledge

Knowledge equivalent to the HSC 4-unit Mathematics course is assumed. Students who have a very good result in the equivalent of the HSC 3-unit course are encouraged to enrol in these units of study but should discuss their plans with a Mathematics adviser.

Relation to other units of study and recommendations

Students should take one unit of study in each semester in order to meet the minimum requirement of 12 credit points of mathematics in the BSc degree. These units of study may not be counted with any other Junior mathematics units of study offered in the same semester. Passes in Junior units of study at this level qualify students to proceed to Intermediate units of study in mathematics and statistics at either the Normal or the Advanced level. Students should note however that some Intermediate units of study in both mathematics and statistics require specific Junior units of study as prerequisites.

MATH 1791 Differential Calculus and Linear Algebra (Advanced)

6 credit points

Assumed Knowledge: HSC 4-unit or top decile 3-unit Mathematics

Additional information: May not be counted with Mathematics 1701 or 1711

When Offered: February

Classes: 4 lec, 2 tut & 1 optional computer lab/wk

Assessment: Two 2hr exams, assignments, class quizzes

The two strands of this unit of study parallel those of Mathematics 1701 but go more deeply into the subject matter and require more mathematical sophistication.

MATH 1792 Integral Calculus and Statistics (Advanced)

6 credit points

Assumed Knowledge: HSC 4-unit Mathematics or Mathematics 1791

Additional information: May not be counted with Mathematics 1702 or 1703 or 1704 or 1712 or 1793 or 1794

When Offered: July

Classes: 4 lec, 2 tut & 1 optional computer lab/wk

Assessment: Two 2hr exams, assignments, class quizzes

The two strands of this unit of study parallel those of Mathematics 1702 but go more deeply into the subject matter and require more mathematical sophistication.

MATH 1793 Integral Calculus and Discrete Mathematics (Advanced)

6 credit points

Assumed Knowledge: HSC 4-unit Mathematics or Mathematics 1791

Additional information: May not be counted with Mathematics 1702 or 1703 or 1704 or 1712 or 1792 or 1794

When Offered: July

Classes: 4 lec, 2 tut & 1 optional computer lab/wk

Assessment: Two 2hr exams, assignments, class quizzes

The two strands of this unit parallel those of Mathematics 1703 but go more deeply into the subject matter and require more mathematical sophistication.

MATH 1794 Statistics and Discrete Mathematics (Advanced)

6 credit points

Assumed Knowledge: 4-unit or top decile 3-unit Mathematics

Additional information: May not be counted with Mathematics 1702 or 1703 or 1704 or 1712 or 1792 or 1793

When Offered: July

Classes: 4 lec, 2 tut & 1 optional computer lab/wk

Assessment: Two 2hr exams, assignments, class quizzes

The two strands of this unit of study parallel those of Mathematics 1704 but go more deeply into the subject matter and require more mathematical sophistication.

Intermediate Mathematics Units of Study

The School of Mathematics and Statistics provides a range of Intermediate units of study, each worth 4 credit points covering a variety of topics in Pure and Applied Mathematics. Students may take up to 8 units of study (32 credit points) in Intermediate Mathematics units of study and may combine them with up to 4 units of study (16 credit points) in Intermediate Statistics. A normal Intermediate load in a discipline is 16 credit points and this is the minimum that should be undertaken by anyone intending to specialise in Senior mathematics.

The units of study are taught at either the Normal or the Advanced level. Entry to an Advanced unit of study usually requires a Credit or better in a Normal level prerequisite or a Pass in an Advanced level prerequisite.

For ease of overview the units of study are arranged under Pure, for students wishing to specialise in Pure Mathematics, and Applied, for those wishing to specialise in Applied Mathematics. Several units of study are suitable for either. Details of each unit of study appear below whilst full details of unit of study structure, content and examination procedures are provided in the Intermediate Mathematics Unit of Study Handbook available from the School at the time of enrolment.

Pure Units of Study (each 4 credit points)

Analysis MATH 2007

Analysis (Advanced) MATH 2907

Differential Equations and Group Theory (Advanced) MATH 2908

Fourier Series and Differential Equations MATH 2005

Graph Theory MATH 2009

Introduction to Modern Algebra MATH 2008

Introduction to Nonlinear Systems and Chaos MATH 2006

Introduction to Nonlinear Systems and Chaos (Advanced) MATH 2906

Linear Algebra (Advanced) MATH 2902

Matrix Applications MATH 2002

Vector Calculus and Complex Variables MATH 2001

Vector Calculus and Complex Variables (Advanced) MATH 2901

Applied Units of Study (each 4 credit points)

Fourier Series and Differential Equations MATH 2005

Introduction to Mathematical Computing MATH 2003

Introduction to Mathematical Computing (Advanced) MATH 2903

Introduction to Nonlinear Systems and Chaos MATH 2006

Introduction to Nonlinear Systems and Chaos (Advanced) MATH 2906

Lagrangian Dynamics MATH 2004

Lagrangian Dynamics (Advanced) MATH 2904

Mathematical Methods (Advanced) MATH 2905

Matrix Applications MATH 2002

Optimisation MATH 2010

Vector Calculus and Complex Variables MATH 2001

Vector Calculus and Complex Variables (Advanced) MATH 2901

Relation to other units of study and recommendations

In general, 2 units of study (8 credit points) of Intermediate mathematics are needed to progress to a Normal Senior mathematics unit of study, and 3 units of study (12 credit points) of Intermediate mathematics to progress to an Advanced Senior unit of study.

If your major interest is in mathematics, then you are strongly encouraged to enrol in 8 units of study (32 credit points) in Intermediate mathematics. If you are considering doing Honours in mathematics, they should include some Advanced units of study.

Students intending to specialise in Applied Mathematics should choose at least 4 units of study from the Applied list above and should include MATH 2005 or 2905.

Students intending to specialise in Pure Mathematics should choose at least 4 units of study from the Pure list above and should include MATH 2002 or 2902 and 2008 or 2908. Other recommended choices would be 2007 or 2907.

Computer Science students may like to include MATH 2009 among their choices.

Physics students would be well-advised to choose MATH 2001 or 2901, and 2005 or 2905.

Prospective teachers of mathematics should consider MATH 2009, and 2007 or 2907.

MATH 2001 Vector Calculus and Complex Variables

4 credit points

Prerequisite: Mathematics 1702 or 1703 or 1792 or 1793

Additional information: May not be counted with Mathematics 2901

When Offered: February

Classes: 3 lec & 1 tut/wk

Assessment: One 2hr exam, assignments, tutorial participation, tutorial quizzes

This unit of study has two major components: firstly, a study of functions of several real variables from a vector point of view, and secondly an introduction to functions of a complex variable. Vector calculus topics include critical points of functions of two variables, line integrals and multiple integrals, surface integrals, change of variables, theorems of Green, Gauss and Stokes with their physical significance. Complex variables topics include definitions and properties of complex functions, differentiability, Cauchy Riemann conditions and analyticity, contour integration and residues.

MATH 2002 Matrix Applications

4 credit points

Prerequisite: Mathematics 1701 or 1791 or Distinction in Mathematics 1711

Additional information: May not be counted with Mathematics 2902

When Offered: February

Classes: 2 lec, 1 tut & 1 computer lab/wk

Assessment: One 2hr exam, assignments, tutorial participation, tutorial quizzes

This unit of study covers systems of linear equations, vector spaces and eigenspaces. In linear equations the topics include existence of solutions, uniqueness, numerical solution, scaled partial pivoting, and residual correction. In vector spaces the topics include subspaces, linear combinations, spanning set, linear dependence, basis, dimension, Lagrange polynomials, linear transformations, kernel, image space,

and rank. In eigenspaces the topics include characteristic equation, computation of eigenspaces, similar matrices, diagonalisation, difference equations, coupled differential equations, iterative solution of $AX=B$; numerical evaluation, power method, Gershgorin circles.

MATH 2003 Introduction to Mathematical Computing

4 credit points

Prerequisite: Mathematics 1702 or 1703 or 1792 or 1793

Additional information: May not be counted with Mathematics 2903

When Offered: February

Classes: 1 lec & 3 computer lab/wk

Assessment: One 1.5hr exam, assignments, computer lab participation

This unit of study consists of two segments, one devoted to computer simulation and modelling and the other to applied computer algebra. In the first, mathematical models will be set up for a range of problems, such as the minimisation of factory pollutants, determination of drug regimes for a diabetic, the modelling of stars, biological patterns and chaos. Students will use computer simulations to explore solutions. The emphasis will be on modelling, rather than programming. The second segment gives hands-on experience with a computer algebra program. Students work through a set of interactive lessons showing them the potential of such programs. Students are required to write programs to solve applied mathematical problems that would be intractable if attempted solely by pen and paper.

MATH 2004 Lagrangian Dynamics

4 credit points

Prerequisite: Mathematics 2001 or 2901

Additional information: May not be counted with Mathematics 2904

When Offered: July

Classes: 2 lec, 1 prac & 1 tut/wk

Assessment: 2hr exam (80%), assignments (20%)

This unit of study provides a first session in dynamics from a higher standpoint. It demonstrates that Newton's laws of motion can be derived from a variational principle. The advantage offered by the Lagrangian formulation in solving for the motion is emphasised. The applications, which include planetary dynamics, illustrate the basic concepts of Newtonian dynamics such as conservation laws. Small oscillations about equilibrium states are treated as part of linear stability theory.

MATH 2005 Fourier Series and Differential Equations

4 credit points

Prerequisite: Mathematics 2001 or 2901

Additional information: May not be counted with Mathematics 2905

When Offered: July

Classes: 3 lec & 1 tut/wk

Assessment: One 2hr exam, assignments

In the Fourier Series segment, periodic phenomena such as wave motion are given a systematic treatment. The basic problem is to represent a periodic function of one variable as the sum of an infinite series of sines and cosines. The theory has extensive applications in engineering, acoustics, internal and surface waves in fluids, etc., as well as in pure mathematics. Then a review of first order equations is followed by a systematic treatment of second order equations using the methods of variation of parameters, undetermined coefficients and the theory of Laplace Transforms. Linear systems of differential equations are treated using matrices and vectors. The final part of the unit of study deals with partial differential equations with the emphasis on the application of the method of separation of variables to first and second order linear equations and on Laplace transforms for initial value problems.

MATH 2006 Introduction to Nonlinear Systems and Chaos

4 credit points

Prerequisite: Mathematics 1702 or 1703 or 1792 or 1793 or Distinction in Mathematics 1712

Additional information: May not be counted with Mathematics 2906

When Offered: February

Classes: 2 lec, 1 tut & 1 computer tut/wk

Assessment: 2hr exam (80%), assignments (20%)

This unit of study aims to provide an introduction to the simplest cases of nonlinear dynamics and chaos and their use in modelling systems in a variety of applications taken from chemistry, biology, physiology and economics. Topics covered include first order finite difference equations, bifurcations, chaos, cellular automata, fractals, one and two dimensional differential equations, fixed points, analysis of stability.

MATH 2007 Analysis

4 credit points

Prerequisite: Mathematics 1702 or 1703 or 1792 or 1793, or Distinction average in Mathematics 1711 and 1712

Additional information: May not be counted with Mathematics 2907

When Offered: July

Classes: 3 lec & 1 tut/wk

Assessment: One 2hr exam, assignments

This unit of study is concerned with sequences and series. Topics include the definition of the limit of a sequence, the principle of monotonic convergence, elementary limit theorems, convergence of an infinite series, the comparison and integral tests; absolute convergence, the ratio test and Taylor Series. The last part is devoted to series of complex terms, dealing with power series and radius of convergence.

MATH 2008 Introduction to Modern Algebra

4 credit points

Prerequisite: Mathematics 2002 or 2902

Additional information: May not be counted with Mathematics 2908

When Offered: July

Classes: 2 lec, 1 tut & 1 computer lab/wk

Assessment: One 2hr exam, assignments

The major topics in this unit of study are inner product spaces and groups. First, it treats the geometric and algebraic properties of inner product spaces and then the geometrical and combinatorial background to groups. Topics covered include the definitions and elementary properties of groups, subgroups, direct products, the permutation, symmetric and cyclic groups, isomorphisms and homomorphisms, cosets, Lagrange's theorem, conjugate elements, rotations and reflections in the plane, and symmetries of an n-gon.

MATH 2009 Graph Theory

4 credit points

Prerequisite: Mathematics 1701 or 1702 or 1703 or 1704 or 1791 or 1792 or 1793 or 1794, or Distinction in Mathematics 1711

When Offered: February

Classes: 3 lec & 1 tut/wk

Assessment: One 2hr exam, assignments, tutorial participation

Broadly, discrete mathematics is about combinations of objects; simple objects like the natural numbers, $1,2,3,\dots$; or subsets of a set; or, in this option, points and edges (graphs). It has applications in almost every branch of science, particularly in computer science and engineering. This unit of study looks mainly at graphs and their applications, for example to network flows and matching theory (where we prove the

celebrated 'Marriage Theorem' of Philip Hall and look at its many applications). We discuss some of the elements of counting theory, building on first-year work, as they apply to enumeration problems in graph theory. For example, we discuss the elementary theory of trees and their enumeration; the colouring of graphs and maps, and chromatic polynomials.

MATH 2010 Optimisation

4 credit points

Prerequisite: *Mathematics 1702 or 1703 or 1792 or 1793 (strongly advise Mathematics 2002 or 2902)*

Additional information: *May not be counted with Econometrics 3510 Operations Research A*

The combination of this unit of study with Mathematics 2002 or 2902 is highly recommended.

When Offered: *July*

Classes: *3 lec & 1 tut/wk*

Assessment: *One 2hr exam, assignments*

This unit of study looks at practical optimisation problems. Theory developed in lectures will be complemented by workstation laboratory sessions using Matlab. Minimal computing experience will be required. Topics will be chosen from linear programming and the simplex algorithm, transportation problems and the north-west corner rule, constrained and unconstrained minimisation of functions, search methods, dynamical programming, calculus of variations, least-squares and singular-value decomposition.

MATH 2901 Vector Calculus and Complex Variables (Advanced)

4 credit points

Prerequisite: *Mathematics 1792 or 1793 or Credit in either Mathematics 1702 or 1703*

Additional information: *May not be counted with Mathematics 2001*

When Offered: *February*

Classes: *3 lec & 1 tut/wk*

Assessment: *One 2hr exam, assignments*

This unit of study is designed to provide the basic tools needed for studying functions of two or more real variables and also an introduction to functions of one complex variable. These subjects are fundamental to many areas of Pure and Applied Mathematics, and are essential for students in Science and Engineering courses. Topics in functions of several variables include the following: Informal theory of multiple integrals, double integrals, change of variables, triple integrals, line integrals, Green's theorem, surface integrals, Stokes' theorem, Jacobians, Hessians, Lagrange multipliers and the implicit function theorem. Elementary complex variable theory includes complex line integrals, Cauchy's Theorem and Integral Formula, residues and real improper integrals.

MATH 2902 Linear Algebra (Advanced)

4 credit points

Prerequisite: *(Mathematics 1791 or Credit in 1701) and (Mathematics 1792 or 1793 or 1794 or Credit in one of 1702 or 1703 or 1704)*

Additional information: *May not be counted with Mathematics 2002*

When Offered: *February*

Classes: *3 lec & 1 tut/wk*

Assessment: *One 2hr exam, assignments*

This unit of study is primarily concerned with linear transformations. Abstract vector spaces are introduced as the correct context in which to discuss linear transformations, and the basic structure theorems for finite dimensional vector spaces are proved. The connections between matrices and linear transformations are investigated. Determinants,

introduced in first year, are revised and investigated further. A brief discussion of permutations is included here. Eigenvalues and eigenvectors are discussed and their usefulness for diagonalizing linear transformations is shown. Diagonalisation techniques are applied to solve simple examples of simultaneous differential equations.

MATH 2903 Introduction to Mathematical Computing (Advanced)

4 credit points

Prerequisite: *Mathematics 1792 or 1793 or Credit in either Mathematics 1702 or 1703*

Additional information: *May not be counted with Mathematics 2003*

When Offered: *February*

Classes: *1 lec & 3 computer lab/wk*

Assessment: *One 1.5hr exam, assignments, computer lab participation*

The content of this unit of study parallels that of Mathematics 2003.

MATH 2904 Lagrangian Dynamics (Advanced)

4 credit points

Prerequisite: *Mathematics 2901 or Credit in Mathematics 2001*

Additional information: *May not be counted with Mathematics 2004*

When Offered: *July*

Classes: *2 lec, 1 prac & 1 tut/wk*

Assessment: *One 3hr exam (70%), assignments (20%), project (10%)*

The content of this unit of study parallels that of Mathematics 2004.

MATH 2905 Mathematical Methods (Advanced)

4 credit points

Prerequisite: *Mathematics 2901 or Credit in Mathematics 2001*

Additional information: *May not be counted with Mathematics 2005*

When Offered: *July*

Classes: *3 lec & 1 tut/wk*

Assessment: *One 2hr exam, assignments*

This unit of study is essentially an advanced version of Mathematics 2005, the emphasis being on solutions of differential equations in Applied Mathematics. The theory of ordinary differential equations is developed for second order linear, including series solutions, special functions, Laplace transform and Sturm-Liouville theory. Methods for partial differential equations and boundary-value problems include separation of variables, Fourier series and transforms.

MATH 2906 Introduction to Nonlinear Systems and Chaos (Advanced)

4 credit points

Prerequisite: *Mathematics 1792 or 1793, or Credit in Mathematics 1702 or 1703*

Additional information: *May not be counted with Mathematics 2006*

When Offered: *February*

Classes: *2 lec, 1 tut & 1 computer tut/wk*

Assessment: *2hr exam (80%), assignments (20%)*

The content of this unit of study parallels that of Mathematics 2006.

MATH 2907 Analysis (Advanced)

4 credit points

Prerequisite: *Mathematics 2901 or Credit in Mathematics 2001*

Additional information: *May not be counted with Mathematics 2007*

When Offered: *July*

Classes: *3 lec & 1 tut/wk*

Assessment: *One 2hr exam, assignments*

The aim of the unit of study is to provide a solid grounding to the general theory of infinite processes. We study in a concrete way the limiting behaviour of sequences, series and functions via interesting and enduring examples from classical analysis. This background is essential to understanding the more abstract theories which are studied in third year and beyond, and their myriad of applications in Science, Engineering, Statistics and Economics. Topics will include convergence of sequences and series, power series of real and complex variables, uniform convergence of sequences and series of functions, and Fourier series with applications.

MATH 2908 Differential Equations and Group Theory (Advanced)

4 credit points

Prerequisite: Mathematics 2902

Additional information: May not be counted with Mathematics 2008

When Offered: July

Classes: 3 lec & 1 tut/wk

Assessment: One 2hr exam, assignments

There are two distinct strands in this unit of study which run concurrently. The differential equations strand develops and applies the Mathematics 2902 unit of study, using the theory of eigenvalues and eigenvectors in the solution of differential equations. Matrix exponential and Jordan decomposition are used to solve linear systems of differential equations, which occur naturally in many branches of Science and Engineering. In the group theory strand topics include subgroups, equivalence relations, cosets, Lagrange's Theorem, homomorphisms, normal subgroups, quotient groups, isomorphism theorems, commutators, finite abelian groups, internal and external direct products, extensions, composition series, Jordan-Hoelder Theorem, Sylow Theorems, solvable and nilpotent groups.

Intermediate Statistics Units of Study

The School of Mathematics and Statistics provides Intermediate units of study, each worth 4 credit points, in Statistics. Students may take up to 4 units of study (16 credit points) in Intermediate Statistics, and may combine them with up to 8 units of study (32 credit points) in Intermediate Mathematics. A normal Intermediate load in a discipline is 16 credit points and students intending to specialise in Senior Statistics should take 4 units of study (16 credit points) of Intermediate Statistics.

Some topics are offered at both Normal and Advanced levels and may not be counted together. Entry to an Advanced unit of study requires a Credit or better in the Normal level prerequisite or a Pass or better in an Advanced level prerequisite.

The units of study (each 4 credit points) are listed below:

February Semester

Probability and Distribution Theory STAT 2001

Introduction to Probability (Advanced) STAT 2901

Data Analysis STAT 2002

July Semester

Estimation Theory STAT 2003

Estimation Theory (Advanced) STAT 2903

Hypothesis Testing STAT 2004

Further information follows, whilst details of units of study structure, content and assessment procedures are provided in the Intermediate Year Unit of Study Handbook available from the School at the time of enrolment.

Relations to other units of study and recommendations

In general 2 units of study (8 credit points) of Intermediate Statistics together with the units of study Mathematics 2001 or 2901 are prerequisites for progression to a normal Senior Statistics unit of study.

If your major interest is statistics, then you are encouraged to enrol in 4 units of study (16 credit points) in Intermediate Statistics. If you are considering doing Honours in Statistics, these units of study should include some Advanced units of study, and choices from Intermediate Mathematics should include at least Mathematics 2001 or 2901 and Mathematics 2002 or 2902.

If you do not intend to major in Statistics but want a solid introduction to Applied Statistics, you should take STAT 2002 in your first semester and STAT 2004 in your second semester. This allows you the option of continuing with STAT 3002 and STAT 3004 at Senior level.

STAT 2001 Probability and Distribution Theory

4 credit points

Prerequisite: Mathematics 1702 or 1792 or Mathematics 1712 and a Credit in Mathematics 1711

Additional information: May not be counted with Statistics 2901

When Offered: February

Classes: 2 lec & 1 tut/wk

Assessment: 2hr exam, assignments, tutorial participation

Distribution theory for discrete and continuous random variables, providing the probabilistic basis for the treatment of samples.

STAT 2002 Data Analysis

4 credit points

Prerequisite: Mathematics 1702 or 1704 or 1792 or 1794 or 1712

When Offered: February

Classes: 2 lec & 1 tut & 1 computer lab/wk

Assessment: 2hr exam, assignments, tutorial participation, one 1 hr computer practical exam

Exploratory data analysis and an introduction to the use of a statistical computing package.

STAT 2003 Estimation Theory

4 credit points

Prerequisite: Statistics 2001 or 2901

Additional information: May not be counted with Statistics 2903

When Offered: July

Classes: 2 lec & 1 tut/wk

Assessment: 2hr exam, assignments

Bivariate distribution theory, estimation, dependence, maximum likelihood estimation and regression theory.

STAT 2004 Hypothesis Testing

4 credit points

Prerequisite: Statistics 2002

When Offered: July

Classes: 2 lec & 1 tut & 1 computer lab/wk

Assessment: 2hr exam, assignments, computer lab participation, one 1hr computer practical exam

Tests of hypotheses about Normal models, including Analysis of Variance, non parametric tests.

STAT 2901 Introduction to Probability (Advanced)

4 credit points

Prerequisite: *Mathematics 1792 or Credit in Mathematics 1702*

Additional information: *May not be counted with Statistics 2001*

When Offered: *February*

Classes: *2 lec & Tut/wk*

Assessment: *2hr exam, assignments*

Topics in Statistics 2001 are treated at an Advanced level, with extensions.

STAT 2903 Estimation Theory (Advanced)

4 credit points

Prerequisite: *Statistics 2901 or Credit in Statistics 2001*

Additional information: *May not be counted with Statistics 2003*

When Offered: *July*

Classes: *2 lec & Tut/wk*

Assessment: *2hr exam, assignments*

Topics in STAT 2003 are treated at an Advanced level, with extensions.

Senior Mathematics Units of Study

The School of Mathematics and Statistics provides a range of Senior units of study, each worth 4 credit points, covering a wide variety of topics in Pure and Applied Mathematics. Students may take up to 12 units of study (48 credit points) at Senior level. Those intending to proceed to Honours or simply to major in mathematics must take a minimum of 6 units of study (24 credit points) from the Science Discipline Area of Mathematics.

The units of study are taught at either the Normal or the Advanced level. Entry into the advanced units of study is restricted to students who have met various prerequisite conditions. Students should consult the list below for requirements of individual Advanced units of study, and seek advice from the Senior year advisers.

The School encourages students undertaking an Advanced program to choose 3 or 4 units of study at the Advanced level.

Students wishing to keep open the possibility of undertaking an Honours year are strongly advised to consult a Senior year adviser about their choice of units of study.

For ease of overview, the units of study are arranged under Pure, for students wishing to specialise in Pure Mathematics, and Applied, for those wishing to specialise in Applied Mathematics. Several units of study are suitable to either. Details for each unit of study appear below, whilst full details of the unit of study structure, content and assessment procedures are provided in the Senior Year Units of Study Handbook, available from the School at the time of enrolment.

It should be noted that not all units of study are offered each year and any unit may be withdrawn due to resources constraints.

Pure Units of Study (each 4 credit points)

February Semester

Algebra I (Advanced) MATH 3902

Categories and Computer Science (Advanced) MATH 3905

Complex Variable (Advanced) MATH 3904

Differential Geometry (Advanced) MATH 3903

History of Mathematical Ideas MATH 3004

Logic MATH 3005

Metric Spaces (Advanced) MATH 3901

Ordinary Differential Equations MATH 3003

Rings and Fields MATH 3002

Topology MATH 3001

July Semester

Algebra E (Advanced) MATH 3907

Coding Theory MATH 3007

Combinatorics (Advanced) MATH 3912

Computational Algebra (Advanced) MATH 3913

Differential Analysis (Advanced) MATH 3911

Financial Mathematics MATH 3015

Geometry MATH 3006

Group Representation Theory (Advanced) MATH 3906

Information Theory MATH 3010

Lebesgue Integration and Fourier Analysis (Advanced) MATH 3909

Nonlinear Analysis (Advanced) MATH 3908

Number Theory MATH 3009

Real Variables MATH 3008

Applied Units of Study (each 4 credit points)

February Semester

Differential Geometry (Advanced) MATH 3903

Fluid Dynamics (Advanced) MATH 3914

History of Mathematical Ideas MATH 3004

Lagrangian Dynamics MATH 3011

Mathematical Computing MATH 3016

Mathematical Computing I (Advanced) MATH 3916

Mathematical Methods (Advanced) MATH 3915

Signal Processing MATH 3019

Signal Processing (Advanced) MATH 3919

July Semester

Coding Theory MATH 3007

Financial Mathematics MATH 3015

Hamiltonian Dynamics (Advanced) MATH 3917

Information Theory MATH 3010

Mathematical Computing II (Advanced) MATH 3918

Nonlinear Analysis (Advanced) MATH 3908

Nonlinear Systems and Biomathematics MATH 3020

Nonlinear Systems and Biomathematics (Advanced) MATH 3920

Partial Differential Equations and Waves MATH 3018

Relation to other units of study and recommendations

In general, 6 units of study (24 credit points) are required in order to major in Mathematics and a credit average is required to progress to an Honours year. Potential Honours students are strongly encouraged to include one or more Advanced level unit of study.

Students intending to major in *Pure Mathematics* should choose at least 6 units of study from the Pure list above; 3 units of study each semester is the normal choice. Intending Honours students are strongly encouraged to include Mathematics 3901 and 3902.

Students intending to major in *Applied Mathematics* should choose at least 6 units of study from the Applied list above.

A *double major* would require a choice of 12 units of study from the lists above.

Particular combinations would be suitable for students with special interests.

Computer Science students: Mathematics 3001, 3002 or 3902, 3005, 3905, 3006, 3007, 3009, 3010, 3912.

Engineering (BSc/BE) students: Mathematics 3001 or 3901, 3003, 3005, 3019 or 3919, 3903, 3904, 3007, 3008, 3010, 3908, 3909.

Physics or Chemistry students: Mathematics 3001 or 3901, 3002, 3003, 3914, 3917, 3903, 3904, 3006, 3008, 3009, 3010, 3908, 3909.

Prospective teachers of Mathematics: Mathematics 3001 or 3901, 3002 or 3902, 3003, 3004, 3005, 3006, 3007, 3008, 3009, 3010.

MATH 3001 Topology

4 credit points

Prerequisite: 8 credit points of Intermediate Mathematics

Additional information: May not be counted with Mathematics 3901

When Offered: February

Classes: 2 lec & 1 tut/wk

Assessment: One 2hr exam, assignments

Topology can be considered as a branch of geometry, and it has been called 'rubber sheet geometry', because it originated in the study of figures which are invariant under elastic deformations. It now forms a basic framework for fields such as functional analysis and nonlinear differential equations.

This unit of study covers a number of the more elementary aspects of both general and combinatorial topology. Topics discussed include continuous mappings and homeomorphisms, compactness, and the combinatorial classification of surfaces.

MATH 3002 Rings and Fields

4 credit points

Prerequisite: 8 credit points of Intermediate Mathematics (strongly advise 2002 or 2902, with 2008 or 2908)

Additional information: May not be counted with Mathematics 3902

When Offered: February

Classes: 2 lec & 1 tut/wk

Assessment: One 2hr exam, assignments

This unit of study is concerned primarily with the algebraic systems such as rings and fields, which are generalizations of familiar examples such as polynomials and real numbers. It generalizes familiar notions of divisibility, greatest common divisors and primality from the integers to other rings, and considers homomorphisms and quotient structures. The tutorials are used to introduce students to the computer algebra package MAGMA.

MATH 3003 Ordinary Differential Equations

4 credit points

Prerequisite: 8 credit points of Intermediate Mathematics (strongly advise 2002 or 2902, with 2001 or 2901)

When Offered: February

Classes: 2 lec & 1 tut/wk

Assessment: One 2hr exam, assignments

This unit of study is an introduction to the theory of systems of ordinary differential equations. Such systems model many types of phenomena in Engineering, Biology and the physical sciences. The emphasis will be not on finding explicit solutions, but instead on the qualitative features of these systems, such as stability, instability and oscillatory behaviour. The aim is to develop a good geometrical intuition into the behaviour of solutions to such systems. Some background in linear algebra, and familiarity with concepts such as limits and continuity, will be assumed.

MATH 3004 History of Mathematical Ideas

4 credit points

Prerequisite: 8 credit points of Intermediate Mathematics

When Offered: February

Classes: 2 lec & 1 tut/wk

Assessment: One 2hr exam, 2500w essay, tut presentation

This unit of study is intended to give students an insight into the way in which mathematics has evolved and through this, a better understanding of the mathematics itself, the main aim is to study the development of ideas underlying the calculus from Newton to Hausdorff (1650-1914). The work of Newton, Leibniz, Euler, Lagrange, Cauchy, Weierstrass and Frechet is discussed in some detail. Students are also required to participate in the tutorial program. In general a tutorial will consist of the reading of a short paper followed by discussions. Each student is expected to prepare and present at least one of these tutorial papers.

MATH 3005 Logic

4 credit points

Prerequisite: (for all but BCST students) 8 credit points of Intermediate Mathematics

Prereq (for BCST students) 8 credit points of Intermediate Mathematics or 12 credit points of Junior Mathematics at Advanced level

When Offered: February

Classes: 2 lec & 1 tut/wk

Assessment: One 2hr exam, assignments

This unit of study is mainly concerned with a general notion of computability, studied by means of Turing machines (simple abstract computers). In particular, it looks at some problems which cannot be solved by any computer. (Note: no experience with computing is required.) In the second part of the unit of study, the results from the first part are applied to mathematics itself. The conclusion is that there is no systematic way of discovering all mathematical truths.

MATH 3006 Geometry

4 credit points

Prerequisite: 8 credit points of Intermediate Mathematics (strongly advise 1701)

When Offered: July

Classes: 2 lec & 1 tut/wk

Assessment: One 2hr exam, assignments

Over the last 100 years or so, transformations have come to play an increasingly important role in geometry. In this unit of study, various groups of transformations are studied in some detail. Isometries, affine transformations, projective transformations, and the famous frieze groups are all discussed. The basic approach is via vectors (and matrices), emphasizing the interplay between geometry and linear algebra. Each provides insight into the other. Vectors are used to study both ordinary geometry and the projective geometry which arises when points at infinity are introduced.

MATH 3007 Coding Theory

4 credit points

Prerequisite: 8 credit points of Intermediate Mathematics (strongly advise 2002 or 2902)

When Offered: July

Classes: 2 lec & 1 tut/wk

Assessment: One 2hr exam, assignments

This unit of study provides a general introduction to the theory of error-correcting codes. After studying general error correcting block codes, with the aim of constructing efficient codes which can be practically implemented, it leads to the study of cyclic codes which are a special case of linear codes, with nice algebraic properties. This unit of study concludes with the construction of classes of cyclic codes that are used in the modern digital communication systems, including the code used in the compact disc player to correct errors caused by dust and scratches.

MATH 3008 Real Variables

4 credit points

Prerequisite: 8 credit points of *Intermediate Mathematics* (strongly advise 2001 or 2007 or 2901 or 2907)

When Offered: July

Classes: 2 lec & 1 tut/wk

Assessment: One 2hr exam, assignments

The aim of this unit of study is to present some of the beautiful and practical results which continue to justify and inspire the study of analysis. The unit of study includes a review of sequence, series, power series and Fourier series. It introduces the notions of asymptotic and uniform convergence. Among topics studied are the Bernoulli numbers, Bernoulli polynomials, the Euler-Maclaurin summation formula, the Riemann zeta function and Stirling's approximation for factorials.

MATH 3009 Number Theory

4 credit points

Prerequisite: 8 credit points of *Intermediate Mathematics*

When Offered: July

Classes: 2 lec & 1 tut/wk

Assessment: One 2hr exam, assignments

This unit of study is an introduction to elementary number theory, with an emphasis on the solution of Diophantine equations (that is, finding integer solutions to such equations as $x^2+y^2=z^2$, $x^2-21y^2=1$). Three main tools are developed: (i) the theory of divisibility and congruence (up to quadratic reciprocity), (ii) geometric methods, and (iii) rational approximation (continued fractions).

MATH 3010 Information Theory

4 credit points

Prerequisite: 8 credit points of *Intermediate Mathematics* (strongly advise 2001 or 2901 and some probability theory)

When Offered: July

Classes: 2 lec & 1 tut/wk

Assessment: One 2hr exam, assignments

This unit of study is a general introduction to the ideas and applications of information theory. The basic concept here is that of entropy, an idea which goes back more than a century to the work of Boltzmann. Interest in the concept was enormously increased by the work of Shannon in the late 1940's. He showed that entropy was a basic property of any (discrete) probability space, and established a fundamental relation between the entropy of a randomly varying signal and the maximum rate at which the signal could be transmitted through a communication line. There is another interpretation of entropy in terms of the financial value of information to a gambler. The unit of study covers applications to data compression, gambling strategies and investment portfolios.

MATH 3011 Lagrangian Dynamics

4 credit points

Prerequisite: *Mathematics 2005 or 2905*

Additional information: May not be counted with *Mathematics 2904*

When Offered: February

Classes: 2 lec & 1 tut/wk

Assessment: One 2hr exam, assignments

This unit of study provides an introduction to the calculus of variations and minimization problems. The principle of Least Action then leads to the equations of Lagrangian dynamics and Galileo's relativity principle produces the Lagrangian for a free particle. The concepts of kinetic energy, potential energy and conservation laws are illustrated for various dynamical systems including those of systems of particles and 2-D rigid bodies.

MATH 3015 Financial Mathematics

4 credit points

Prerequisite: 8 credit points of *Intermediate Mathematics* (strongly advise 2010 and some probability theory) and one of *Mathematics 1702 or 1703 or 1792 or 1793*

When Offered: July

Classes: 2 lec & 1 tut/wk

Assessment: One 2hr exam, assignments

This unit of study is an introduction to the Mathematical Theory of Finance and Financial Markets. It utilizes a number of mathematical methods including first order difference and differential equations, basic concepts of mathematical statistics such as the expectation of a random variable and the covariance of two random variables, optimization of functions of many variables using the method of Lagrange parameters and the Kuhn-Tucker conditions. These are applied to the study of the pricing of riskless securities, portfolio theory and a capital asset pricing model.

MATH 3016 Mathematical Computing I

4 credit points

Prerequisite: 8 credit points of *Intermediate Mathematics* and one of *Mathematics 1702 or 1703 or 1792 or 1793*

Additional information: May not be counted with *Mathematics 3916*

When Offered: February

Classes: 2 lec & 1 tut/wk

Assessment: One 2hr exam, assignments

This unit of study provides an introductory unit of study on Fortran 95 programming and numerical methods. Topics covered include computer arithmetic and computational errors, systems of linear equations, interpolation, solution of nonlinear equations, numerical quadrature and initial value problems for ordinary differential equations.

MATH 3018 Partial Differential Equations and Waves

4 credit points

Prerequisite: *Mathematics 2005 or 2905*

When Offered: July

Classes: 2 lec & 1 tut/wk

Assessment: One 2hr exam, assignments

After a review of ordinary differential equations this unit of study covers Sturm-Liouville eigenvalue problems and demonstrates their role in solving PDE's. The standard equations of mathematical physics, the wave equation, the diffusion (heat) equation and Laplace's equation, are treated, together with various applications.

MATH 3019 Signal Processing

4 credit points

Prerequisite: *Mathematics 2005 or 2905*

When Offered: February

Classes: 2 lec & 1 tut/wk

Assessment: One 2hr exam, assignments, computer project

This unit of study is an introduction to the mathematical theory of Digital Signal Processing. It consists of both theory and application. A significant component of the unit of study involves computer exercises using MATLAB. Topics treated include analogue and digital signals, transforms, the spectral theory of digit signal and wavelets. Applications include sampling and aliasing, filter design and the basics

of image processing.

MATH 3020 Nonlinear Systems and Bio mathematics

4 credit points

Prerequisite: 8 credit points of *Intermediate Mathematics* (strongly advise 2908 or 3003) and one of *Mathematics 1702 or 1703 or 1792 or 1793*

When Offered: July

Classes: 2 lec & 1 tut/wk

Assessment: One 2hr exam, assignments

This unit of study is concerned with nonlinear ordinary and partial differential equations applied to biological systems. The applications will be drawn from predator-prey systems, transmission of diseases, chemical reactions, beating of the heart, neurons (nerve cells), and pattern formation. The emphasis is on qualitative analysis including phase-plane methods, bifurcation theory and the study of limit cycles. The unit of study will include some computer simulations as illustrations.

MATH 3901 Metric Spaces (Advanced)

4 credit points

Prerequisite: 12 credit points of *Intermediate Mathematics* (strongly advise *Mathematics 2907*)

Additional information: May not be counted with *Mathematics 3001*

When Offered: February

Classes: 2 lec & 1 tut/wk

Assessment: One 2hr exam, assignments

Topology was invented by Poincaré at the end of the 19th century in an attempt to understand subtle qualitative problems in celestial mechanics. Since then there has been an explosive development of the subject and it now forms a basic framework for fields as diverse as algebraic geometry and non-linear differential equations. It is also intensively studied in its own right. In this unit some of the basic ideas of topology are developed. Topics covered include metric spaces, open and closed subsets, subspaces, convergent sequences, limits, complete spaces, continuous mappings, homeomorphisms, equivalent metrics, Contraction Mapping Theorem, Cantor's Intersection Theorem, completion, compact spaces, Heine-Borel Theorem, connected spaces, topological spaces, subspaces and product spaces, the Hausdorff condition, other separation properties, normal spaces, Urysohn's Lemma.

MATH 3902 Algebra I (Advanced)

4 credit points

Prerequisite: 12 credit points of *Intermediate Mathematics* (strongly advise *Mathematics 2902*)

Additional information: May not be counted with *Mathematics 3002*

When Offered: February

Classes: 2 lec & 1 tut/wk

Assessment: One 2hr exam, assignments

This unit of study is motivated by questions of solvability of algebraic equations. To deal with such questions the concepts of rings, fields and permutation groups are introduced. It begins with an historical perspective and shows how some problems in geometry can be converted into problems in algebra. Tools are then developed to tackle algebraic integral domains, fields of fractions, subrings, homomorphisms, ideals, quotient rings, polynomial rings, division and Euclidean algorithms, factorisation, Eisenstein's criterion, finite fields, field extensions, minimum polynomials, splitting fields, Fundamental Theorem of Algebra, field automorphisms and Galois groups, simplicity of the alternating groups on five letters or more, unsolvability

of the quintic.

MATH 3903 Differential Geometry (Advanced)

4 credit points

Prerequisite: 12 credit points of *Intermediate Mathematics* (strongly advise 2001 or 2901, with *Mathematics 3001 or 3901*)

When Offered: February

Classes: 2 lec & 1 tut/wk

Assessment: One 2hr exam, assignments

Differential Geometry is an important branch of mathematics in which one uses Calculus to study geometric objects, such as curves, surfaces and higher-dimensional objects. It also has close connections with classical and modern physics. This unit of study covers elementary properties of curves and surfaces in R^3 , following Do Carmo's book, leading to the celebrated Gauss-Bonnet Theorem. If time allows, either the language of differential forms will be introduced or some global theory of differential geometry will be developed.

MATH 3904 Complex Variable (Advanced)

4 credit points

Prerequisite: 12 credit points of *Intermediate Mathematics* (strongly advise *Mathematics 2001 or 2901*, with *Mathematics 3001 or 3901*)

When Offered: February

Classes: 2 lec & 1 tut/wk

Assessment: One 2hr exam, assignments

This unit of study continues the study of functions of complex variables introduced in the Intermediate units of study (*Mathematics 2001 or 2901*) assuming some knowledge of algebra (for example, that covered in *Mathematics 2008*). It will be advantageous for students to also take either *Mathematics 3901 Metric Spaces (Advanced)*, or *Mathematics 3001 Topology* if they intend to do this unit of study. The unit of study begins with a review of elementary properties of analytic functions, Cauchy's integral formula, isolated singularities and the calculus of residues. This will be followed by selected topics from the theory of uniform convergence, entire functions, gamma function, zeta function, elliptic functions, harmonic functions, conformal mappings, Riemann surfaces.

MATH 3905 Categories and Computer Science (Advanced)

4 credit points

Prerequisite: 12 credit points of *Intermediate Mathematics*

When Offered: February

Classes: 2 lec & 1 tut/wk

Assessment: One 2hr exam, assignments

In the past four or five years there has been an upsurge of interest in the applications of category theory and categorical logic to theoretical computer science (much of the relevant category theory has been developed by members of the Sydney Category Seminar). Topics in this unit of study will include: categories, free categories, generators and relations, dual of a category, distributive categories, imperative programs, data types in a distributive category, stacks, arrays, binary trees, queues, categories of functors, computational category theory.

MATH 3906 Group Representation Theory (Advanced)

4 credit points

Prerequisite: 12 credit points of *Intermediate Mathematics* (strongly advise *Mathematics 3902*)

When Offered: July

Classes: 2 lec & 1 tut/wk

Assessment: One 2hr exam, assignments

This topic is a natural extension of linear algebra combined with group theory. Groups occur naturally wherever there is symmetry of any kind: linear algebra is the fundamental tool of solving equations. Representation theory provides techniques for analysing symmetrical systems of equations. The central problem of the subject is the decomposition of a complicated representation into simple constituents. The remarkable theory of group characters, which provide the algebraic machinery for this decomposition, is the main topic of the unit of study.

This unit of study is only offered in odd years.

MATH 3907 Algebra II (Advanced)

4 credit points

Prerequisite: 12 credit points of Intermediate Mathematics (strongly advise Mathematics 3002 or 3902)

When Offered: July

Classes: 2 lec & 1 tut/wk

Assessment: One 2hr exam, assignments

In the study of vector spaces it is always assumed that the scalars are elements of some field; in particular, division by nonzero scalar is always possible. Sometimes however, there is a need to replace the field by a ring, such as the ring of integers, in which nonzero elements do not always have inverses. A vector space over such a ring is called a 'module'. This unit of study deals with modules, particularly modules over \mathbb{Z} and other integral domains, and with various applications of the theory. The structure of finite abelian groups is completely described. There is also an introduction to the study of algebraic integers, including generalizations of concepts of divisibility and factorization of ordinary integers.

This unit of study is offered only in even years.

MATH 3908 Nonlinear Analysis (Advanced)

4 credit points

Prerequisite: 12 credit points of Intermediate Mathematics (strongly advise Mathematics 3901)

When Offered: July

Classes: 2 lec & 1 tut/wk

Assessment: One 2hr exam, assignments

The intention of this unit of study is to provide an introduction to the modern theory of differential equations and bifurcation theory. There are two key aspects to the unit of study. In the first place, the aim is to develop and apply the geometric or topological approach to differential equations. This involves ideas such as 'phase portraits' and 'Liapunov stability', and originated at the end of the 19th century with the work of Poincaré and Liapunov. Our second goal is to give an introduction to 'bifurcation' theory. Here the idea is to describe how systems can change as a parameter varies. Bifurcation theory is used in the study of a wide range of pure and applied problems and is basic, for example, to an understanding of symmetry breaking and phase transitions in physics or the modern theory of chaos. One of the main results is the famous 'Hopf bifurcation theorem'. This result shows how one can change continuously from an equilibrium to a stable periodic oscillation.

MATH 3909 Lebesgue Integration and Fourier Analysis (Advanced)

4 credit points

Prerequisite: 12 credit points of Intermediate Mathematics (strongly advise Mathematics 2907 and Mathematics 3901)

When Offered: July

Classes: 2 lec & 1 tut/wk

Assessment: One 2hr exam, assignments

Integration is, of course, a fundamental tool in many areas of mathematics. Lebesgue's theory of integration is the one used in most modern analysis. It provides very general conditions under which integrals are defined and such formulas as the limit of an infinite sequence of integrals is equal to the integral of the limit of the sequence of functions are valid. These conditions are usually easy to verify in any particular example. The theory is based on measure theory, which is a generalization of the ideas of area and volume. This is applied to the study of Fourier series and integrals.

MATH 3911 Differential Analysis (Advanced)

4 credit points

Prerequisite: 12 credit points of Intermediate Mathematics (strongly advise Mathematics 2901 and 3902)

When Offered: July

Classes: 2 lec & 1 tut/wk

Assessment: One 2hr exam, assignments

Two functions defined in a neighbourhood of the origin of \mathbb{R}^n are said to be equivalent if they differ by a change of coordinates. In the simplest cases of regular points or nondegenerate singular points the function is equivalent to a linear form or a quadratic form respectively (Morse Lemma). The unit of study covers several extensions of these classical results and provides an introduction to the so-called 'elementary catastrophes' of Thorn.

This unit of study is not offered every year.

MATH 3912 Combinatorics (Advanced)

4 credit points

Prerequisite: 12 credit points of Intermediate Mathematics

When Offered: July

Classes: 2 lec & 1 tut/wk

Assessment: Generally one 2hr exam, assignments

This unit of study is concerned with methods of enumeration. It begins with elementary methods, including use of bijections, as well as ordinary and exponential generating functions, together with investigation of some of the important numbers that arise in counting: binomial coefficients, Stirling, Bell, Fibonacci, Catalan numbers, etc. The second part introduces some more modern methods of enumeration such as the finite operator calculus and Polya theory. In the last part, more recent developments are studied, including the combinatorics of partially ordered sets.

MATH 3913 Computational Algebra (Advanced)

4 credit points

Prerequisite: 12 credit points of Intermediate Mathematics (strongly advise Mathematics 3002 or 3902)

When Offered: July

Classes: 2 lec & 1 tut/wk

Assessment: One 2hr exam, assignments

Traditional numerical computation in Science and Engineering is concerned with the solution of those problems which can be reduced to calculations involving limited precision approximations to elements belonging to the real or complex fields. By way of contrast, computational algebra is concerned with techniques for the solution of 'non-numerical' problems. Typical examples of such problems are factoring a polynomial with integer coefficients into irreducible factors, finding the indefinite integral (if it exists) of a function, and determining exact solutions of systems of polynomial equations. This unit of study examines the fundamental algorithms for performing exact computation in the ring of integers, various \mathbb{R} -modules and polynomial rings. Applications in areas such as cryptography, indefinite integration and robotics are to be briefly reviewed.

MATH 3914 Fluid Dynamics (Advanced)
4 credit points

Prerequisite: Mathematics 2905 or Credit in Mathematics 2005
When Offered: February
Classes: 2 lec & 1 tut/wk
Assessment: One 2hr exam, assignments

This unit of study provides a first session in fluid dynamics, starting with the equations of flows by stream functions or potentials. It develops the elementary theorems and tools, including Bernoulli's equation, the role of vorticity, the vorticity equation, Kelvin's circulation theorem and Helmholtz's theorem. Topics covered include viscous flows, boundary layers, potential theory and 2-D airfoils, and complex variable methods. It concludes with an introduction to hydrodynamic stability and the transition to turbulent flow.

MATH 3915 Mathematical Methods (Advanced)
4 credit points

Prerequisite: Mathematics 2905 or Credit in Mathematics 2005
When Offered: February
Classes: 2 lec & 1 tut/wk
Assessment: One 2hr exam, assignments

This unit of study begins with a review of analytic functions, complex integration and power series. These techniques are applied to the evaluation of real variable integrals and summation of series. The second part is a study of some of the special functions of mathematical physics in the real and complex domains. Examples include various hypergeometric functions and their connection with certain ordinary and partial differential equations, and also elliptic functions and their connection with the simple pendulum and the spinning top. The third part introduces transforms methods, generalised functions and Green's functions with applications to boundary value problems.

MATH 3916 Mathematical Computing I (Advanced)
4 credit points

Prerequisite: 8 credit points of Intermediate Mathematics and one of Mathematics 1792 or 1793 or Credit in Mathematics 1702 or 1703
Additional information: May not be counted with Mathematics 3016
When Offered: February
Classes: 2 lec & 1 tut/wk
Assessment: One 2hr exam, assignments

See entry for Mathematics 3016 Mathematical Computing I.

MATH 3917 Hamiltonian Dynamics (Advanced)
4 credit points

Prerequisite: Mathematics 2904, or Credit in Mathematics 3011
When Offered: July
Classes: 2 lec & 1hr tut/wk
Assessment: One 2hr exam, assignments

This unit of study provides a brief recapitulation of the essential features of Lagrange's equations and of the calculus of variations before introducing the Hamiltonian and deriving Hamilton's equations from a variational principle. Canonical transformations, that is, transformations which take a Hamiltonian system into a new Hamiltonian system, then lead in a natural way to the Hamilton-Jacobi equation of mechanics, by means of which any integrable Hamiltonian system is most readily solved. The role of action angle variables in perturbation theory is described, and a brief introduction to the onset of chaos in Hamiltonian systems is given. In the last part the use of Pontriagin's principle in optimisation and control theory is discussed.

MATH 3918 Mathematical Computing II (Advanced)
4 credit points

Prerequisite: Mathematics 3016 or Engineering Mathematics 2052
When Offered: July
Classes: 1 lec & 2 computer lab/wk
Assessment: 3 computer projects

In this unit of study, students solve computational problems in applied mathematics where numerical or computer techniques are required for their solution. These problems are to be chosen from areas such as geophysical and astrophysical fluid dynamics, mathematical biology, neural networks, industrial mathematics and data analysis.

MATH 3919 Signal Processing (Advanced)
4 credit points

Prerequisite: Mathematics 2905 or Credit in Mathematics 2005
Additional information: May not be counted with Mathematics 3019
When Offered: February
Classes: 2 lec & 1 tut/wk
Assessment: One 2hr exam, assignments, computer project

See entry for Mathematics 3019 Signal Processing.

MATH 3920 Nonlinear Systems and Biomathematics (Advanced)
4 credit points

Prerequisite: 8 credit points of Intermediate Mathematics (strongly advise 2908 or 3003) and one of Mathematics 1792 or 1793 or Credit in Mathematics 1702 or 1703
Additional information: May not be counted with Mathematics 3020
When Offered: July
Classes: 2 lec & 1 tut/wk
Assessment: One 2hr exam, assignments

See entry for Mathematics 3020 Nonlinear Systems and Biomathematics.

Senior Statistics Units of Study

The School of Mathematics and Statistics provides several Senior units of study, each worth 4 credit points, in Statistics. Students wishing to specialise in Statistics should take at least 6 units of study (24 credit points) of Senior Statistics.

Some topics are offered at Normal and Advanced levels and may not be counted together. Entry to an Advanced unit of study requires a Credit or better in a Normal level prerequisite or a Pass or better in an Advanced level prerequisite.

The units of study (each 4 credit points) are listed below:

February Semester

Distribution Theory and Inference STAT 3001

Statistical Theory (Advanced) STAT 3901

Applied Linear Models STAT 3002

Linear Models (Advanced) STAT 3902

Time Series Analysis STAT 3003

July Semester

Applied Stochastic Processes STAT 3005

Markov Processes (Advanced) STAT 3905

Design of Experiments STAT 3004

Sampling Theory and Categorical Data STAT 3006

Multivariate Analysis (Advanced) STAT 3907 (Not offered in 1998)

Further information follows, whilst details of unit of study structure, content, and assessment procedures are provided in the *Third Year Unit of Study Handbook* available from the School at the time of enrolment.

Relation to other units of study and recommendations

In general 6 units of study (24 credit points) are required in order to major in Statistics, and a credit average is required to progress to an Honours year. Potential Honours students are strongly encouraged to include all available Advanced level units of study.

Students intending to major in Statistics should choose 3 units of study of Senior Statistics each semester, making 24 credit points in total.

STAT 3001 Distribution Theory and Inference

4 credit points

Prerequisite: *Mathematics 2001 or 2901 and Statistics 213 or 293 (given in 1997)*

Additional information: *May not be counted with Statistics 3901*

When Offered: *February*

Classes: *2 lec & 1 tut/wk*

Assessment: *One 2hr exam, assignments*

Multivariate distribution theory and linear transformations of variables. Properties of estimators, uniformly mostpowerful tests and likelihood ratio tests.

STAT 3002 Applied Linear Models

4 credit points

Prerequisite: *Statistics 212 or 213 or 293 (given in 1997)*

Additional information: *May not be counted with Statistics 3902*

When Offered: *February*

Classes: *2 lec & 1 tut & 1 computer lab/wk*

Assessment: *One 2hr exam, assignments, one 1hr computer practical exam*

Multiple regression, principal components, MANOVA, discriminant analysis.

STAT 3003 Time Series Analysis

4 credit points

Prerequisite: *Statistics 213 or 293 (given in 1997)*

When Offered: *February*

Classes: *2 lec & 1 tut & 1 computer lab/wk*

Assessment: *One 2hr exam, assignments*

Modelling and analysing time-dependent situations containing some dependence structure.

STAT 3004 Design of Experiments

4 credit points

Prerequisite: *Statistics 3002 or 3902*

When Offered: *July*

Classes: *2 lec & 1 tut & 1 computer lab/wk*

Assessment: *One 2hrexam, assignments, one 1hr computer practical exam*

Design and analysis of controlled comparative experiments, block designs, Latin squares, split-plot designs, 2n factorial designs.

STAT 3005 Applied Stochastic Processes

4 credit points

Prerequisite: *Statistics 211 or 291 (given in 1997) or 2001 or 2901 (given in 1998) and Mathematics 2001 or 2901*

Additional information: *May not be counted with Statistics 3905*

When Offered: *July*

Classes: *2 lec & 1 tut/wk*

Assessment: *One 2hr exam, assignments*

Discrete and continuous time Markov chains, introduction to Brownian motion.

STAT 3006 Sampling Theory and Categorical Data

4 credit points

Prerequisite: *Statistics 212 or 213 or 293 (given in 1997)*

When Offered: *July*

Classes: *2 lec, 1 tut & 1 computer lab/wk*

Assessment: *One 2hr exam, assignments*

Sampling without replacement, stratified sampling, ratio estimation, systematic and cluster sampling, contingency tables, log linear models.

STAT 3901 Statistical Theory (Advanced)

4 credit points

Prerequisite: *Mathematics 2001 or 2901 and Statistics 293 (given in 1997)*

Additional information: *May not be counted with Statistics 3001*

When Offered: *February*

Classes: *2 lec & 1 tut /wk*

Assessment: *One 2hr exam, assignments*

Topics in Statistics 3001 are treated at an Advanced level, with extensions.

STAT 3902 Linear Models (Advanced)

4 credit points

Prerequisite: *Statistics 293 or Credit in 213 (given in 1997) and Mathematics 2002 or 2902*

Additional information: *May not be counted with Statistics 3002*

When Offered: *February*

Classes: *2 lec, 1 tut & 1 computer lab/wk*

Assessment: *One 2hr exam, assignments, one 1hr computer practical exam*

Topics in Statistics 3002 are treated at an Advanced level, with extensions.

STAT 3905 Markov Processes (Advanced)

4 credit points

Prerequisite: *Statistics 293 (given in 1997) and Mathematics 2001 or 2901 and Mathematics 2002 or 2902*

Additional information: *May not be counted with Statistics 3005*

When Offered: *July*

Classes: *2 lec & 1 tut /wk*

Assessment: *One 2hr exam, assignments*

Topics in Statistics 3005 are treated at an Advanced level, with extensions.

STAT 3907 Multivariate Analysis (Advanced)

4 credit points

Prerequisite: *Statistics 3902 and either 3001 or 3901*

Additional information: *Not available in 1998*

When Offered: *July*

Classes: *2 lec, 1 tut & 1 computer lab/wk*

Assessment: *One 2hr exam, assignments*

This unit of study studies the analysis of data on several variables measured simultaneously.

Mathematics and Statistics Honours

The School of Mathematics and Statistics offers three Honours programs for students who have complete at least 24 credit points of Senior units of study in appropriate subject areas and who are of sufficient merit. The programs are:

Applied Mathematics
Mathematical Statistics
Pure Mathematics

Honours units of study consist of both formal coursework and an essay project. There is provision for students to take approved units of study from other research areas within the School and from other Departments. The essay 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.

Interested students should contact the fourth year coordinator at some convenient time before pre-enrolment. Senior level students contemplating an Honours year are strongly advised to consult the Senior unit of study handbooks for further advice and to discuss their choice of Senior units of study with the appropriate Senior level coordinator.

Further details of the Honours year are available from the coordinators for Applied Mathematics 4, Mathematical Statistics 4 and Pure Mathematics 4 and the respective unit of study handbooks.

MATH 4100 Pure Mathematics Honours

48 credit points

When Offered: February

MATH 4200 Applied Mathematics Honours

48 credit points

When Offered: February

STAT 4100 Mathematical Statistics Honours

48 credit points

When Offered: February

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 units of study in the Faculty of Science.

The units of study are available as Intermediate units of study 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 credit points of engineering units of study.

These units of study 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 units of study 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.

Registration

All students are required to register with Mr P. McHugh, Room 318 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.

Tutorials and laboratories

All students are required to undertake the tutorial and laboratory work associated with these units of study, details of which are provided in the timetables. The experimental and tutorial work, an integral part of the unit of study, complements the lecture material.

MECH 2200 Thermo-fluids

6 credit points

Prerequisite: 12 credit points each of Junior Mathematics and Junior Physics

Additional information: May not be counted with MECH 2201 Thermodynamics

When Offered: February

See Faculty of Engineering handbook for unit description.

MECH 2500 Engineering Dynamics 1

4 credit points

When Offered: July

Assessment: Exam and assignments

See Faculty of Engineering handbook for unit description.

MECH 2400 Mechanical Design 1

6 credit points

Prerequisite: 12 credit points each of Junior Mathematics and Junior Physics

When Offered: July

Classes: 2 lec & two 2hr drawing office sessions/wk

Assessment: Assignments, quizzes

See Faculty of Engineering handbook for unit description.

Textbooks:

Boudny Engineering Drawing, McGraw-Hill

Reference book

Shigley Mechanical Engineering Design, McGraw-Hill

Department of Microbiology

The Department of Microbiology offers units of study that equip students for a career in microbiology in fields of health, industry and basic research.

In addition, it provides introductory units of study to students of agriculture, pharmacy and science. These units of study will help students who wish to specialise in related fields where microorganisms are often used in studying life processes, e.g. biochemistry, genetics and botany.

Registration

All BSc students (except Pharmacy students) must register with the Department (Level 5 Biochemistry/Microbiology Building) during the last week prior to the start of Semester. Students will then be allocated to practical classes. Failure to register during this time may preclude allocation to particular practical classes. Students with a unit of study in Microbiology in the July Semester must confirm their intention on the first day of the July Semester.

MICR 2001 Introductory Microbiology

8 credit points

Teacher/Coordinator: Coordinator Mrs Dalins

Mrs Dalins, Prof. Reeves, Dr New, Dr Carter, Dr Duxbury

Prerequisite: Qual 12 credit points of Junior Biology

Prereq Chemistry 1102 or 1902 or 1904 and Mathematics 1701 or 1711 or 1791 and one of Mathematics 1702 or 1704 or 1712 or 1792 or 1794
Additional information: May not be counted with Microbiology 2003 or 2901

When Offered: February

Classes: 3 lec, 1 tut & 4prac/wk

Assessment: One 3hr exam, continuous assessment in prac, 2 assignments, prac exam

This unit of study aims to give the student sufficient knowledge and technical skills to provide a foundation for future study of microbiology. It is also suitable for students requiring a working knowledge of microbiology while specialising in related fields 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 component focuses on basic, safe microbiological techniques and the use of these to study examples of microbial activity which are illustrative of the lecture series.

Textbooks:

Prescott, L.M. et al. (eds) Microbiology, (3rd edn), W.C. Brown, 1996

MICR 2002 Applied Microbiology

8 credit points

Teacher/Coordinator: Coordinator Mrs Dalins

Mrs Dalins, Dr Carter, Prof. Reeves, Dr Humphery-Smith, Dr Duxbury

Prerequisite: Microbiology 2001 or 2901

Additional information: May not be counted with Microbiology 2004 or 2902

When Offered: July

Classes: 3 lec, 1 tut & 4prac/wk

Assessment: One 3hr exam, continuous assessment in prac, 2 assignments, prac exam

This unit of study is designed to expand the understanding of, and technical competence in, microbiology, building on the knowledge and skills acquired in Microbiology 2001 or 2901.

The lectures cover two broad topics: molecular microbiology of the organism and microbial biotechnology and applications. The molecular microbiology covers microbial genetics, regulation and manipulation of the bacterial genome, the structure and functioning of prokaryotic cells and aspects of microbial taxonomy and microbial evolution.

The microbial biotechnology section covers food microbiology (production, spoilage and preparation, as well as the safety of foods) and aspects of public health and medical microbiology (host-parasite relationships, host defences, epidemiology of selected diseases,

prevention of disease). Industrial microbiology deals with large scale production, traditional products, recombinant DNA products, biosensors and biocontrol agents, biodeterioration and bioremediation. Practical classes enable the study of material which both complements and supplements the lecture topics. Excursions to industrial concerns are included.

Work experience

On completion of Microbiology 2002 students will be offered the opportunity to undertake work experience for approximately one month in a microbiology laboratory of choice (hospital, food, research, environmental etc.).

Textbooks:

As for Microbiology 2001

MICR 2003 Theoretical Microbiology A

4 credit points

Coordinator: Mrs Dalins

Mrs Dalins, Dr Carter, Prof. Reeves, Dr New, Dr Duxbury

Prerequisite: Qual 12 credit points of Junior Biology

Prereq Chemistry 1102 or 1902 or 1904 and Mathematics 1701 or 1711 or 1791 and one of Mathematics 1702 or 1704 or 1712 or 1792 or 1794
Additional information: May not be counted with Microbiology 2001 or 2901

When Offered: February

Classes: 3 lec/wk

Assessment: One 3hr exam

This unit of study is suitable for students who are majoring in other aspects of biology and wish to acquire abroad background knowledge in microbiology. Students attend the same lectures as those enrolled in Microbiology 2001. There is no practical or tutorial component.

Textbooks:

As for Microbiology 2001

MICR 2004 Theoretical Microbiology B

4 credit points

Coordinator: Mrs Dalins

Mrs Dalins, Dr Carter, Prof. Reeves, Dr Humphery-Smith, Dr Duxbury

Prerequisite: Microbiology 2001 or 2003 or 2901

Additional information: May not be counted with Microbiology 2002 or 2902

When Offered: July

Classes: 3 lec/wk

Assessment: One 3hr exam

This unit of study is suitable for students who are majoring in other aspects of biology and wish to expand their knowledge of microbiology beyond that acquired in Microbiology 2001, 2003 or 2901 with further theoretical considerations of the subject. Students attend the same lectures as those enrolled in Microbiology 2002. There is no practical or tutorial component.

Textbooks:

As for Microbiology 2001

MICR 2901 Introductory Microbiology (Advanced)

8 credit points

Coordinator: Mrs Dalins

Mrs Dalins, Prof. Reeves, Dr New, Dr Carter, Dr Duxbury

Prerequisite: Qual Credit or better in Biology 1002 or 1003 or 1902 or 1903 and at least a pass in Chemistry 1102 or 1902 or 1904

Prereq Mathematics 1701 or 1711 or 1791 and Mathematics 1702 or 1704 or 1712 or 1792 or 1794

Additional information: May not be counted with Microbiology 2001 or 2003

Credit average or better is required in either Junior Biology or Chemistry

When Offered: February

Classes: 3 or 4 lec, 1 tut & 3 or 4 prac/wk

Assessment: As for Microbiology 2001, plus one 3hr exam

This unit of study will be available to students who have performed well in the Biology and Chemistry Junior units of study. The unit of study is based on Microbiology 2001 with alternative components. The content and nature of these components may vary from year to year. Selection criteria for entry into the unit of study will be available from the coordinator at the time of enrolment.

Textbooks:

As for Microbiology 2001

MICR 2902 Applied Microbiology (Advanced) **8 credit points**

Coordinator: Mrs Dalins

Mrs Dalins, Dr Carter, Prof. Reeves, Dr Humphery-Smith, Dr Duxbury, Dr Ferenci

Prerequisite: Qual Credit or better in Microbiology 2001 or in the equivalent components in Microbiology 2901

Additional information: May not be counted with Microbiology 2002 or 2004

When Offered: July

Classes: 4 lec, 1 tut & 3prac/wk

Assessment: As for Microbiology 2002 plus one 3hr exam

The unit of study is based on Microbiology 2002 with alternative components. The content and nature of these components may vary from year to year.

Textbooks:

As for Microbiology 2001

MICR 3001 General and Medical Microbiology **12 credit points**

Coordinator: Dr Duxbury

Dr Duxbury, Dr New, Dr Carter, Dr Humphery-Smith, Dr Ferenci and others

Prerequisite: Qual Microbiology 2002 or 2902 or both Microbiology 2001 and 2004 or both Microbiology 2004 and 2901

Prereq Biochemistry 2001 or 2101 or 2901 or Agricultural Chemistry 2001 or Biology 2005 or 2905

Additional information: May not be counted with Microbiology 3901

When Offered: February

Classes: 3 lec, 6-7prac & 2-3 other/wk

Assessment: One 2hr exam and one 1.5hr exam, essay, prac

This unit of study extends some of the topics covered in Microbiology 2001 and 2002. General Microbiology includes microbial growth and metabolism, microbial ecology, and food microbiology. The lecture series 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 Microbiology covers aspects of epidemiology, host defences, sexually transmitted diseases, and other important bacterial, viral, fungal, protozoal, helminth and zoonotic infections.

The practical component is designed to enhance students' practical skills and to complement the lecture series.

Textbooks:

To be announced

MICR 3002 Molecular and Environmental Microbiology

12 credit points

Coordinator: Dr Duxbury

Dr Duxbury, Dr New, Dr Ferenci, Prof. Reeves, Dr Carter, Dr Humphery-Smith

Prerequisite: Qual Microbiology 2002 or 2902 or both Microbiology 2001 and 2004 or both Microbiology 2004 and 2901

Prereq Biochemistry 2001 or 2101 or 2901 or Agricultural Chemistry 2001 or Biology 2005 or 2905

Additional information: May not be counted with Microbiology 3902

When Offered: July

Classes: 3 lec, 6-7prac & 2-3 other/wk

Assessment: One 2hr exam and one 1.5hr exam, essay, prac

This unit of study extends some of the topics covered in Microbiology 2001 and 2002. Molecular Microbiology covers aspects of bacterial structure and physiology and principles of molecular pathogenicity. Lectures on bacterial structure and physiology include structural aspects of surface components, membranes, periplasm and peptidoglycan, and a discussion of drug resistance mechanisms. Principles of Molecular Pathogenicity covers clones in pathogenic species, modes of pathogenesis and adhesion, bacterial toxins, antigenic variation, and vaccines. Environmental Microbiology includes plant microbiology, particularly in relation to nitrogen fixation systems, agrobacterium and crown gall, root colonisation, and endophytes. The unit of study also covers aspects of the distribution and activities of microbes in terrestrial and aquatic ecosystems, including their roles in the biodegradation and bioremediation of organic pollutants.

The practical component is designed to enhance students' practical skills and to complement the lecture series. Project work may form part of the practical component subject to the availability of resources.

Textbooks:

To be announced

MICR 3901 General and Medical Microbiology (Advanced)

12 credit points

Coordinator: Dr Duxbury

Dr Duxbury, Dr New, Dr Carter, Dr Humphery-Smith, Dr Ferenci and others

Prerequisite: Qual Microbiology 2002 or 2902 or both Microbiology 2001 and 2004 or both Microbiology 2004 and 2901

Prereq Biochemistry 2001 or 2101 or 2901 or Agricultural Chemistry 2001 or Biology 2005 or 2905

Additional information: May not be counted with Microbiology 3001 Credit or better is required in Microbiology 2001 or 2002 or 2004 or the equivalent components of Microbiology 2901 or 2902

When Offered: February

Classes: 4 lec, 6-7prac & 1-2 other/wk

Assessment: Two 2hr exams and one 1.5hr exam, essay, prac

This unit of study is based on Microbiology 3001. It is available to students who have performed well in Microbiology 2001 or 2901, and 2002, 2004 or 2902. The unit of study consists of a series of additional lectures related to the research interests in the Department. Consequently, the unit of study content may change from year to year. The selection criteria for entry into the unit of study will be available from the Coordinator at the time of enrolment.

Textbooks:

To be announced

MICR 3902 Molecular and Environmental Microbiology (Advanced)

12 credit points

Coordinator: Dr Duxbury

Dr Duxbury, Dr New, Dr Ferenci, Prof. Reeves, Dr Carter, Dr Humphery-Smith

Prerequisite: Qual Microbiology 2002 or 2902 or both Microbiology 2001 and 2004 or both Microbiology 2004 and 2901

Prereq Biochemistry 2001 or 2101 or 2901 or Agricultural Chemistry 2001 or Biology 2005 or 2905

Additional information: May not be counted with Microbiology 3002 Credit or better is required in Microbiology 2001 or 2002 or 2004 or the equivalent components of Microbiology 2901 or 2902

When Offered: July

Classes: 4 lec, 6-7prac & 1-2 other/wk

Assessment: Two 2hr exams and one 1.5hr exam, essay, prac

This unit of study is based on Microbiology 3002. It will be available to students who have performed well in Microbiology 2001 or 2901, and 2002, 2004 or 2902. The unit of study consists of a series of additional lectures related to the research interests in the Department. Consequently, the unit of study content may change from year to year. The selection criteria for entry into the unit of study will be available from the Coordinator at the time of enrolment.

Textbooks:

To be announced

MICR 4001 Microbiology Honours

48 credit points

Coordinator: Dr Ferenci

When Offered: February

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 their first semester which will cover diverse aspects of the subject. The coursework involves an essay as well as analysis of recently published papers in microbiology.

An expression of interest in Honours is required from students by the end of the semester before the Honours year, on a form to be lodged with the Honours Coordinator. Entry into the Honours year is usually dependent on an average of Credit level performance in Senior microbiology units of study.

Department of Pharmacology

This Department offers a general training in pharmacology to students in the Faculty of Science studying for the B Sc, BMedSc and BPharm degrees. It provides two Intermediate 4 credit point units of study, and four Senior 12 credit point units of study for BSc students.

PCOL 2001 Pharmacology Fundamentals

4 credit points

Coordinator: Dr Robin Allan

Prerequisite: 12 credit points of Junior Chemistry (including Chemistry 1102 or 1902) and 24 credit points of units of study from other Science Discipline Areas

Additional information: This is a qualifying unit of study for Pharmacology 3001 or 3002. Students are strongly advised to complete Junior units of study in Biology before enrolling in Pharmacology 2001

When Offered: February

Classes: 2 lec/wk & 4prac/tut sessions

Assessment: One 1.5hr exam, classwork

This unit of study 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.

Textbooks:

Rang, H.P. et al. Pharmacology, (3rd edn) Churchill Livingstone, 1995
Study aid

Neal, M.J. Medical Pharmacology at a Glance, Blackwell Scientific Publications, 1992

Reference books

Gilman, A.G. et al. Goodman and Gilman's The Pharmacological Basis of Therapeutics, Pergamon Press, 1990

Katzung, B.G. (ed.) Basic and Clinical Pharmacology, Appleton & Lange, 1989

PCOL 2002 Pharmacology — Drugs and People

4 credit points

Coordinator: Dr Robin Allan

Prerequisite: 12 credit points of Junior Chemistry (including Chemistry 1102 or 1902) and 24 credit points of units of study from other Science Discipline Areas

Additional information: This is a qualifying unit of study for Pharmacology 3001 or 3002. Students are strongly advised to complete Junior units of study in Biology before enrolling in Pharmacology 2002

When Offered: July

Classes: 2 lec/wk & 4prac/tut sessions

Assessment: One 1.5hr exam, classwork

This unit of study explores how drugs produce their effects in the body and what these effects are. The effects of drugs on the autonomic nervous system and the types and actions of drugs used for the treatment of pain and inflammation are discussed. The social use of drugs and the effects of some commonly abused drugs are examined. There is also a brief introduction to the toxicology of natural poisons, in particular snake and spider venoms.

Textbooks:

Rang, H.P. et al. Pharmacology, (3rd edn), Churchill Livingstone, 1995
Study aid

Neal, M.J. Medical Pharmacology at a Glance, Blackwell Scientific Publications, 1992

Reference books

Gilman, A.G. et al. Goodman and Gilman's The Pharmacological Basis of Therapeutics, Pergamon Press, 1990

Katzung, B.G. (ed.) Basic and Clinical Pharmacology, Appleton & Lange, 1989

PCOL 3001 Molecular Pharmacology and Toxicology

12 credit points

Coordinator: Dr Ian Spence

Prerequisite: Qual Pharmacology 2001 and 2002

Additional information: Students are strongly advised to consider Intermediate units of study in Biochemistry and/or Chemistry together with Physiology 2001 and 2002 if they wish to undertake Pharmacology 3001

When Offered: February

Classes: 4 lec, 2 tut & 6prac/wk

Assessment: Two 3hr exams, classwork

This unit of study covers two major areas of pharmacology: (1) toxicology, and (2) drug design and development.

The toxicology area covers metabolism of toxic substances, toxicity to major organs, epidemiology and carcinogenesis. It aims to provide an overview of 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 unit of study all students prepare a drug profile — a document similar to that required by regulatory authorities when a new drug is introduced. This provides students with the opportunity to become familiar with, firstly, regulatory procedures and, secondly, with the detailed pharmacology of one particular compound.

Textbooks:

Reference books

Gilman, A.G. et al. Goodman and Gilman's The Pharmacological Basis of Therapeutics, Pergamon Press, 1990

Klaasen, C.D. Casarett & Doull's Toxicology, The Basic Science of Poisons, Macmillan

Krogsgaard-Larsen, P. and Bundgaard, H. (eds) A Textbook of Drug Design and Development, Harwood Academic Publishers, 1991

PCOL 3002 Neuro- and Cardiovascular Pharmacology

12 credit points

Coordinator: Dr Ian Spence

Prerequisite: Qual Pharmacology 2001 and 2002

Additional information: Students are strongly advised to consider Intermediate units of study in Biochemistry and/or Chemistry together with Physiology 2001 and 2002 if they wish to undertake Pharmacology 3002

When Offered: July

Classes: 4 lec, 2 tut & 6prac/wk

Assessment: Two 3hr exams, classwork

The lecture series provides a comprehensive, systematic study of three major areas of pharmacology: (1) neuropharmacology, (2) cardiovascular pharmacology, and (3) respiratory pharmacology. The neuropharmacology component examines the actions of psychoactive drugs at all levels from single cells through to behaviour. The cardiovascular and respiratory components examine therapeutic intervention in disease states such as hypertension and asthma, and the mechanisms of drug action.

In addition to the core component students choose an elective selected from a number offered by the Department. These cover specific topics in depth and some are laboratory based. Details of these are available from the Department before the commencement of the July semester.

Textbooks:

Rang, H.P. et al. Pharmacology (3rd edn), Churchill Livingstone, 1995

Study aids

Einstein, R. Pharmacology Self-assessment Questions for Students, Butterworths, 1989

Neal, M.J. Medical Pharmacology at a Glance, Blackwell Scientific Publications, 1992

Reference books

Cooper, J.R. et al. The Biochemical Basis of Neuropharmacology, Oxford, 1991

Gilman, A.G. et al. Goodman and Gilman's The Pharmacological Basis of Therapeutics, Pergamon Press, 1990

PCOL 3101 Toxicology and Computer-aided Drug Design

12 credit points

Coordinator: Dr Ian Spence

Prerequisite: Qual Pharmacology 2001 and 2002

Corequisite: Pharmacology 3001

When Offered: February

Assessment: One 3hr exam, classwork

Subject to the approval of the Head of the Department of Pharmacology, exceptional students may take Pharmacology 3101 simultaneously with Pharmacology 3001. Pharmacology 3101 involves extended practical work and seminars, and may include attendance at certain lectures in a related subject.

Textbooks:

As for Pharmacology 3001

PCOL 3102 Advanced Pharmacodynamics

12 credit points

Coordinator: Dr Ian Spence

Prerequisite: Qual Pharmacology 2001 and 2002

Corequisite: Pharmacology 3002

When Offered: July

Assessment: One 3hr exam, classwork

Subject to the approval of the Head of the Department of Pharmacology, exceptional students may take Pharmacology 3102 simultaneously with Pharmacology 3002. Pharmacology 3102 involves extended practical work and seminars, and may include attendance at certain lectures in a related subject.

Textbooks:

As for Pharmacology 3002

PCOL 4001 Pharmacology Honours

48 credit points

Coordinator: Assoc. Prof. R. Einstein

When Offered: February

Subject to a satisfactory standard being attained in Pharmacology, a student may arrange to read for the Honours degree in this subject area. Much of the work will be arranged to suit the interest of the individual. The student will participate in a research project in progress in the Department. A literature review and a 50 page thesis on the research project must be prepared. Seminars on the literature review, the project and another chosen topic will be given by the student.

School of Physics

The School of Physics provides undergraduate units of study in Physics at Junior, Intermediate, Senior and Honours levels. Appropriate unit of study choices are available for candidates who wish to major in Physics, to proceed to Honours in Physics, or to combine Physics with a major in another subject area. Several other Faculties and other Departments within the Faculty of Science require that Junior Physics be taken as part of the students' preparation for later studies in their more specialised fields. Similarly, Intermediate Physics units of study are taken by many Faculty of Engineering students, as well as by many Faculty of Science students who intend to major in other subjects.

The School of Physics provides units of study at the Junior and Intermediate level for students wishing to complement other studies with Physics units of study which have an environmental emphasis, and for students wishing to major in Physics within the BSc (Environmental) award course program.

Location

Physics Junior units of study: lectures in Physics Building, laboratories in Carslaw Building.

Physics Intermediate, Senior and Honours units of study: Physics Building.

Noticeboards

On the balcony outside the Carslaw Physics laboratories and in the Physics Building as appropriate for each unit of study.

Registration

Junior units of study: In assigned laboratory periods during the first week of each semester.

Intermediate units of study: At first lecture, in the Physics Building. See noticeboard for allocation of lecture theatres.

Senior units of study: At first lecture, in the Physics Building. Consult noticeboard early in orientation period.

Advice on units of study

A member of the physics staff is normally present among Faculty advisers during enrolment week to advise intending commencing students. The Undergraduate Office, Room 202, Physics Building, will arrange for students to meet advisers for later year units of study.

Junior Physics Units of Study

Lecturer in Charge: Mrs R.M. Millar, Head of Junior Physics

There are six different semester length units of study offered at the Junior level. Physics 1001 (Regular), Physics 1002 (Fundamentals) and Physics 1901 (Advanced) are offered in the February semester only and Physics 1003 (Technological), Physics 1004 (Environmental and Life Sciences) and Physics 1902 (Advanced) are offered in the July semester only. Completion of one unit of study in each semester provides a solid foundation for further studies in Physics in higher years. The February semester laboratory work provides an introduction to experimental techniques while reinforcing concepts of physics introduced in lectures. In the July 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.

Administrative Assistant

Junior Physics: Mrs E. Hing, Room 202, Physics Building.

Information booklet

Further information about Junior Physics units of study is contained in a booklet for intending commencing students available at enrolment or during Orientation or from the Junior year administrative assistant.

PHYS 1001 Physics (Regular)

6 credit points

Prerequisite: AKN HSC Physics or HSC 4-unit Science

Additional information: May not be counted with Physics 1002 or 1901

See prerequisites for Intermediate Physics units of study.

Recommended concurrent unit of study: Mathematics 1701 or 1791

When Offered: February

Classes: 3 lec & 3 prac/tut/wk

Assessment: One 3hr exam, lab & assignments

This unit of study is for students who gained 65 marks or better in HSC 2-unit Physics or equivalent. The lecture series contains three four-week modules on the topics of Mechanics, Fluids and Fields, and Waves.

Textbooks:

HaUiday, D., Resnick, R., and Walker, J. Fundamentals of Physics (5th ed), John Wiley, 1996

Physics Laboratory Manuals (School of Physics Publication)

PHYS 1002 Physics (Fundamentals)

6 credit points

Prerequisite: AKN no assumed knowledge of Physics

Additional information: May not be counted with Physics 1001 or 1901

See prerequisites for Intermediate Physics units of study.

Recommended concurrent unit of study: Mathematics 1701 or 1791

When Offered: February

Classes: 3 lec & 3 prac/tut/wk

Assessment: One 3hr exam, lab & assignments

This unit of study is designed for students who have not studied Physics previously. The lecture series contains three four-week modules on the Language of Physics, Mechanics, and Waves.

Textbooks:

HaUiday, D., Resnick, R., and Walker, J. Fundamentals of Physics (5th ed), John Wiley, 1996

Physics Laboratory Manuals (School of Physics Publication)

PHYS 1901 Physics (Advanced) A

6 credit points

Prerequisite: 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

Additional information: May not be counted with Physics 1001 or 1002

See prerequisites for Intermediate Physics units of study.

Recommended concurrent unit of study: Mathematics 1701 or 1791

When Offered: February

Classes: 3 lec & 3 prac/tut/wk

Assessment: One 3hr exam, lab & assignments

Physics 1901 (Advanced) A is intended for students who have a strong background in Physics and an interest in studying more advanced topics. It proceeds faster than Physics 1001 (Regular), covering further and more difficult material. The lecture series contains 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:

HaUiday, D., Resnick, R., and Walker, J. Fundamentals of Physics (5th ed), John Wiley, 1996

Physics Laboratory Manuals (School of Physics Publication)

PHYS 1003 Physics (Technological)

6 credit points

Assumed Knowledge: HSC 2-unit Physics or HSC 4-unit Science or Physics 1001 or 1002 or 1902 or equivalent*

*Subject to Senate/Faculty approval

Additional information: May not be counted with Physics 1004 or 1902

See prerequisites for Intermediate Physics units of study.

Recommended concurrent unit of study: Mathematics 1702 or 1792

When Offered: July

Classes: 3 lec & 3 prac/tut/wk

Assessment: One 3hr exam, lab & assignments

This unit of study 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 series contains three four-week modules on the topics of electromagnetism, thermal physics, and quantum and materials physics.

Textbooks:

HaUiday, D., Resnick, R., and Walker, J. Fundamentals of Physics (5th ed), John Wiley, 1996

Physics Laboratory Manuals (School of Physics Publication)

PHYS 1004 Physics (Environmental and Life Sciences)

6 credit points

Assumed Knowledge: HSC 2-unit Physics or HSC 4-unit Science or Physics 1001 or 1002 or 1901 or equivalent*

*Subject to Senate/Faculty approval

Additional information: May not be counted with Physics 1003 or 1902

See prerequisites for Intermediate Physics units of study.

Recommended concurrent unit of study: Mathematics 1702 or 1792

When Offered: July

Classes: 3 lec & 3 prac/tut/wk

Assessment: One 3hr exam, lab & assignments

This unit of study has been designed specifically for students interested in further study in environmental and life sciences. The lecture series contains three four-week modules on the topics of electromagnetism, properties of matter, and atoms, nuclei and quanta.

Textbooks:

Halliday, D., Resnick, R., and Walker, J. Fundamentals of Physics (5th ed), John Wiley, 1996

Physics Laboratory Manuals (School of Physics Publication)

PHYS 1500 Astronomy

6 credit points

Assumed Knowledge: No assumed knowledge of Physics

When Offered: July

Classes: 3 lec & 3 tut/wk

Assessment: 1h exam, 2 essays, prac, assignments

This unit of study provides a broad understanding of the structure, scale and diversity of the universe and an appreciation of the scientific methods used to achieve this understanding. Current areas of investigation, new ideas and concepts which often receive wide media attention will be used to demonstrate how science attempts to understand new and remote phenomena and how our ideas of our place in the universe are changing. The range of topics includes the planets, the solar system and its origin, spacecraft discoveries, stars, supernovas, black holes, galaxies, quasars, cosmology and the Big Bang. It also includes an observing session.

Textbooks:

(Provisional choice)

Abell, G.O. Morrison, D. and Wolff, S.C. Realm of the Universe, Saunders College Publishing, Fort Worth USA, 1994

PHYS 1902 Physics (Advanced) B

6 credit points

Prerequisite: TER at least that for acceptance into BSc(Advanced) and HSC 2-unit Physics or HSC 4-unit Science or Physics 1901 or grade of Distinction or better in Physics 1001 *

*Subject to Senate/Faculty approval

Additional information: May not be counted with Physics 1003 or 1004

See prerequisites for Intermediate Physics units of study.

Recommended concurrent unit of study: Mathematics 1702 or 1792

When Offered: July

Classes: 3 lec/tut & 3 prac/wk

Assessment: One 3hr exam, lab & assignments

This unit of study is a continuation of Physics 1901 (Advanced) A. Students who have completed Physics 1001 (Regular) or Physics 1002 (Fundamentals) at Distinction level may enrol. It proceeds faster than Physics 1003 (Technological), covering further and more difficult material. The lecture series contains three four-week modules on the topics of electromagnetism, thermal physics, quantum and materials physics, and superconductivity.

Textbooks:

Halliday, D., Resnick, R., and Walker, J. Fundamentals of Physics (5th ed), John Wiley, 1996

Physics Laboratory Manuals (School of Physics Publication)

Intermediate Physics Units of Study

Lecturer in charge: Dr J Ulrichs

The School of Physics offers four units of study in each semester at the Intermediate level. A full year Intermediate program in Physics would normally be selected from one of the following combinations: Physics 2001 and 2002, for students majoring in the physical and engineering sciences; Physics 2101 and 2102 for students with a strong interest in the environmental or life sciences; Physics 2901 and 2902, the advanced physics course for students who have achieved a Credit or better in Physics 1003 or 1004. These three programs are qualifying units of study for Senior level physics. Two other units of study, Physics 2103 and 2104, are shorter units of study for students in the environmental sciences who do not plan to continue with physics at a Senior level.

Full details of Intermediate Physics unit of study structures, contents and assessment policies are provided in the Intermediate Physics Information for students booklet available at the time of enrolment.

PHYS 2001 Physics (Technological) A

8 credit points

Prerequisite: Qual 12 credit points of Junior Physics or Physics IE Prereq 12 credit points of Junior Mathematics other than Mathematics 1711 and 1712 or Credit or better in Mathematics 1711 and 1712

Additional information: May not be counted with Physics 2101 or 2103 or 2901

This is a qualifying unit of study for Senior Physics

When Offered: February

Classes: 3 lec, 3 prac & 2 microlab/wk

Assessment: One 3hr exam, four computer based assignments, microlab (report & test), prac report

Lectures

This unit of study 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.

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.

Practical Work:

Experimental physics is taught as a laboratory unit of study of three-hour sessions and includes experiments in the areas of instrumentation, quantum physics, properties of matter and environmental sensing and measurement. The unit of study 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 and on a written report and oral presentation of it on a selected experiment.

Textbooks:

Eisberg, R. and Resnick, R. Quantum Physics (2nd ed), Wiley, 1985

O'Byrne, J. (ed.) Experimental Physics Notes, School of Physics

Smith, R. Observational Astrophysics, Cambridge 1995

PHYS 2002 Physics (Technological) B
8 credit points

Prerequisite: Qual 12 credit points of Junior Physics or Physics IE
Prereq 12 credit points of Junior Mathematics other than Mathematics 1711 and 1712 or Credit or better in Mathematics 1711 and 1712
Additional information: May not be counted with Physics 2102 or 2104 or 2902

This is a qualifying unit of study for Senior Physics

When Offered: July

Classes: 3 lec, 3 prac & 2 microlab/wk

Assessment: One 3hr exam, 2prac reports, four computer based lab assignments, microlab (report & test), prac report

Lectures

This unit of study 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.

Microlab

The computational physics component is similar to that of Physics 2001, except that the material for the unit of study will be drawn from optics topics.

Practical Work:

As for Physics 2001, except that in the last part of the July semester students work in teams on a project, write a report on it and present the results in an oral report to other members of the class.

Textbooks:

O'Byrne, J. (ed.) Experimental Physics Notes, School of Physics

PHYS 2101 Physics (Environmental) A
8 credit points

Prerequisite: Qual 12 credit points of Junior Physics or Physics IE
Prereq 12 credit points of Junior Mathematics other than Mathematics 1711 and 1712 or Credit or better in Mathematics 1711 and 1712
Additional information: May not be counted with Physics 2001 or 2103 or 2901

This is a qualifying unit of study for Senior Physics

When Offered: February

Classes: 3 lec, 3 prac & 2 microlab/wk

Assessment: One 3hr exam, four computer based assignments, microlab (report & test), prac report

Lectures

This unit of study 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.

Microlab

As for Physics 2001.

Practical Work:

As for Physics 2001.

Textbooks:

Eisberg, R. and Resnick, R. Quantum Physics (2nd ed), "Wiley, 1985

O'Byrne, J. (ed.) Experimental Physics Notes, School of Physics

Smith, R. Observational Astrophysics, Cambridge, 1995

PHYS 2102 Physics (Environmental) B
8 credit points

Prerequisite: Qual 12 credit points of Junior Physics or Physics IE
Prereq 12 credit points of Junior Mathematics other than Mathematics 1711 and 1712 or Credit or better in Mathematics 1711 and 1712
Additional information: May not be counted with Physics 2002 or 2104 or 2902

This is a qualifying unit of study for Senior Physics

When Offered: July

Classes: 3 lec, 3 prac & 2 microlab/wk

Assessment: One 3hr exam, four computer based assignments, microlab (report & test), prac report

Lectures

This unit of study 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.

Microlab

As for Physics 2002.

Practical Work:

As for Physics 2002.

Textbooks:

O'Byrne, J. (ed.) Experimental Physics Notes, School of Physics

PHYS 2103 Introduction to Environmental Physics
4 credit points

Prerequisite: Qual 12 credit points of Junior Physics or Physics IE
Prereq 12 credit points of Junior Mathematics other than Mathematics 1711 and 1712 or Credit or better in Mathematics 1711 and 1712
Additional information: May not be counted with Physics 2001 or 2101 or 2901

This is not a qualifying unit of study for Senior Physics

When Offered: February

Classes: 3 lec/wk for part sem (27 total); 3 prac/wk for part sem (18 total)

Assessment: One 2hr exam, two computer based assignments, prac report

Lectures

This unit of study is intended for students in the environmental sciences who do not plan to take Senior level units of study in Physics. Lectures are shared with Physics 2101 except that astronomy is not offered.

Practical Work:

As for Physics 2001 except that students work for half the semester only.

PHYS 2104 Applications of Environmental Physics
4 credit points

Prerequisite: Qual 12 credit points of Junior Physics or Physics IE
Prereq 12 credit points of Junior Mathematics other than Mathematics 1711 and 1712 or Credit or better in Mathematics 1711 and 1712
Additional information: May not be counted with Physics 2002 or 2102 or 2902

This is not a qualifying unit of study for Senior Physics

When Offered: July

Classes: 3 lec/wk part sem (26 total); 3 prac/wk part sem (18 total)

Assessment: One 2hr exam, three computer based assignments, prac report

Lectures

This unit of study is intended for students in the environmental sciences who do not plan to take Senior level units of study in Physics. The lecture topics include instrumentation for the physical and environmental sciences, and energy transport in the environment.

Practical Work:

As for Physics 2002 except that students work for half the semester only.

Textbooks:

O'Byrne, J. (ed.) Experimental Physics Notes, School of Physics

PHYS 2901 Physics (Advanced) A

8 credit points

Prerequisite: Qual Physics 1901 and 1902 or 12 credit points of other Junior Physics units of study with an average of a Credit or better
Prereq 12 creditpoints of Junior Mathematics other than Mathematics 1711 and 1712 or Credit or better in Mathematics 1711 and 1712

Additional information: May not be counted with Physics 2001 or 2101 or 2103

This is a qualifying unit of study for Senior Physics

When Offered: February

Classes: 3 lec, 3 prac & 2 microlab/wk

Assessment: One 3hr exam, four computer based assignments, microlab (report & test), prac report

Lectures

The advanced Intermediate units of study 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 2901 include advanced quantum mechanics, astronomy, and an introduction to advanced electrodynamics.

Microlab

As for Physics 2001.

Practical Work:

As for Physics 2001.

Textbooks:

Eisberg, R. and Resnick, R. Quantum Physics (2nd ed), Wiley, 1985

O'Byrne, J. (ed.) Experimental Physics Notes, School of Physics

Smith, R. Observational Astrophysics, Cambridge 1995

Griffiths, D.J. Introduction to Electrodynamics (2nd ed), Prentice Hall,

1989

PHYS 2902 Physics (Advanced) B

8 credit points

Prerequisite: Qual Physics 1901 and 1902 or 12 creditpoints of other Junior Physics units of study with an average of a Credit or better
Prereq 12 creditpoints of Junior Mathematics other than Mathematics 1711 and 1712 or Credit or better in Mathematics 1711 and 1712

Additional information: May not be counted with Physics 2002 or 2102 or 2104

This is a qualifying unit of study for Senior Physics

When Offered: July

Classes: 3 lec, 3 prac & 2 micwlab/wk

Assessment: One 3hr exam, four computer based assignments, microlab (report & test),prac report

Lectures

Refer to Physics 2901 for an overall description of the advanced Intermediate program. The lectures in Physics 2902 include advanced electrodynamics, advanced optics, and instrumentation for the physical and environmental sciences.

Microlab

As for Physics 2002.

Practical Work:

As for Physics 2002.

Textbooks:

Griffiths, D.J. Introduction to Electrodynamics, Prentice Hall, 1989

O'Byrne, J. (ed.) Experimental Physics Notes, School of Physics

Senior Physics Units of Study

Lecturer in charge: DrN Cramer

Physics provides a range of 4 credit point lecture-based units of study, and 4 and 8 credit point laboratory based units of study. Most units of study are offered at either the normal or the Advanced level. Entry into the Advanced units of study is restricted to students who have met various qualifying unit of study conditions. Students intending to specialise in Physics or to proceed to Physics Honours must take a minimum of 24 credit points of Physics units of study, which must include lecture units on Quantum Mechanics, Relativity, Thermal Physics, and at least one of the subjects: Condensed Matter Physics and Photonics, Astrophysics, Plasma Physics, Modern Optics, Nuclear and Particle Physics, and Acoustics and Ultrasonics. (Not all of these subjects will be available in any one year.) At least 8 credit points of the minimum 24 must be in experimental physics or special project units. (The special project is undertaken in a research group of the Physics School, and may be on an experimental or theoretical topic, subject to approval.) The remainder of the required number of credit points may be made up by a choice of lecture units, computer based units or experimental units. It is possible to take up to 48 credit points in Senior Physics units of study.

Students not specialising in Physics may take any of the above units of study. In addition, there are a number of 4 credit point units of study designed for such students which offer study of particular topics in Physics, and combine lectures and a small number of experiments on the topic. These are the units of study PHYS 3105 Astrophysics, PHYS 3106 Plasma Physics, PHYS 3107 Modern Optics, PHYS 3108 Nuclear and PHYS 3200 Quantum Physics. These units are subject to conditions and availability. The units PHYS 3108 Nuclear and Particle Physics, PHYS 3109 Acoustics and Ultrasonics, and PHYS 3004 Condensed Matter Physics and Photonics are also suitable for such students.

The detailed minimum requirements for students specialising in Physics or intending to proceed to Physics Honours are as follows. The corresponding Advanced units of study may be substituted for any of these units of study.

- (a) Physics 3003
- (b) Physics 3005
- (c) at least one of Physics 3004, 3006 and 3007
- (d) at least 8 credit points selected from any of:
 - (i) either Physics 3008 or Physics 3009,
 - (ii) either Physics 3101 or Physics 3102,
 - (iii) either Physics 3103 or Physics 3104
- (e) at least one other unit of study selected from the units of study in (c) and (d).

PHYS 3003 Quantum Mechanics and Relativity

4 credit points

Prerequisite: Qual 16 creditpoints of Intermediate Physics

Prereq 8 credit points of Intermediate Mathematics

Additional information: May not be counted with Physics 3903 or 3200

When Offered: February

Classes: 3 lec/wk

Assessment: 3hr exam, assignments

The non-relativistic theory of quantum mechanics is treated, with particular emphasis on applications, such as in atomic and molecular physics. The theory of special relativity and its applications in classical mechanics and electromagnetism are also covered.

Textbooks:

Eisberg, R. and Resnick, R. Quantum Physics of Atoms, Molecules, Solids, Nuclei and Particles (2nd ed)

Reference book

Griffiths, D.J. Introduction to Electrodynamics (2nd ed)

Taylor, E.E and Wheeler, J.A. Spacetime Physics (2nd ed)

PHYS 3004 Condensed Matter Physics and Photonics 4 credit points

Prerequisite: Qual 16 credit points of Intermediate Physics
Prereq 8 credit points of Intermediate Mathematics
Additional information: May not be counted with Physics 3904
When Offered: February
Classes: 3 lec/wk
Assessment: 3hr exam, assignments

This unit of study covers two of the most important, and closely related, areas of research in contemporary physics and application to technology and engineering. The physics of condensed matter, in particular the solid state, is studied, including the topics in photonic technology such as optical fibres.

Textbooks:

Reference book

Kittel, C. Introduction to Solid State Physics (6th ed)

PHYS 3005 Topics in Modern Physics A 4 credit points

Prerequisite: Qual 16 credit points of Intermediate Physics
Prereq 8 credit points of Intermediate Mathematics
Additional information: May not be counted with Physics 3905
When Offered: July
Classes: 3 lec/wk
Assessment: 3hr exam, assignments

This unit of study covers thermal physics and energy physics, plus a choice of one subject covering an important research area of contemporary physics. Thermal physics covers the laws of thermodynamics, and energy physics explores the technological, environmental and practical uses and consequences of thermodynamics. The option subjects are in the areas covered by the research departments of the School of Physics: Astrophysics, Plasma Physics, Modern Optics, Nuclear and Particle Physics, and Acoustics and Ultrasonics. Only three of these option subjects may be offered in the one year.

Textbooks:

Eisberg, R. and Resnick, R. Quantum Physics of Atoms, Molecules, Solids, Nuclei and Particles (2nd ed) (for Nuclear and Particle Physics)

Reference book

Zemansky and Dittman Heat and Thermodynamics

Chen Introduction to Plasma Physics and Controlled Fusion (Vol 1) (for Plasma Physics)

PHYS 3006 Topics in Modern Physics B 4 credit points

Prerequisite: Qual 16 credit points of Intermediate Physics
Prereq 8 credit points of Intermediate Mathematics
Additional information: May not be counted with Physics 3906
When Offered: July
Classes: 3 lec/wk
Assessment: 3hr exam, assignments

This unit of study covers a choice of two subjects covering important research areas of contemporary physics: Astrophysics, Plasma Physics, Modern Optics, Nuclear and Particle Physics, and Acoustics and Ultrasonics. Only three of these option subjects may be offered in the one year. The option subjects cover the same topics as for Physics 3005.

PHYS 3007 Computational Physics 4 credit points

Prerequisite: Qual 16 credit points of Intermediate Physics
Prereq 8 credit points of Intermediate Mathematics
Additional information: May not be counted with Physics 3907
When Offered: February
Classes: 3 lec/wk
Assessment: 2hr exam, project

This unit of study covers the concepts and applications of computational techniques in physics, including the numerical modelling of physical systems and the use of computers in experimental data analysis and signal processing. The following topics will be included: Fourier series, Fourier transforms and their applications in physics, the fast Fourier transform, digital processing of signals, bandwidth and filtering, two-dimensional Fourier transforms and image analysis.

PHYS 3008 Experimental Physics A 4 credit points

Prerequisite: Qual 16 credit points of Intermediate Physics
Prereq 8 credit points of Intermediate Mathematics
Additional information: May not be counted with Physics 3908 or 3009 or 3909
When Offered: February
Classes: 4hrprac/wk
Assessment: Prac assessment

Electronic design and instrumentation for the physics laboratory, plus 4 other experiments drawn from a range of experiments in the areas of waves and optics, nuclear physics and the properties of matter.

PHYS 3009 Experimental Physics B 8 credit points

Prerequisite: Qual 16 credit points of Intermediate Physics
Prereq 8 credit points of Intermediate Mathematics
Additional information: May not be counted with Physics 3008 or 3908 or 3909
When Offered: February
Classes: 8hrprac/wk
Assessment: Prac assessment

Electronic design and instrumentation for the physics laboratory, plus 9 other experiments drawn from a range of experiments in the areas of waves and optics, nuclear physics and the properties of matter.

PHYS 3101 Experimental Physics C 4 credit points

Prerequisite: Qual 16 credit points of Intermediate Physics
Prereq 8 credit points of Intermediate Mathematics
Additional information: May not be counted with Physics 3102 or 3801 or 3802
When Offered: July
Classes: 4hrprac/wk
Assessment: Prac assessment

Five experiments are undertaken, drawn from a range of experiments in the fields of waves and optics, nuclear physics and the properties of matter.

PHYS 3102 Experimental Physics D

8 credit points

Prerequisite: Qual 16 credit points of Intermediate Physics

Prereq 8 credit points of Intermediate Mathematics

Additional information: May not be counted with Physics 3101 or 3801 or 3802

When Offered: July

Classes: Shrprac/wk

Assessment: Prac assessment

Ten experiments drawn from a range of experiments in the area of waves and optics, nuclear physics and the properties of matter.

PHYS 3103 Special Project A

4 credit points

Prerequisite: Qual 16 credit points of Intermediate Physics

Prereq 8 credit points of Intermediate Mathematics

Additional information: May not be counted with Physics 3104 or 3803 or 3804

(This unit of study will be available from 1999)

When Offered: February

Classes: 4hrprac/wk

Assessment: Written report and oral presentation

This unit of study will be available from 1999)

The equivalent of 4 hours per week is spent in a research group within the School of Physics, working on a research experiment or theoretical project supervised by a researcher.

PHYS 3104 Special Project B

4 credit points

Prerequisite: Qual 16 credit points of Intermediate Physics

Prereq 8 credit points of Intermediate Mathematics

Additional information: May not be counted with Physics 3103 or 3803 or 3804

When Offered: July

Classes: 4hrprac/wk

Assessment: Written report and oral presentation

As for Physics 3103, but in the July semester.

PHYS 3301 Scientific Computing

4 credit points

Prerequisite: 16 credit points of Intermediate units of study in Chemistry, Computer Science, Mathematics, Physics or Statistics

When Offered: February

Classes: 2 lec & 2hr computer lab/wk

This unit of study covers the computational techniques used to model aspects of the physical world in order to study them. The unit of study will present the main issues in computational modelling, numerical techniques and accuracy, and the use of mathematical simulation packages. It includes extensive hands-on tutorials. As this unit of study deals with general principles it is suitable for students in any scientific discipline.

PHYS 3302 Advanced Measurement Instrumentation and Control

4 credit points

Prerequisite: 16 credit points of Intermediate units of study in Biochemistry, Chemistry, Computer Science, Geology, Mathematics, Physics or Statistics

Additional information: (This unit of study will be available from 1999)

When Offered: February

Classes: 4hr lab/wk

Assessment: Examination, assignments and practical work

(This unit of study will be available from 1999)

This unit of study covers scientific data acquisition and control using high level language and graphical interfaces (eg Labview) on PC-based systems. Examples would include environmental monitoring, process control and audio/musical applications. A practical module, based on Labview, covers conventional sensors and transducers (thermocouples, strain gauges, photodiodes, anemometers, etc) with possible extension to more exotic devices from quantum electronics, biosensors and molecular devices. As this unit of study deals with general principles it is suitable for students in any scientific discipline.

PHYS 3303 Scientific Visualisation

4 credit points

Prerequisite: Physics 3301

When Offered: July

Classes: 2 lec & 2hr computer lab/wk

Assessment: Examination, assignments and practical work

The topics covered in this unit of study include introduction to visualisation, 2D image processing, visualisation of 2D data in 2 and 3 dimensions, dealing with different image formats, 3D scientific data volumes, visualisation techniques (volume, isosurface, mesh), use/abuse of colour, volume visualisation, 3D geometric datasets, using a generic visualisation package (AVS), incorporating computational models within a visualisation, real-time visualisation, producing output, conceptual visualisation, experience with computer animation programs. As this unit of study deals with general principles it is suitable for students in any scientific discipline.

PHYS 3801 Experimental Physics C (Advanced)

4 credit points

Prerequisite: Qual Physics 2901 and 2902, or Credit or better in Physics 2001 or 2101 and Credit or better in Physics 2002 or 2102

Prereq 16 credit points of Intermediate Mathematics

Additional information: May not be counted with Physics 3101 or 3102 or 3802

When Offered: July

Classes: 4hrprac/wk

Assessment: Prac assessment

As for Physics 3101 with extension material.

PHYS 3802 Experimental Physics D (Advanced)

8 credit points

Prerequisite: Qual Physics 2901 and 2902, or Credit or better in Physics 2001 or 2101 and Credit or better in Physics 2002 or 2102

Prereq 16 credit points of Intermediate Mathematics

Additional information: May not be counted with Physics 3101 or 3102 or 3801

When Offered: July

Classes: 8hrprac/wk

Assessment: Prac assessment

As for Physics 3102 with extension material.

PHYS 3803 Special Project A (Advanced)

4 credit points

Prerequisite: Qual Physics 2901 and 2902, or Credit or better in Physics 2001 or 2101 and Credit or better in Physics 2002 or 2102

Prereq 16 credit points of Intermediate Mathematics

Additional information: May not be counted with Physics 3103 or 3104 or 3804

When Offered: February

Classes: 4hrprac/wk

Assessment: Written report and oral presentation

(This unit of study will be available from 1999)

As for Physics 3103, but at a more challenging level.

PHYS 3804 Special Project B (Advanced)

4 credit points

Prerequisite: Qual Physics 2901 and 2902, or Credit or better in Physics 2001 or 2101 and Credit or better in Physics 2002 or 2102

Prereq 16 credit points of Intermediate Mathematics

Additional information: May not be counted with Physics 3103 or 3104 or 3803

When Offered: July

Assessment: Written report and oral presentation

As for Physics 3104, but at a more challenging level.

PHYS 3903 Quantum Mechanics and Relativity (Advanced)

4 credit points

Prerequisite: Qual Physics 2901 and 2902 or Credit or better in Physics 2001 or 2101 and Credit or better in Physics 2002 or 2102

Prereq 16 credit points of Intermediate Mathematics

Additional information: May not be counted with Physics 3003 or 3200

When Offered: February

Classes: 3 lec/wk

Assessment: 3hr exam, assignments

This unit of study covers the same topics as Physics 3003, with extension material. The formal foundations of Quantum Mechanics are emphasized.

Textbooks:

Bransden, B.H. and Joachain, C.J. Introduction to Quantum Mechanics
Reference book

Griffiths, D.J. Introduction to Electrodynamics (2nd ed)

PHYS 3904 Condensed Matter Physics and Photonics (Advanced)

4 credit points

Prerequisite: Qual Physics 2901 and 2902 or Credit or better in Physics 2001 or 2101 and Credit or better in Physics 2002 or 2102

Prereq 16 credit points of Intermediate Mathematics

Additional information: May not be counted with Physics 3004

When Offered: February

Classes: 3 lec/wk

Assessment: 3hr exam, assignments

This unit of study covers the same topics as Physics 3004, with extension material.

PHYS 3905 Topics in Modern Physics A (Advanced)

4 credit points

Prerequisite: Qual Physics 2901 and 2902 or Credit or better in Physics 2001 or 2101 and Credit or better in Physics 2002 or 2102

Prereq 16 credit points of Intermediate Mathematics

Additional information: May not be counted with Physics 3005

When Offered: July

Classes: 3 lec/wk

Assessment: 3hr exam, assignments

This unit of study covers the same topics as in Physics 3005, except that Energy Physics is replaced by Statistical Mechanics, which provides the molecular basis of thermodynamics. Extension material is also provided.

Textbooks:

Eisberg, R. and Resnick, R. Quantum Physics of Atoms, Molecules, Solids, Nuclei and Particles (2nd ed) (for Nuclear and Particle Physics)
Reference book

Zemansky and Dittman Heat and Thermodynamics

Chen Introduction to Plasma Physics and Controlled Fusion (Vol 1) (for Plasma Physics)

PHYS 3906 Topics in Modern Physics B (Advanced)

4 credit points

Prerequisite: Qual Physics 2901 and 2902, or Credit or better in Physics 2001 or 2101 and Credit or better in Physics 2002 or 2102

Prereq 16 credit points of Intermediate Mathematics

Additional information: May not be counted with Physics 3006

When Offered: July

Classes: 3 lec/wk

Assessment: 3hr exam, assignments

This unit of study is as for the unit of study Physics 3006, with extension material.

PHYS 3907 Computational Physics (Advanced)

4 credit points

Prerequisite: Qual Physics 2901 and 2902, or Credit or better in Physics 2001 or 2101 and Credit or better in Physics 2002 or 2102

Prereq 16 credit points of Intermediate Mathematics

Additional information: May not be counted with Physics 3007

When Offered: February

Classes: 3 lec/wk

Assessment: 2hrexam, project

This unit of study is as described for Physics 3007 Computational Physics, with extension material.

PHYS 3908 Experimental Physics A (Advanced)

4 credit points

Prerequisite: Qual Physics 2901 and 2902, or Credit or better in Physics 2001 or 2101 and Credit or better in Physics 2002 or 2102

Prereq 16 credit points of Intermediate Mathematics

Additional information: May not be counted with Physics 3008 or 3009 or 3909

When Offered: February

Classes: 4hrprac/wk

Assessment: Prac assessment

As for Physics 3008 with extension material.

PHYS 3909 Experimental Physics B (Advanced)

8 credit points

Prerequisite: Qual Physics 2901 and 2902, or Credit or better in Physics 2001 or 2101 and Credit or better in Physics 2002 or 2102

Prereq 16 credit points of Intermediate Mathematics

Additional information: May not be counted with Physics 3008 or 3009 or 3908

When Offered: February

Classes: 8hrprac/wk

Assessment: Prac assessment

As for Physics 3009 with extension material.

Senior Physics units of study 3105- 3200

The following units of study Physics 3105 to Physics 3200 are intended for students not specialising in Physics. Not all of these units of study may be offered in any one year - check with the Senior Physics coordinator. They are not offered at the Advanced level. The same option subjects in Physics 3005, 3905, 3006 and 3906 may not be taken.

PHYS 3105 Astrophysics

4 credit points

Prerequisite: Qual 16 credit points of Intermediate Physics
Prereq 8 credit points of Intermediate Mathematics
Additional information: (May not be available every year - check with the Senior Physics coordinator)
When Offered: July
Classes: 2 lec & 2hrprac/wk
Assessment: 1hrexam, assignments, prac assessment

This unit of study is intended for students not majoring in physics. The lecture component is the same as for the astrophysics component of Physics 3005. Several experiments illustrating the principles of astrophysics are also undertaken in the physics laboratory.

PHYS 3106 Plasma Physics

4 credit points

Prerequisite: Qual 16 credit points of Intermediate Physics
Prereq 8 credit points of Intermediate Mathematics
Additional information: (May not be available every year - check with the Senior Physics coordinator)
When Offered: July
Classes: 2 lec & 2hrprac/wk
Assessment: 2hrexam, assignments, prac assessment

This unit of study is intended for students not majoring in physics. The lecture component is the same as for the plasma physics component of Physics 3005. Several experiments illustrating the principles of plasma physics are also undertaken in the physics laboratory.

PHYS 3107 Modern Optics

4 credit points

Prerequisite: Qual 16 credit points of Intermediate Physics
Prereq 8 credit points of Intermediate Mathematics
Additional information: (May not be available every year - check with the Senior Physics coordinator)
When Offered: July
Classes: 2 lec & 2hrprac/wk
Assessment: 2hrexam, assignments, prac assessment

This unit of study is intended for students not majoring in physics. The lecture component is the same as for the modern optics component of Physics 3005. Several experiments illustrating the principles of modern optics are also undertaken in the physics laboratory.

PHYS 3108 Nuclear and Particle Physics

4 credit points

Prerequisite: Qual 16 credit points of Intermediate Physics
Prereq 8 credit points of Intermediate Mathematics
Additional information: (May not be available every year - check with the Senior Physics coordinator)
When Offered: July
Classes: 2 lec & 2hrprac/wk
Assessment: 2hr exam, assignments, prac assessment

This unit of study is intended for students not majoring in physics. The lecture component is the same as for the nuclear and particle physics component of Physics 3005. Several experiments illustrating the principles of nuclear and particle physics are also undertaken in the physics laboratory.

PHYS 3109 Acoustics and Ultrasonics

4 credit points

Prerequisite: Qual 16 credit points of Intermediate Physics
Prereq 8 credit points of Intermediate Mathematics
Additional information: (May not be available every year - check with the Senior Physics coordinator)
When Offered: July
Classes: 2 lec & 2hrprac/wk
Assessment: 1hrexam, assignments, prac assessment

This unit of study is intended for students not majoring in physics. The lecture component is the same as for the acoustics and ultrasonics component of Physics 3005. Several experiments illustrating the principles of acoustics and ultrasonics are also undertaken in the physics laboratory.

PHYS 3200 Quantum Physics

4 credit points

Prerequisite: Qual 16 credit points of Intermediate Physics
Prereq 8 credit points of Intermediate Mathematics
Additional information: May not be counted with Physics 3003 or 3903
When Offered: February
Classes: 2 lec & 2hrprac/wk
Assessment: 2hrexam, assignments, prac assessment

This unit of study is intended for students not majoring in physics. The lecture component is the same as for the quantum physics component of Physics 3003. Several experiments illustrating the principles of quantum physics are also undertaken in the physics laboratory.

PHYS 4001 Physics Honours

48 credit points

Lecturer in Charge: Dr P. Robinson
Prerequisite: Qual 24 credit points of Senior Physics
When Offered: February
Classes: 160 lec & research project
Assessment: Three 3hr and five 2hr exams, one 9000w report

Students of sufficient merit may be admitted to Honours 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 series of lectures and prescribed reading cover quantum mechanics, statistical mechanics and kinetic theory, electromagnetic theory, condensed matter physics, plasma physics, modern optics, sub-atomic physics, astrophysics and relativistic quantum mechanics. Additional options, 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, plasma astrophysics, and astrophysical shock theory.

Honours students are associated with one of the research groups in the School of Physics, and their research project is apart 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.

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 colloquiums, seminars and meetings of the Physics Board. They may be employed for a few hours per week in Junior teaching.

Department of Physiology

The Department of Physiology provides the following units of study for those wishing to study Physiology: introductory general Intermediate units of study and for those wishing to major in the subject, in-depth Senior units of study encompassing Neuroscience in the February and July semesters and Heart and Circulation in the July semester.

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. Tutorial/practical class times will be included on personal timetables and more detailed information will be provided at the first class.

PHSI 2001 Introductory Physiology A

4 credit points

Coordinator: Dr M. Frommer, assisted by Mrs I. Sehnelder

Prerequisite: 12 Junior credit points each of Chemistry and Mathematics, and 12 Junior credit points of two of Biology, Computer Science, Physics or Psychology

When Offered: February

Classes: 3 lec & 1 tut or 1 prac/wk

Assessment: One 3hr exam, data analysis, essays

This is a general unit of study dealing with the functions of some of the major human body systems - the cardiovascular, respiratory and haematological systems - with an introduction on excitable cell physiology (nerve and muscle). Both oral and written communication skills are assessed.

Practical Work:

The practical component involves simple experiments using human subjects and animal tissue, with an emphasis on data analysis.

Textbooks:

Rhoades, R. and Pflanzler, R. R. Human Physiology, Saunders, 1996

PHSI 2002 Introductory Physiology B

4 credit points

Coordinator: Dr Frommer, other Department of Physiology staff

Prerequisite: Physiology 2001

Additional information: This is a qualifying unit of study for Senior Physiology units of study

When Offered: July

Classes: 3 lec & 1 tut or 1 prac/wk

Assessment: One 3hr exam, data analysis, essays

This is a general unit of study dealing with the functions of the remaining major human body systems - central nervous system (neuroanatomy, neurophysiology), endocrine, renal and gastrointestinal systems. Both oral and written communication skills are assessed.

Practical Work:

The practical component involves simple experiments using human subjects, with an emphasis on data analysis.

Textbooks:

Rhoades, R. and Pflanzler, R. R. Human Physiology, Saunders, 1996

PHSI 3001 Neuroscience

12 credit points

Teacher/Coordinator: Dr P. Martin, Dr J. Mitrofanis

Prerequisite: Qual Physiology 2002 or Anatomy and Histology 2002 Prereq Biochemistry (2001 and 2002) or (2101 and 2102) and an additional 8 or more credit points from any Intermediate unit/s of study in the following subjects: Anatomy and Histology, Biology, Chemistry, Computer Science, Mathematics, Microbiology, Pharmacology, Physics, Physiology, Psychology or Statistics

Additional information: Students in the Faculty of Engineering who have completed Physiology 2002 plus at least one other Intermediate unit of study similar to one of the above prerequisites may be permitted to enrol by the unit of study Supervisor

When Offered: February

Classes: 4 lec & 8prac/wk

Assessment: One 3hr exam, spot tests, essays, prac reports, seminar presentations

The aim of this unit of study is to give the student a comprehensive view of the structure and function of the human nervous system. Our current knowledge of how the brain works is based on the analysis of the normal structure of the nervous system and its pathways, the functional effects of lesions and neurological diseases in different parts of the nervous system, and the way that nerve cells work at the molecular, cellular and integrative level. The lecture series addresses the different topics, each of which offers special insight into the normal function of the nervous system in health and disease.

Practical Work:

The practical component of this unit of study consists of small group tutorials in neuroanatomy, experimental and computer based sessions on physiological methods, and small group sessions in which you will discuss current research papers related to the lecture topics. You will have the opportunity to examine human brain specimens during the tutorials, and in the Wilson Museum in the Department of Anatomy and Histology. Computer based facilities which allow you to learn the brain structures by simulated dissection are also available.

Textbooks:

Kandel, E., Schwartz, J. and Jessell, T. Principles of Neural Science (3rd ed), Elsevier

or

Bear, M. R., Connors, B. W., Paradiso, M.A. Neuroscience: Exploring the Brain, Baltimore, Williams and Williams, 1996

(Kandel et al is recommended for students who intend to study Neuroscience 3002 in the July semester)

PHSI 3002 Neuroscience — Cellular and Integrative

12 credit points

Prerequisite: Qual Physiology 3001

When Offered: July

Classes: 3 lec, 3 tut & 6hrprac/wk

Assessment: One 3hr exam, spot tests, essays, prac reports, seminar presentations

This unit of study 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:

Practical work will take the form of either an experimental project carried out in a research laboratory or an extensive library research project

Textbooks:

Kandel, E. Schwartz, J. and Jessell, T. Principles of Neural Science (3rd ed), Elsevier

PHSI 3003 Heart and Circulation

12 credit points

Teacher/Coordinator: Dr J. Hoh

Prerequisite: Qual Physiology 2002

Prereq Biochemistry (2001 and 2002) or (2101 and 2102) and an additional 8 or more credit points from any Intermediate unit(s) of study in the following subjects: Anatomy and Histology, Biology, Chemistry, Computer Science, Mathematics, Microbiology, Pharmacology, Physics, Physiology, Psychology or Statistics

Additional information: Students in the Faculty of Engineering who have completed Physiology 2002 plus at least one other Intermediate course similar to one of the above prerequisites may also be permitted to enrol

When Offered: July

Classes: 4 lec, 2 tut & 6hrprac/wk

Assessment: One 3hr exam, spot tests, essays, prac reports, seminar presentations

This unit of study offers an up to date and in depth treatment of the structure and function of the cardiovascular system at the organ system, cellular and molecular levels. There is a particular focus on exercise physiology and the way in which the heart, circulation and muscle contribute to the limits of sporting achievement. The excitability, contractility and energetics of the heart and blood vessels are studied, and the regulation of these organs by local (physical and chemical) factors, hormones and the nervous system are discussed, with emphasis on cellular and molecular mechanisms. At the systemic level, the unit of study deals with short term (neural) mechanisms controlling the blood pressure, and how the system behaves during exercise and other stresses. Long term (hormonal) mechanisms regulating blood pressure via the renal control of extracellular fluid volume, and the pathophysiology of atherosclerosis and hypertension are also discussed.

Practical Work:

Lectures are combined with practical laboratory experiments on animals and human subjects.

PHSI 4001 Physiology Honours

48 credit points

Teacher/Coordinator: Coordinator Dr J. Hoh

When Offered: February

During fourth year, no formal series of lectures is provided but students are given a relevant problem to investigate. This problem usually represents a small facet of one of the major current research projects within the Department, and the students work in collaboration with members of the staff. Students write a thesis embodying the results of their work.

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.

A normal three year sequence in Psychology is Psychology 1001, 1002, 2001, 2002, 3001 and 3002. Psychology 2101 and 2102 (which together are identical to Psychology 2001) are intended only for students wishing to vary the above sequence for reasons such as mid year entry or failure in 1001.

The units of study available are:

Psychology 1001 6 credit points

Psychology 1002 6 credit points

Psychology 2001 8 credit points

Psychology 2002 8 credit points

Psychology 2101 4 credit points

Psychology 2102 4 credit points

Psychology 3001 12 credit points

Psychology 3002 12 credit points

In addition, Bachelor of Psychology students must study two or more of the following:

Psychology 3101 12 credit points

Psychology 3102 12 credit points

Psychology 3103 12 credit points

Psychology 3104 12 credit points

These consist of additional options not chosen by students within Psychology 3001 and 3002.

Registration and noticeboards

Students in all years must register during the orientation period. Psychology 1001 students register by going to the Carslaw Building during orientation and collecting a personalised computer generated timetable, which will indicate the lecture times and the tutorial group to which they have been allocated. Further information will be posted at the Enrolment Centre and on the Junior Psychology noticeboard on the 4th Floor of the Griffith-Taylor Building.

Information about registration meetings for Psychology 2001, 2002, 3001 and 3002 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 2001 and 2002 and also in Psychology 3001 and 3002. Students wishing to graduate with Honours in Psychology are urged to discuss their choice of other subjects with a Faculty adviser as soon as practicable. There is currently a quota on entry to Psychology 4.

Examinations

Undergraduate units of study are examined at the end of each semester and include classwork by way of essays, reports or practical/laboratory work. At the beginning of each unit of study or module, students are advised of its relative weight and the contributions of exam and classwork for assessment purposes.

Textbooks:

Check Departmental syllabi before buying prescribed texts.

PSYC 1001 Psychology 1001

6 credit points

When Offered: February

Classes: 3 lec, one 2hr demonstration/tut/wk

Assessment: One 3hr exam, one 1000w essay, two tut tests; experimental participation

Psychology 1001 is a general introduction to the main topics and methods of psychology, and is the basis for advanced work as well as being of use to those not proceeding with the subject. Psychology 1001 covers the following areas: subject matter and methods of psychology; basic statistics and measurement; behavioural neuroscience; sensory processes; social psychology; personality theory.

Textbooks:

To be advised and Psychology 1001 Handbook (1998)

PSYC 1002 Psychology 1002

6 credit points

When Offered: July

Classes: 3 lec & 2hr demonstration/tut/wk

Assessment: One 3hr exam, one 1250w prac report, two tut tests; experimental participation

Psychology 1002 covers the following areas: human development; humanmental abilities; learning, motivation and abnormal psychology; visual perception; cognitive processes.

Textbooks:

To be advised and Psychology 1002 Handbook (1998)

PSYC 2001 Psychology 2001

8 credit points

Prerequisite: Psychology 1001 and 1002

When Offered: February

Classes: 4 lec & up to 4hr tut/prac/wk

Assessment: Two 2hr exams, class quizzes, report

Psychology 2001 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, 2 quizzes

Personality

Classes: 1 lec & 1 tut/wk

Assessment one 1hr exam

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, quiz.

Textbooks:

See Departmental handout

PSYC 2002 Psychology 2002

8 credit points

Prerequisite: Psychology 1001 and 1002 and either 2001 or 2101 or, with permission, equivalent Statistics content

When Offered: July

Classes: 4 lec & up to 4hr tut/prac/wk

Assessment: Two 2hr exams, quizzes, prac report

Psychology 2002 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, 2 quizzes

Learning and Behavioural Neuroscience

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, quiz.

Textbooks:

See Departmental handout

PSYC 2101 Psychology 2101

4 credit points

Prerequisite: Psychology 1002

Corequisite: Psychology 1001

Additional information: May not be counted with Psychology 2001

When Offered: February

The coursework for this unit of study consists of the Statistics and Individual Differences modules from Psychology 2001.

PSYC 2102 Psychology 2102

4 credit points

Prerequisite: Psychology 2002 and 2101

Additional information: May not be counted with Psychology 2001

When Offered: February

The coursework for this unit of study consists of the Sensation and Perception and Personality modules from Psychology 2001.

PSYC 3001 Psychology 3001

12 credit points

Prerequisite: Qua! Psychology 2001 (or 2101 and 2102) and Psychology 2002

When Offered: February

Classes: 4 lec & up to 6hr oftut/prac/wk

Assessment: Four 1hr exams, essays, prac reports, quizzes

Classes

Psychology 3001 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.

Timetabling of units of study

Because of timetabling difficulties some units of study are offered at times other than those listed for Psychology 3001 and 3002 in the timetable for Senior units of study.

Students wishing to proceed to Psychology 4 Honours must complete the four modules History and Philosophy of Psychology I and II, Measurement and Psychometrics and Statistics and Research Design, plus two other modules in each semester.

Students not wishing to proceed to Psychology 4 Honours must complete any four modules each semester.

All Psychology modules 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 1hr exam, one essay, tut paper

Cognitive Processes: Recognition, Search and Memory

Classes: 1 lec & 1 tut/wk

Assessment one 1hr exam, prac report, quiz

History and Philosophy of Psychology I: Historical Foundations

(Required of students wishing to proceed to Psychology Honours)

Classes: 1 lec & 1 tut/wk

Assessment one 1hr exam, one essay, tut paper

Intelligence

Classes: 1 lec & 1 tut/wk

Assessment one 1hr exam, quiz

Learning and Motivation

Classes: 1 lec & up to 2hr of tut or prac/wk

Assessment one 1hr exam, prac report or essay

Measurement and Psychometrics

(Required of students wishing to proceed to Psychology Honours)

Classes: 1 lec & 1 tut/wk

Assessment one 1hr exam, prac report

Social Psychology

Classes: 1 lec & 1 tut/wk

Assessment one 1hr exam, prac report

Theoretical Bases of Development

Classes: 1 lec & 1 tut/wk

Assessment one 1hr exam, prac report.

PSYC 3002 Psychology 3002

12 credit points

Prerequisite: Qual Psychology 2001 and 2002. History and Philosophy I module requires History and Philosophy I

When Offered: July

Classes: 4 lec & up to 6hr of tut/prac/wk

Assessment: Four 1hr exams, essays, prac reports, quizzes

Classes and unit of study information: See Psychology 3001.

The topics include:

Behavioural Neuroscience

Classes: 1 lec & up to 2hr of prac or tut/wk

Assessment one 1hr exam, prac report, quiz

Child Abnormal Psychology

Classes: 1 lec & 1 tut/wk

Assessment one 1hr exam, one essay, tut paper

Developmental Issues

Classes: 1 lec & 1 tut/wk

Assessment one 1hr exam, report

Environmental and Organisational Psychology

Classes (1 lec & 1 tut)/wk

Assessment one 1hr exam, one prac report

History and Philosophy of Psychology II: Philosophical Principles

(Required of students wishing to proceed to Psychology Honours)

Prereq History and Philosophy of Psychology I: Historical Foundations

Classes: 1 lec & 1 tut/wk

Assessment one 1hr exam, one essay, tut paper

Human Performance

Classes: 1 lec & 1 tut/wk

Assessment one 1hr exam, 10 short reports, tutorial quiz

Language and Communication

Classes: 1 lec & 2 prac/wk (6 weeks only)

Assessment one 1hr exam, assignment/quizzes

Perceptual Systems

Classes: 1 lec & up to 2hr of tut or prac/wk

Assessment one 1hr exam, prac report

Statistics and Research Design

(Required of students wishing to proceed to Psychology Honours)

Classes: 1 lec & 1 tut/wk

Assessment one 1hr exam, prac report

The Nature/Nurture Controversy in Psychology

Classes: 1 lec & 1 tut/wk

Assessment one 1hr exam, one essay, tut paper.

PSYC 4001 Psychology Honours

48 credit points

Prerequisite: Average of Credit or better in Psychology 2001 and 2002, and also in 3001 and 3002; specified options in Psychology 3001 and 3002

When Offered: February

Assessment: Formal exams in General Psychology and Methods; report of empirical research project; theoretical thesis or take-home examination in three Special Fields modules

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:

- devise, conduct and report upon an empirical research project,
- write a theoretical thesis or attend three Special Fields modules and write three essays;
- attend one General Psychology lecture series and two Method lecture series. The areas of psychology in which the empirical research project may be carried out may depend on the interests and specialities of staff members.

Bachelor of Science (Environmental)

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 units of study. A total of 144 credit points is required for the degree.

For information on other relevant units of study for this degree program, please refer to the Bachelor of Science units of study descriptions in this chapter.

HSC Aggregate

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

Transferring into the BSc (Environmental)

Students will only be permitted to transfer from other degrees offered by the Faculty of Science into the Bachelor of Science (Environmental) degree program with the approval of the Dean.

Bachelor of Science (Environmental) Junior Units of Study

Candidates are required to enrol in and complete:

- Global Geology 1001 and Geomorphic Environments and Change 1002
- Biology 1001 or 1901 and either Biology 1002 or 1902
- Chemistry 1101 or 1901 or 1903 and either 1102 or 1902 or 1904
- Physics 1001 or 1002
- Mathematics 1704.

ENV11001 Global Geology

6 credit points

Coordinator: Dr M. Hughes

Corequisite: Biology 1001 or 1901 and Chemistry 1101 or 1901 or 1903 and Physics 1001 or 1002

When Offered: February

Classes: 3 lec & prac/tut/wk

Assessment: One 3hr exam, class work

The unit of study serves as an introduction to environmental geology by examining global geological processes and their controls on the human environment. The unit of study explores the origin of the Earth within the developing Solar System and traces the evolution of the Earth's hydrosphere, atmosphere and biosphere through geological time. Other topics include plate tectonics, and the influence of volcanic activity, earthquakes and other geological hazards on human occupation of the planet. The unit of study includes an examination of minerals and rocks as an introduction to the study of the Earth's mineral and energy resources.

Students considering enrolling in this unit of study should study the pamphlet on the Junior unit of study in Geology, obtainable from the Enquiry Office in the Edgeworth David Building. It gives details of unit of study content, text and reference books, staffing and other relevant matters.

ENV11002 Geomorphic Environments and Change*

6 credit points

Coordinator: Assoc. Prof. D. Dragovich

Prerequisite: Global Geology 1001

Corequisite: Biology 1002 or 1902 and Chemistry 1102 or 1902 or 1904 and Mathematics 1704

Additional information: *Subject to Faculty/Senate approval

When Offered: July

Classes: 3 lec & prac/tut/wk

Assessment: One 3hr exam, class work

This unit of study completes the introduction to environmental earth sciences by examining geographical scales of environmental concern, such as catchments, river basins, hydrology and land-use. The unit of study 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.

Bachelor of Science (Environmental) Intermediate Units of Study

You must enrol in all of the Environmental Science Intermediate units of study (Natural Environmental Systems 2001, Anthropogenic Impacts on Environment 2002, Environmental Science B1 2101, and Environmental Science B2 2102).

Please note: Intermediate units of study in the Bachelor of Science (Environmental) will change from 1999. For details contact the Environmental Studies Coordinator.

ENVI2001 Natural Environmental Systems

8 credit points

Prerequisite: Global Geology 1001 and Geomorphic Environments and Change 1002 and Biology 1002 or 1902 and Chemistry 1102 or 1902 or 1904 and Mathematics 1702 or 1703 or 1704 or 1792 or 1793 or 1794 (or Mathematics 1711 and 1712)

Corequisite: Environmental Science B1 2101 and 8 credit points from the approved list of units of study (consult the Chair of the Committee for BSc(Environmental))

When Offered: February

Classes: 3 lec, 1 tut & 2prac/wk, field excursions inprac time and in vacations

Assessment: One 3hr exam, 3 prac assignments

The two units of study Natural Environmental Systems 2001 and Anthropogenic Impacts on Environment 2002 must be taken. You must also enrol in Environmental Science B1 2101 and Environmental Science B 2102 below.

Natural Environmental Systems 2001 and Anthropogenic Impacts on Environment 2002 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.

(Intermediate units of study in the B achelor of Science (Environmental) will change from 1999. For details contact the Environmental Studies Coordinator)

ENVI 2002 Anthropogenic Impacts on Environment

8 credit points

Prerequisite: Natural Environmental Systems 2001 and Environmental Science B1 2101

Corequisite: Environmental Science B2 2102

When Offered: July

Classes: 3 lec, 1 tut & 2 prac/wk, field excursions in prac time and in vacations

Assessment: One 3hr exam, 3 prac assignments per semester

The two units of study Natural Environmental Systems 2001 and Anthropogenic Impacts on Environment 2002 must be taken. You must also enrol in Environmental Science B1 2101 and Environmental Science B 2102 below.

Natural Environmental Systems 2001 and Anthropogenic Impacts on Environment 2002 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.

(Intermediate units of study in the B achelor of Science (Environmental) will change from 1999. For details contact the Environmental Studies Coordinator)

ENVI 2101 Environmental Science B1

8 credit points

Prerequisite: As for Natural Environmental Systems 2001

Corequisite: Natural Environmental Systems 2001 and 8 credit points from the approved list of units of study (consult the Chair of the Committee for BSc(Environmental))

When Offered: February

Classes: 3 lec/tut & 3 prac/wk

Assessment: One 3hr exam, lab and assignments

You must enrol in both Environmental Science B1 2101 and Environmental Science B2 2102 in addition to Natural Environmental Systems 2001 and Anthropogenic Impacts on Environment 2002.

This unit of study consists of one module: Introduction to Environmental Physics in which students will take Physics 1001 or 1002 or 1901. A complete description is available in the Physics entry of the Faculty Handbook.

(Intermediate units of study in the B achelor of Science (Environmental) will change from 1999. For details contact the Environmental Studies Coordinator)

ENVI 2102 Environmental Science B2 8 credit points

Prerequisite: Natural Environmental Systems 2001 and Environmental Science B1 2101

Corequisite: Anthropogenic Impacts on Environment 2002

When Offered: July

Assessment: See below

You must enrol in both Environmental Science B1 2101 and Environmental Science B2 2102 in addition to Natural Environmental Systems 2001 and Anthropogenic Impacts on Environment 2002.

Module 1 Introduction to Environmental Physics

Classes July Sem: 3 lec/tut & 3 prac/wk

Assessment one 3hr exam, lab and assignments

Students will take Physics 1004. A complete description is available in the Physics entry of the Faculty Handbook.

Module 2 Design and Analysis of Environmental Sampling

Classes July Sem: Weeks 1-6: 2 lec & prac/wk

Assessment one 1.5hr exam

This module is a modification of a successful module in the Senior Biology (Ecology) course and will run in conjunction with it. The module 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 module 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.

(Intermediate units of study in the Bachelor of Science (Environmental) will change from 1999. For details contact the Environmental Studies Coordinator)

Bachelor of Science (Environmental) Senior Units of Study

You must enrol in both Environmental Science Senior units of study (ENVI3001 and 3002). Both Senior Environmental Science units of study consist of Core (4 credit points) and Option modules (totalling a minimum of 8 credit points) to be taken from those offered in the relevant contributory Schools and Departments (subject to the approval of the Chair of the Program Committee for Environmental Science). No student may take Option modules so as to gain more than 12 credit points in any one relevant discipline per year, so careful consideration must be given towards both February and July Semester subjects at the beginning of the February Semester. Furthermore, no option may be counted towards a Senior Environmental Science unit of study and be counted simultaneously toward any other Senior or other enrolment. All enrolments in options other than the core must be approved by the host Department/School or Unit of Study Executive Officer.

ENVI 3001 Environmental Law and Planning 12 credit points

Prerequisite: Anthropogenic Impacts on Environment 2002 and Environmental Science B2 2102 and approved Intermediate units of study to a minimum worth of 16 credit points

Corequisite: Senior units of study from approved Science Discipline Areas (Agricultural Chemistry, Biology, Chemistry, Geography, Geology, Microbiology or Soil Science) totalling a minimum of 12 credit points

When Offered: February

Environmental Science 3A Core Module 4 credit points

Classes: 4 lec or tut/wk; 28hr of prac and field-units of study

Assessment one 1.5hr exam and 2 prac assignments each semester; one major environmental report

The Core section in Senior Environmental Science build on foundations laid by the Intermediate Environmental Science units of study to provide the integration of scientific and other aspects of environmental problem-solving and professional responsibilities. Topics in the 3 A Core module include introductions to environmental ethics, law, and issues of planning, regulation and management for the built and natural environments.

Environmental Science 3A Option Modules

The following list of Options modules are available for inclusion within the ENVI 3001. The modules are of varying durations and credit point values, as detailed below. This list is subject to change according to the availability of resources from within the contributing Departments. No student may take Option modules so as to gain more than 12 credit points in any one relevant discipline per year, so careful consideration must be given towards both ENVI 3001 and 3002 options at the beginning of the February Semester. Please see the Chair of the Program Committee for Environmental Science for an up-to-date listing.

Biological Sciences

Ecophysiology (4 credit points) {Taken as part of School of Biology Honours program}

Ecophysiology is a field course, held over 3 days, that covers general physiological interactions between organisms and their environment.

Chemistry

Chemistry 3 A (Environmental) (Chemistry 3601, 4 credit points)

Consists of 2 hours of lectures and 2 hours of practical each week, covering the subjects Spectroscopic Identification of Organic Compounds, Instrumental Methods in Analytical Chemistry, Aquatic Chemistry and Radiation Chemistry. Assessment is by exam and practical.

Physics

Energy and the Environment (Physics 3600, 4 credit points)

Geography

Ancient Environments (6 credit points) {Taken as part of Geography 3101}

Environmental Fluvial Geomorphology (6 credit points) {Taken as part of Geography 3101}

Agricultural Chemistry & Soil Science

Environmental Soil Physics (6-credit points). {Taken as part of Soil Science 3001}

Pedology (6-credit points). {Taken as part of Soil Science 3001}

Environmental Plant & Soil Chemistry (4-credit points) {Taken as part of Agricultural Chemistry 3002}

Geology and Geophysics

Physical Sedimentology (Marine Science 3001/MS3, 6 credit points)

Microbiology

Microbiology (2x4 credit points - one each semester) {Taken as part of Microbiology 2001 and 3002}

These 2 modules must be taken together. They cannot be taken individually.

The February Semester module would cover: an introduction to microbiology; basic techniques (microscopy, staining, cultivation of bacteria); sterilization and disinfection; prokaryotes; eukaryotes; and microbial growth, with 3 hours of lectures, 1 of tutorials and 4 of practical each week for the first 7 weeks of semester.

In the July Semester, the module would consist of 1 lecture and 3 hours of practical each week for the whole semester, covering environmental aspects of plant, soil and water microbiology.

ENVI 3002 Environmental Assessment

12 credit points

Prerequisite: *Environmental Law and Planning 3001*

Corequisite: *Senior units of study from approved Science Discipline Areas (Agricultural Chemistry, Biology, Chemistry, Geography, Geology, Microbiology or Soil Science) totalling a minimum of 12 creditpoints*

When Offered: July

Environmental Science 3B Core Module 4 creditpoints

Classes: 4 lec or tut/wk; 28hr of prac and field-units of study

Assessment one 1.5hr exam and 2 prac assignments each semester; one major environmental report

The Core section in Senior Environmental Science build on foundations laid by the Intermediate Environmental Science units of study to provide the integration of scientific and other aspects of environmental problem-solving and professional responsibilities. Topics in the 3B Core module include introductions to environmental economics, and issues concerning environmental impact assessment. Emphasis will be on practical work in field-units of study 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.

Environmental Science 3B Option Modules

The following Options modules are available for inclusion within the Environmental Assessment ENVI 3002. This list is subject to change according to the availability of resources from within the contributing Departments. No student may take Option modules so as to gain more than 12 credit points in any one relevant discipline per year, so careful consideration must be given towards both Environmental Law and Planning ENVI 3001 and Environmental Assessment ENVI 3002 subjects at the beginning of the February Semester. Please see the Chair of the Program Committee for Environmental Science for an up-to-date listing.

Biological Sciences

Ecology (8 credit points) {Taken as part of Biology 3202}

Divided into field component (4 credit points) and lectures (4 credit points), running in the July semester. The field component (week before semester starts) is compulsory for the lecture series.

Terrestrial Ecology (4 credit points) {Taken as part of Biology 3202}

Terrestrial ecology considers the biology of organisms in terrestrial ecosystems and analyses their distribution and abundance. This module investigates the relationships between ecology and the management of populations and communities for conservation and exploitation.

Plant Ecology (4 credit points) {Taken as part of Biology 3202}

Plant ecology examines the ecological processes that produce complex interactions within plant populations. The role of genetics, demography and populations structure in the management and conservation of plants will be considered.

Chemistry

Chemistry 3B (Environmental) (Chemistry 3602, 4 creditpoints)

Consists of 2 hours of lectures and 2 hours of practical each week, covering the subjects Chemistry Laboratory Practices, Marine Chemistry, Mineral Chemistry and Atmospheric Photochemistry. Assessment is by exam and practical.

Geography

Coastal Zone Management (6 credit points) {Taken as part of Geography 3102}

Geographical Information Systems (6 creditpoints) {Taken as part of Geography 3102}

Rock Weathering (6 creditpoints) {Taken as part of Geography 3002}

Agricultural Chemistry & Soil Science

Advanced Soil Chemistry (6-credit points). {Taken as part of Soil Science 3002}

Geology and Geophysics

Environmental Geophysics (Geophysics 3005, 4 credit points)

Chemical Processes in the Oceans (Marine Science S3001/MS8, 6 creditpoints)

Marine Geology and Palaeoclimates (Marine Science 3001/MS9, 6 credit points)

Microbiology

Microbiology (2x4 creditpoints - one each semester) {Taken as part of Microbiology 2001 and 3002}

These 2 modules must be taken together. They cannot be taken individually.

The February Semester module would cover: an introduction to microbiology; basic techniques (microscopy, staining, cultivation of bacteria); sterilization and disinfection; prokaryotes; eukaryotes; and, microbial growth, with 3 hours of lectures, 1 of tutorials and 4 of practical each week for the first 7 weeks of semester.

In the July Semester, the module would consist of 1 lecture and 3 hours of practical each week for the whole semester, covering environmental aspects of plant, soil and water microbiology.

CHEM 3601 Chemistry 3A (Environmental)

4 credit points

Prerequisite: *Chemistry 1102 or 1902 and Anthropogenic Impacts on Environments 2002*

Additional information: *May not be counted with Chemistry 3101 or 3201 or 3901 or 3102 or 3202, or 3902 or 3903*

When Offered: February

Classes: 2 lec and 2hrprac/workshop/wk

Assessment: 45 min exams (67%), prac reports (33%)

This unit of study contains lectures on modern methods for identifying and quantifying chemicals in the environment. In this unit of study, the complexity of natural systems will be considered. Features of this complexity will be introduced through a discussion of the chemistry of natural waters. The multiple equilibria, phases, separation of aqueous systems will be discussed and the adsorption and transport of chemicals into and out of the system. Geochemical modelling of aqueous systems will be included. The final section will introduce the theories of radiation chemistry with its industrial, environmental and medical applications. The effects of exposure of man and materials to radiation will be considered.

CHEM 3602 Chemistry 3B (Environmental)

4 credit points

Prerequisite: *Chemistry 1102 or 1902 and Anthropogenic Impacts on Environments 2002*

Additional information: *May not be counted with Chemistry 3101 or 3201 or 3901 or 3102 or 3202 or 3902 or 3903*

When Offered: July

Classes: 2 lec and 2hrprac/workshop/wk

Assessment: 45 min exams (67%), prac reports (33%)

This unit of study contains a general introduction to laboratory safety and provides an introduction to risk and hazard analysis, recognition and limitation procedures. It will enable the student to use, locate and retrieve information from safety data bases. There will be an overview of the actions and effects on human health especially with respect to carcinogens. The safe use, storage and disposal of chemicals and radiation sources will be covered.

There will be an introduction to geochemistry with major themes of geochemical cycles, chemical weathering, coal chemistry and the fate of trace elements after the combustion of coal. In addition there will be an introduction to the inorganic chemistry of the sea. Topics include the composition of seawater, biological concentration of minerals, manganese nodules and the chemistry of the deep sea hydrothermal vents.

The fourth topic in this unit of study is the chemistry of the atmosphere which will lead to an investigation of the natural atmosphere, photochemical smog, acid rain and ozone depletion.

PHYS 3600 Energy and the Environment

4 credit points

Prerequisite: *Environmental Science 2102 or 12 credit points of Junior Physics*

When Offered: *February*

Classes: *1 lec & 1 sem & 2hrs made up of sem, field trips, project work and pres/wk*

Assessment: *2000w essay (25%), 2000w case study & oral presentation (45%), seminars following field trips (30%)*

This unit of study covers the following aspects of energy and the environmental: energy use, power generation including alternative methods, environmental impact of energy use and power generation including the greenhouse effect, atmospheric impacts: ozone depletion and pollution, transportation and pollution, energy management in buildings, solar thermal energy, photovoltaics, nuclear energy, risk assessment, socio-economic and political issues related to energy use and power generation.

The unit of study will consist of one lecture and one seminar per week, with a further two hours per week made up of 3 field trips, work on a project and oral presentation of an essay and the results of the project.

ENVI 4001 Environmental Science Honours

48 credit points

When Offered: *February*

Bachelor of Science (Molecular Biology and Genetics)

BIOL 1904 Living Systems Molecular (Advanced)

6 credit points

Assumed Knowledge: *2-unit Biology or Biology 1901 or equivalent*

Additional information: *May not be counted with Biology 1002 or 1003 or 1902 or 1905*

Students must be enrolled in the Molecular Biology and Genetics Degree Program.

When Offered: *July*

Classes: *3 lec & 3hrprac/wk & 7 discussion sessions*

Assessment: *One 2hr exam, assignments, classwork and an assignment based on discussion sessions*

This unit of study is the same as Biology 1902 except for the addition of 7 special molecular biology and genetics discussion sessions, which consist of topical seminars and discussions in this discipline. An essay based on these discussions can be included as part of the assessment of the unit of study.

BIOL 1905 Human Biology Molecular (Advanced)

6 credit points

Assumed Knowledge: *HSC 2-unit Biology or Biology 1901 or equivalent*

Additional information: *May not be counted with Biology 1002 or 1003 or 1902 or 1904*

Students must be enrolled in the Molecular Biology and Genetics Degree Program.

When Offered: *July*

Classes: *3 lec & 3hrprac/wk & 7 discussion sessions*

Assessment: *One 2hr exam, assignments, classwork and an assignment based on discussion sessions*

This unit of study is the same as Biology 1903 except for the addition of 7 special molecular biology and genetics discussion sessions, which consist of topical seminars and discussions in this discipline. An essay based on these discussions can be included as part of the assessment of the unit of study.

CHEM 1905 Chemistry 1A Molecular (Advanced)

6 credit points

Prerequisite: *TER of at least 88 and at least 75% in HSC 2-unit Chemistry or equivalent*

Additional information: *May not be counted with Chemistry 1001 or 1101 or 1901 or 1903 or 1906*

When Offered: *February*

Classes: *3 lec/tut & 3hrprac/wk & 7 discussion sessions*

Assessment: *One 3hr closed book exam (70%), prac reports and quizzes (15%), assignments (5%), essay based on discussion sessions (10%)*

This unit of study is the same as that in the normal degree program except for the addition of 7 special molecular biology and genetics discussion sessions, which consist of topical seminars and discussions in this discipline. An essay based on these discussions is included as part of the assessment of the unit of study.

CHEM 1906 Chemistry 1A Molecular (Special Studies Program)

6 credit points

Prerequisite: *TER of at least 98 and at least 85% in HSC 2-unit Chemistry or equivalent*

Additional information: *May not be counted with Chemistry 1001 or 1101 or 1901 or 1903 or 1905*

When Offered: *February*

Classes: *3 lec/tut & 3hrprac/wk & 7 discussion sessions*

Assessment: *One 3hr closed book exam (70%), prac reports and quizzes (15%), assignments (5%), essay based on discussion sessions (10%)*

This unit of study is the same as that in the normal degree program except for the addition of 7 special molecular biology and genetics discussion sessions, which consist of topical seminars and discussions in this discipline. An essay based on these discussions is included as part of the assessment of the unit of study.

CHEM 2903 Chemistry Life Sciences (Advanced)

8 credit points

Prerequisite: *Qual Chemistry 1902 or 1904*

Prereq 12 credit points of Junior Mathematics

Additional information: *May not be counted with Chemistry 2001 or 2101 or 2201 or 2301 or 2901 or 2502*

When Offered: *February*

Classes: *4 lec & 4hrprac/wk*

Assessment: *One 3hr closed book and one 24hr open book exam (67%) and prac reports (33%)*

The aim of this unit of study 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 unit of study 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:

As for Chemistry 2001

MICR 2005 Fundamental Microbiology

4 credit points

Teacher/Coordinator: Coordinator Dr Carter

Prerequisite: Qual Biology 1901 and Biology 1904 or 1905 and Chemistry 1902 or 1904

When Offered: February

Classes: 2 lec/wk & 4hrprac/wk for 7wks

Assessment: One 1.5hr exam (65%), continuous assessment (15%), prac exam (15%), assignment (5%)

This unit of study 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.

Textbooks:

As for Microbiology 2001

MICR 2906 Microbiological Applications and Biotechnology (Advanced)

4 credit points

Teacher/Coordinator: Coordinator Dr Carter

Prerequisite: Qual Microbiology 2005 and Biology 1901 and (1904 or 1905) and Chemistry 1902 or 1904

When Offered: July

Classes: 2 lec & 4hr prac/wk for 6wks

Assessment: One 1.5hr exam (65%), continuous prac assessment (15%), continuous assessment (15%), assignment (5%)

This unit of study is designed to expand the understanding of and the technical competence in Microbiology, building on the knowledge and skills acquired in Microbiology 2005. 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.

Textbooks:

As for Microbiology 2002

BCHM 3904 Metabolic and Medical Biochemistry Molecular (Advanced)

12 credit points

Prerequisite: Qual Biochemistry 2002 or 2902

Additional information: May not be counted with Biochemistry 3002 or 3902

When Offered: July

Classes: 4 lec & 8hr/wk & 4 discussion sessions

Assessment: One 3hr, one 2hr & one 1hr theory exam, one 1.5hr theory of prac exam, prac work and an essay based on discussion sessions

This unit of study is the same as that in the normal degree program except for the addition of 4 special molecular biology and genetics discussion sessions, which consist of topical seminars and discussions in this discipline. An essay based on these discussions is included as part of the assessment of the unit of study.

BIOL 3905 Eukaryotic Genetics and Development Molecular (Advanced)

12 credit points

Teacher/Coordinator: Biology 3203 Executive Officer

Prerequisite: Qual 16 credit points of Biology including Biology 2905

Additional information: May not be counted with Biology 3203 or 3904

When Offered: July

Classes: 4 lec & 8prac/wk, one 2 day excursion & 4 discussion sessions

Assessment: One 3hr theory exam, one 1.5hr theory of prac exam, prac reports & projects, seminars and an essay based on discussion sessions

This unit of study is the same as Biology 3904 except for the addition of four special molecular biology and genetics discussion sessions, which consist of topical seminars and discussions in this discipline. An essay based on these discussions can be included as part of the assessment of the unit of study. This is an optional Senior unit of study for the BSc (Molecular Biology and Genetics) program.

CHEM 3903 Chemistry 3 Life Sciences (Advanced)

12 credit points

Prerequisite: Qual Chemistry 2903

Additional information: May not be counted with Chemistry 3102 or 3902

When Offered: July

Classes: 4 lec & 8prac/wk & 4 compulsory discussion sessions

Assessment: Nine 45min exams (60%), prac reports (30%), assignments based on discussion sessions (10%)

The aim of this unit of study is to provide students enrolled in the Molecular Biology and Genetics degree program with some advanced chemistry required for an understanding of the subject. The unit of study consists of 4 core modules dealing with DNA chemistry, metals in biology, chemical safety and a variety of options (outlined below) that provide a basis for understanding chemical processes and chemical techniques used in molecular biology and genetics studies. A special practical component is designed to illustrate the principles given in the lectures. In addition, 4 seminars from specialists in molecular biology and genetics will be given to illustrate recent research in the area.

The list of modules for the theory component is given below and more detailed descriptions of the content of these modules are given in the Senior Chemistry Handbook.

Compulsory

3C5d Chemistry Laboratory Practices

3114c Biological and Medical Inorganic Chemistry 1: Metals in Biomolecules

3115d Biological and Medical Inorganic Chemistry 1: Chemotherapy and Toxicology

3016d Bioorganic Chemistry 2: The Chemistry of DNA and Carbohydrates

Options (choose 5)

3110c Transition Metal Chemistry

307c Bioorganic Chemistry 1: Amino Acids and Peptides

308c Heterocyclic Chemistry 2
309C NMR Spectroscopy in Organic Chemistry
3013d Heterocyclic Chemistry 2
3PT9 Colloid Chemistry
3PT20c Radiation Chemistry

Some of these modules may not be offered in the July semester in 1998.

MICR 3004 Molecular Biology of Pathogens 12 credit points

Prerequisite: Qual Microbiology 2005 or 2906

When Offered: July

Classes: 4 lec & 8hrs prac/wk and 4 discussion sessions

Assessment: Two 2hr exams, practicals, and an essay based on discussion sessions.

This unit of study is the same as that in Microbiology 3003, except for the addition of 4 special molecular biology and genetics discussion sessions, which consist of topical seminars and discussions in this discipline. An essay based on these discussions is included as part of the assessment of the unit of study.

Bachelor of Science/Bachelor of Law

These Law units of study are taken on the main University campus. The remainder of the units of study 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 units of study except Legal Institutions may be offered in both semesters depending on availability of staff.

LAWS 1007 Law, Lawyers and Justice in Australian Society 6 credit points

Teacher/Coordinator: Alex Ziegert

Prerequisite: Legal Institutions

When Offered: July, 1998

Classes: 1 x 2h lecture & 1 x 2hr seminar per week

See Faculty of Law handbook for unit description.

LAWS 3000 Federal Constitutional Law 10 credit points

Prerequisite: Legal Institutions; Law, Lawyers and Justice in Australian Society

When Offered: February, 1998

Classes: 2 x 2hr seminars per week

See Faculty of Law handbook for unit description.

LAWS 1006 Legal Institutions 6 credit points

When Offered: February, 1998

Classes: 1 x 1hr lecture & 2 x 2 hrs seminars per week

See Faculty of Law handbook for unit description.

LAWS 3200 Administrative Law 8 credit points

Prerequisite: Legal Institutions I & II; Constitutional Law; Torts

When Offered: February, 1998

Classes: 2 x 2 hrs seminars per week

See Faculty of Law handbook for unit description.

LAWS 2000 Contracts 8 credit points

Prerequisite: Legal Institutions I & II

When Offered: February, 1998

Classes: 2x2 hrs seminars per week

See Faculty of Law handbook for unit description.

LAWS 2001 Criminal Law 8 credit points

Prerequisite: Legal Institutions; Law, Lawyers and Justice in Australian Society

When Offered: July, 1998

Classes: 2x2 hrs seminars per week

See Faculty of Law handbook for unit description.

LAWS 3001 Torts 10 credit points

Prerequisite: Legal Institutions, Law, Lawyers and Justice in Australian Society

When Offered: July, 1998

Classes: 2 x 2hr seminars per week

See Faculty of Law handbook for unit description.

Bachelor of Computer Science and Technology

ELEC 1101 Science, Technology and Engineering 6 credit points

Prerequisite: AKn HSC Mathematics 3-unit course and the Physics section of the Science 3-unit or 4-unit course or 2-unit Physics

Corequisite: Mathematics 1701 or 1791 and 1703 or 1793 and Computer Science 1001 or 1901 and 1002 or 1902

When Offered: February

Classes: 6hr lec, lab, tut & computing/wk

Assessment: Presentations, reports and assignments plus two 2hr exams at the end of the semester.

This unit of study focuses on concepts and student skills. The majority of the contact hours involve learning in a hands on environment. The unit of study consists of material from three areas:

Communication Skills: Human communication; technical skills in written, numeric and graphical communication; computer communication tools such as word processors, spread sheets, charting and drawing packages; and management of people, documents and projects.

Analogue Circuits: Linear DC circuit elements and laws, and series and parallel circuits; concepts of equivalent circuits; operational amplifiers and circuits; electrical measurement tools; safety issues; and computer based simulation of circuits.

Digital Circuits: Number systems and codes; logic gates and Boolean algebra; combinatorial logic circuits; and digital arithmetic.

Textbooks:

To be determined

ELEC 1102 Introductory Electronic Circuits

6 credit points

Prerequisite: Mathematics 1701 and Electrical Engineering 1101

When Offered: July

Classes: 6hr lec, lab, tut & computing/wk

Assessment: Presentations, reports and assignments plus two 2hr exams at the end of the semester.

This unit of study focuses on technical knowledge and skills. About two thirds of the contact hours involve laboratory, tutorial and project work. The unit of study consists of material from two areas:

Electrical Circuits: Network analysis; capacitors and inductors; first order circuits and transient responses; step responses; complex numbers, phasors, impedance and admittance; steady state analysis; frequency analysis; frequency response of RLC circuits; filters; AC power, reactive power and power factor.

Computer Circuits: Sequential logic, including counters and registers; synchronous sequential circuits; programmable logic devices; introduction to microprocessors, databases, tristate signals, memories and interfacing; MSI logic circuits; and a major project.

ELEC 2101 Electrical and Digital Systems

4 credit points

Prerequisite: Electrical Engineering 1102 Introductory Electronic Circuits and Computer Science 1002 or 1902

When Offered: February

Classes: 2 lec & 2hr tut/wk

Assessment: One 2hr exam and assignments

Transient and steady state responses of electric circuits. Complex frequency analysis, phasors. Laplace transform, transfer functions and frequency response. Transformers. Two port networks. Introduction to energy conversion; balanced three phase circuits. Modelling and simulation using Matlab.

Textbooks:

To be advised

ELEC 2401 Electronic Devices and Circuits

4 credit points

Prerequisite: Electrical Engineering 1102

When Offered: July

Classes: 2 lec & average 2hrprac/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.

Textbooks:

To be advised

ELEC 2501 Signals and Communications

4 credit points

Prerequisite: Mathematics 1701 and 1703, and Electrical Engineering 1102

When Offered: July

Classes: 2 lec & average 2hrs lab/tut/wk

Assessment: Lab, assignments and a 2hr exam at end of semester

Time and frequency representations of elementary signals and periodic and non-periodic signals. Fourier series and transform. Linear systems: impulse and frequency response. System functions of analog filters. Communication system fundamentals: channels, baseband communication of analog signals and binary data, amplitude and frequency modulation and demodulation.

ELEC 2601 Microcomputer Systems

4 credit points

Prerequisite: Electrical Engineering 1102 Introductory Electronic Circuits

When Offered: February

Classes: 2 lec & average 2hrs lab/tut/wk

Assessment: Lab, assignments and a 2hr exam at end of semester.

Computer architecture and assembly language programming. Microprocessor and microcontroller systems, memory and IO interfacing, interrupts and interrupt handling. Serial and parallel communications. Elements of real time control; CPU and memory security and protection. System design, implementation and debugging.

Bachelor of Computer Science and Technology - Table V (ii) Units of Study

All qualifying, pre- and corequisite units of study, details of staff, examinations, course delivery and descriptions are as described in the appropriate Department or School entry for the BSc.

COMP 3201 Algorithmic System Project	4 credit points
COMP 3202 Computer Systems Project	4 credit points
COMP 3203 Intelligent Systems Project	4 credit points
COMP 3204 Large-Scale Software Project	4 credit points
COMP 3205 Product Development Project	4 credit points
COMP 3206 Bioinformatics Project	4 credit points

Bachelor of Computer Science and Technology - Table V(iii) Units of Study

With the exception of ECMT3510 Operations Research A and ECMT3520 Operations Research B, all qualifying, pre- and co-requisite units of study, details of staff, examinations, course delivery and descriptions are as described in the appropriate Department or School entry for the BSc.

MATH 3005 Logic	4 credit points
MATH 3007 Coding Theory	4 credit points
MATH 3010 Information Theory	4 credit points
MATH 3016 Mathematical Computing I	4 credit points
MATH 3019 Signal Processing	4 credit points
MATH 3912 Combinatorics (Advanced)	4 credit points
MATH 3913 Computational Algebra (Advanced)	4 credit points
MATH 3916 Mathematical Computing II (Advanced)	4 credit points
MATH 3905 Categories & Computer Science (Advanced)	4 credit points
STAT 3004 Design of Experiments	4 credit points
GEOG 3102 Coastal Environmental Management and GIS	12 credit points
ECMT 3510 Operations Research A	8 credit points
Consult Faculty of Economics Handbook 1998 for details.	
ECMT 35 20 Operations Research B	8 credit points
Consult Faculty of Economics Handbook 1998 for details.	
PHYS 3301 Scientific Computing	4 credit points
PHYS 3302 Advanced Measurement Instrumentation and Control	4 credit points
PHYS 3303 Scientific Visualisation	4 credit points

Bachelor of Medical Science

Bachelor of Medical Science - Junior Units of Study

The following units of study are as prescribed by the Senate resolutions in force from 1997.

All qualifying, pre- and corequisite units of study, details of staff, examinations, units of study delivery and descriptions are as described under the appropriate Department or School entry for the BSc.

BIOL 1001 Concepts in Biology	6 credit points
BIOL 1002 Living Systems	6 credit points
BIOL 1003 Human Biology	6 credit points
BIOL 1901 Concepts in Biology (Advanced)	6 credit points
BIOL 1902 Living Systems (Advanced)	6 credit points
BIOL 1903 Human Biology (Advanced)	6 credit points
CHEM 1101 Chemistry IA	6 credit points
CHEM 1102 Chemistry IB	6 credit points
CHEM 1901 Chemistry IA (Advanced)	6 credit points
CHEM 1902 Chemistry IB (Advanced)	6 credit points
CHEM 1903 Chemistry IA (Special Studies Program)	6 credit points
CHEM 1904 Chemistry IB (Special Studies Program)	6 credit points
COMP 1001 Introductory Programming	6 credit points
COMP 1002 Introductory Computer Science	6 credit points
COMP 1901 Introductory Programming (Advanced)	6 credit points
COMP 1902 Introductory Computer Science (Advanced)	6 credit points
MATH 1701 Differential Calculus and Linear Algebra	6 credit points
MATH 1702 Integral Calculus and Statistics	6 credit points
MATH 1703 Integral Calculus and Discrete Mathematics	6 credit points
MATH 1704 Statistics and Discrete Mathematics	6 credit points
MATH 1711 Life Sciences Mathematics 1	6 credit points
MATH 1712 Life Sciences Mathematics 2	6 credit points
MATH 1791 Advanced Differential Calculus and Linear Algebra	6 credit points
MATH 1792 Advanced Integral Calculus and Statistics	6 credit points
MATH 1794 Advanced Statistics /Discrete Mathematics	6 credit points
PHYS 1001 Physics (Regular)	6 credit points
PHYS 1002 Physics (Fundamentals)	6 credit points
PHYS 1003 Physics (Technological)	6 credit points
PHYS 1004 Physics (Environmental and Life Sciences)	6 credit points
PHYS 1901 Physics (Advanced) A	6 credit points
PHYS 1902 Physics (Advanced) B	6 credit points
PSYC 1001 Psychology 1001	6 credit points
PSYC 1002 Psychology 1002	6 credit points

Bachelor of Medical Science - Intermediate Core Units of Study

Except for BMED 2001, all qualifying, pre- and co-requisite units of study, details of staff, examinations, units of study delivery and descriptions are as described under the appropriate Department or School entry for the BSc.

BMED 2001 Human Life Sciences	24 credit points
PCOL 2001 Pharmacology Fundamentals (For description see Department/School entry for BSc)	4 credit points
PCOL 2002 Pharmacology Drugs and People (For description see Department/School entry for BSc)	4 credit points
BCHM 2101 Genes and Proteins Theory (For description see Department/School entry for BSc)	4 credit points
BCHM 2102 Molecules, Metabolism and Cells Theory (For description see Department/School entry for BSc)	4 credit points

BMED 2001 Human Life Sciences 24 credit points

Coordinator: Mrs F Janod-Groves

Prerequisite: Qual 12 credit points of Junior Mathematics, 12 credit points of Junior Chemistry, 12 credit points of Junior Physics, and 12 credit points of Junior Biology or 12 credit points of Junior Computer Science or 12 credit points of Junior of Psychology

When Offered: February

Classes: 5 lec, 2 tut & 7prac/wk

Assessment: Written & prac exams, essays, prac reports, oral presentations

This is a broadly based, integrated unit of study 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 foetus.

Textbooks:

Sherwood, L. Human Physiology: From Cells to Systems (3rd ed)

Bachelor of Medical Science - Intermediate Units of Study - Electives

All qualifying, pre- and co-requisite units of study, details of staff, examinations, unit of study delivery and descriptions are as described under the appropriate Department or School entry for the BSc. 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 2001 Genes and Proteins 8 credit points
(For description see Department/School entry for BSc)

BCHM 2901 Genes and Proteins (Advanced) 8 credit points
(For description see Department/School entry for BSc)

BCHM 2002 Molecules, Metabolism and Cells 8 credit points
(For description see Department/School entry for BSc)

BCHM 2902 Molecules, Metabolism and Cells (Advanced) 8 credit points
(For description see Department/School entry for BSc)

BIOL 2005 Molecular and General Genetics 8 credit points
(For description see Department/School entry for BSc)

BIOL 2905 Molecular and General Genetics (Advanced) 8 credit points
(For description see Department/School entry for BSc)

HPSC 2001 Introductory Philosophy of Science 4 credit points
(For description see Department/School entry for BSc)

HPSC 2002 Introductory History of Science 4 credit points
(For description see Department/School entry for BSc)

Bachelor of Medical Science - Senior Core Units of Study

When Offered: February

The following are the core Senior units of study for the Bachelor of Medical Science:

BMED 3001 Human Life Sciences 4 credit points

BMED 3002 Microbiology and Immunology 8 credit points

BMED 3001 Human Life Sciences 4 credit points

Teacher/Coordinator: Coordinator Dr B. Phillips

Prerequisite: Qual Human Life Sciences 2001

Prereq Pharmacology 2001 and 2002, and Biochemistry 2101 and 2102 or Biochemistry 2001 and 2002 or Biochemistry 2901 and 2902

When Offered: February

Classes: 1-2 lec & 2 tut/wk

Assessment: Tut assessment, 4 group presentations, 1 essay

In this unit of study students will investigate five topics drawn from the most active areas of research in cellular physiology and biology. The intention of the unit of study 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 unit of study 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) four oral group presentations one for each of the topics studied in the small-group sessions, and

(3) an essay on a subject related to the broad area of the unit of study.

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.

Textbooks:

Alberts, et al. Molecular Biology of the Cell (3rd ed.)

BMED 3002 Microbiology and Immunology 8 credit points

Coordinator: Dr Humphery-Smith

Dr Britton, Prof. Reeves, Dr New, Mrs Dalins, Dr Carter, Dr Briscoe

Prerequisite: Qual Human Life Sciences 2001

Prereq Pharmacology 2001 and 2002, and Biochemistry 2101 and 2102 or Biochemistry 2001 and 2002 or Biochemistry 2901 and 2902

When Offered: February

Classes: 4 lec & 6prac/wk

Assessment: One 3hr exam, prac

This core unit of study 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.

Bachelor Medical Science - Senior Units of Study - Electives (February)

When Offered: February

Except for History and Philosophy of Science 3102, all qualifying, pre- and co-requisite units of study, details of staff, examinations, unit of study delivery and descriptions are as described under the appropriate Department or School entry for the BSc.

ANAT 3001 Microscopy and Histochemistry 12 credit points
(For description see Department/School entry for BSc)

BCHM 3001 Molecular Biology and Structural Biochemistry 12 credit points
(For description see Department/School entry for BSc)

BCHM 3901 Molecular Biology and Structural Biochemistry (Advanced)	12 credit points
(For description see Department/School entry for BSc)	
BIOL 3103 Molecular Genetics and Recombinant DNA Technology	12 credit points
(For description see Department/School entry for BSc)	
BIOL 3903 Molecular Genetics and Recombinant DNA Technology (Advanced)	12 credit points
(For description see Department/School entry for BSc)	
CPAT 3001 Cell Pathology A	12 credit points
(For description see Department/School entry for BSc)	
HPSC 3102 History of the Biomedical Sciences	12 credit points
PCOL 3001 Molecular Pharmacology and Toxicology	12 credit points
(For description see Department/School entry for BSc)	
PHSI 3001 Neuroscience	12 credit points
(For description see Department/School entry for BSc)	

HPSC 3102 History of the Biomedical Sciences
12 credit points

Teacher/Coordinator: To be arranged

Prerequisite: Qual History and Philosophy of Science 2001 and 2002

When Offered: February

Classes: 4 lec, 4 tut & 4prac/wk

Assessment: Tut assignment, one 3000w essay, project report, take-home exam

This unit of study 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 unit of study 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 unit of study 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 unit of study will consider later developments in life sciences, particularly in genetics. The discovery of the structure of DNA brings the unit of study to an end.

Throughout the unit of study, 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.

Bachelor of Medical Science - Senior Units of Study - Electives (July)

When Offered: July

Except for Anatomy and Histology 3003, Microbiology 3003, Immunology (BMED 3003) and Infectious Diseases (BMED 3004), all qualifying, pre- and co-requisite units of study, details of staff, examinations, unit of study delivery and descriptions are as described under the appropriate Department or School entry for the BSc.

ANAT 3002 Cells and Development	12 credit points
(For description see Department/School entry for BSc)	
ANAT 3005 Topographical Anatomy	12 credit points
BCHM 3002 Metabolic and Medical Biochemistry	12 credit points
(For description see Department/School entry for BSc)	
BCHM 3902 Metabolic and Medical Biochemistry (Advanced)	12 credit points
(For description see Department/School entry for BSc)	
BIOL 3203 Eukaryotic Genetics and Development	12 credit points
(For description see Department/School entry for BSc)	
BIOL 3904 Eukaryotic Genetics and Development (Advanced)	12 credit points
(For description see Department/School entry for BSc)	
CPAT 3002 Cell Pathology B	12 credit points
(For description see Department/School entry for BSc)	
MICR 3003 Molecular Biology of Pathogens	12 credit points
BMED 3003 Immunology	12 credit points
BMED 3004 Infectious Diseases	12 credit points
PCOL 3002 Neuro- and Cardiovascular Pharmacology	12 credit points
(For description see Department/School entry for BSc)	
PHSI 3002 Neuroscience — Cellular and Integrative	12 credit points
(For description see Department/School entry for BSc)	
PHSI 3003 Heart and Circulation	12 credit points
(For description see Department/School entry for BSc)	

ANAT 3005 Topographical Anatomy 12 credit points

Teacher/Coordinator: Dr Provis

Prerequisite: Qual Human Life Sciences 2001

When Offered: July

Classes: 3 lec & 9 tut orprac/wk

Assessment: One 3hr exam, oneprac exam, one 2500w essay

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

BMED 3003 Immunology 12 credit points

Teacher/Coordinator: Assoc. Prof. Britton

Prerequisite: Qual Human Life Sciences 2001

Prereq Pharmacology 2001 and 2002, and Biochemistry 2101 and 2102 or Biochemistry 2001 and 2002 or Biochemistry 2901 and 2902

When Offered: July

Classes: 3 lec, 1 tut & 8prac/wk

Assessment: Exam, essays, prac

This unit of study, 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 unit of study. The following topics will be covered: the normal immune system; immunopathology; and immunological techniques.

BMED 3004 Infectious Diseases 12 credit points

Teacher/Coordinator: Assoc. Prof Harbour, Prof. Reeves

Prerequisite: *Qua! Human Life Sciences 2001*

Prereq Pharmacology 2001 and 2002, and Biochemistry 2101 and 2102 or Biochemistry 2001 and 2002 or Biochemistry 2901 and 2902

Corequisite: *Microbiology 3003*

When Offered: July

Classes: 4 lec & 8prac/wk

Assessment: One 3hr exam, one 1hrprac, three lab reports

This unit of study 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 unit of study 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.

MICR 3003 Molecular Biology of Pathogens 12 credit points

Teacher/Coordinator: Coordinator Dr Humphery-Smith
Dr Ferenci, Prof. Reeves, Dr Carter, Dr Humphery-Smith

Additional information: Students are advised not to attempt this unit of study if they have not performed well in BMED 3002 Microbiology and Immunology

When Offered: July

Classes: 4 lec & 8prac/wk

Assessment: Two 2hr exams, practical

This unit of study is designed to provide an understanding of microbial disease at the molecular level. The following topics will be covered: introductory bacterial genetics; pathogenic processes and the molecular basis of pathogenicity in bacteria; structure and function of micro-organisms and action of antibiotics and chemotherapeutic agents; and pathogenic processes in fungi and viruses.

BMED 4001 Bachelor of Medical Science Honours 48 credit points

When Offered: February

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.

An Honours degree may be taken by students of sufficient merit in any of the Departments offering Senior level core or option units of study. Entry to Honours units of study 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.

Bachelor of Pharmacy

Pharmacy First Year Units of Study

Pre-1997 Resolutions

Consult the *Faculty of Science Handbook 1996* for details of units of study available under the pre-1997 Resolutions. The units of study are as prescribed by the Senate Resolutions in force from 1990. For further details consult the appropriate Department.

BIOL 1601 Biology (Pharmacy) 12 credit points

Teacher/Coordinator: Biological Sciences staff

Prerequisite: AKn Biology section of the HSC 3-unit Science course

When Offered: February

Classes: 3 lec & 3 prac/wk

Assessment: One 2hr exam, assignments, classwork

This unit of study 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. The July semester begins with human evolution, human population dynamics and the impact of people on the environment. The unit of study includes human nutrition, distribution of essential requirements to and from the cells, control of body functions and defence mechanisms. After discussion of reproduction and development the unit of study concludes with some controversial aspects of human genetics. This unit of study comprises the combination of Biology 1001 and 1003 available to Bachelor of Science students.

Textbooks:

Feb Sem: Knox, R.B. et al. *Biology*, McGraw-Hill, 1995

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

CHEM 1602 Chemistry (Pharmacy) 12 credit points

Teacher/Coordinator: See School of Chemistry for list of staff

Assumed Knowledge: AKn HSC Chemistry 2-unit or the chemistry component of the 3/4-unit Science course and the 2-unit Mathematics course

When Offered: February

Classes: 3 lec & 1 tut/wk & 3hrsprac/wk for 10 wks

Assessment: Feb Sem: one 3hr exam; July Sem: one 3hr 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 1602 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.

MATH 1604 Mathematics/Statistics (Pharmacy)
6 credit points

Prerequisite: *AKn HSC 2-unit Mathematics or equivalent (Students without this assumed knowledge are advised to attend a bridging course in February)*

When Offered: February

Assessment: assignments (10%), one 2hr exam (90%)

Classes: Sem 1: 2 lec & 4 tut/wk

This unit of study provides mathematical tools, mostly from the calculus, that are needed for other units of study in this degree. The emphasis is on the behaviour of functions of various kinds, leading to the solution of differential equations.

Textbooks:

Huges-Hallett, D. et al. *Calculus (International Edition)*, Wiley

Reference books

Arya, J.C. and Lardner, R.W. *Mathematics for the Biological Sciences*, Prentice-Hall

Gentry, R.D. *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:

Pagano, M. and Gauvreau, K. *Principles of Biostatistics*, Duxbury Press, 1993.

PHAR 1603 Introductory Pharmacy
6 credit points

Teacher/Coordinator: *Coordinator Ms Sainsbury*

Assumed Knowledge: *HSC 2-unit Chemistry or equivalent and (HSC Physics section of 3 or 4 unit Science course or 2 unit Physics)*

When Offered: July

Classes: See below

Assessment: See below

This unit of study is made up of two sections:

Pharmaceutical Science

Classes July Sem: 3 lec & 2hr tut/workshops/wk for 9 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 July Sem: 1 lec/wk & 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.

Textbooks:

Martin, A.N. *Physical Pharmacy*, Lea & Febiger, 1993

PSYC 1605 Psychology (Pharmacy)
12 credit points

When Offered: February

This unit of study is a combination of PSYC 1001 and 1002. See Department of Psychology entry under BSc for details.

Pharmacy Second Year Units of Study

Pre-1997 Resolutions

Consult the *Faculty of Science Handbook 1996* for details of units of study available under the pre-1997 resolutions. The units of study are prescribed by the Senate Resolutions in force from 1990. For further details consult the appropriate Department.

BCHM 2601 Biochemistry 2 (Pharmacy)
6 credit points

Teacher/Coordinator: *Dr Darvey*

Prerequisite: *Chemistry (Pharmacy) 1602*

When Offered: February

Classes: 3 lec/wk

Assessment: One 3hr exam/sem

This unit of study 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 unit of study 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

MICR 2605 Microbiology (Pharmacy)
3 credit points

Teacher/Coordinator: *Coordinator Mrs Dalins*

Prerequisite: *Biology (Pharmacy) 1601*

When Offered: February

Classes: 2 lec & 2 or 2.5hrprac/wk for 10 wks

Assessment: One 2hr exam, prac

This unit of study 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.

Textbooks:

Reference

Tortora, G.T. et al. *Microbiology: An Introduction (5th ed)*, Benjamin/Cummings, 1995

PCOL 2602 Pharmacology 2 (Pharmacy)

4 credit points

Teacher/Coordinator: Coordinators Assoc. Prof. Starmer, Assoc. Prof. Mylecharane

Prerequisite: CHEM 1602 (Chemistry (Pharmacy))

Corequisite: BCHM2601 (Biochemistry 2 (Pharmacy)), PHAR 2606 (Pharmacy Practice)

When Offered: July

Classes: 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.

Textbooks:

Rang, H.P. et al. Pharmacology (3rd edn), Churchill Livingstone, 1995

Dale, M.M. and Dickenson, A.H. Companion to Pharmacology, Churchill Livingstone, 1993

Neal, M.J. Medical Pharmacology at a Glance, Blackwell Scientific Publications, 1992

Reference books

Cooper, J.R. et al. The Biochemical Basis of Neuropharmacology, Oxford, 1991

Hardman, J.G., and Limbird, L.E. (eds) Goodman and Gilman's The Pharmacological Basis of Therapeutics (9th ed), Pergamon, 1996

Katzung, B.G. (ed.) Basic and Clinical Pharmacology, Appleton & Lange, 1992

PHAR 2604 Medicinal Chemistry

10 credit points

Teacher/Coordinator: Coordinator Dr MB Morris

Prerequisite: Chemistry (Pharmacy) 1602, Introductory Pharmacy 1603

Corequisite: Biochemistry (Pharmacy) 2601, Pharmacology (Pharmacy) 2602

When Offered: February

Classes: Feb Sem: 3 lec, 1 tut & 3hrprac/wk; July Sem: 2 lec & 1hr tut/wk

Assessment: Feb Sem: one 3hr exam, classwork; July Sem: 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.

Textbooks:

Nogrady, T. Medicinal Chemistry - a Biochemical Approach, Oxford U.P., 1988

or

Foye, W.O et al. Principles of Medicinal Chemistry, Williams & Wilkins, 1995

Reference books

Burger, A. B., Taylor, P. Medicinal Chemistry, Interscience, 1980; 1995

Pratt, W. Principles of Drug Action: the Basis of Pharmacology, Churchill/Livingstone, 1990

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

Connors, K. A. A Textbook of Pharmaceutical Analysis, Wiley, 1982

Martin, A.N. Physical Pharmacy, Lea & Febiger, 1993

Munson, J.W. Pharmaceutical Analysis - Modern Methods, Marcel Dekker, 1981

Solomons, T.W.G. Organic Chemistry, Wiley, 1992

Vogel, A.I. Quantitative Inorganic Analysis, Longmans, 1978

PHAR 2606 Pharmacy Practice

5 credit points

Coordinator: DrIKrass

Prerequisite: Psychology (Pharmacy) 1605, Introductory Pharmacy 1603

Corequisite: Pharmacology (Pharmacy) 2602

When Offered: February

Classes: Feb Sem: 1 lec/wk, seven 2hr tut; July Sem: 2 lec/wk, seven 2hr tut

Assessment: Feb Sem: one 1hr exam (35%), 0.5hr tut assessment (10%)

July Sem: 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.

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, respiratory system, cardiovascular system, and antibiotics. Actual applications of drug knowledge gained in other parts of the unit of study 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:

Tindall, W.N. et al. Communication Skills in Pharmacy Practice, Lea & Febiger, 1994

Herfindal, E.T et al. Textbook of Therapeutics: Drug and Disease Management, Williams & Wilkins, Baltimore, 1996

USPDI 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 1997, Vols 1 & 2, Australian Pharmacy Publications Co.

The Merck Manual of Diagnosis and Therapy (17th edn), Merck, Sharp & Dohme Research Industries, 1997

Mims Annual, Multimedia Australia Pty Ltd, 1996

PHAR 2607 Pharmaceutical Microbiology

4 credit points

Co-ordinator: Dr E. M. Gipps

Prerequisite: Introductory Pharmacy 1603

Corequisite: Microbiology (Pharmacy) 2605

When Offered: July

Classes: 2 lec/wk for 3 wks then: 1 lec, 1 tut & 4hr ofprac/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 unit of study 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.

Textbooks:

Reference books

Aulton, M.E. (ed) *Pharmaceutics: The Science of Dosage Form Design*, Churchill Livingstone, 1988

Hugo, W.B. and Russell, A.D. *Pharmaceutical Microbiology*, Blackwell, 1992

PHAR 2608 Physical Pharmaceutics

10 credit points

Coordinator: Dr H K Chan

Prerequisite: Chemistry (Pharmacy) 1602 and Introductory Pharmacy 1603

When Offered: February

Classes: 3 lec/wk, 36hrprac (Feb Sem); 12hrprac (July Sem)

Assessment: Feb Sem: one 3hr exam (45%) and prac (10%); July Sem: one 3hr exam (45%)

Solid pharmaceuticals and particle science; liquid formulations; diffusion and dissolution of drugs; theory and models; drug-packaging interactions; colloidal dispersions, rheology; surface and interfacial tension; surface active materials; micelle formation; drug solubilisation; suspensions; emulsions; semisolids; pharmaceutical complexes; biophysical properties of protein and peptide drugs.

Textbooks:

Martin, A.N. *Physical Pharmacy*, Lea & Febiger, 1993

Reference books

Aulton, M.W (ed) *Pharmaceutics: The Science of Dosage Form Design*, Churchill Livingstone, 1988

Banker, G.S. and Rhodes, C.T (eds) *Modern Pharmaceutics*, Marcel Dekker, 1990

Connors, K.A. et al. *Chemical Stability of Pharmaceuticals*, Wiley-Interscience, 1979

Florence, A.T. and Attwood, D. *Physiochemical Principles of Pharmacy*, Macmillan, 1988

Gennaro, A.R (ed) *Remington's Pharmaceutical Sciences*, Mack, 1985

Lachman, L. et al *The Theory and Practice of Industrial Pharmacy*, Lea & Febiger, 1986

PHSI 2603 Physiology (Pharmacy)

6 credit points

Prerequisite: Biology (Pharmacy) 1601

When Offered: February

Classes: 3 lec/wk

Assessment: February Sem: one 1.5hr exam (50%); July Sem: one 1.5hr exam (50%)

This unit of study 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.

Textbooks:

To be advised

Pharmacy Third Year Units of Study

None of the new 3000-level units of study 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. Units of study available in 1998 under the pre-1997 Regulations are listed below, followed by the replacement units of study, which will be available from 1999. These latter unit of study descriptions are included for information.

Third Year units of study offered in 1998 under Pre-1997 Resolutions

Students are required to complete a total of 50 credit points, of which 42 are from required or core units of study. The remaining eight credit points are made up by the selection of one of the four elective units of studies offered.

Core Units of Study:

Pharmacokinetics 3

Formulation 3

Medicinal Chemistry 3

Pharmacy Practice 3

Pharmacology 3 for Pharmacy

Dispensing Practice 3

Elective Units of Study:

Experimental Pharmacology 3

Toxicology 3

Industrial Pharmacy 3

Biopharmaceutics 3.

PCOL 3501 Pharmacology 3 for Pharmacy

8 credit points

Coordinator: Assoc. Prof. Starmer, Assoc. Prof. Mylecharane

Prerequisite: Biochemistry 2 for Pharmacy

Corequisite: Pharmacy Practice 3

When Offered: February

Classes: 2 lec/wk & nine 6hrprac; Sem 2: 2 lec/wk

Assessment: Feb Sem: one 1.5hr exam, prac exam, classwork; July Sem: one 1.5hr exam

Chemotherapy: antibacterial, antiviral, antifungal, antiprotozoal, anthelmintic and anticancer drugs. Immunosuppressants. Respiratory and gastro-intestinal 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 component reinforces and illustrates the theory underlying the actions of drugs.

Textbooks:

Textbooks, study aids and reference books, as recommended for Pharmacology 2 for Pharmacy

PHAR 3501 Pharmacokinetics 3

4 credit points

Coordinator: Dr Cutler

Prerequisite: Physical Pharmacy 2

Wlten Offered: February

Classes: 4 lec or tut/wk

Assessment: 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, 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.

Textbooks:

Reference books

Gibaldi, M. Biopharmaceutics and Clinical Pharmacokinetics (4th edn), Lea and Febiger, 1990

Hladky, S.B. Pharmacokinetics, Manchester University Press, 1990

Rowland, M. and Tozer, T.N. Clinical Pharmacokinetics (2nd edn), Lea & Febiger, 1989

PHAR 3502 Formulation 3

4 credit points

Coordinator: Pharmaceutics staff

Prerequisite: Physical Pharmacy 2

Wlten Offered: February

Classes: 3-4 lec/wk, 5hr ofprac/wk for 2 wks

Assessment: 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

Ansel, H.C. Introduction to Pharmaceutical Dose Forms, Lea & Febiger, 1985

Australian Pharmaceutical Formulary 15

Aulton, M.E. (ed.) Pharmaceutics: The Science of Dosage Form

Design, Churchill Livingstone, 1988

Connors, K.A. et al. Chemical Stability of Pharmaceuticals, Wiley-Interscience, 1979

Florence, A.T. and Attwood, D. Physicochemical Principles of Pharmacy, MacMillan, 1988

Foye, W.O Principles of Medicinal Chemistry, Chapters 41 & 43, Williams &Wilkins, 1995

Gennaro, A.R. (ed.) Remington's Pharmaceutical Sciences, Mack, 1985

Lachman, L. et al. Theory and Practice of Industrial Pharmacy, Lea & Febiger, 1986

Rowland, M. and Tozer, T.N. Clinical Pharmacokinetics, Lea & Febiger, 1980

Sampson, C.B. Textbook of Radiopharmacy, Gordon & Breach, 1990
Smith, K.C. (ed.) The Science of Photobiology, Plenum, 1989

PHAR 3503 Medicinal Chemistry 3

4 credit points

Coordinator: Assoc. Prof. Holder

Prerequisite: Biochemistry 2 for Pharmacy

Corequisite: Pharmacology 3 for Pharmacy

Wlten Offered: February

Classes: 3 lec/wk, 6hr ofprac/wk for 4 wks, tuts

Assessment: Feb Sem: 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:

Foye, W.O. et al. Principles of Medicinal Chemistry, Williams & Wilkins, 1995

Reference books

Burger, A. Medicinal Chemistry, Interscience, 1980; 1995

Hansch, C. (ed.) Comprehensive Medicinal Chemistry, Pergamon, 1990

Pratt, W. et al. (eds) Principles of Drug Action — the Basis of Pharmacology, Churchill Livingstone, 1990

PHAR 3504 Pharmacy Practice 3

18 credit points

Coordinator: to be advised

Corequisite: Medicinal Chemistry 3, Pharmacokinetics 3, Pharmacology 3 for Pharmacy

Wlten Offered: February

Classes: 2 or 5 lec, one 2hrtut & one 3hr externship (community)/wk, 1 wk of externship (hospital)

Assessment: Feb Sem: one 1hr exam (clinical), 0.5hr viva, externship (case studies); July Sem: one 2hrexam (clinical), 0.5hr viva, one 1hr exam (admin.), 1hr externship (case studies), tut participation

Therapeutics

Coordinator To be advised

Classes February Sem: 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 the February semester include epidemiology, pathophysiology, symptoms, signs, management of 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 February Sem: 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.

Textbooks:

As for Pharmacy Practice 2 (Therapeutics section)

PHAR 3505 Dispensing Practice 3

4 credit points

Coordinator: DrMcLachlan

Corequisite: Formulation 3

When Offered: February

Classes: 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 unit of study 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:

Australian Pharmaceutical Formulary 5, 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 ed), Pharmaceutical Press, 1980

Colleti, D.M. and Aulton, M.E. (eds) Pharmaceutical Practice, Churchill Livingstone, 1990

PCOL 3502 Experimental Pharmacology 3

8 credit points

Coordinators: Assoc. Prof. Mylecharane, Assoc. Prof. Starmer

Corequisite: Pharmacology 3 for Pharmacy, Medicinal Chemistry 3

When Offered: July

Classes: 2 seminar/wk, 6hrprac/wk for 9wks, 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:

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.

PHAR 3506 Toxicology 3

8 credit points

Coordinator: Assoc. Prof Holder

Corequisite: Medicinal Chemistry 3

When Offered: July

Classes: 3 lec, 1 tut & 5hrprac/wk for 8 wks or an essay

Assessment: One 3hr exam, classwork (including an essay if this is the option chosen)

Theory

The lecture series 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 intoxication 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.

Textbooks:

Reference books

Hayes, A.W. (ed.) Principles and Methods of Toxicology, Raven Press, 1989

Kaplan, A., Szabo, L.L. and Opheim, K.E. Clinical Chemistry: Interpretation and Techniques, Lea & Febiger, 1988

Klaasen, C.D., Doull, J and Amdur, M.O. (eds) Casarett and Doull's 'Toxicology - the Basic Science of Poisons', Pergamon, 1991 or 1996

PHAR 3507 Industrial Pharmacy 3

8 credit points

Coordinator: Prof. Brown

Prerequisite: Coreq Pharmacokinetics 3, Formulation 3

When Offered: My

Classes: 4 lec/wk, 1 tut/fn, 2 wkfieldwork

Assessment: One 3hr exam (Sem 2), essay report onprac

Theory

This unit of study 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 unit of study 'Toxicology 3' and the lecture and seminar component of the section entitled 'Formulation and dosage form design', as described under the unit of study 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 unit of study 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.

PHAR 3508 Biopharmaceutics 3

8 credit points

Coordinator: Dr Ramzan

Corequisite: Formulation 3, Pharmacokinetics 3, Dispensing Practice 3

When Offered: July

Assessment: see above

This unit of study 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 July Sem: 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 component.

Dosage-form design

Coordinator Dr Gipps

Classes July Sem: 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

Coordinator Dr Cutler

Classes July Sem: 6hr prac/wk for 9wks

Assessment classwork, one 1hr exam

This component 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.

PHAR 3601 Dispensing

4 credit points

Prerequisite: Physical Pharmaceutics 2608, Microbiology (Pharmacy) 2605 and Pharmaceutical Microbiology 2607

Corequisite: Formulation 3603

When Offered: February

Classes: 1 lec & 3hrprac/wk

Assessment: Two 3hr exams (including theory andprac), continuous assessment

THIS UNIT OF STUDY IS NOT AVAILABLE IN 1998

AVAILABLE FROM 1999

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 series and allow the students to prepare a variety of pharmaceutical products and critically assess them.

PCOL 3602 Pharmacology (Pharmacy)

8 credit points

Coordinator: Assoc. Prof. Mylecharane

Prerequisite: Physiology (Pharmacy)

Corequisite: Medicinal Chemistry 3604 and Pharmacy Practice 3606

When Offered: February

Classes: Feb Sem: 2 lec & 4hrprac/wk; July Sem: 2 lec/wk

Assessment: One 1.5hr exam (each semester), prac exam, classwork

THIS UNIT OF STUDY IS NOT AVAILABLE IN 1998

AVAILABLE FROM 1999

The aims of this unit of study 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 unit of study covers chemotherapy (antibacterial, antiviral, antifungal, antiprotozoal, anthelmintic and anticancer drugs), analgesics and anti-inflammatory agents, respiratory drugs, gastro-intestinal 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 unit of study 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 Intermediate and Senior year Pharmacology units of study.

PHAR 3603 Formulation

5 credit points

Prerequisite: *Pharmaceutical Microbiology 2607 and Physical Pharmaceutics 2608*

Corequisite: *Dispensing 3601*

When Offered: *February*

Classes: *2 lec, 12hr ofprac & two 1hr tut/wk*

Assessment: *One 2hr exam (45%) (each semester); prac (5%), tut (5%)*

THIS UNIT OF STUDY IS NOT AVAILABLE IN 1998

AVAILABLE FROM 1999

This unit of study 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.

PHAR 3604 Medicinal Chemistry

12 credit points

Prerequisite: *Biochemistry (Pharmacy) 3602*

Corequisite: *Pharmacology (Pharmacy) 3602 and Pharmacy Practice 3606*

When Offered: *February*

Classes: *3 lec, 4hr ofprac & 1hr tut/wk*

Assessment: *One 3hr exam (35%), classwork (15%) (each semester)*

THIS UNIT OF STUDY IS NOT AVAILABLE IN 1998

AVAILABLE FROM 1999

This unit of study 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 the February 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 the July 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.

PHAR 3605 Pharmacokinetics

6 credit points

Prerequisite: *Physical Pharmaceutics 2608*

When Offered: *February*

Classes: *4 lec or tut/wk*

Assessment: *Assessment one 3hr exam*

THIS UNIT OF STUDY IS NOT AVAILABLE IN 1998

AVAILABLE FROM 1999

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.

PHAR 3606 Pharmacy Practice

13 credit points

Corequisite: *Pharmacology (Pharmacy) 3602, Pharmacokinetics 3605*

When Offered: *February*

Classes: *2 lec/wk, ten 2hr tut, nine 4hrfieldwork; Sem 2:3 lec/wk, ten 2hrtut, nine 4hrfieldwork*

Assessment: *Assessment Feb Sem (40%): 1hr clinical exam (15%), 0.5hr oral exam (15%), tut (5%), externship assessment (5%); July Sem (60%): one 2hr exam (25%), 0.5hr oral exam (15%), tut (5%), externship (15%)*

THIS UNIT OF STUDY IS NOT AVAILABLE IN 1998

AVAILABLE FROM 1999

Therapeutics

This section is a continuation of the therapeutics section of Pharmacy Practice 2. Topics covered in the February semester include epidemiology, pathophysiology, symptoms, signs, management of 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 unit of study will explore the role of pharmacists in conducting medication regime reviews, implementing clinical intervention and interprofessional 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.

Pharmacy Honours (from 1999)

Pharmacy Honours Units of Study (1997 Resolutions only)

The following Third Year units of study are additional units of study required for the BPharm(Hons) (see section 11 of the 1997 Resolutions). They are scheduled for implementation in 1999. For further information, consult the Department.

PHAR 3701 Pharmacy (Honours)	5 credit points
PHAR 3706 Pharmaceutical Chemistry (Honours)	5 credit points
PHAR 3707 Pharmaceutics (Honours)	5 credit points
PCOL 3708 Pharmacology (Pharmacy Honours)	5 credit points
PHAR 3709 Pharmacy Practice (Honours)	5 credit points

PCOL 3708 Pharmacology (Pharmacy Honours)

5 credit points

When Offered: July

THIS UNIT OF STUDY IS NOT AVAILABLE IN 1998.

PHAR 3701 Pharmacy (Honours)

5 credit points

Prerequisite: All first and second year Pharmacy units of study

Corequisite: All third year Pharmacy pass degree units of study

When Offered: February

Classes: 1.5hr lec, 1.5hr tut & 1.5hr sem/wk

Assessment: Exam (30%), Assignment (50%), Oral exam (20%)

THIS UNIT OF STUDY IS NOT AVAILABLE IN 1998

Statistical analysis: Statistical data handling, graphs, means and standard deviations. Interpretation of significance tests and confidence intervals. Statistical comparison of samples. Calculation of sample size required for simple studies. Use of SPSSWTN computer program for statistical analysis.

Scientific literature evaluation and scientific presentation: Computing: Use of advanced computer software packages; data-bases; graphics. Information retrieval: Advanced use of library resources including on-line literature data bases. Seminar Sessions: Consisting of literature evaluation; written and oral presentations.

PHAR 3706 Pharmaceutical Chemistry (Honours)

5 credit points

Prerequisite: All first and second year Pharmacy units of study

Corequisite: All third year Pharmacy pass degree units of study

When Offered: February

Classes: 1hr lec, 1hr tut & 2hrprac/wk

Assessment: Exam (40%), assignment (20%),prac reports (20%) and oral exam (20%)

THIS UNIT OF STUDY IS NOT AVAILABLE IN 1998

Analysis and Structure of Biomolecules: theoretical and practical application of spectroscopic techniques; quantitative detection of

therapeutic drugs, assessment of their purity, and analysis of impurities; analysis of the chemical properties of drugs and their targets; analysis and determination of the structure and structural properties of drugs, their targets, and drug-target complexes; research, clinical and industrial applications of mass spectrometry and nuclear magnetic resonance spectroscopy.

Cellular Biology and Drug Design: approaches to rational drug design; macromolecules as targets and ligands; cellular signal transduction pathways; use of macromolecules such as peptides, proteins and nucleic acids as therapeutic agents; structure-activity relationships, specificity and toxicity of potential drug substances.

PHAR 3707 Pharmaceutics (Honours)

5 credit points

Prerequisite: All first and second year Pharmacy units of study

Corequisite: All third year Pharmacy pass degree units of study

When Offered: July

Classes: 2.5 lec/tut, 1hr prac & 1 seminar/wk

Assessment: Exam (40%), assignment (20%), prac reports (20%) and oral presentation (20%)

THIS UNIT OF STUDY IS NOT AVAILABLE IN 1998

Analysis and Structure of Biomolecules: theoretical and practical application of spectroscopic techniques; quantitative detection of therapeutic drugs, assessment of their purity, and analysis of impurities; analysis of the chemical properties of drugs and their targets; analysis and determination of the structure and structural properties of drugs, their targets, and drug-target complexes; research, clinical and industrial applications of mass spectrometry and nuclear magnetic resonance spectroscopy.

Diffusion and Dissolution: development of more advanced models for the characterisation of dissolution and diffusional processes of drugs in vivo and in vitro.

Advanced Physical Pharmaceutics and Dosage Form Design: discussion of basic polymer science pertinent to pharmaceutical dose forms including biodegradable and bioerodable polymers. Selection of dosage forms will be critically evaluated.

PHAR 3709 Pharmacy Practice (Honours)

5 credit points

Prerequisite: All first and second year Pharmacy units of study

Corequisite: All third year Pharmacy pass degree units of study

When Offered: July

Classes: 5hr tut/wk

Assessment: Assignment (50%) and presentation (50%)

THIS UNIT OF STUDY IS NOT AVAILABLE IN 1998

Seminars and tutorials will be given to illustrate. Research methodologies used in social, clinical, behavioural and epidemiological pharmacy practice research. Hypotheses formulation, sampling techniques, concept of bias, interview techniques, questionnaire design, reliability and validity will be covered along with clinical trial design and evaluation. This unit of study is designed to develop students' skills in critical evaluation of the research literature.

Pharmacy Honours (1998 and 1999)

When Offered: February

Honours program available from 1998 to 1999 under the Pre-1997 Resolutions.

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. 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 degree.

Students who are considering the Honours unit of study are encouraged to consult widely with members of the academic staff during their Senior year. Further information, in the form of unit of study 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.

PHAR 4601 Integrated Dispensing

4 credit points

Prerequisite: *Dispensing Practice 3601 and Pharmacy Practice 3606*

When Offered: *February*

Classes: *4hrprac class/wk*

Assessment: *Prac work exam (50%), assessment (50%)*

THIS UNIT OF STUDY IS NOT AVAILABLE IN 1998

The aim of the Integrated Dispensing 4601 unit of study is to link together, in a meaningful way, the skills and knowledge that students have developed in Dispensing Practice 3601 and Pharmacy Practice 3606 units of study. The emphasis is on clinical practice and will develop the theme that dispensing is not a single event but requires skills and knowledge from a variety of areas of pharmacy practice as well as interaction with the patient and prescriber. This will be achieved using a simulated practice environment. Students will learn to integrate the training they have received in dose form preparation with patient counselling skills, forensic and administrative requirements (including the use of computer-based dispensing programs), as well as, the professional aspects of pharmacy to allow them to become competent dispensers of medicines.

PHAR 4602 New Drug Technologies

4 credit points

Prerequisite: *Medicinal Chemistry 3604*

When Offered: *February*

Classes: *3 lec & 1 tut/wk*

Assessment: *Two 2hr exam and 1 quiz/class assessment*

THIS UNIT OF STUDY IS NOT AVAILABLE IN 1998

Therapeutic Products from Biotechnology:

12 lectures, 4 tutorials

Brief review of the structure and function of deoxyribonucleic acid; the genetic code, replication, transcription, recombinant DNA technology; isolation and purification of protein gene products; general properties of biotechnology-produced pharmaceutical products; handling and storage of biotechnology-produced products; specific examples of biotechnology-produced products (including insulin, growth hormone, tissue plasminogen activator, DNase, interferons, hematopoietic growth factors, clotting factors); recombinant DNA - produced pharmaceuticals under development; impact of biotechnology on pharmaceutical care; influence of biotechnology on drug discovery (screening, receptor structure determination, protein engineering); gene therapy.

Application of Immunology and Pharmaceutical Products:

9 lectures, 3 tutorials

Introduction to the cells of the immune system (lymphocytes, mononuclear phagocytes, granulocytes); haematopoiesis haematopoietic agents; acquired versus cell-mediated immunity; phases of immune response (cognitive, activation, effector mediation via complement, phagocytosis, granulocytosis); outline of the inflammatory response; B-lymphocytes and antibodies/antibody therapy and diagnosis, T-lymphocytes and antigen presentation/vaccine development; helper cells and infection; hypersensitivity; interleukins; cytokines; immune response and immune diseases; examples of molecular medicine (HIV, rheumatoid arthritis, lupus, multiple sclerosis, Grave's disease).

Toxicology:

21 lectures, 7 tutorials

General toxicity testing: Aspects covered include test design, type, results and interpretation; the place of toxicology in the community and in the development of pharmaceuticals. Specific topics include: clinical toxicology (treatment of overdose, clinical manifestations of poisonous plants), management of poisoning, envenomation and its treatment), regulation by government of toxicity of pharmaceuticals and chemical substances; subacute and chronic toxicity; carcinogenicity; teratogenicity, mutagenesis, organ toxicity.

Biochemical mechanisms of toxicity: Factors affecting toxicity and the mode of action of toxic chemicals and pharmaceuticals are discussed. These include metabolic transformations and the balance between detoxification and intoxication pathways, genetic factors, induction and inhibition of metabolic pathways. Toxicity of xenobiotics (eg lipid peroxidation, altered calcium homeostasis, covalent binding and alkylation). Experimental approach to understanding cell death. Toxicology of environmental chemicals, including pesticides, arylamides (eg paracetamol), polycyclic hydrocarbons, fungal metabolites, herbicides (eg paraquat) and hydrocarbons (solvents).

Textbooks:

Foye, W.O., Lemke, T.L. and Williams, D.A. Principles of Medicinal Chemistry (4th edn), Williams & Wilkins, 1995

Klaassen, CD., Amdur, M.O. and Doull, J. Casarett and Doull's Toxicology: The Basic Sciences of Poisons (3rd edn), Macmillan, 1986 (or 4th edn, 1991)

Abbas, A.K., Lichtman, A.H. and Pober, J.S. Cellular and Molecular Immunology, W.B. Saunders Company, 1991

PHAR 4603 Pharmaceutics Workshop

4 credit points

Prerequisite: *Pharmacokinetics 3605 and Formulation 3603*

When Offered: *February*

Classes: *4hr tut/Avorkshop/wk*

Assessment: *Assignments (70%) and oral presentation (30%)*

THIS UNIT OF STUDY IS NOT AVAILABLE IN 1998

Small group workshop will consider problems of formulation and delivery of drugs with a range of physiochemical, biopharmaceutic, pharmacokinetic and therapeutic properties. The selected examples will include drugs with high and low solubility, with long and short elimination half-lives and with narrow and wide therapeutic range. Each student will be given the task of developing a pharmaceutical profile for an individual drug to be presented for group discussion at the workshop.

PHAR 4604 Pharmacotherapeutics

12 credit points

Prerequisite: Pharmacy Practice 3606, Pharmacology (Pharmacy) 3602 and Pharmacokinetics 3605

Corequisite: Clinical Practice 4605, Integrated Dispensing 4601, Clinical Information/Technology 4606 and Clinical Pathology 4607

When Offered: February

Classes: 4 lec & 2hr tut/wk

Assessment: Two oral exams (20% each sem), two written exams (20% each sem) and Tutorial participation (10% each sem)

THIS UNIT OF STUDY IS NOT AVAILABLE IN 1998

Therapeutics lectures will be followed up with tutorials which will be practice-based in order to illustrate specific practice situations. Therapeutics topics will be covered in great detail in order to understand how drugs affect different populations, how drugs are used in different situations and specific drugs are chosen and the dosageregimen which is appropriate for that disease. In addition, the ability to communicate such information in an appropriate manner will be discussed. Diseases and drug therapy, endocrinology, cardiology, respiratory, oncology, renal, TPN, geriatrics haematology and paediatrics. The unit of study will expand the role of the pharmacist in monitoring therapeutic outcomes, and in participating in therapeutic decision-making.

Textbooks:

Edwards and Walker Clinical Pharmacy and Therapeutics

Herfindal Clinical Pharmacy and Therapeutics

PHAR 4605 Clinical Practice

12 credit points

Prerequisite: Pharmacy Practice 3606, Pharmacology (Pharmacy) 3602 and Pharmacokinetics 3605

Corequisite: Pharmacotherapeutics 4604, Integrated Dispensing 4601, Clinical Information and Technology 4606 and Clinical Pathology 4607

When Offered: February

Classes: 3hrs tut & 3hrs clinical rounds/wk

Assessment: Case assessment by peers and clinical specialists (100%)

THIS UNIT OF STUDY IS NOT AVAILABLE IN 1998

This unit of study will expect the students to follow the progress of patients by extracting and organising information from patient medication histories and interviews. Literature information relevant to the case will be sought in an attempt to review and propose therapeutic options for management. Aspects of communication, verbal presentation and an ability to discuss the case critically will be developed through the unit of study. Each case study will cover the drugs under review, the disease state, past medical and pharmaceutical history, social and demographic parameters. The students' decision making ability will be developed. The appropriateness of therapeutic plans will be reviewed.

Textbooks:

Edwards and Walker Clinical Pharmacy and Therapeutics

Herfindal Clinical Pharmacy and Therapeutics

USP-DI Drug Information for the Health Care Professional

PHAR 4606 Clinical Information/Technology

2 credit points

Prerequisite: Pharmacy Practice 3606, Pharmacology (Pharmacy) 3602 and Pharmacokinetics 3605

Corequisite: Pharmacotherapeutics 4604, Integrated Dispensing 4601, Clinical Practice 4605 and Clinical Pathology 4607

When Offered: July

Classes: 4 lec; twelve 2hr tut (2hr/wk)

Assessment: Written assignments (100%)

THIS UNIT OF STUDY IS NOT AVAILABLE IN 1998

Critical evaluation of the literature using clinical trial papers will take place. Drug and disease information responses will be prepared by each students using technology to search and retrieve information from data bases. The communication of these responses to patients and health care professionals will undertaken using novel computer technology. As new technology becomes available it is important for students to have the necessary skills to operate and use such technology in the healthcare setting. This unit of study will use the latest technology in a practice environment. Initially students will use clinical trial papers to understand and critically evaluate literature in this area. They will use this information in their case history preparations. They will prepare drug information responses as would be required by a practising pharmacist in the healthcare environment. Time will be spent in the laboratory accessing the latest information networks and using CD ROM data bases to prepare appropriate drug information for other healthcare professionals and patients. The students will present their responses to their peers for critical evaluation and improvement.

PHAR 4607 Clinical Pathology

4 credit points

Prerequisite: Pharmacy Practice 3606 and Medicinal Chemistry 3604

Corequisite: New Drug Technologies 4602, Pharmacotherapeutics 4604, Clinical Practice 4605, Integrated Dispensing 4601 and Clinical Information/Technology 4606

When Offered: July

Classes: 3 lec/wk & 7 x 2hrs tut

Assessment: One 2hr exam (50%), assignments (50%)

THIS UNIT OF STUDY IS NOT AVAILABLE IN 1998

The principles and practice of various tests on the physiological and biochemical processes in health and disease, as applied to diagnosis, treatment and prevention of disease. The basic laboratory principles and techniques, and pathophysiology and methods of analysis are covered.

Textbooks:

Kaplan, A. and Szabo, L.L. Clinical Chemistry: Interpretation and Techniques, William and Wilkins, 1994

PHAR 4608 Ethics and History of Pharmacy

2 credit points

Corequisite: Pharmaceutical Management 4609

When Offered: July

Classes: 1 lec/wk & 7x 2hr tuts

Assessment: Written exam (50%), tutorial assessment (50%)

THIS UNIT OF STUDY IS NOT AVAILABLE IN 1998

Topics to be covered are the beginnings and antiquity of Pharmacy, main periods of Pharmacy history, traditions of Asian, European and American Pharmacy, the beginnings and growth and diversity of Pharmacy Practice in Australia, the changing relationships between Pharmacy and allied professions, roles which Pharmacy has played in the Australian community. Topics include standards of society, the Pharmacy Board, the Society of Hospital Pharmacists, ethical behaviour in practice. Professional misconduct cases will be discussed.

Textbooks:

Haines, G. Pharmacy in Australia - the National Experience

PHAR 4609 Pharmaceutical Management

4 credit points

Corequisite: *Ethics and History of Pharmacy 4608 and Pharmaceutics Workshop 4603*

When Offered: July

Classes: 4 lec/wk

Assessment: Written exam

THIS UNIT OF STUDY IS NOT AVAILABLE IN 1998

Topics to be covered include registration of therapeutic substances in Australia, clinical research trials, pharmacoeconomics, industry management, business management, basic marketing and accounting, law, hospital administration, negotiation and conflict resolution skills.

Pharmacy Honours (from 2000)

When Offered: February

THESE UNITS OF STUDY ARE NOT AVAILABLE IN 1998

Fourth Year units of study available under the 1997 Resolutions from 2000. The following Fourth Year units of study are scheduled for implementation in 2000.

PHAR 4704 Pharmacotherapeutics (Honours) 13 credit points

PHAR 4705 Clinical Practice (Honours) 6 credit points

PHAR 4706 Pharmaceutical Chemistry (Honours) 29 credit points

PHAR 4707 Pharmaceutics (Honours) 29 credit points

PCOL 4708 Pharmacology (Pharmacy Honours) 29 credit points

PHAR 4709 Pharmacy Practice (Honours) 29 credit points.

PCOL 4708 Pharmacology (Pharmacy Honours)

29 credit points

When Offered: February

THIS UNIT OF STUDY IS NOT AVAILABLE IN 1998.

PHAR 4704 Pharmacotherapeutics (Honours)

13 credit points

Prerequisite: *All third year Pharmacy pass degree units of study, Pharmacy (Honours) 3701 and 5 additional credit points of a unit of study designated Honours at the 3000 level from table VIIB*

Additional information: *May not be counted with Pharmacotherapeutics 4604*

When Offered: February

Classes: Feb sem: 4 lec & 2hr tut/wk; July sem: 4-5 lec & 2-5hr tut/wk

THIS UNIT OF STUDY IS NOT AVAILABLE IN 1998

Therapeutics lectures will be followed up with tutorials which will be practice-based in order to illustrate specific practice situations. Therapeutics topics will be covered in great detail in order to understand how drugs affect different populations, how drugs are used in different situations and how specific drugs are chosen and the dosage regimen which is appropriate for that disease. In addition, the ability to communicate such information in an appropriate manner will be discussed. Diseases and drug therapy include endocrinology, cardiology, respiratory, oncology, renal, TPN, geriatric haematology and paediatrics. The unit of study will expand the role of the pharmacist in participating in therapeutic decision-making and monitoring therapeutic outcomes. Lectures will cover the Pharmaceutical Society, the Pharmacy Board and the Society of Hospital Pharmacists ethical behaviour in practice.

Textbooks:

Edwards and Walker Clinical Pharmacy and Therapeutics

Herfindal Clinical Pharmacy and Therapeutics

USP-DI Drug Information for the Health Care Professional

PHAR 4705 Clinical Practice (Honours)

6 credit points

Prerequisite: *Qual All third year Pharmacy pass degree units of study, Pharmacy (Honours) 3701 and 5 additional credit points of a unit of study designated Honours at the 3000 level from table VIIB*

Additional information: *May not be counted with Clinical Practice 4605*

When Offered: February

Classes: 3 lec & 3hr clinical rotation/wk

THIS UNIT OF STUDY IS NOT AVAILABLE IN 1998

This unit of study will expect the students to follow the progress of patients by extracting and organising information from patient medical histories and interviews. Literature information relevant to the case will be sought in an attempt to review and propose therapeutic options for management. Aspects of communication, verbal presentation and an ability to discuss the case critically will be developed through the unit of study. Each case study will cover the drugs under review, the disease state, past medical and pharmaceutical history, social and demographic parameters. The students' decision making ability will be developed. The appropriateness of therapeutic plans will be reviewed.

Textbooks:

Edwards and Walker Clinical Pharmacy and Therapeutics

Herfindal Clinical Pharmacy and Therapeutics

USP-DI Drug Information for the Health Care Professional

PHAR 4706 Pharmaceutical Chemistry (Honours)

29 credit points

Prerequisite: *Qual All third year Pharmacy pass degree units of study and Pharmacy (Honours) 3701*

When Offered: February

Classes: Feb sem: 2hr lec & 2hr tut/wk July sem: 25hr/wk practical (Research Project)

Assessment: Feb sem:

THIS UNIT OF STUDY IS NOT AVAILABLE IN 1998

The Pharmaceutical Chemistry Honours 4 units of study is designed to extend the Pharmacy undergraduate's knowledge and skills in research practice and problem solving, and written and oral scientific communication. The unit of study provides an important basis for those who wish to become candidates for the PhD, MSc and MPharm

degrees. In addition, elective units of study provide extra training in specialised areas and will be particularly useful for those seeking employment in industrial, government and hospital laboratories. (Honours students will also retain essentially all of the professionally based training of the pass degree and complete in the same time.)

Assessment

February semester:

For each of the three Electives:

Assignment - 50%

Exam - 50%

Research project preparation:

Assignment - 10%

Oral presentation - 45%

Written presentation - 45%

July semester:

Research project:

Thesis/oral presentation - 100%

Full year:

February semester - 25%

July semester - 75%

FEBRUARY SEMESTER

Students will select three Electives (1 credit point each) from a total of seven electives offered. An additional compulsory option (1 credit point) must be undertaken which will prepare students for their research laboratory work in the July semester. The description of these options is as follows:

Research Project Preparation (1 credit point)

Students in the Honours program will be required to perform the following tasks:

- . select a research project;
- . perform a detailed, up-to-date literature survey on their project and evaluate the literature;
- . write a project proposal and give an oral presentation consisting of background to the research field, significance and objectives of the project, research plan and methods to be used, and possible outcomes;
- . participate in workshops on scientific record keeping, data presentation, and thesis writing.

Electives (1 credit point each)

Approaches to Drug Synthesis

Research and development in Pharmaceutical Chemistry often involve organic reactions for the formation of derivatives in analysis or the preparation of model compounds for testing. This unit of study has the objective of extending the student's knowledge of organic chemistry, including factors which influence organic reactivity, and developing an understanding of the more commonly encountered reactions, based on a grounding in electronic theory.

Radiation Biology

This unit of study will discuss various topics in the application of high energy (B, g, neutrons) and low energy (UV-visible light) radiation to biological systems for therapeutic and diagnostic purposes.

Molecular Modelling and QSAR

This unit of study is intended to explore some of the approaches to the discovery of biologically active compounds and the ways in which that activity may be amplified.

Molecular modelling or molecular graphics provides a means of making three-dimensional models representing small molecules or macromolecules that can be manipulated interactively by a computer

from a video screen display. This elective option is an introduction to the use of molecular graphics for drug design, and consists of a series of lectures followed by demonstrations and problem solving, using the molecular graphics facilities in the Department of Pharmacy.

Drug-Receptor Interactions and Signal-Transduction Mechanisms

The lectures consider in detail the dose-response curve and its relationship to drug affinity and efficacy. The concept of spare receptors (receptor reserve) and amplification mechanism will be considered in relation to optimal drug use. The latter part of the option will examine selected drug receptors, with reference to their known molecular structures and the mechanism of transduction of extracellular signals resulting from intracellular events leading to biological activity.

Targetted Drug Design

Strategies for the design of agents used in various cancer therapy procedures will be discussed, including chemotherapeutic substances, agents of immunological origin and compounds activated and/or released in it by various mechanisms.

Advances in Xenobiochemistry

This is an extension of the undergraduate unit of study on metabolism directed towards an intimate understanding of the complexities of drug metabolising systems in animals and man. Lectures will cover aspects such as mechanisms of drug oxidation, stereochemical specificity of mixed function oxidase, mechanisms of mixed function oxidase induction, inhibition and inactivation, and the multiplicities of both conjugating enzymes and cytochrome P⁴⁵⁰. Emphasis will be placed on the methodological aspects involved in obtaining results in the above areas.

Toxicology- Molecular Mechanisms of Tissue Damage

The emphasis in this option will be placed on the biochemical and pharmacodynamic mechanisms through which toxic substances exert their effects. Effects examined will include carcinogenicity, mutagenicity (including the extensively used bacterial Ames' test), tissue necrotic damage, teratogenicity. Some time will be devoted to methods of detection and recognition of carcinogens.

JULY SEMESTER

Research Project (25 credit points)

Honours students will commence work on their research projects two weeks before the normal commencement of the July semester. All preparatory work for the research project will have been completed in the February semester.

PHAR 4707 Pharmaceutics (Honours)

29 credit points

Prerequisite: All thirdyear pass degree units of study and Pharmacy (Honours) 3701

When Offered: February

Classes: Feb sem: 4hr lec/tut: July sem: 25hr/wk Research project

THIS UNIT OF STUDY IS NOT AVAILABLE IN 1998

The Pharmaceutics Honours unit of study is designed to extend the Pharmacy undergraduate's knowledge and skills in research methodology, problem solving and written and oral scientific communication in specialist areas of Pharmaceutics. The unit of study provides an important basis in advanced coursework and laboratory research for those who wish to become candidates for the PhD, MSc and MPharm degrees. (Honours students will also retain essentially all of the professionally based training of the Pass degree and complete in the same time.)

Assessment

February semester:

Each option

Tutorials - 20%

Assignments - 20%

Exam - 60%

July semester:

Research Project

Project plan and presentation - 20%

Thesis and oral presentation - 80%

FEBRUARY SEMESTER

Students will take the core option, Advanced Pharmacokinetics and Biopharmaceutics and select three further options from seven options of electives, up to 1 elective option may be selected from Pharmaceutical Chemistry 4706 or Pharmacy Practice 4709.

Advanced Pharmacokinetics and Biopharmaceutics (1 credit point)

This unit of study deals with: (1) aims and methods of modelling pharmacokinetics; (2) pharmacokinetics of chiral compounds; (3) metabolite kinetics; (4) nonlinear kinetics; (5) physiological modelling; (6) population pharmacokinetics.

Pharmacodynamics (0.5 credit points)

This option deals with both qualitative and quantitative relationships between drug effect (either therapeutic or toxic) and its concentration in various body fluids. Specific topics to be discussed include the relationship between drug concentration and onset, intensity and duration of effect, for drugs exhibiting either mono- or multi-compartment pharmacokinetic behaviour administered either as single or multiple oral or intravenous doses. Strategies for examining drug pharmacodynamics in disease will also be considered.

Drug Macromolecular Binding (0.5 credit points)

This option deals with the nature of binding equilibria between drugs and other small molecules and proteins and other natural and synthetic macromolecules. It includes the theory of multiple equilibria for binding to single and multiple classes of sites, interactions between sites, cooperative binding. An evaluation is given of direct and separation methods of measurement of binding and the determination of binding parameters. The biopharmaceutical significance of binding interactions will be discussed.

From Topicals to Transdermals (0.5 credit points)

This option will briefly review basic emulsion science and then consider some of the recent developments in the formulation of emulsions especially for topical use. There will also be a discussion of the design of transdermal delivery devices and on some ways to enhance the delivery of drugs through the skin. Students will deliver a short oral presentation on an aspect of this topic to the group.

Technology for Solid Dose Forms (0.5 credit points)

A short review of the pharmaceuticals of solid dosage forms will be followed by case studies of particular drugs and excipients. Characterisation and stability to manufacturing stresses will be emphasised. Students will prepare a monograph on these aspects of one selected drug (normally a drug in the student's research project).

Advanced Pharmacokinetics (1 credit point)

This option is for students with a strong academic or research interest in pharmacokinetics. It is concerned largely with model-independent methods in pharmacokinetics, with particular emphasis on linear systems approaches and the theory and application of deconvolution methods in bioavailability.

Fortran Programming (1 credit point)

This option is concerned with digit computer programming in Fortran with an emphasis on applications to pharmacokinetics.

Aerosol Drug Delivery (0.5 credit points)

After an introduction to some fundamental aspects of aerosols, their in-vitro generation and characterisation (types of aerosol devices, aerosol particle sizing techniques, and the advantages and limitations), in-vivo characterisation (lung deposition and clearance), and new developments on aerosol delivery for proteins, peptides and gene therapy.

Data Treatment (1 credit points)

The option deals with mathematical representation of data, and the use of experimental data in testing mathematical models. There is an emphasis on pharmacokinetic applications.

Delivery of Peptides (0.5 credit points)

Peptides and proteins will be reviewed in terms of the problem encountered in physical and chemical interactions with a range of dosage forms, plus the biological barriers to peptide absorption. Examples to be used will include delivery of LHRH and rh Dnase, oral and parental delivery of insulin and oral vaccination and proteinaceous materials.

Ophthalmic Drug Delivery (0.5 credit points)

The normal physiology and anatomy of the eye will be discussed in terms of the barriers posed to the delivery of therapeutic agents. The inter-relationships between the defence mechanisms of the eye and formulation factors (pH, tonicity, preservatives, surface tension, viscosity) will be illustrated. The design of novel delivery systems for ophthalmic drugs will be discussed.

Pharmacokinetic Variability (0.5 credit points)

This option considers variability in pharmacokinetics arising from variability in body composition, age, sex, genetic factors, disease, drug interactions, and environmental factors.

JULY SEMESTER

Research Project (25 credit points)

Honours students will commence work on their projects two weeks before the normal commencement of the July semester. All preparatory work for the research project will have been completed in the February semester. A final seminar and thesis describing research results and conclusions is to be presented as the end of the July semester.

PHAR 4709 Pharmacy Practice (Honours)

29 credit points

Prerequisite: All third year pass degree units of study and Pharmacy (Honours) 3701

When Offered: February

Classes: Feb sem 4hrs tut/wk; July sem 25hrs/wk Research project

Assessment: Protocol development (10%) and Thesis (90%)

THIS UNIT OF STUDY IS NOT AVAILABLE IN 1998

Weekly discussion between students, their supervisors and other pharmacy practice personnel will take place in order to evaluate and formulate possible methodologies for research projects. Students will provide short oral presentations for open discussion with other staff and postgraduate students at the weekly scheduled pharmacy practice research meetings, research projects in areas of Pharmacy Practice such as Pharmacoeconomics, Pharmacoepidemiology, professional Practice, Geriatric Patients, Asthma Management and Clinical Practice will be offered. (Honours students will also retain essentially all of the professionally based training of the pass degree and complete in the same time.

Bachelor of Psychology

Psychology is the study of behaviour and involves an understanding of such areas as the biological bases of behaviour, theories of learning, social influences on the behaviour of individuals and groups, abnormal behaviour, personality and individual differences in behaviour. The BPsych has been designed for those students wishing to become professional psychologists.

Award Course Structure

In this award course you will study four years of psychology together with other units of study chosen from within the Faculty of Science. You can also study a limited number of units of study from the Faculties of Arts and Economics.

Areas of Psychology studied

Junior

- * Psychobiology
- * Sensory Processes
- * Social Psychology
- * Personality
- * Psychological Statistics
- * Cognition
- * Perception
- * Human Development
- * Intelligence
- * Learning
- * Motivation and Abnormal Psychology

Intermediate

- * Neuro science
- * Cognition
- * Perception
- * Psychological Statistics
- * Individual Differences
- * Learning and Behavioural Neuroscience
- * Social Psychology

Senior options may include:

- * Research Methods
- * Psychological Statistics
- * History of Psychology
- * Philosophy of Psychology
- * Human Performance
- * Neuroscience
- * Human Development
- * Intelligence
- * Sensory Processes
- * Abnormal Psychology
- * Child Abnormal
- * Language and Communication
- * Organisational/Environmental Conceptual Issues in Psychology
- * Perception
- * Memory and Attention
- * Social Psychology
- * Learning and Motivation

Students in the BPsych study more senior options in Psychology than do students studying psychology in other award courses.

In the fourth year, if accepted into the Honours program, students undertake special units of study and a research project. If successful, they graduate with the BPsych (Hons).

Progression requirements

Students must gain a credit average in each year of psychology in order to progress in the BPsych. Students who fail to meet these criteria can transfer into the BSc. In order to complete the fourth year of the Bachelor of Psychology students must be eligible to enter the Honours program. Students who do not meet this requirement are awarded the BSc, provided they have completed the minimum credit points necessary.

Career Opportunities

There are many career opportunities currently available for four-year trained psychology graduates. From the year 2000 membership of the Australian Psychological Society requires four years of study in psychology

(which the BPsych provides), plus two years of postgraduate study. Trained psychologists are in high demand.

Assumed Knowledge

HSC 2 or 3 unit Mathematics. Other assumed knowledge requirements depend on subjects chosen.

For most award courses you don't have to complete particular subjects at school for admission to the University of Sydney. The University has what are called Assumed Knowledge requirements.

Warning: If you do not have the assumed knowledge (or its equivalent) you will be at a considerable disadvantage. You should contact the Faculty for information about bridging courses or recommended supplementary work.

The Assumed Knowledge subjects that are listed for each award course refer to the subjects studied for the New South Wales Higher School Certificate. Examples of equivalent studies would be Chemistry and Physics studied for the Victoria VCE A' level, South Australian Matriculation (SAM), International Baccalaureate, STPM, Hong Kong Advanced Level or Indian School Certificate examinations.

Bridging courses in Mathematics are offered by the Mathematics Learning Centre (phone: 02 9351 4061).

PSYC 3003 Psychology 3003

12 credit points

Corequisite: Psychology 3001

Additional information: This unit of study is available only to students in the BPsych degree

When Offered: February

PSYC 3004 Psychology 3004

12 credit points

Corequisite: Psychology 3002

Additional information: This unit of study is available only to students in the BPsych degree

When Offered: July

6. Other Faculty 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 offered by 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
A.P. Elkin Fund	varies	Students of Aboriginal descent.
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.
Brian Rawson Memorial Prize	250	Most improved performance from Junior to Intermediate Science.
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.
Environmental Science Scholarships	2 000	On the basis of academic merit to students entering the BSc (Environmental).
Faculty of Science Dean's Honour List Prize	varies	Highest WAM of all candidates in first, second and third years of study.
Farrand Scholarship	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.
James Robinson Orange Memorial Prize	700	Children or grandchildren of members of the Loyal Orange Institution. 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.
Korner Prize	100	Proficiency in the core units of study within the second year of the BMedSc.
Medical Science Scholarships (2)	2 000	On the basis of academic merit to students entering the BMedSc.
Molecular Biology and Genetics Scholarship	2 000	On the basis of academic merit to students entering the BSc (Molecular Biology and Genetics).
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.
Prize in Marine Sciences	30	Proficiency in Senior Marine Sciences units of study.
Procter and Gamble	2 500	Awarded on academic merit and leadership qualities.
Robert Campbell	200 p.a.	Students in financial need and of sufficient merit. Application from Year 1 students at any time.
Science Achievement Prize	500	Highest WAM for all units of study to a student completing the requirements for a Faculty degree in six semesters.
Science Entry Scholarships	2 000	Awarded to highly ranked Alumni Scholarship applicants.
Science Scholarship for Academic Excellence	2 000	Awarded to students with a TER of 100.

Prize or scholarship	Value \$	Qualifications
Science Scholarships (10)	500 each	Full-time first year BSc students for academic merit in the HSC (or equivalent) who have not previously undertaken tertiary study.
Slade Prizes (6)	80	Proficiency in practical classes in Intermediate Chemistry, Geology, Biochemistry, or Junior Geography or Biology.
Universities Credit Union Scholarship	500	Undergraduates who are members (of at least one year's standing) of Universities Credit Union.
University of Sydney Staff Prize	Texts to a value of \$300	On Academic merit to full-time candidates in a degree program of the Faculty.
Biochemistry		
Amrad Pharmacia Award in Experimental Biochemistry	250	Most outstanding student in Senior Biochemistry practical.
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.
Biochemistry Alumni Award	250	Merit in Senior Biochemistry to a student proceeding to Biochemistry Honours.
Fisons Award	400	Merit in Biochemistry 3002 to a student proceeding to Biochemistry Honours.
G.S. Caird Scholarship	650	Proficiency in Intermediate Biochemistry to a student proceeding to Senior Biochemistry.
Johnson & Johnson Awards (2)	250	Merit in Intermediate Biochemistry practical to a student proceeding to Senior Biochemistry.
Roslyn Flora Goulston Prize	530	Distinction in Senior Biochemistry to a student proceeding to Biochemistry Honours.
Biological Sciences		
Biology Entry Scholarships (2)	2 000 each	On the basis of TER to intending BSc Biology majors.
Collie Prize	160	Highest aggregate mark in Junior Biology.
E.N. (Ted) O'Reilly Memorial Prize	275	Merit in Senior Plant Physiology.
Eleanor Chase Memorial Prize	200	Merit in Biology 2001 and 2002.
Eva Saunders Memorial Prize Sciences.	60	To a female student for merit in Intermediate or Senior Plant
G.S. Caird Scholarship in Botany	650	Merit in Senior Plant Sciences to a student proceeding to Honours.
G.S. Caird Scholarship in Zoology	650	Merit in Senior Zoology to a student proceeding to Zoology Honours.
Gabriella Wittman Prize	140	Proficiency in Genetics in Senior Biology.
George Herbert Clarke Prize	100	Merit in Intermediate Plant Morphology to a student born in Australia.
Haswell Prize	120	Proficiency in 24 credit points of Senior Zoology.
lima Brewer Prize	300	Excellence in Honours Botany or Plant Sciences.
John H. Elliott Memorial Prize	150	Best BSc(Hons) thesis in Animal Biology.
Mary Besly Memorial Prize	100	Merit in Intermediate or Senior Invertebrate Zoology.
Professor Spencer Smith-White Prize	200	Proficiency in Genetics Honours.
William John Dakin Memorial Prize in Zoology	250	Greatest proficiency in First Class Honours in Biology.
Chemistry		
Arthur Hollis Memorial Prize	150	Merit in Intermediate Organic Chemistry
C.H. Wilson Prize	70	Highest grade in Organic Chemistry Honours.
Charles E. Fawsitt Prize	120	For merit in Junior Chemistry.
Chemistry Entry Scholarships (2)	2 000 each	On the basis of academic merit to intending BSc Chemistry majors.
Edna Maude Goulston Prize in Organic Chemistry	275	Merit in Organic Chemistry Honours.
Frank E. Dixon Scholarship	650	Merit in Senior Chemistry.
G.S. Caird Scholarships (3)	850	Merit in Senior Chemistry to students proceeding to Chemistry Honours.

Prize or scholarship	Value \$	Qualifications
Hush Prize in Theoretical Chemistry	350	Merit in Senior Theoretical Chemistry.
Inglis Hudson Scholarships (3)	150x2 300x1	Merit in Senior Science for students proceeding to Organic Chemistry Honours.
Iredale Prize	95	Merit in Intermediate Physical Chemistry.
Janet Elspeth Crawford Prize in Chemistry	1400	To a female graduate for merit in Honours in 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.
Liversidge Scholarships (2)	450 p.a.	Chemistry (1901 & 1902) or (1903 & 1904) or (1101 & 1102) student who in the immediately preceding year, achieved the highest number of marks in HSC 4 unit chemistry.
Royal Australian Chemical Institute Analytical Chemistry Prize	250	Merit in Senior analytical chemistry units of study.
Royal Australian Chemical Institute Prize	500	Merit in undergraduate Chemistry (preference to RACI members).
Walter Burfitt Scholarship No. 1	750	Merit in Senior Chemistry to a student proceeding to Chemistry Honours.
Computer Science		
Canon Scholarship for Excellence in Computer Science	10 000	Honours students in Computer Science.
CISCO Prize	500	Merit in COMP 3007
Computer Science and Technology Scholarships (2)	2 000	Academic performance in HSC or equivalent to students entering the BCST.
G.S. Caird Scholarship	650	Merit in Intermediate Computer Science.
Ian Jackson Memorial Prize	50	Merit in Senior Computer Science.
Lionel Singer Corporation Prize for Excellence in the Field of Computing	200	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.
Tyree Scholarship in Computer Science	20 000 over 4 years	Academic achievement in the BCST to a student for participation in an international exchange program.
Geography		
Geography Entry Scholarship	2 000	On the basis of academic merit to intending BSc Geography major.
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 units of study.
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		
A.J. Shearsby Prize	80	Junior Geology student gaining the highest place in HSC 2 unit Science/Geology.
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..
C.E. Marshall Scholarship	525	Merit in Junior Geology.
CRAE Mapping Prize	250	Proficiency in Senior Mapping.
CRAE Ore Deposits Prize	150	Proficiency in Senior Ore Deposit/Economic Geology.
Deas-Thomson Scholarship in Geology	6 500	Proficiency in Geology Honours to a student proceeding to postgraduate Geology.

Prize or scholarship	Value \$	Qualifications
Deas-Thomson Scholarship in Mineralogy	1000	Merit in Senior Geology to a student proceeding to Honours.
Earth Resources Foundation Honours Year Scholarships (2)	1 000	Proficiency in Senior Geological Sciences.
Earth Resources Foundation First Year Scholarships (4)	600	Merit in March semester 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.
Edgeworth David Prize for Palaeontology	60	Proficiency in Senior Palaeontology.
Elliston Medal	medal	Proficiency in Economic Geology, Igneous Petrology, Metamorphic Petrology or Sedimentology Honours.
Geo Instruments Prize	1 000	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.
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.
Leo A. Cotton Prize in Exploration Geophysics	80	Proficiency in Intermediate Exploration Geophysics.
Olga Marian Browne Prize	50	Best Intermediate Geology field report.
Quodling Testimonial Prize	200	Proficiency in Senior Petrology.
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		
Australian Federation of University Women (N.S.W.) Prize in Mathematics	50	Merit in Mathematics Honours by a female graduate.
Barker Prize	375	Merit in Mathematics or Statistics Honours.
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.
George Allen Scholarship (3)	400	Merit in Senior Mathematics and Statistics to students proceeding to Honours.
K.E Bullen Scholarships Nos. I & II	1250	Merit in Senior Applied Mathematics by a student proceeding to full-time Honours.
K.E. Bullen Scholarship No. III	1000	Merit in Senior Applied Mathematics by a female student proceeding to full-time Honours.
K.E. Bullen Memorial Prize	650	Merit in Applied Mathematics Honours.
Mathematics Entry Scholarships (2)	2 000 each	On the basis of academic merit to intending BSc Mathematics majors.
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	50 + membership	Merit in Statistics Honours.
The M.J. and M. Ashby Prize for Mathematics in Science	250	Best Honours essay in the School.
Lewy Miall Pattinson Scholarships		On the basis of academic merit to a student enrolled in Honours.
Tim Brown Prize No. 1	130	Merit in Intermediate Mathematical Statistics.
Tim Brown Prize No. 2	210	Merit in Senior Mathematical Statistics.
Veronica Thomas Prize	100	Proficiency in General Statistical Methods.
Wadsworth Publishers Prize	125	Merit in Junior Mathematics.
Medical Oncology		
Medical Oncology Scholarship	1000	Honours research in Cancer Biology.
Microbiology		
Sydney Chinese Association Prize	100	Proficiency in Senior Microbiology or Agricultural Microbiology.

Prize or scholarship	Value \$	Qualifications
Pharmacology		
Roland H. Thorp Prize	200	Proficiency in Senior Pharmacology.
Pharmacy		
David Hutcheson Prize for Pharmacy Practice	150	Merit in Pharmacy Practice 3.
Guild Insurance Company Limited Prize	100	Merit in Senior Pharmacy.
Lewy Miall Pattinson Scholarships		Academic merit to a student enrolled in Honours
Pamela Frances Anderson Prize	110	Merit in Pharmacology 3 for Pharmacy.
Pharmaceutical Society of New South Wales Prizes (3)	- 70	Merit in Junior, Intermediate and Senior year BPharm.
Pharmacy Scholarships (2)	2 000 each	On the basis of academic merit to students entering the BPharm.
Walter Noel Gillies Scholarship in Pharmacy	1000	Merit in First Year of BPharm.
William Joseph Collett Shoppee Prize	90	Merit in Pharmaceutical Chemistry (Honours).
Physics		
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.
Australian Institute of Physics (N.S.W. Branch) Prize in Physics	200	Merit in Physics Honours.
Deas-Thomson Scholarship in Physics	6 500	Merit in Senior Physics.
Geoffrey Builder - AWA Prize	250	Intermediate Physics practical.
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.
Physics Entry Scholarships (2)	2 000 each	On the basis of academic merit to intending BSc Physics majors.
Smith Prize	200	Merit in Junior experimental Physics.
The Shiroki Prize	500	Merit in Physics Honours.
W.I.B. Smith Prize	300	Merit in Senior Physics practical.
Walter Burfitt Scholarship No. II	750	Merit in Senior Physics.
Physiology		
David J. Monk Adams Award	600	Travel grant for Honours candidate.
Colin Dunlop Prize	100	Best performance in Physiology Honours.
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).
Dick Thomson Prize	60	Merit in Psychology 4 Honours.
Frank Albert Prize in Psychology	70	Merit in Intermediate Psychology.
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.
Psychology Scholarships (2)	2 000 each	On the basis of academic merit to students entering the BPsych.
Both Undergraduates and Postgraduates		
K.E. Bullen (Greig Fester Pty Ltd) Scholarship	1 500	Merit in Senior or Honours Applied Mathematics.
K.E. Bullen (Kinhill Engineers Pty Ltd) Scholarship	1500	Merit in Senior or Honours Applied Mathematics.
Henry Chamberlain Russell Prize	250 - 1 400	Essay, thesis or research report on Astronomy.
Lewy Miall Pattinson Scholarships	300 - 2 000	Undergraduate study in Pharmacy or postgraduate research in Pharmaceutical Science.
Postgraduate awards		
The David Coffey Geotechnical Research Scholarship	15 000p.a.	Postgraduate research scholarship in Geotechnics and Geomechanics.

Prize or scholarship	Value \$	Qualifications
John Coutts Scholarship	1 000 p. a.	Postgraduate research in Science.
Earth Resources Foundation Scholarship	10 500	Research in Geology or Geophysics.
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	Medal	PhD thesis in Psychology.
A.H. Martin Scholarship	550	Merit in MPsych.
T.G. Room Medal	Medal	PhD thesis in Pure Mathematics.
Science Centenary Fund Scholarship	2 500	Postgraduate research in science.
Martin and Elizabeth Jane Simmat Prize No. 2	250	Merit in MPsych.
The Margaret Stewart Fund Scholarship	15 364p.a.	Postgraduate research in Psychology.
Elizabeth Wunsch Postgraduate Research Scholarship in Pharmacy	14 260 p.a.	Postgraduate research in Pharmacy.
Postgraduate, Postdoctoral or Visiting		
Amgen Prize	500	Best aggregate score for Case History Oral Presentations in DipHPharm.
Professor Harry Messel Research Fellowships in Physics (2)	27 139 - 30 133	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	varies	Postgraduate research in Science.
Edgeworth David Travelling Scholarship	varies	Postgraduate research in the Geological Sciences.
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 p.a	Undergraduate students in Geology, Chemical or Mechanical Engineering. Year 1 students not eligible

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 enrollment 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 close by.

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 3625/6291.

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 units of study or with the mathematical requirements of other subjects.

Many university units of study assume that students have a certain level of knowledge of mathematics. These include junior units of study in chemistry, computer science, economics and physics and many intermediate senior units of study, 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 units of study 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 unit of study, you should contact the Mathematics Learning Centre.

At the centre we can advise you about your choice of units of study, 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 units of study 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 9351 4061.

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 Centre

The Careers Centre can help you throughout your course. Visit it as often as you like. Some of the areas in which the Careers Centre 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 (the Careers Centre 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, the Careers Centre'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.

The Careers Centre 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: Carlaw, 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
MSc(EnvironSc)	Master of Science (Environmental Science)
MSc(Micr&An)	Master of Science (Microscopy and Microanalysis)
PhD	Doctor of Philosophy
DSc	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 (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 1, Statutes and Regulations*. Prospective candidates should consult with the Head of the Department most closely concerned as early as possible

Doctor of Philosophy (PhD)

The degree of Doctor of Philosophy is a research degree awarded for a thesis considered to be a substantially original contribution to the subject concerned. Some coursework may be required (mainly in the form of seminars) but in no case is it a major component.

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 degree or equivalent, or is three years in the case of candidates holding a bachelor's degree with first class or second class honours; the maximum period of candidature is normally 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.

Master of Science (MSc) and Master of Pharmacy (MPharm)

Graduates of the University of Sydney with first or second class honours and candidates in the final year of an approved honours unit of study 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

Master of Information Technology (MInfTech)

Course overview

The Master of Information Technology requires 1.5 years (3 semesters) of full-time study. The degree is designed to teach you current developments in topics you have already studied as well as extend your knowledge in advanced computing subjects. The program consists of one year of coursework and a one semester project in your major area of interest.

During the first and second semesters of attendance you have the opportunity to select from a number of computer science units of study. These cover areas such as object-oriented systems, computer graphics, artificial intelligence, database systems, operating systems, software engineering, networks and user interfaces.

Also available during the first year is selection of units of study covering advanced topics within various areas. In addition you have the option in the February and July semester to study a subject which involves completing a group project. Project options are available in computer systems, large scale software, algorithmic systems, intelligent systems and product development.

You can also choose to study a limited amount of other approved units of study from outside the Computer Science Department.

In your third semester you will be required to complete a substantial piece of programming using the knowledge gained during the course. This project may be related to your employment.

Table I (each unit of study 6 credit points)

Students select units of study from this Table in their area of interest.

COMP 5001 Algorithms
COMP 5002 Artificial Intelligence
COMP 5003 Computer Architecture
COMP 5004 Computer Graphics
COMP 5005 Database Systems
COMP 5006 Logic Programming
COMP 5007 Networked Systems
COMP 5008 Object Oriented Systems
COMP 5009 Operating Systems
COMP 5100 Software Engineering
COMP 5101 Theory of Computation
COMP 5102 User Interfaces

Table II (each unit of study 6 credit points)

Units of study are group projects designed to put into practice the work covered in Table I. Only one unit of study may be taken from this table.

COMP 5201 Algorithmic Systems Project
COMP 5202 Computer Systems Project
COMP 5203 Intelligent Systems Project
COMP 5204 Large-Scale Software Project
COMP 5205 Product Development Project

Table III (each unit of study 6 credit points)

A minimum of 24 credit points must be chosen from this Table and Table IV.

Please note: availability of units of study in this Table may vary.

COMP 5301 Algorithms (Adv Topic)
COMP 5302 Artificial Intell (Adv Topic)
COMP 5303 Comp Architecture (Adv Topic)
COMP 5304 Computer Graphics (Adv Topic)
COMP 5305 Computer Networks (Adv Topic)
COMP 5306 Database Systems (Adv Topic)
COMP 5307 Distributed Systems (Adv Topic)
COMP 5308 Machine Learning (Adv Topic)
COMP 5309 O-O Systems (Adv Topic)
COMP 5400 Operating Systems (Adv Topic)
COMP 5401 Software Eng (Adv Topic)
COMP 5402 User Interfaces (Adv Topic)
COMP 5403 Computation Theory (Adv Topic)
COMP 5404 Scientific Visualisation (Adv Topic)

COMP 5301-5304 contain specific material on recent advances in these areas and content will change as necessary to accommodate advances in technology.

Table IV (each unit of study 6 credit points)

A minimum of 24 credit points must be chosen from this Table and Table III.

Please note: availability of units of study in this Table may vary.

COMP 5601 Advances in Computer Science 1

COMP 5602 Advances in Computer Science 2

COMP 5603 Advances in Computer Science 3

COMP 5604 Advances in Computer Science 4

COMP 5601-5604 contain specific material on recent advances in these areas and content will change as necessary to accommodate advances in technology.

Table V (24 credit points)

This project is compulsory for all students in the Master of Information Technology.

COMP 5701 Information Technology Project

Course outcomes

Upon completion of the Master of Information Technology graduates will have a sound knowledge base in several cutting-edge topics within information technology. They will also have experience in applying this knowledge to the implementation of a useful system.

Admission Requirements

To be eligible you must have either:

- (i) a three year degree with a major in computer science from an approved University or equivalent and at least a Credit or "B" average in the final year computer science component.

OR

- (ii) a three year degree with a major in computer science from an approved University or equivalent and two years of experience in the information technology industry in a role such as analysis/programming, network management, technical support or systems integration. Experience in sales or operations is not counted as technical.

Course Requirements

To be awarded the Master of Information Technology you will need to successfully complete 72 credit points. A normal full-time workload is 24 credit points per semester.

Each unit of study is worth six credit points with the exception of the Information Technology Project which is worth 24 credit points.

You will need to select your units of study at the beginning of your study and your study plan will need to be approved by your adviser before you may commence the program. This guarantees a breadth of study and ensures that your course will cover material new to you. The plan can only be modified with your adviser's approval.

Your course selection must satisfy the following requirements:

- a total of 72 credit points
- at least 24 credit points from Tables III and/or IV
- at most 6 credit points from Table II
- 24 credit points from Table V - Information Technology Project
- at most 12 credit points from other Departments/Faculties (approval by your supervisor is required).

Note: It is not compulsory that these 12 credit points be made up of units of study from other Departments/Faculties, you may select these credit points from units of study in the Master of Information Technology.

COMP 5001 Algorithms

6 credit points

Assessment: Assignments, written exam

Classes: 2 lec, 1 tut/wk

Table 1

This unit of study 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 and 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.

CO MP 5002 Artificial Intelligence 6 credit points

Assessment: Assignments, written exam

Classes: 2 lec, 1 tut/wk

Table 1

This unit of study will explore topics from selected areas of AI, give 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.

CO MP 5003 Computer Architecture 6 credit points

Assessment: Assignments, written exam

Classes: 2 lec, 1 tut & 2 prac/wk

Table 1

In this unit of study, you will design and build simple computers. A major focus is the series of Logic Laboratory workshop experiments. Emphasis will be placed on performance enhancement by parallelism, pipelining, and similar techniques. The importance of parallelism in logical design will also be addressed by studying techniques for achieving high performance arithmetic in both gate level and chip level designs.

COMP 5004 Computer Graphics 6 credit points

Assessment: Assignments, written exam

Classes: 2 lec, 1 tut/wk

Table 1

This unit of study 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 5005 Database Systems 6 credit points

Assessment: Assignments, written exam

Classes: 2 lec, 1 tut/wk

Table 1

This unit of study is an introduction to Database Management Systems (DBMSs) and concentrates on the modern relational systems. It covers how to understand the information stored in a relational DBMS, and how to find the answer to questions using the SQL language. Choosing a good representation for data, using normalisation, and data modelling. The main issue will be how to convert a problem description in English to entities, relationships and eventually to relational tables. Object-Oriented Database Management Systems, considered by many as the next generation DBMSs, will also be presented at the end of this unit of study.

COMP 5006 Logic Programming 6 credit points

Assessment: Assignments, written exam

Classes: 2 lec, 1 tut/wk

Table 1

In this unit of study, Prolog is presented as a programming language in the broader context of Logic Programming. 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 5007 Networked Systems 6 credit points

Assessment: Assignments, written exam

Classes: 2 lec, 2 prac/wk

Table 1

This unit of study deals with various aspects of communications and distribution systems. 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 unit of study 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). Emphasis, however, is placed on the Internet and TCP/IP protocol suite. Students are expected to be able to write distributed applications based on the client/server model using Remote Procedure Call (RPC).

Practical Work:

The practical aspects of the unit of study are centred around a specially designed network laboratory. Experiments aim to provide hands-on experiences of many essential, but difficult, aspects of networking. The unit of study offers a wide range of experiments, from the network physical layer (RS-232), managing Microsoft Windows Networks, basic Unix administration to programming with sockets, remote procedure calls, to writing client/server applications, Simple Mail Transfer Protocol (SMTP) application.

COMP 5008 Object-Oriented Systems 6 credit points

Assessment: Assignments, written exam

Classes: 2 lec, 1 tut/wk

Table 1

This unit of study introduces the use of object-oriented thinking and tools through the whole software life-cycle. It studies 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 5009 Operating Systems 6 credit points

Assessment: Assignments, written exam

Classes: 2 lec, 1 tut/wk

Table 1

This unit of study provides an introduction to the design and construction of modern operating systems. The emphasis is design and the identification of high-level abstractions. There is a strong practical component and the syllabus 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 unit of study 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 5100 Software Engineering 6 credit points

Assessment: Assignments, written exam

Classes: 2 lec, 1 tut/wk

Table 1

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 5101 Theory of Computation 6 credit points

Assessment: Assignments, written exam

Classes: 2 lec, 1 tut/wk

Table 1

This unit of study is a study of the NP-hard or NP-complete and the unsolvable problems and the techniques for proving that they are inherently difficult or impossible to solve. A model of computation called Turing machines is introduced and later in the unit of study it is shown how recursive functions in arithmetic can provide an alternative basis for computation.

COMP 5102 User Interfaces 6 credit points

Assessment: Assignments, written exam

Classes: 2 lec, 1 tut/wk

Table 1

This unit of study 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. The technical skills of User Interface programming include learning current tools for building interfaces. Students will learn to use the Unix tools lex and yacc in the construction of compilers for small languages that can be easily modified. Finally, there will be a common thread of user-centred software design. This will be taught in terms of principles and through case studies as well as the practical work.

COMP 5201 Algorithmic Systems Project 6 credit points

Assessment: Quality of software product, written report, product presentation

Classes: Supervised project

Table 2

Real-life instances of problems such as graph drawing, computational geometry, timetable construction are typically too large to be solved without using efficient algorithms that have been developed for them. Student work in groups 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 5202 Computer Systems Project 6 credit points

Assessment: Quality of software product, written report, product presentation

Classes: Supervised project

Table 2

Students work in groups on a software project. The aim is to provide substantial practical experience in designing and modifying an operating system. This will involve extension and modification of an operating system, which runs on simulated hardware above Unix. The simulation is realistic and all of the usual operating system implementation problems, including synchronisation, memory management, I/O, etc, will be encountered.

COMP 5203 Intelligent Systems Project 6 credit points

Assessment: Quality of software product, written report, product presentation

Classes: Supervised project

Table 2

Working in groups, students will write computer programs to solve practical problems in a way "similar" to intelligent beings. Students

will be asked to apply learned AI techniques to solve small but realistic and knowledge intensive tasks (eg., advice-giving, troubleshooting), in a carefully selected domain; and to evaluate the utility and performance of the techniques used.

COMP 5204 Large-Scale Software Project 6 credit points

Assessment: Quality of software product, written report, product presentation

Classes: Supervised project

Table 2

Students will work in groups to produce 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.

COMP 5205 Product Development Project 6 credit points

Assessment: Quality of software product, written report, product presentation

Classes: Supervised project

Table 2

Students work in groups in the specification and testing of a substantial software product, using sophisticated techniques including object-oriented programming. An important aspect is discussion with eventual users to determine their needs.

COMP 5701 Information Technology Project 24 credit points

Table 5

This project is worth 24 credit points and is compulsory for all students in the Master of Information Technology. This unit of study requires you to complete a substantial piece of programming using the knowledge gained from the course and can be related to your employment.

Resolutions of the Senate

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 units of study and a project as prescribed by the Faculty.

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

(3) In these resolutions the expression "to complete a unit of study" means

- (i) to attend the lectures, and the meetings, if any, for seminars or tutorial instruction;
- (ii) to complete satisfactorily the essays, exercises and practical work if any; and
- (iii) to pass the examinations of the unit of study.

Time limits

4. A candidate may proceed on either a full-time or a part-time basis.
5. (1) A full-time candidate shall complete the requirements for the degree not 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 credit points of units of study covering material new to the candidate and selected from units of study satisfying the conditions approved from time to time by the Faculty; and
 - (ii) a supervised project component worth 24 credit points.

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 units of study prescribed for the degree, may receive credit of up to 24 credit points towards the requirements for the degree, provided that the completed work was not counted towards the requirements of another degree.

Master of Nutrition and Dietetics (MNutrDiet)

Course overview

The Master of Nutrition and Dietetics is a course designed to survey all aspects of human nutrition, with special emphasis on the needs of dietitians who will be working in Australia. It provides the basic training for hospital and community dietitians and nutritionists and is one of the recognised professional courses for dietitians in Australia.

The course requires two years of full-time work and study. The first year consists of coursework, lectures, tutorials and practicals. In the second year, one semester is devoted to clinical training and the other semester is spent on a small research project. The dates for this course do not follow the undergraduate academic year. First year starts at the same time as undergraduate teaching but there is some work during

vacations. Second year commences in late January.

Course outcomes

Upon completion of the course, the graduate will have a sound knowledge base in nutrition and dietetics, possess the skills to improve nutritional status of individuals, families and the community at large and to modulate the course of illness with dietetics. The graduate will be skilled in basic research and have a lifelong commitment to the pursuit of excellence in professional conduct.

Admission Requirements

Applicants must have a degree from a recognised institution and have completed two full semesters in Biochemistry and Human Physiology. For example, a student who completed a BSc at the University of Sydney should have studied Biochemistry 2001 and 2002 and Physiology 2001 and 2002. A student who has completed a BMedSc should have studied Biochemistry 2101 and 2102 and BMED 2001 Human Life Sciences. These subjects are required by the Dietitians Association of Australia.

Course requirements

First Year

This is an integrated academic year of teaching, practicals and study. As part of the course, students attend the Ryde College of Technical and Further Education for practicals in commercial cookery, followed by dietetic cookery. This costs an additional \$500. All students take the courses listed below.

Second year

In the third semester (Jan to June) approximately half of the class does a clinical and community dietetics training placement while the other half does a research project. Then in the fourth semester (July to Nov) students change to the alternate activity.

During the second year all students are required to attend formal lectures at the University on ten days. Lectures on management, advanced clinical nutrition and advanced community nutrition are compulsory.

The units of study are supervised by a Board of Studies in Nutrition and Dietetics, chaired by the Dean of the Faculty of Science.

NTDT 5001 Nutritional Biochemistry 2 credit points

The study of biochemical interrelationships between nutrients, energy supply and modification of metabolism by disease.

NTDT 5002 Nutritional Science 6 credit points

The study of the macronutrients ie, protein, fat, carbohydrate, energy and the micronutrients ie vitamins and minerals.

NTDT 5003 Foods 2 credit points

The study of nutritional content, production and consumption of major foods.

NTDT 5004 Food Science 2 credit points

The study of principles of food preservation, processing, safety and microbiology.

NTDT 5005 Dietary Intake and Nutritional Assessment 4 credit points

The study of methodology for assessing dietary intake and nutritional status.

NTDT 5006 Principles of Dietetic Practice 2 credit points

The study of knowledge and skills of professional dietetic conduct.

NTDT 5007 Clinical Nutrition and Dietetics 12 credit points

This unit of study includes paediatrics at the New Children's Hospital. The study of medicine as it relates to nutrition and the modification of diet and nutrition support of patients with different illnesses.

NTDT 5008 Public Health Nutrition 4 credit points

The study of nutrition in the prevention of disease and the methods involved in promotion of nutritious food for all.

NTDT 5009 Community and Applied Nutrition 8 credit points

The study of nutrition assessment, planning, intervention and outcomes in the community.

NTDT 5101 Food Service Management 4 credit points

The study of food service systems for use in institutions.

NTDT 5102 Communications 2 credit points

The study of counselling and education methods to communicate nutrition to individuals, groups and nations.

NTDT 5103 Research Project 24 credit points

During the research semester each student has a research supervisor. Research projects may be small surveys, simple bench work, supervised hospital assignments or library searches, etc, and are carried out in the University or with an external supervisor. During the semester students have tutorials once a week with an academic adviser. Students also attend nutrition seminars.

NTDT 5104 Clinical and Dietetics Training Placement 24 credit points

Students are attached to two or more teaching hospitals and their associated community dietetic centres. There are 20 weeks' of training in dietetic practice. The majority of time is spent in the wards or outpatient departments. Four weeks are usually spent in the community and ten days in food service administration. Students may also elect to spend some placement time in the food industry.

The teaching hospitals

Teaching hospitals include; Royal Prince Alfred, Royal North Shore, Westmead, Bankstown, New Children's, Concord, Gosford, Hornsby, Lidcombe, Liverpool, Prince Henry, Prince of Wales, St Vincent's, Fairfield, Manly, Mona Vale, Nepean, St George, Ryde, Canberra Hospitals, Newcastle Hospitals.

Master of Nutritional Science (MNutrSc)

Course overview

The Master of Nutritional Science provides the same survey of all aspects of human nutrition in the first year, as the MNutrDiet but is designed for those persons who wish to pursue a career in nutrition research and/or development. The second year is devoted to a research project, with regular seminars. Students have a range of areas to choose from for their research year, for example sports nutrition, lipid biochemistry, infant nutrition or ecological research.

Admission Requirements

Applicants must have a degree from a recognised institution and have completed two full semesters in Biochemistry and Human Physiology. In special cases the requirement for 2nd year university Physiology can be replaced by such alternatives as a third year course in Biochemistry or in Food Science.

Course outcomes

Upon completion of the course the graduate will have a sound knowledge base in nutritional science and possess the skills to conduct nutrition research projects.

Course requirements

First year

The first year coursework and practicals coincide with those for

MNutrDiet with the exception of Principles of Dietetic Practice and the cookery course at TAFE which are replaced by tutorials and study on scientific methodology in nutrition.

Second Year

The second year is devoted to a full-time research project, supervised by a member of the academic staff of the Human Nutrition Unit, which is written up for assessment in a short thesis.

Unit of Study descriptions

First Year

As listed under first year for Master of Nutrition and Dietetics (above).

Admission

Application forms are available from the Faculty of Science. Applications close on November 7 and should be lodged with the Faculty of Science together with your academic record, two written academic referee reports from your University and a statement from you saying why you are interested in dietetics. Include information about any relevant work experience you have had in this area as well. Admission is competitive.

Master of Pharmacy (Clinical) (MPharm(Clin))

Course overview

The course has been designed to extend your clinical abilities and help you acquire the skills to conduct research within your practice. The course is a three year, part-time course and requires six semesters (48 units) of study.

Course outcomes

The overall goal of this course is to provide the opportunity for pharmacists to develop their knowledge and skills, enabling them to promote rational drug therapy and thus optimise patient health outcomes.

Admission requirements

Applicants must have completed either:

- (i) a Pharmacy degree and an honours or diploma course

OR

- (ii) a Pharmacy degree and a minimum of three years experience as a pharmacist, subject to approval by the head of department.

OR

- (iii) equivalent, subject to approval by the head of department.

Course structure

The program requires 48 credit points. Half of this time will be spent on coursework and the remainder will be spent completing a clinical research project. The minimum time required for the project will be three semesters and the maximum time allowed will be seven semesters.

The 24 credit points of coursework consist of:

Semester 1

PHAR 5001 Advanced Therapeutics 2 credit points

PHAR 5002 Medication Review 1 4 credit points

PHAR 5003 Drug Information 2 credit points

Semester 2

PHAR 5004 Adv. Therapeutics 2 4 credit points

PHAR 5005 Pharmacoepidemiology 2 credit points

PHAR 5009 Adv. Pharmacokinetics 2 credit points

Semester 3

PHAR 5006 Statistics 2 credit points

PHAR 5007 Medication Review 2 4 credit points

PHAR 5008 Scientific Presentation 2 credit points

Semester 4-6

Research Methods and Design of Research Project

Research Project

PHAR 5001 Advanced Therapeutics 1 2 credit points

Assessment: Oral examination (100%)

Classes: 2hrs lec/week

Therapeutics and the interactions between medicines is becoming increasingly complex. This course is designed to add to your knowledge in the area of therapeutics and further your understanding of the interactions between medicines in various disease states. Lecture topics will include respiratory diseases, pain management, cardiology, and infectious diseases.

PHAR 5002 Medication Review 1 4 credit points

Assessment: Cases presented during semester- peer assessment (50%), lecturer assessment (50%)

Classes: 1hr lec & 3hrs tut/week

The rationale for and interactions between medicines requires in-depth understanding of medicines and disease states. To optimise drug therapy pharmacists must conduct medication review on a routine basis. This course will enable you to take a patient's medication history and assess each therapeutic item in terms of appropriateness. Cases will be provided from your practice setting and reviewed weekly.

PHAR 5003 Drug Information 2 credit points

Assessment: Assignments - 100%

Classes: 2hrs lec/wk for 3 wks & 2hrs tut/wk for 6 wks & assignments 2hrs/wk for 5 wks

You will be guided through the use of the latest drug information sources and the provision of this information to others will also be explored. Six lectures on drug information sources and their utilisation will be given, followed by two hours per week of tutorials for six weeks where the latest drug information sources will be explored. Finally, two hours per week for five weeks will be used to process this information in structured assignments.

PHAR 5004 Advanced Therapeutics 2 4 credit points

Assessment: Oral examination - 50%, tutorial assessment - 50%

Classes: 2hrs lec & 2hrs tut/wk

The complex interactions between medicines in specialised groups such as geriatrics and paediatrics as well as patients with multiple disease states will be explored in lectures and tutorials.

PHAR 5005 Pharmacoepidemiology 2 credit points

Assessment: Tutorial assessment - 50%, assignment - 50%

Classes: 1hr lec/wk for 14 wks & 1hr tut/wk for 14 wks

The amount of epidemiological literature a pharmacist is required to assess is rapidly expanding. Interpretation of clinical literature will take place so that the outcomes described take on meaning in the therapeutic setting. Lectures will cover topics such as sample size considerations, clinical pharmacy, drug surveillance, studies of drug utilisation, role of therapeutic drug monitoring, post marketing surveillance, bias, and confounding.

PHAR 5006 Statistics 2 credit points

Assessment: Assignment - 100%

Classes: 2hrs lec/wk

Relevant statistical methods will be covered including parametric and non-parametric statistics. Lecture topics will include displaying data, tables, charts and plots, sampling and summarising data, probability,

binomial distribution, non-parametric tests, association, correlation and introduction to ANOVA.

PHAR 5007 Medication Review 2 4 credit points

Assessment: By case presentation and participation (50%); assessment conducted by peers (50%)

Classes: 1hr lec & 3hrs tut/wk

This unit of study is designed to build on the principles and practice established in Medication Review 1.

PHAR 5008 Scientific Presentation 2 credit points

Assessment: Tutorial assignment (50%), protocol presentation (50%)

Classes: 2hrs lec/wk for 6 wks & 2hrs tut/wk for 8 wks

This unit of study is designed to provide you with the basic theory of communication for oral presentation. Practical assignments will explore this theory. The writing skills developed in this unit of study will help with the research thesis.

PHAR 5009 Advanced Pharmacokinetics 2 credit points

Assessment: Continuous assessment (50%) / written assignment (50%)

Classes: 2hrs lec/wk for 6 wks & 2hrs tut/wk for 8 wks

Topics covered will be explored in terms of pharmacokinetic principles. Study will begin with a review of basic principles in pharmacokinetics and pharmacodynamics. A range of issues that centre on the role and application of these principles into clinical practice will then be addressed. Where possible, patient and specific drug case histories as well as problem solving approaches to learning will be used to highlight the application of pharmacokinetic and pharmacodynamic concepts to practice.

PHAR 5101 Research Methods and Design of Research Project 24 credit points

Assessment: Protocol assessment (25%), research thesis (75%)

Classes: 2hrs tut/wk for 14 wks & 2hrs pracs/wk for 14 wks

The methods available to carry out Pharmacy Practice research will be explored and the protocol for your research project designed. The research project will be carried out following development of the protocol. The research and thesis preparation will be conducted over three semesters (minimum) - seven semesters (maximum).

Resolutions of the Senate 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.(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 units of study and a project as prescribed by the Faculty of Science.

(2) A unit of study shall consist of lectures, seminars, tutorial instruction, essays and practical work as prescribed.

(3) In these resolutions to complete a unit of study 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 unit of study
- (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 credit points of units of study covering new material to the candidate, selected from units of study satisfying the conditions approved by the Faculty, and
- (ii) a supervised research project worth 24 credit points.

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 units of study prescribed by the degree, may receive credit of up to 8 credit points towards the requirements for the degree.

Master of Psychology (MPsych)

Course overview

The course requires two years of full time study and takes a scientific and evidence-based approach to clinical psychology. Just under half of the program is formal academic training with a similar amount of practical experience. The research project takes the equivalent of one day per week for one year.

Course outcome

The MPsych program provides a postgraduate qualification in clinical psychology recognised by the New South Wales Departments of Health, Corrective Services and Department of Community Services as qualifying the holder for progression to the grade of Clinical Psychologist after two years paid employment (including one after graduation from the course). The course is accredited by the Clinical Board of the Australian Psychological Society and by the NSW Psychologists Registration Board.

Admission requirements

Applicants should possess a good honours degree in Psychology from a course which has included a research thesis and a major course in abnormal psychology.

Course requirements

The Master of Psychology requires two years of full-time or four years of part-time study (international students may only study full-time). The course is divided into two parts.

PART I of the course includes study in the following areas:

Psychological Assessment
Applied Psychometrics
Psychosis
Adult Therapy
Neuropsychology
Disabilities Behavioural Medicine
Psychophysiology
Psychopharmacology
Professional Practice
Addictive Behaviours
Therapy Skills
Abnormal Psychology
Behavioural Assessment
Child Problems

Research Methods

PART I also includes practical training & clinical placement.

PART II of the course consists of a lecture/tutorial program on options selected by the student. The options normally include child clinical psychology, clinical neuropsychology and behavioural medicine. Students also attend lectures on core material, and attend case discussions.

During PART II students are required to attend clinical placements for 2 days per week during the semester and short vacation and 3 days per week in the long vacation.

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.

PSYC 5001 Psychological Assessment 3 credit points
Includes Therapy Skills and Assessment Skills.

PSYC 5003 Applied Psychometrics 2 credit points

PSYC 5004 Psychosis 3 credit points

PSYC 5006 Adult Therapy 5 credit points

Includes Abnormal Psychology, Behavioural Assessment and Behavioural Therapy.

PSYC 5007 Neuropsychology 1A 3 credit points

PSYC 5008 Disabilities, Psychogeriatrics and Rehabilitation	4 credit points
PSYC 5009 Child Therapy	3 credit points
PSYC 5101 Neuropsychology 1B	3 credit points
PSYC 5102 Psychophysiology and Behavioural Medicine	3 credit points
PSYC 5103 Psychopharmacology	3 credit points
PSYC 5104 Professional Practice	2 credit points
PSYC 5105 Addictive Behaviours	2 credit points
PSYC 5106 Research Thesis	12 credit points
This is a year long unit of study.	
PSYC 5107 Assessment Placement	8 credit points
PSYC 5108 Therapy Placement	8 credit points
PSYC 5109 Family, Couple and Sex Therapy	4 credit points
PSYC 5201 Option 1	4 credit points
Choice between Child Neuropsychology 2 and Child Health Psychology.	
PSYC 5202 Option 2	4 credit points
Choice between Behavioural Medicine 2 and Neuropsychology 2.	
PSYC 5203 Clinical Placements	12 credit points
This is a year-long unit of study.	
PSYC 5204 Case Discussions and Case Reports	12 credit points
This is a year long unit of study.	

Master of Psychology/PhD (MPsych/PhD)

Qualified students are also able to combine the MPsych and the PhD. For more information, contact the Department directly.

Master of Science (Environmental Science) (MSc(EnvironSc))

Course overview

The Master of Science (Environmental Science) requires between 18 to 24 months full-time study or 18 to 48 months part-time study. The MSc(EnvironSc) is worth 72 credit points, consisting of a minimum of 24 credit points from coursework modules and 48 credit points gained from the completion of an interdisciplinary research project. This degree expands upon the existing Graduate Diploma of Science (Environmental Science), extending the knowledge base by providing the students with further training and research experience.

Course outcomes

The aims of the MSc(EnvironSc) are the same as the Graduate Diploma of Science (Environmental Science), the driving force of which is to enable students to solve environmental problems that require the integration of knowledge from diverse disciplines. The MSc(EnvironSc), like the Graduate Diploma of Science (Environmental Science), is designed for recent graduates wishing to obtain employment in environmental science. Pursuit of this career path requires a background in the environmental science disciplines in addition to the undergraduate degree majors. The program is also suitable for graduates already working in a specific area of

environmental science (such as chemistry or geology) who are interested in gaining additional information about related areas of environmental science.

Admission requirements

Students with honours degrees or with a Credit (B+) or better average in their first degree are able to enter directly into the Masters. Other students may enter directly into the Graduate Diploma and apply to transfer after into the Masters after they have completed one year of the graduate diploma.

Course requirements

The Master of Science (Environmental Science) consists of coursework to a total of 24 credit points, chosen from the units of study listed under the Graduate Diploma in Science (Environmental Science), plus an interdisciplinary research project worth 48 credit points. Completion of the MSc(EnvironSc) will take between 18-24 months full-time and up to 48 months part-time.

Course descriptions

As for the Graduate Diploma of Science (Environmental Science), with the addition of the project which is described below.

ENVI 5001 Interdisciplinary Research Project 48 credit points

The research project is equivalent to one year's full-time work. The work load is spread over 2 to 3 semesters for full-time students and special arrangements are made for part-time students. For students already in employment, the research project may be on a project that is related to their work. Other students are expected to select a topic and approach suitable supervisors during their first semester, which under normal circumstances would be mostly course work. A list of suitable topics and supervisors will be supplied to students who do not wish to select their own topic.

Resolutions of the Senate

Master of Science (Environmental Science)

Eligibility for admission

- An applicant for admission to candidature for the degree shall, except as provided in Chapter 10 of the by-laws-
 - have completed an Honours degree majoring in a Science discipline that has a significant environmental emphasis, or in Environmental Science, or equivalent; or
 - have completed the requirements for the Graduate Diploma of Science (Environmental Science).

Availability

- (1) Admission to candidature may be limited by a quota. In determining the quota, the University will take into account:
 - availability of resources including space, laboratory and computing facilities; and
 - availability of adequate and appropriate supervision.
- (2) In considering an application for admission to candidature the Program Committee for Environmental Science and the Faculty shall take account of the quota and will select, in preference, applicants who are most meritorious in terms of section 1 above.

Method of progression

- (1) A candidate for the degree shall proceed by completing units of study and a project as prescribed by the Faculty.
 - A unit of study shall consist of such lectures, seminars, tutorial instruction, essays, exercises or practical work as may be prescribed. In these resolutions, 'to complete a unit of study' or any derivative expression means:
 - to attend the lectures and the meetings, if any, for seminars or tutorial instruction;

- (ii) to complete satisfactorily the essays, exercises and practical work if any; and
- (iii) to pass any other examination of the unit of study that may apply.

Time limits

4. A candidate may proceed on either a full-time or a part-time basis.
5. (1) A full-time candidate shall complete the requirements for the degree not earlier than the end of the third semester and not later than the end of the fourth 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 third semester and not later than the end of the eighth semester of candidature, unless otherwise determined by the Faculty.

Requirements for the degree

6. Candidates for the degree are required to complete satisfactorily:
 - (i) units of study granting a minimum of 24 credit points covering material new to the candidate and selected from units of study satisfying the conditions approved from time to time by the Faculty; and
 - (ii) a supervised project component worth 48 credit points.

Examination

7. On completion of the requirements for the degree, the Faculty shall determine the results of the candidature, on the recommendation of the Chair of the Program Committee - Environmental 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 units of study prescribed for the degree, may receive credit of up to 24 credit points towards the requirements for the degree, provided that the completed work was not counted towards the requirements of another degree.

Master of Science (Microscopy and Microanalysis) MSc(Micr&An)

Course Overview

The Master of Science (Microscopy and Microanalysis) by coursework is an extension of the Graduate Diploma in Science (Microscopy and Microanalysis) by the addition of two projects and a long essay which consolidate the skills and knowledge gained through the coursework modules. The MSc can be completed in 3 semesters (full-time) or can be taken part-time (minimum candidature 4 semesters).

Course Outcomes

Upon the completion of the MSc, graduates will possess research skills and a practical and theoretical background in a wide variety of microscopy, microanalysis and specimen preparation techniques for the materials or life sciences.

Admission Requirements

Graduates who hold a Bachelor of Science or Engineering, or who have an equivalent degree or standard of knowledge; or completion of the Graduate Diploma in Science (Microscopy and Microanalysis) at credit level.

Course Requirements

Graduation requires 72 credit points, made up of 48 credit points of coursework taken from the Graduate Diploma in Science (Microscopy and Microanalysis), plus two practical projects (8 credit points each) and a long essay (8 credit points). The 48 credit points of coursework includes 32 credit points of core modules, and 16 credit points chosen from a range of optional modules for the Materials or Life Sciences.

Unit of Study Descriptions

For coursework modules refer to the module descriptions for the Graduate Diploma in Science (Microscopy and Microanalysis). Projects and essays may be chosen or designed according to the interests and needs of the student.

MCAN 5001 Project 1 8 credit points

A range of short research projects will be offered to suit the interests and skills of the students. These projects will develop and reinforce the knowledge and skills gained in the coursework component.

MCAN 5002 Project 2 8 credit points

A range of short research projects to suit the interests and skills of the students will be offered. These projects will develop and reinforce knowledge and skills gained in the coursework component. (This is a core unit of study.)

MCAN 5003 Essay 8 credit points

A wide range of essay topics will be offered. (This is a core unit of study.)

Resolutions of the Senate

Master of Science (Microscopy and Microanalysis)

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 degree in Science, Engineering or equivalent; or
 - (ii) have completed the requirements for the Graduate Diploma of Science (Microscopy and Microanalysis) at credit level.

Availability

2. (1) Admission to candidature may be limited by a quota. In determining the quota, the University will take into account:
 - (i) availability of resources including space, laboratory and computing facilities; and
 - (ii) availability of adequate and appropriate supervision.
 (2) In considering an application for admission to candidature the Faculty shall take account of the quota and will select, in preference, applicants who are most meritorious in terms of section 1 above.

Method of progression

3. (1) A candidate for the degree shall proceed by completing units of study and a project as prescribed by the Faculty.
 (2) A unit of study shall consist of such lectures, seminars, tutorial instruction, essays, exercises or practical work as may be prescribed. In these resolutions, 'to complete a unit of study' or any derivative expression means:
 - (i) to attend the lectures and the meetings, if any, for seminars or tutorial instruction;
 - (ii) to complete satisfactorily the essays, exercises and practical work if any; and
 - (iii) to pass any other examination of the unit of study that may apply.

Time limits

4. A candidate may proceed on either a full-time or a part-time basis.
5. (1) A full-time candidate shall complete the requirements for the degree not earlier than the end of the third semester and not

later than the end of the fifth semester of candidature, unless otherwise determined by the Faculty.

- (2) A part-time candidate shall complete the requirements for the degree not earlier than the end of the fourth semester and not later than the end of the eighth semester of candidature, unless otherwise determined by the Faculty.

Requirements for the degree

6. Candidates for the degree are required to complete satisfactorily:
 - (i) units of coursework granting a minimum of 48 credit points of study selected from units of study satisfying the conditions approved from time to time by the Faculty; and
 - (ii) supervised projects and essays worth 24 credit points.

Examination

7. On completion of the requirements for the degree, the Faculty shall determine the results of the candidature, on the recommendation of the Head of the School of Physics.

Progress

8. The Faculty may -
 - (i) call upon any candidate to show cause why that candidature should not be terminated by reason of unsatisfactory progress towards completion of the degree; and
 - (ii) 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 units of study prescribed for the degree, may receive credit of up to 48 credit points towards the requirements for the degree, provided that the completed work was not counted towards the requirements of another degree.

GRADUATE DIPLOMAS

Graduate Diploma in Science (GradDipSc)

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) (GradDipSc(EnvironSc))

Course overview

The Graduate Diploma of Science (Environmental Science) requires 1 year of full-time or two years of part-time study. The major themes addressed in the coursework are: environmental sciences, environmental politics, project evaluation and assessment, decision making and conflict management.

Course outcomes

The Graduate Diploma of Science (Environmental Science) is designed for recent graduates wishing to obtain employment in environmental science. The program is also for graduates already working in a specific area of environmental science (such as chemistry or geology) who are

interested in gaining additional information about related areas of environmental science.

Environmental scientists and managers are increasingly finding that they need to have a broad interdisciplinary knowledge base and the ability to be flexible and innovative in their application of such knowledge. The aim of the Graduate Diploma of Science (Environmental Science) is to provide students who complete the course with the ability to solve environmental problems that require the integration of knowledge from diverse disciplines. Emphasis is placed on studies which span several disciplines, adaptive problem solving and the development of new skills and expertise. Students completing this postgraduate course will have a solid grounding in all basic areas of environmental science, enabling them to understand in a general way the various environmental problems that can arise and the disparate solutions that can be applied to solve such problems, and to comprehend all aspects of environmental assessment.

Admission requirements

Applicants for the Graduate Diploma of Science (Environmental Science) must have completed a Bachelor of Agricultural Science, Bachelor of Science, Bachelor of Veterinary Science or any other equivalent degree.

Course requirements

The Graduate Diploma consists of coursework to a minimum of 32 credit points, chosen from the subjects below, plus an interdisciplinary research project worth 16 credit points. The availability of each unit of study will vary from year to year and is dependent upon Departmental involvement at that time. Full time students undertake to complete the above requirements in 1 year, while part-time students complete coursework to the value of at least 12 credit points each semester, thus taking 1 to 2 years to complete the Diploma.

Resolutions of the Senate

Graduate Diploma in Science (Environmental Science)

1. A unit of study shall consist of lectures together with such tutorial instructions, essays, exercises or practical work as may be prescribed. In these resolutions, to *'complete a unit of study'* and derivative expressions mean —

- (i) to attend the lectures and the meetings, if any, for tutorial instruction;
- (ii) to complete satisfactorily the essays, exercises and the practical work, if any; and
- (iii) to pass the examination on the unit of study.

2. To qualify for the Graduate Diploma in Science (Environmental Science) candidates must obtain a minimum of 32 credit points from the following units of study, subject to the availability of that unit of study at the time of enrolment, in addition to satisfactorily completing an interdisciplinary research project (worth 16 credit points).

Either Environmental Geomorphology or Ancient Environments

Human Ecology

Environmental Resource Modelling

Total Catchment Management

Either Environmental Biology I or Introductory Environmental Chemistry

Sampling Techniques for Environmental Monitoring/Assessment

Environmental Biology II

Advanced Environmental Chemistry

Environmental Physics

Environmental Geology I

Environmental Geology II

Environmental Law

Natural Resource Economics

The Built Environment and Planning Aspects of the Environment

Unit of Study Descriptions

ENVI 4701 Environmental Geomorphology 5 credit points

This unit of study demonstrates how geomorphological concepts about rivers and fluvial landscapes can be used to understand and manage environmental problems. Landforms and processes are both modified by human activities, and the module focuses on problems created thereby. This unit of study involves 21 lectures as well as practical analysis of fieldwork.

ENVI 4702 Ancient Environments 5 credit points

This is an optional unit of study to be undertaken by those students who have already completed the Environmental Geomorphology module as part of a Senior year Geography unit of study.

Ancient environments deals with the long-term history of the Australian biophysical environment, tracing changes from the start of the Cenozoic up to the present day. This unit of study involves 3 lectures as well as practical analysis of some fieldwork.

ENVI 4703 Human Ecology 2 credit points

Human ecology provides a broad perspective through which you can apply your undergraduate field of knowledge. In this unit of study you will study the interrelationships between population, resources environment and development. The unit of study involves 21 contact hours, including talks by guest speakers.

ENVI 4704 Environmental Resource Modelling 2 credit points

The aim of this unit of study is to provide the conceptual and practical bases of aspects of modelling which are of particular value to natural resource managers and is designed for non-programmers. This unit of study involves 4 contact hours per week for one half semester.

ENVI 4705 Environmental Biology I 3 credit points

This unit of study introduces fundamental concepts of modern ecology for environmental scientists so as to provide non-biologically trained persons an understanding of the terms of ecology. This unit of study involves 3 contact hours per week for a semester.

ENVI 4706 Sampling and Techniques for Environmental Monitoring/Assessment 2 credit points

This unit of study examines the problems of environmental sampling and introduces the statistical bases behind correct sampling regimes. This module involves 4 contact hours per week for one half semester.

ENVI 4707 Environmental Physics 3 credit points

Environmental impacts of energy generation and use are addressed in this unit of study. Major topics include physics of energy sources, global energy resources, energy economics, politics and culture, solar thermal and photovoltaic energy systems and atmospheric systems. This unit of study involves 3 contact hours per week for one semester and includes several field trips.

ENVI 4708 Introductory Environmental Chemistry 3 credit points

Introductory Environmental Chemistry provides the basic chemical knowledge required to be able to understand the chemical analysis of air, water and soil samples taken from the field. This unit of study involves 3 contact hours per week for one semester.

ENVI 4709 Advanced Environmental Chemistry 2 credit points

Advanced Environmental Chemistry provides a more in depth chemical knowledge, covering aquatic chemistry (the equilibria and dynamics of natural waters), marine chemistry (an introduction to the inorganic chemistry of the sea), mineral chemistry (an introduction to geochemistry), and nuclear chemistry and radiation. This unit of study involves 2 contact hours per week for one semester.

ENVI 4801 Total Catchment Management 4 credit points

The aims of this unit of study are to develop an advanced understanding of how rivers function and to derive general principles by which rivers and the water they convey should be managed. The unit of study comprises aspects of pure geomorphology, environmental geomorphology, and management. Material covered will include contemporary river management issues such as flow regulation, inter-basin diversions, extractive industries, urbanisation and river engineering, and legislative controls and institutional arrangements for effective river management.

ENVI 4802 Environmental Geology I 3 credit points

Environmental Geology explores topics such as human-environment interactions, land use and waste management, geologic site investigation, geophysical site investigation, and the principles of ground water flow. This unit of study largely involves the practical analysis of fieldwork samples and the application of acquired environmental knowledge.

ENVI 4803 Environmental Law 4 credit points

This is an overview unit of study which looks at a number of environmental issues at various levels of analysis, policy making, implementation of policy and dispute resolution. It will provide a broad background of the political and economic issues as they related to the legal issues involved plus a general coverage of all laws in Australia pertaining to environmental matters. This unit of study involves lecture material and an essay on policy issues.

ENVI 4804 Natural Resource Economics 2 credit points

Natural Resource Economics provides an overview of the economic analysis of resource use, and its importance to the consideration of most of the environmental problems facing the world today. This unit of study involves 2 contact hours per week for 9 weeks.

ENVI 4805 The Built Environment and Planning Aspects of the Environment 2 credit points

The aim of this unit of study is to introduce the concepts and procedures which are relevant to the application of scientific analysis to the formulation of urban and regional development policy and strategies. This unit of study involves 3 contact hours per week for 8 weeks.

ENVI 4806 Interdisciplinary Research project 16 credit points

The research project is carried out under the direction of a supervisor and gives students the opportunity to undertake research on an aspect of an environmental problem which is of particular interest to them. Students are assessed on the quality of their research report

ENVI 4807 Environmental Geology II 3 credit points

Environmental Geology explores topics such as human-environment interactions, land use and waste management, geologic site investigation, geophysical site investigation, and the principles of ground water flow. This unit of study largely involves the practical analysis of fieldwork samples and the application of acquired environmental knowledge.

ENVI 4808 Environmental Biology II 3 credit points

This unit of study follows on from Environmental Biology I, and covers in more depth the concerns of modern ecology pertaining to both marine and terrestrial creatures. An understanding of the Threatened Species Conservation Act is also provided.

Graduate Diploma in Science (Microscopy and Microanalysis) (GradDipSc(Micr&An))

Course Overview

The Graduate Diploma in Science (Microscopy and Microanalysis) provides a professional qualification to microscopists for industry, research and education. The course develops and enhances skills in specimen preparation, operation of microscopes and analytical equipment, maintenance of electron microscopes, interpretation of microscope images and microanalysis. The Graduate Diploma can be completed in 2 semesters (full-time) or can be taken part-time.

Course Outcomes

Upon the completion of the Graduate Diploma, graduates will possess a practical and theoretical background in a wide variety of microscopy, microanalysis and specimen preparation techniques for the materials or life sciences.

Admission Requirements

Applicants for the Graduate Diploma should have a Bachelor of Science in the physical sciences, life sciences, computer science, geology, palaeontology or a Bachelor of Engineering, or equivalent qualifications or experience. Applications will also be considered from those with a Bachelor of Arts who wish to acquire microscopy and microanalysis skills for such areas as archaeology, history of art and museum studies.

Course Requirements

Candidates must complete 48 credit points from the course modules, including 32 credit points of compulsory modules and 16 credit points of optional modules for the materials or life sciences.

Resolutions of the Senate

Graduate Diploma in Science (Microscopy and Microanalysis) (GradDipSc(Micr&An))

1. A unit of study shall consist of lectures together with such tutorial instruction, essays, exercises or practical work in the laboratory as may be prescribed. In these resolutions, to 'complete a unit' of study and derivative expressions shall mean —

- (i) to attend the lectures, laboratories, tutorials and meetings as recommended;
- (ii) to complete satisfactorily any practical and theoretical assignments; and
- (iii) to pass the examination on the unit of study.

2. A candidate shall complete coursework to the value of 48 credit points comprising ten core units of study and an independent project and report, worth 36 credit points, and optional units of study worth 12 credit points selected from the following table:

Core units of study

Principles of Microscopy and Microanalysis	2 credit points
Instrumentation—Light Microscopy	2 credit points
Instrumentation -Transmission Electron Microscopy	2 credit points
Instrumentation—Monitoring and Maintaining Electron Microscopes	2 credit points

Introductory Specimen Preparation for Optical Microscopy	2 credit points
Specimen Preparation (Biological or Materials)—TEM and SEM	4 credit points
Surface Microscopy	2 credit points
Signal and Image Processing	4 credit points
Advanced Instrumentation—Optical, X-ray and Electron Spectroscopy	4 credit points
Advanced instrumentation—Confocal Microscopy	4 credit points
Independent Project and Report	4 credit points

Optional Units of Study

Instrumentation- Scanning Electron Microscopy	2 credit points
Advanced Instrumentation-Transmission Electron Microscopy	1 credit point
Advanced Instrumentation-Scanning Electron Microscopy	1 credit point
Advanced Biological Specimen Preparation for Optical Microscopy	2 credit points
Introduction to Diffraction	2 credit points
Diffraction Techniques—Advanced	2 credit points
Microanalysis for Materials—Electron Techniques	4 credit points
Microanalysis for Materials—Non-electron Techniques	4 credit points
Microanalysis in Life Sciences	2 credit points
Advanced Techniques in Biological EM	4 credit points
Advanced Techniques for Optical Microscopy	4 credit points
Image Analysis	2 credit points
Stereology	2 credit points
Image Capture and Recording	2 credit points

3. Satisfactory progress shall be as determined by the Faculty.

MCAN 4001 Principles of Microscopy and Microanalysis **2 credit points**

Coordinator/teacher. Professor Colin Sheppard

Introduces the general principles of microscopy and microanalysis, and reviews the basic physical principles on which they are based, including optics and image formation. (This is a core unit of study.)

MCAN 4002 Instrumentation — Light Microscopy **2 credit points**

Coordinator/teacher. Dr Guy Cox

Gives students a basic understanding of the workings of the optical microscope and the practical ability to use it effectively. Polarisation, phase-contrast, dark field, DIC and fluorescence are covered at an elementary level. (This is a core unit of study.)

MCAN 4003 Instrumentation — Transmission Electron Microscopy **2 credit points**

Coordinator/teacher. Professor David Cockayne

Trains participants, with no prior knowledge of electron microscopy, to become operators of the transmission electron microscope. Participants are given a practical understanding of the operation and

construction of the microscope and how to obtain the optimum performance from it in routine operation. (This is a core unit of study.)

MCAN 4004 Instrumentation — Scanning Electron Microscopy 2 credit points

Coordinator/teacher. Dr Clive Nockolds

Trains participants, with no prior knowledge of electron microscopy, to become operators of the scanning electron microscope. Participants are given a practical understanding of the operation and construction of the microscope and of how to obtain the optimum performance from it in routine operation. (This is a core unit of study.)

MCAN 4005 Advanced Instrumentation — Transmission Electron Microscopy 1 credit point

Coordinator/teacher: Professor David Cockayne

Prereq MCAN 4003

Gives training in advanced imaging and diffraction techniques (including high resolution microscopy), and quantitative analysis in transmission electron microscopy. A basic knowledge of the construction and operation of the microscope (as provided, for example in Instrumentation—Transmission electron microscopy) is assumed. (This is an option.)

MCAN 4006 Advanced Instrumentation — Scanning Electron Microscopy 1 credit point

Coordinator/teacher. Dr Clive Nockolds

Prereq MCAN 4004

Gives training in advanced techniques in scanning electron microscopy, including high resolution microscopy. A basic knowledge of the construction and operation of the microscope (as provided, for example in Instrumentation — Scanning Electron Microscopy) is assumed. (This is an option.)

MCAN 4007 Instrumentation — Monitoring and Maintaining Electron Microscopes 2 credit points

Coordinator/teacher. Professor David Cockayne

Prereq MCAN 4003 or 4004

Provides training in monitoring the performance of electron microscopes, and in basic maintenance procedures for transmission and scanning electron microscopes. (This is a core unit of study.)

MCAN 4008 Introductory Specimen Preparation for Optical Microscopy 2 credit points

Coordinator/teacher. Dr Annick Ansselin

Develops knowledge and skills in the fundamentals of specimen preparation for light microscopy including techniques for biological, material and industrial applications. (This is a core unit of study.)

MCAN 4009 Advanced Biological Specimen Preparation for Optical Microscopy 2 credit points

Coordinator/teacher. Dr Teresa Dibbayawan

Prereq MCAN 4008

Develops knowledge and skills in advanced techniques in specimen preparation for biological and medical applications (eg, histochemistry, fluorescent dyes, autoradiography). (This is an option.)

MCAN 4101 Biological specimen preparation — TEM & SEM 4 credit points

Coordinator/teacher. Dr Guy Cox

Presents theory and practical skills of routine specimen preparation techniques used in the biological sciences including fixing, embedding, drying, coating and staining techniques. (This is a core unit of study for the Life Sciences stream.)

MCAN 4102 Materials Specimen Preparation - TEM and SEM 4 credit points

Coordinator/teacher. Professor David Cockayne

Gives practical training in the preparation of a wide range of materials for electron microscopy, including metals, semiconductors, powders, ceramics and thin films, using a wide range of preparation techniques including electropolishing, ion milling, dimple grinding, chemical polishing and cleavage. (This is a core unit of study for the Materials stream.)

MCAN 4103 Surface Microscopy 2 credit points

Coordinator/teacher: Dr Philip Lukins

This unit of study is concerned with the nature of surfaces and the imaging techniques that can be used to obtain topographical, spectroscopic and structural information about them. Techniques include various scanning probe microscopies (eg, scanning tunnelling microscopy, atomic force microscopy and near-field scanning optical microscopy), optical interference microscopies for surface studies, and surface profilometry. (This is a core unit of study.)

MCAN 4104 Signal and Image Processing 4 credit points

Coordinator/teacher. Dr Allan Jones

This unit of study covers the nature and processing of signals, concentrating on two dimensional signals represented by images. Emphasis will be on the correct treatment of real data to provide a basis for reliable research. Participants will develop a sound working knowledge of image processing which is based on an understanding of both the strengths and the limitations that are inherent in image data, and the technology applied to it. This will be set in the context of the nature of the analysis which is to follow processing, either human photo-interpretation or machine vision. Topics include: the nature of images and their general characteristics, an overview of image processing and its context in science, nomenclature, characteristics of the human visual system versus machine vision, spatial filtering, image arithmetic, introduction to segmentation, binary image processing, colour spaces, Fourier methods and filters in the frequency domain, and introductory morphological processing. (This is a core unit of study.)

MCAN 4105 Advanced Instrumentation — Optical, X-ray and Electron Spectroscopy 4 credit points

Coordinator/teacher. Professor David Cockayne

Teaches the principles of construction, operation and maintenance of instruments involved in a broad range of spectroscopic techniques. Participants will receive training in the use of instruments measuring electron energy loss spectra, cathodoluminescence spectra and X-ray spectra, and in the interpretation of the data. (This is a core unit of study.)

MCAN 4106 Instrumentation — Confocal Microscopy 2 credit points

Coordinator/teacher. Dr Guy Cox

Introduces the general principles of confocal microscopy and training in the use of the confocal microscope. It covers the theory behind confocal microscopy, the instrumentation and its applications. (This is a core unit of study.)

MCAN 4107 Advanced Instrumentation — Confocal Microscopy 2 credit points

Coordinator/teacher. Professor Colin Sheppard

Prereq MCAN 4002 and 4106

Provides advanced training in confocal microscopes, and introduction to specialised techniques. (This is an option.)

MCAN 4108 Independent Project and Report
4 credit points

Coordinator/teacher. Dr Annick Ansselin

Prereq MCAN 4002 and 4003 and 4004 and 4008 and MCAN 4102 or 4101

Gives students the opportunity to extend the practical work encountered in other modules. Students will choose topics in consultation with members of academic staff and complete project work under supervision. (This is a core unit of study.)

MCAN 4109 Introduction to Diffraction
2 credit points

Coordinator/teacher. Professor David McKenzie

Introduces the basics of diffraction theory and its applications to powder diffraction and elementary single crystal diffraction. Participants are trained to collect, process and interpret powder diffraction data using electrons, neutrons and x rays. (This is an option.)

MCAN 4201 Diffraction Techniques — Advanced
2 credit points

Coordinator/teacher. Professor David McKenzie

Prereq MCAN 4109

Akn: mathematic ability including elementary complex numbers and integration

Provides training in advanced structural analysis using X-ray, electron and neutron techniques. (This is an option.)

MCAN 4202 Microanalysis for Materials — Electron Techniques
4 credit points

Coordinator/teacher. Professor David Cockayne

Provides a theoretical introduction and practical training in a broad range of microanalytical techniques which rely on the interaction of electrons with materials, including EDS and WDS techniques, the electron probe, Auger spectroscopy and cathodoluminescence. (This is an option.)

MCAN 4203 Microanalysis for Materials — Non-electron Techniques
4 credit points

Coordinator/teacher. Dr Dougal McCulloch

This unit of study provides an introduction and some training in a range of materials characterisation techniques. Techniques covered include a range of surface science analytical methods, infra-red and Raman spectroscopy and ion beam analysis techniques. On completion of this unit of study, the student will be aware of the wide range of materials characterisation techniques available and understand their strengths and weaknesses. (This is an option.)

MCAN 4204 Microanalysis in the Life Sciences
2 credit points

Coordinator/teacher. Dr Clive Nockolds

Prereq MCAN 4004 and 4101

Provides an introduction to a broad range of microanalytical techniques which rely on the interaction of electrons with materials including EDS, EELS and cryotechniques. The module concentrates on teaching the skills in techniques commonly required for biological applications. (This is an option.)

MCAN 4205 Advanced Techniques in Biological Electron Microscopy
4 credit points

Coordinator/teacher. Dr Maret Vesik

Prereq MCAN 4003 and 4004 and 4101

Develops further the knowledge and skills in biological specimen preparation techniques and image interpretation obtained in Biological Specimen Preparation. Training in specialised techniques including cryotechniques and immunolabelling is provided. (This is an option.)

MCAN 4206 Advanced Techniques for Optical Microscopy
4 credit points

Coordinator/teacher. Carol Cogswell/Professor Colin Sheppard

Prereq MCAN 4002

Gives training in specialised techniques for light microscopy. Techniques covered include fluorescence microscopy, stereo microscopy, photomicrography and microscopy using a mix of optical modes. (This is an option.)

MCAN 4207 Image Capture and Recording
2 credit points

Coordinator/teacher. Dr Allan Jones

This unit of study provides a basic introduction to techniques and instrumentation used for recording images. Topics to be covered in this module include: colour and BAV photographic techniques, video and slow scan image capture, limitations of image recording techniques, electronic storage media, image display, and printing of digital images. (This is an option.)

MCAN 4208 Image Analysis
2 credit points

Coordinator/teacher. Dr Allan Jones

This unit of study covers techniques which can be applied to images that are directed at extracting quantitative parameters characteristic of the content of the image. Emphasis will be on the application of these techniques to typical problems encountered in microscopy based imaging, but applicability to more general classes of image will also be covered. Participants will develop a sound working knowledge of image analysis which is based on an understanding of both the strengths and the limitations of the techniques of analysis. The context of this unit of study assumes a basic understanding of image processing techniques which may have been applied to images to restore or enhance them prior to analysis. Topics in this module include: a general review of image acquisition, filters and transforms, segmentation methods, calibration of hardware for analysis, extraction of simple features from images, advanced feature extraction from images, limitations of measurement, and an overview of classification techniques used to discriminate measured objects. (This is an option.)

MCAN 4209 Stereology
2 credit points

Coordinator/teacher. Dr Annick Ansselin

Provides a general overview of stereology, including global, specific, manual and computerised measurements, geometric probability, density estimation and sampling. (This is an option.)

Graduate Diploma in Science (Psychology) (GradDipSc(Psych))

In addition to the Resolutions of the Senate governing the Graduate Diploma in Science and the other graduate diplomas which may be found in the *University of Sydney Calendar, 1996. Vol 1, Statutes and Regulations*, the following applies, from 1997, to the Graduate Diploma in Science (Psychology):

Eligibility for admission

- (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 a Bachelor of Science or Bachelor of Arts, or any other degree at the University of Sydney which includes units of study in Psychology acceptable to the Faculty.

Course overview

The Graduate Diploma in Science (Psychology) allows students to study the principles of applied areas of Psychology. The diploma requires one year of full-time or two years of part-time study.

Course outcomes

Upon completion of this course the graduate will have a sound background in significant theoretical and practical issues in general and applied psychology, an understanding of research methodology in both experimental and field studies context, be capable of finding and assessing relevant research literature and be prepared to undertake supervised training in certain non-clinical professional areas of psychology.

Course requirements

The program involves attending lectures and seminars in four courses and completing a research project. The compulsory components in addition to the research project, are Psychological Theory and Psychological Research. The electives offered in 1997 are Abnormal and Health Psychology, Counselling Psychology and Psychology of Addiction. All lectures are in the late afternoon/evening and day and evening seminars are available. Part-time candidates must complete successfully the compulsory components in the first year of candidature.

Admission requirements

Applicants must have completed a bachelors degree with a major in Psychology from a recognised tertiary institution within the past 10 years.

Entry to other postgraduate programs

The graduate diploma does not lead to admission to graduate research programs. Students who perform exceptionally well in all components of the program may be permitted to enrol in the undergraduate honours unit of study which may lead to further postgraduate study.

Resolutions of the Senate

Graduate Diploma in Science (Psychology)

1. A unit of study shall consist of lectures together with such tutorial instructions, essays, exercises or practical work as may be prescribed. In these resolutions, to 'complete a unit of study' and derivative expressions shall mean

- (i) to attend the lectures and the meetings, if any, for tutorial instruction;
- (ii) to complete satisfactorily the essays, exercises and the practical work, if any; and
- (iii) to pass the examination on the unit of study.

A candidate shall complete coursework to the value of 20 credit points comprising three core units of study and two elective units of study selected from the following table:

Core units of study (4 credit points each)

Psychological Research
Psychological Theory
Research Project

Elective units of study (4 credit points each)

Abnormal and Health Psychology
Counselling Psychology
Psychology of Addiction

3. Satisfactory progress shall be as determined by the Faculty.

Units of Study

PSYC 4701 Psychological Theory

The unit of study Psychological Theory requires students to attend one lecture and one seminar per week. The unit of study covers issues of "self and "mind", determinism as a psychological category, the concept of cognition, "Third-force" and other opponents of a mechanistic psychology. Some opponents of objectivity in recent philosophy of science will also be examined.

PSYC 4702 Psychological Research

The unit of study Psychological Research requires students to attend one lecture and one seminar per week. In first semester the program covers issues in field research such as ethical considerations, the field experiment, the survey and data collection by observation, interview and questionnaire. The analysis of data will also be examined. Semester 2 covers issues of experimental research such as hypothesis testing and systematic variation vs controls.

PSYC 4703 Research Project

The research project requires students to attend one seminar a week and involves active contributions to small group meetings of up to 12 students. Contact hours for the project are up to 1.5 hours per week. Members of each group work together on a project under the supervision of a member of academic staff. Each student must then submit a report of between 2,500 words and 5,000 words. Topics for the research project are drawn from a number of different areas of psychology.

PSYC 4704 Health And Abnormal Psychology

The unit of study Health and Abnormal Psychology requires students to attend one lecture and one seminar per week. In first semester students address theoretical and empirical issues associated with a number of health and medical conditions. Particular health problems discussed may vary from year to year, but will include issues such as definition and scope of health psychology, health beliefs, compliance with medical regimens, risk perception and risk taking, and the conceptualisation of stress.

In second semester students address classification, epidemiology, and aetiology of major diagnostic psychopathologies. Both assessment and treatment issues are considered from a behavioural and cognitive-behavioural orientation. Areas of study include eating disorders, anxiety disorders, temperament, disruptive behaviour disorders and depression.

PSYC 4705 Counselling Psychology

Counselling Psychology requires students to attend one lecture and one 1 hour seminar per week. The weekly meetings will consist of lectures, seminar papers, discussions centred on selected audio and visual aids and, to a lesser extent, role plays and demonstrations. The intention of the course is to critically examine the foundations of counselling processes and to consider empirical research.

PSYC 4706 Psychology of Addiction

In first semester this unit of study examines the nature of addiction: definitions, theories, research, and treatment in relation to the consumption of drugs. The focus of the lectures will be addiction to alcohol, nicotine and heroin. However, a wider range of drug addictions will be considered in less detail.

In second semester students examine the extent to which the idea of addiction can be used to explain repetitive behaviours that do not involve the consumption of drugs. The possibility of generalised theories of addiction is considered in relation to gambling, exercise, and food consumption.

Current Departmental rules on progress

In the event of a candidate failing one unit of study, permission may be granted for the candidate to repeat the unit of study in the following year. Candidature will normally be terminated if any two units of study are failed or if a unit of study is failed twice.

Diploma in Hospital Pharmacy (DipHPHarm)

Coordinator Dr Phillip Atkin

Classes and Assessment details from Department

Admission consult the coordinator

Course overview

This one year full-time course is designed to prepare the graduate pharmacist for their clinical role in modern hospitals. Specialist training in clinical pharmacy, hospital experience, research methods and scientific presentation are provided.

Course outcomes

Upon the completion of the course, the graduate will have a sound knowledge base in hospital pharmacy, be skilled in clinical therapeutics and be confident in communicating with other health professionals.

Admission requirements

Satisfactory completion of the BPharm degree or equivalent.

Course structure

All students must complete the following subjects:

Therapeutics

Case Histories

Computing

Literature Review

Research Methods

Statistics

Experiential learning in the hospital environment

Research project

PHAR 4901 Therapeutics 8 credit points

Advanced study of the therapeutic use of drugs in the context of the clinical setting.

PHAR 4902 Case Histories 1 credit point

Development of the ability to present a clinical case with enough relevant information and in a sufficiently concise manner so as to justify the therapeutic decisions made.

PHAR 4903 Computing 1 credit point

Aids in the development of skills in word processing, database, spreadsheet management, statistical and graphics presentations.

PHAR 4904 Literature Review 1 credit point

Develops the ability to critically evaluate the medical and scientific literature.

PHAR 4905 Research Methods 4 credit points

To allow students to independently assess strengths and weaknesses of different approaches to evaluating a given research topic and to select the approach which serves their needs.

PHAR 4906 Statistics 2 credit points

Biostatistical analysis of clinical research data.

PHAR 4907 Experiential Learning in the Hospital Environment

Hospital placements allow students to experience first hand the role of pharmacists in the context of a range of medical and surgical specialisations.

PHAR 4908 Research project

To allow the student experience research from the inception stage, through methodological development and literature assessment, ethics submission, data collection, data evaluation and interpretation and final report writing.

Some examples of research projects completed include:

Penicillin Allergy - documentation and reliability

Oral administration to patients with dysphagia

Missed doses and the drug distribution system

Prophylaxis for cyclophosphamide induced haemorrhagic cystitis

PHAR 4909 Clinical Biochemistry 1 credit point

A general unit of study on the biochemical basis of disease and common lab tests which help in diagnosis.

PHAR 4910 Clinical Tutorials 1 credit point

To complement lectures by providing a practical pharmacist-oriented approach to therapeutic topics

PHAR 4911 Medical Liason 2 credit points

Attending discussion in therapeutics with final year medical students.

PHAR 4912 Therapeutics Review 2 credit points

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.

Scholarships and prizes: postgraduate

This handbook contains simplified details of some of the prizes and scholarships offered by 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	14 961 (1997)	31 October	Graduates with Hons 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 post-graduate research scholarship and who requires a supplementary grant
Earth Resources Foundation Scholarship	10 500		Research in geology and geophysics
Farrand Postdoctoral Research Fellowship	27 139-30133		Research in area of science
Henry Bertie and Florence Mabel Gritton 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	14474		Research in pharmacy
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

Scholarship	Value \$	Closing date for applications	Qualifications
J.B. Watt Travelling Scholarship	9000*	as advertised	Graduate with Hons 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 teaching in 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*	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 Cornforth 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 of 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 Post-Graduate 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.

8, Faculty of Science Staff

Faculty

The Faculty of Science Staff

Dean

Professor Robert G. Hewitt

Pro-Deans

Associate Professor Christopher B. Gillies

Associate Professor Anthony F. Masters

Associate Deans

Professor Leslie D. Field

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, BA Well. MA

Faculty Manager

Barbara Chmielewski, BA (Comm) U.T.S.

Faculty Administration Officer

Elisabeth Van de Wetering, BA

Postgraduate Adviser

Maria A. Marshall

Undergraduate Adviser

Thea Papageorgiou

Computer Systems Officer

John Twyman

Administrative Assistants

Ranee M. Boteju, BA Colombo

Rowena Bower, BSc(Hons)

Erica Jobling

Lisa N. Jones, BA

Jennifer R. McAllister

Ann Phillips

Marketing Manager

Adrienne Jerram, BA Macq. GDipCommMan U.T.S.

Professional Development Course Coordinator

Anne M. Powell, BBusCom Q.U.T

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.

Lecturer

Stephen R. Cattle, BScAdr PhD

Research Associates

Shahid Chohan, MSc Faisalabad PhD U.M.I.S.T.

CRC for Sustainable Cotton Production

Professional Officer

John T. Corbett

Research Associate

John Triantifilis, BScAgr PhD

Francisco Sanchez-Bayo, MSc PhD Madrid (Auton)

Senior Research Associate

Inakwu O.A. Odeh, BSc Ibadan PhD Adel.

Senior Technical Officers

Colin Bailey, BAppIsc N.S.W.I.T.

Chris Conoley, BSc Macq.

Kevin McLauchlan, BiolTechHCert S.T.C.

Technical Officer

Iona Gyorgy, BiolTechCert BSc(Biotech) U.T.S.

Administrative Assistant

Pamela Clifford

Honorary Appointments

Emeritus Professor

Neville Collis-George, MSc Mane. PhD Camb.,

HonDScAgr FRSCHEM

Honorary Associates

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. McWoy, BSc Belf. PhD Flin.

Associate Professors

Richard J. Bandler, BA Mjami (Ohio) PhD Carnegie-Mellon DSc

Cristobal G. dos Remedios, PhD DSc

Christopher R. Murphy, BSc Adel. PhD Flin.

Cedric D. Shorey, MSc PhD U.N.S.W., CGIA FCGI

William S. Webster, BSc PhD Lond.

Senior Lecturers

Vladimir J. Balcar, BSc Sheff. PhD A.N.U.

Maria Byrne, BSc Galway PhD Vic.B.C.

John Mitrofanis, BSc U.N.S.W. PhD

Lynette A. Moffat, BSc PhD

Jan M. Provis, BSc PhD U.N.S.W.

Margaret A. Swan, BSc PhD

Lecturers

Robin Arnold, MSc

Deborah Bryce, BSc N'cle(N.S.W.) MChiroprac Macq.

Denise A. Donlon, BA PhD N.E. BSc DipEd

Senior Research Fellows

Julian A. Barden, PhD Macq.
Coral G. Chamberlain, MSc PhD
Tailoi Chan-Ling, MOpton PhD U.N.S.W., FAAO

Research Fellows

Frank Lovicu, BSc PhD
Robbert de Iongh, MSc PhD

Associate Lecturers

Fiona Stewart, BSc N.E. MB BS
Richard Ward, BMedSci MB BS Monash

Professional Officers

Peter R. Mills, DipMT A.I.M.L.S., AAIMLS
Vera Terry, BSc PhD

Senior Technical Officers

Darryl R. Cameron

Clive H. Jeffrey

Roland A. Smith

Technical Officers

Jim Demcsak

Murat Kekic

Henry Marell

Michael White

Administrative Officer

Lena Ting, DipPublAdmin H.K.

Debbie Douglass

Administrative Assistants

Mai Pham, BSc U.T.S.

Adam Tierney, BA

Honorary Appointments

Honorary Associates

Arthur V. Everitt, BSc PhD

Robert R. Munro, MD BS, FRACS

John K. Pollak, BSc PhD

Richard Wright, BA Camb. MA

Research Associates

Peter O. Bishop, MB BS DSc MD, FRS FAA

William Burke, BSc PhD Lond.

Biochemistry

McCaughey Professor

(Vacant)

Professors

Philip William Kuchel, BMedSc MB BS Adel. PhD A.N.U.

Appointed 1980

Robert Gerard Wake, MSc PhD, FAA

Appointed 1977

Associate Professors

Richard I. Christopherson, BSc PhD Melb.

Alan R. Jones, PhD Mane. MSc

Gregory B. Ralston, BSc U.N.S.W. PhD A.N.U.

Michael B. Slaytor, MSc PhD

Senior Lecturers

Charles A. Collyer, BSc Flin. PhD

Arthur D. Conigrave, BSc(Med) MB BS MSc PhD, FRACP

Ivan G. Darvey, BSc PhD U.N.S.W.

Gareth S. Denyer, BA DPhil Oxf.

Simon B. Easterbrook-Smith, BSc Well. PhD Adel.

Glenn F. King, BSc PhD

Michael A.W. Thomas, DPhil Oxf. BSc

Anthony S. Weiss, BSc PhD

Emma Whitelaw, BSc A.N.U. DPhil Oxf.

Lecturer

Merlin Crossley, BSc Melb. DPhil Oxf.

Associate Lecturers

Douglas J. Chappell, BA BSc PhD DipEd

Jill Johnston, BSc Qld DipEd Catholic C.E.(Syd.)

Joan P. Loke, GradDipEdStudies Kuring-gai C.A.E. MSc

Senior Research Fellow

J. Mitchell Guss, BSc PhD

Research Fellow

William A. Bubb, DIC Lond. BSc PhD

Computer Systems Manager

Dennis R. Leonard, MSc

Administrative Officer

Michael C. Miller, BiolTechCert S.T.C. BAppSc N.S.W.I.T.

DipBusStud N.E.

Senior Technical Officers

Robert T. Czolij, BSc Macq. BiolTechCert S.T.C.

Joseph Dimauro, MSc

William G. Lowe, BiolTechCert S.T.C.

Peter L. McGuire, ElecEngCert S.T.C. ElectronicsEngCert G.T.C.

Ross I. Taylor, FittMachCert ToolmakingCert S.T.C.

Technical Officers

Cesar De La Paz

Juliana Ferenczi

Debra Phillips, QTACert N.Z.I.M.L.T.

Laboratory Assistant

Catherine De Bono

Librarian

Sarah L. Barrett, DipIM(Lib) U.N.S.W. BA

Administrative Assistants

Stephen Conaghan

Bronwyn Ferguson (part-time)

Jeanine Ward

Honorary Appointments

Emeritus Professors

Clifford H. Gallagher, PhD Lond. DVSc, FACVSc FRCPath

Noel S. Hush, DSc Mane. MSc, FRS FAA FRACI

Honorary Associates

Michael A. Messer, MSc PhD Melb.

Vivian K. L. Whittaker, MB BS Qld PhD A.N.U.

Honorary Research Associate

Stephen D. Lyons, BSc Melb. PhD

Human Nutrition Unit - Staff

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-Farinelli, BSc PhD DipNutrDiet

Samir Samman, BSc PhD

Kellogg Lecturer in the Human Nutrition Unit
Philippa Lyons Wall, BSc DipNutrDiet PhD

Lecturer

Sue Amanatidis, BSc DipNutrDiet (half-time)

Professional Officer

Ziaul I. Ahmad, BAppSc(Biomed) MAppSc U.T.S.

Laboratory Assistant

Bradley Carter (half-time)

Administrative Assistants

Isa Hopwood

Honorary Appointments

Honorary Clinical Supervisors

Lyn Brown, DiplM CertDiet Melb.

Susan Burke, BSc DipFood Tech U.N.S.W. DipNutrDiet

Jo Burton, BSc DipNutrDiet

Kathy Chapman, BSc, MNutrDiet

Susan Dumbrell, BSc MNutrDiet

Jane Francis, BSc. DipNutrDiet

Anne Gordon, BSc GradDipDiet GradDipHEd+Prom

Peter Guest, DipEd U.W.S. DipSportsSc MBA Macq. BSc DipNutrDiet

Jane Harris, BSc MNutrDiet

Jenny Hazelton, BSc A.N.U. DipNutrDiet

Wendy Hodge, BSc U.N.S.W. DipNutrDiet

Margaret Holyday, BSc DipNutrDiet

Michelle Hughes, BSc DipNutrDiet

Keryn Kahl, BSc Adelaide DipHNutDiet Flinders

Helen Knott, BSc CertDiet N'cle

Maria Kokkinakos, BSc. DipNutrDiet

Debbie Lillienthal, BScHEc Canada GradDipEdStud

Maria Loveday, BSc Deakin CertDiet Vic

Rhonda Matthews, BSc DipDiet Deakin Vic

Jenny McDonnell, BSc DipNutrDiet

Felicity McLean, BSc U.N.E. GradDipNutrDiet Q.I.T.

Anne McMahan, BAppSc U.W.S. MNutrDiet

Marcelle Middleton, BSc A.N.U./U.C. DipNutrDiet

Lesley Miller, BSc DipNutrDiet

Sandra Millet, BSc DipNutrDiet

Dianne Muniz, BSc U.N.S.W. DipNutrDiet Adelaide

Margaret Nicholson, BSc. DipNutrDiet MEd DipEd

Rita Nicolaou, BSc DipNutrDiet

Nola Patterson, BSc Qld DipNutrDiet

Joanne Prendergast, BSc Acadia Pdt Montreal MHPEd U.N.S.W.

Leigh Reeve, BSc Qld DipNutrDiet

Elizabeth Robinson, BAppSc U.W.S. MNutrDiet W'gong

Beth Rohrlach, BSc DipNutrDiet

Michele Ryan, BSc DipNutrDiet

Janice Sangster, BSc DipNutrDiet

Angela Saunders, BSc(Diet) Loma Linda RD USA

Fifi Spechler, BSc DipNutrDiet

Brett Thompson, BSc GradDipDiet Curtin, WA

Dian Tranter, BSc DipNutrDiet

Dawn Vanderkroft, BSc U.B.C. CertDiet

Deanne Waldron, BSc U.N.E. MNutrDiet

Kathy Walsh, BSc DipNutrDiet

Amanda Whitworth, BSc DipNutrDiet

Sue Wright, BSc DipNutrDiet

Sharon Youde, BSc MNutrDiet.

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, AUAPharmPhD 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. PhD N'clefJ.K.), FRES (McCaughey
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.

Peter McGee, BAgSc PhD Adel. DipHEd U.N.S.W.

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

Sean Connell, BSc Cant. N.Z. MSc Auck PhD

Susan Franklin, BSc Aberystwyth MSc S'ton PhD

Murray J. Henwood, BSc Well. PhD A.N.U.

Bruce Lyon, BSc PhD Monash

Jan Marc, BSc PhD U.N.S.W.

Benjamin Oldroyd, BScAgr PhD

Kathryn Raphael, BA PhD Macq

Glenda Wardle, MSc Auck. MS PhD Chic.

Associate Lecturers

Graham Harvey, BSc Griffith, MSc QLD, PhD U.N.S.W.

Dieter Hochuli, BSc Monash

Miles Hoskin, BSc Plymouth, Phd W'gong

Osu Lilje, BSc

Charlotte Taylor, BSc Dund. PhD Aberd.

Associate Lecturers (half-time)

Rosanne Quinell, BSc PhD A.N.U.

Jennifer Saleeba, BSc PhD Melb.

Fellowship Holders

ARC Postdoctoral Research Fellows

Michael Beck, MS Virginia PhD Florida State (Inst, of Marine Ecol.
Bronwyn Gillanders, BSc Canterbury N.Z. MSc Otago PhD
J. Scott Keogh, BScAg Illinois State MSc Illinois PhD
Michael Lee, BSc QLD PhD Camb
Mats Olssen, BSc PhD Gotenborg

NH & MRC Fellows

Karen Cullen, BSc Brown PhD

Ian Paulsen, BSc PhD Monash

U2000 University of Sydney Postdoctoral Fellow

Marti Anderson, BA Occidental College GradDipSci PhD
(Inst, of Marine Ecol.)

Faculty of Science Postdoctoral Fellow

Gregory Rouse, MSc QLD PhD

Grant Funded Postdoctoral Staff

Christopher Airriess BSc PhD Calg.

Ambariyanto, BSc Deponegoro PhD

Leila Blackman, BSc PhD

Melissa H. Brown, BSc PhD Adel.

M. G. Chapman, BSc Natal, MSc PhD (Inst, of Marine Ecol.)

Neville B.C. Firth, BSc PhD Monash

Marianne Frommer, BSc PhD

Malcolm Haddon, BSc Aberystwyth MSc Bangor PhD Otago (Inst.
of Marine Ecol.)

John Harper, BSc PhD Qu.

Ross Jones, BSc S'ton. PhD James Cook

William K. Loh, PhD

Thomas Madsen, PhD Lund

Ian Montgomery, BA Dublin PhD (Inst, of Marine Ecol.)

Jennifer Saleeba, BSc PhD Melb.

Professional Officers Grade III

Mark Curran, BSc(GenSc)

Janice L. Jacobs, BSc(GenSc)

Michael Joseph, BSc

Administrative Officer

Maureen Claxton, BA R'dg DipEd N.E.

Administrative Officer (part-time)

Suzan Ramsey

Finance Officer

Daniela Viola, RAG Scuola di Ragioneria (Milan)

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 Rugged

Heather Sowden, BiolTechCert S.T.C.

Klaus-Peter Suckau, DiplIng Tech.Univ. Munich

Technical Officers

Matthew Bulbert, BSc N'cle

Margaret Gilchrist, BiolCert S.T.C.

Joanna Hines, BSc GradDipSci (Env Sci)

Hamish MacKenzie, BiolCert S.T.C.

Ralph Maddox, BiolTechCert Arm.T.C.

Claudio Muhlrads, 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 Giragosyan (half-time)

Mihaly Ferenczi, BAgSc Godaloo

Animal House Attendant (part-time)

Cara Chambers

Attendants

Hamlet Giragosyan (half-time)

Julio Pena

Caretaker (Crommelin Biological Field Station, Pearl Beach)

Eric Pearce

Administrative Assistants

Brigid McKay, BSc Auck.

Sabine Krause

Roslyn Malin (part-time)

Claudia Morales

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 FAAAS

Michael G. Pitman, OBE, MA PhD ScD Camb., FAA

Spencer Smith-White, DScAgr, FAA

John Alexander Thomson, MSc MAgSc PhD Melb.

Visiting Professor

Frank Talbot, BSc Witw. PhD Cape T.

Honorary Research Associates

Heather Adamson, PhD Macq. BSc

Ross A. Bradstock, BSc PhD

Alan Clift, BScAgr PhD

Donald Colgan, BSc A.N.U. PhD Melb.

Stephen Cork, BSc PhD U.N.S.W.

Simon Davy, BSc PhD Bangor

Graham J. Faichney, BSc(AgrSc) MScAgr PhD DAgSc Melb.

Timothy Flannery, BA LaT. MSc Monash PhD U.N.S.W.

Leslie Hall, BAppSc Canb. PhD Qld

George Humphrey, LLB U.N.S.W. BA PhD

Julia M. Hush, PhD

Francis L. Lemckert, MSc

Garry Lynch, BSc Flinders, PhD Monash

Valerie B. Morris, BSc PhD Edin.

Peter Myerscough, MA PhD Oxon

John D. Pollard, BSc MB BS PhD

Deirdre Sharkey, BSc

John A Sved, BSc PhD Adel.

Donelle Trautman, BSc

Fiona Wild, BSc Edin.

Honorary Teaching Associates

Daniel Bickel, BSc Michigan PhD

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.

Winston Ponder, MSc PhD DSc Auck.

George Wilson, BA Indiana MSc U.C.S.D. PhD La Jolla

Visiting Scholars

Lawrence Fowke, BA Sask, PhD Carleton

Frank Gleason, BSc Trinity College, Hartford PhD U.C.L.A.

Ellen Popodi, MSc Wise PhD Marquette

Rudolf Raff, BSc Penn PhD Duke

Sharon Minsuk, BS Stanford PhD U.C.L.A. Berkeley

Elizabeth Raff, BS Penn. State PhD Duke

Jeffery Villinski, BA Minnesota MS Houston

Dehna Wang, BSc Shandong PhD Beijing.

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 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 of Chemistry (Organic Chemistry) (Personal Chair)

Walter Charles Taylor, PhD DSc Mane. MSc, FRACI CChem

Appointed 1985

Professor in Chemistry (Inorganic Chemistry) (Personal Chair)

Peter A. Lay, BSc Melb. PhD A.N.U., FRACI CChem

Appointed 1997

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

Scott H. Kable, BSc PhD Griffith DipBusAdmin Q.I.T.

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.

Michael S. Sherburn, BSc PhD Nott.

Lecturer (fixed-term)

Mark W. Rutland, BSc PhD A.N.U.

ARC Senior Research Fellows

Phil Attard, BSc U.N.S.W. PhD A.N.U.

Barbara Messerle, BSc PhD, MRACI CChem

Jeffery R. Reimers, BSc PhD A.N.U., MRACI CChem

ARC Research Fellows

Christopher J Burns, BSc PhD Melb.

Wendy A. Clucas, 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.

Sally Wright-Lucas, BSc PhD LaT.

Ping Yin, PhD Sus., MRSC CChem

Research Associates

Luke Doepel, BSc

Paul Humphrey, PhD GradDipEd Adel., MRACI CChem

Matthew P. Wilkinson, BSc PhD

Postdoctoral Fellows

Greg Metha, BSc PhD Monash

Pengwei Zhu, BSc Zhejiang PdH A.N.U.

Professional Officers

Bradley Collins, BSc PhD Qld (Optical Spectroscopy)

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)

Jaroslav T. Popiolkiewicz (Electronics)

Michael P. Smyth, BSc(GenSc) (Mass Spectrometry)

Xiaomin Song, PhD III. (Mass Spectrometry)

Peter Turner, BSc Flind. MSc PhD U.N.E.

Z. John Trafalski (Electronics)

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

Lynne Harvey

Sophie Patsalides

Janet Sassanfar

Lisa Wu

Honorary Appointments

Professorial Fellow

Dalway J. S waime, MSc Melb. PhD Aberd., FRACI CChem (Inorganic Chemistry)

Honorary Professor

John T. Pinhey, 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

Adrian George, BSc PhD R'dg, MRSC MRACI CChem

Peter Hidi, MSc Bud., FRACI CChem

Robert K. Norris, DIC Lond. PhD DSc, FRACI, CChem

Richard W. O'Brien, BE U.N.S.W. PhD Camb.

Craig M. Barnes BSc PhD MRACI

Honorary Lecturer

Alan J. Williams, MSc PhD, MRACI CChem.

Basser Department of Computer Science

Professors

J. Ross Quinlan, PhD Wash. BSc

Appointed 1988

Associate Professors

Allan G. Bromley, BSc PhD

Robert J. Kummerfeld, BSc PhD

Reader

David Feng, MS Shanhai Jiao Tong MS PhD Calif.

Senior Lecturers

Alan Fekete, PhD Harv. BSc

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

Antonios Symvonis, DipCompEng&InfoSc Patras MS PhD Texas

Michael Wise, BA BE PhD U.N.S.W.

Lecturers

Nitin Indurkha, PhD Rutgers

Wayne Wobcke, BSc MSc Qld PhD Essex

Associate Lecturers

James Donovan, BA DipCompSc MSc

Anthony Greening, BAppSci C.Sturt

Michael Hitchens, BMath PhD N'cle(N.S.W)

Computer Systems Supervisor

Raymond Loyzaga, BSc U.N.S.W.

Computer Systems Officers

John Bignucolo, MSc

Piers R. Dick-Lauder, BSc DipCompSc Brad.

Michael Flanagan, PhD

Roy Giles, BSc Wales

Bruce Janson, BSc

Greg Ryan, BSc

Senior Technical Officers

Allan Creighton

Remo Di Giovanni

Arthur Scott

Technical Officer

Witold Janus

Administrative Officer

Helene Orr

Administrative Assistants

Georgina Keatch

Juhyun Pak

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

Rex Di Bona, BE(Hons) PhD Syd

Stefan Eberl, MSc UNSW

Norman Foo, ME Cant. MA PhD Mich.

Michael Fulham, MB BS (UNSW)

Roger Fulton, MSc UTS

Frans Henskens, BMath PhD DipEd DipCompSc N'cle (N.S.W.)

Brian Hulton, BSc(Hons) MSc(Med Phys) Aberd

Jesse Jin, PhD Otago

Steve Meikle, PhD UNSW

Agathe Merceron PhD Paris

Cecile Paris, PhD Columbia

Jack R. Phillips, BMechE PhD Melb.

John Rosenberg, BSc(Hons) PhD Monash

Eric Tsui, PhD Deakin.

Geography

McCaughey Professor

Eric Waddell, BA Oxf. MA McGill PhD A.N.U.

Associate Professors

John Connell, BA PhD Lond.

Deirdre Dragovich, MA Adel. PhD

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.

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, BA Melb. 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 Hovell 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

Joop Stienstra, MSc Delft (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., FAA

Appointed 1993

Eugene Seneta, MSc Adel. PhD A.N.U., FAA

Appointed 1979

Professor in Pure Mathematics (Personal Chair)

Gustav Isaac Lehrer, PhD Warw. BSc

Appointed 1990

Professor in Mathematical Statistics (Personal Chair)

John Robinson, BSc Qld PhD

Appointed 1991

Readers

John J. Cannon, MSc PhD

Donald I. Cartwright, PhD 111. 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

Malcolm P. Quine, MSc Lond. PhD A.N.U.

Donald E. Taylor, MSc Monash DPhil Oxf.

Robert F.C. Walters, MSc Qld PhD A.N.U.

Director of First Year Studies

William D. Palmer, MLitt MA N.E. BSc PhD DipEd

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.

Hugh Luckcock, BSc Auck. PhD N'cle(U.K.)

Charles Macaskill, BSc PhD Adel.

Mary R. Myerscough, DPhil Oxf. MSc

Gordon P. Monro, BSc Monash PhD Brist.

Nigel R. O'Brian, MA Camb. PhD Warw.

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

Adrian M. Nelson, PhD Lond. BSc

Laurentiu Paunescu, MSc Bucharest PhD
 M. Shelton Peiris, DipMath MSc Peradeniya PhD Monash
 Mary C. Phipps, MSc
Associate Lecturers
 Mark J. Craddock, BSc PhD U.N.S.W.
 Matthew Hardman, BSc
 Xuezhong He, BSc Ningxia MSc Hebei PhD Flin.
 Michael Stewart, BSc MA
 Vinsensia Suhana, BSc Auck. BSc U.N.S.W.
 William R. Unger, MSc PhD
Computer Systems Officers
 Robert B. Pearson, BSc ADipA M.C.A.E.
 James S. Richardson, PhD Warw. MSc
 Paul Szabo, BSc Havana
 Michael R. Wilson, BSc
ARC Postdoctoral Research Fellow
 Andrew L. Matacz, BAppSc Curtin BSc W.Aust. PhD Adel.
Postdoctoral Fellows
 Piergiulio Katis, BSc
 Stephen G. Lack, BSc
 Andrew P. Mathas, BSc MSc PhD 111.
 Shusen Yan, MS South China Uni.Tech. PhD Wuhan Inst.
ARC Research Associate
 Harm Voskuil, PhD Groningen
ARC Senior Research Associate
 Jian-Yi Shi, MS East China Normal Uni PhD Warwick
Senior Research Assistants
 Bruce C. Cox, BSc
 Allan K. Steel, BA
Research Assistants
 Gregory Cave, BSc
Administrative Officers
 Deirdre Lawrie, MA Dund.
Administrative Assistants
 Flora Armaghanian
 Viola Chao
 Janet Doyle
 Sonia Morr
Honorary Appointments
Emeritus Professors
 Gordon Elliott Wall, BSc Adel. PhD Camb., FAA
 Gregory Maxwell Kelly, BA PhD Camb. BSc, FAA
 Peter Robert Wilson, BA MSc Melb. PhD, FRAS
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
 Honorary Associate Professors
 John M. Mack, MA Camb. BSc PhD
 Denis E. Winch, MSc PhD, FRAS
Honorary Teaching Associate
 Geoffrey R. Ball, BA.

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
 Ian Humphery-Smith, BSc PhD Qld
 Peter B. New, BAgSc Tas. PhD Adel.
Lecturers
 Deidre A. Carter, BSc Otago PhD Lond.
 Ilze Dalins, MSc
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.
 William 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, MB BS PhD Lond. FRACP
 Appointed 1992
Professors
 Judith L. Black, MB BS PhD, FRACP
 Graham A. R. Johnston, MSc PhD Camb., CChem., FRACI FTSE
 Appointed 1980
Clinical Professor
 Gillian M. Shenfield, MA BCh DM Oxf., FRCP FRACP
Associate Professors
 MacDonald J. Christie, BSc Flin. PhD
 Rosemarie Einstein, BSc PhD
 Ewan J. Mylecharane, BPharm V.I.C. BSc PhD Melb.
 Graham A. Starmer, MSc Mane. PhD
Clinical Associate Professor
 Geoffrey G. Duggin, MB BS PhC, FRACP FAFPHM
Senior Lecturers
 Robin D. Allan, BSc Qld PhD James Cook
 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, BSc PhD Monash
Associate Lecturers
 Izabela M. Brzuszczyk, BSc PhD
Research Fellows
 Billy Chieng, BPharm PhD
 Mark A. Connor, BSc PhD Wahsington

Karen O. McKay, BSc PhD
Robert J. Vandenberg, BSc PhD
Christopher W. Vaughan, BE(Elect.) U.N.S.W.
M.BiomedE U.N.S.W. PhD

*Honorary Appointments
Adjunct Professor*

Susan M. Pond, AM MB BS MD U.N.S.W., FRACP FTSE

Honorary Associates

Sandra D. Anderson, BSc PhD Lond.

James Bell, BA MB BS, FRACP

Noel J. Chambers, BSc PhD

Gregory B. Chesher, MSc PhD

L. Bruce Cobbin, BSc Melb. PhD

Peter Gray, BSc PhD

Annette S. Gross, BPharm PhD

Merlin E. H. Howden, BSc PhD Caltech

Michael Kassiou, BSc U.N.S.W. PhD U.N.S.W.

David L.B. Kerr, BSc PhD Adel.

Jennifer Ong, BSc PhD Adel.

Laurent P. Rivory, BVSc Qld PhD Qld

Diana M. Temple, BSc W.Aust. MSc PhD

Sandra N. Webb, BPharm V.I.C. PhD Strath.

Pharmacy

Professor of Pharmaceutical Chemistry

Basil Don Roufogalis, 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 PhD James Cook, MRACI

Iqbal M. Ramzan, DipPharm C.I.T. N.Z. MSc PhD

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

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

Frances Harrison, BPharm BA

Erica Sainsbury, BPharm MSc, MPS

Suzann Sime, BSc U.N.S.W.

Susan J. Taylor, MSc Lond. BPharm, MRPharmS

Joint Appointments — Teacher Practitioners

Ben J. Basger, BPharm MSc DipHPharm, MPS

Barbara Bazarnik, BSc BPharm Lond.

Heidi David, BPharm, DipHPharm

Rebecca Moles, BPharm DipHPharm

Kim Sucic, BSc BPharm DipHPharm

Academic (Research only)

Fatemeh Akhlaghi-Karoudi, PharmD Msh. Iran PhD

Alaina J. Ammit, BAppSc U.T.S. MSc PhD

Vadim Dedov, BMMS PhD Yekaterinburg

Margaret Hughes, BSc PhD

Jane H. Langford, BSc MPharm Qld PhD

Andrew Schrader, BSc PhD Monash

Van Hoan Tran, BPharm PhD

Railing Wang, BSc MSc Fudan PhD

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

Melissa Crampton, BAppSc U.W.S. MPH W'gong

Fiona Kelly, BPharm

Genevieve Peacock, BPharm DipHPharm

Senior Research Assistants

Abilio deAlmeida Neto, BSc U.N.S.W.

Paula Whithead, BPharm GDS

Research Assistants

Damien Liu-Brennan, BMedSc

Rosalie A. Robinson, BA MEd GradDipEng U.N.S.W.

Celina Seeto, BMedSc

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

Catherine Eaton

Maxine Mackellar, BA

Lynnette White

Administrative Officer

Susan Putnam

Computer Liaison

Nicole Haywood, BMath N'cle (N.S.W.)

Librarian

Lise Roberts, BA Macq. DipLib U.N.S.W.

Attendant

Jay O'Sullivan

Glassware Cleaners

Freda Kambosos

Win Kyi

Honorary Appointments

Professorial Fellow

Barry J. Allen, PhD W'gong DSc Melb., FAIP

Honorary Associate

Richard Thomas, PhD MSc, FPS

Anne Keogh, MB BS MD FRACP

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

Herbal Medicines Research and Education Centre (HMREC)

Director (Ex Officio)

Professor Shalom Isaac Benrimoj, BPharm PhD Bradford, MPS

Executive Director

Professor Basil Don Roufogalis, MPharm PhD DSc, MPS

Director - Research Programs

Dr H.T. Andrew Cheung, MSc H.K. DIC PhD DSc Lond., FRACI
FRSChem

Director - Education Programs

Dr Colin C. Duke, BSc Qld PhD James Cook, MRACI

Director - Traditional Medicine & International Programs

Professor Yun Cheung Kong

Director - Analytical Programs

Associate Professor Douglas E. Moore, MSc PhD

Coordinator

Dr George Q. Li.

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 HE

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 of Physics (Electromagnetic Physics)

Ross C. McPhedran, BSc PhD Tas.

Professor of Physics (Materials Physics)

David R. McKenzie, BSc PhD U.N.S.W.

Readers

Richard W. Hunstead, BSc PhD

Peter A. Robinson, BSc PhD

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.

Andrew J. Booth, BA DPhil Oxf.

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 N.Z. PhD A.N.U.

James B.T. McCaughan, MSc PhD

John W. O'Byrne, BSc PhD

J. Gordon Robertson, BSc Adel. PhD

WilUam 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

Ian J. Cooper, BSc MPhysics DipEd U.N.S.W.

Anne Green, BSc Melb. PhD

Joseph Khachan, BSc PhD U.N.S.W.

Rosemary M. Millar, BSc Qld MED

ARC Research Fellows

Elaine M. Sadler, BSc Qld PhD A.N.U.

Sergei Vladimirov, MSc PhD Moscow Inst.Phys.&Eng.

Research Fellow

Qi-Chu Zhang, MSc PhD U.N.S.W.

Associate Lecturers

George Braoudakis, BSc PhD

Manjula D. Sharma, MSc DAPh S.Pac.

Postdoctoral Fellows

Pal Fekete, BSc PhD

Carol A. Jackson, BA Camb.

Vincent J. McIntyre, BSc MSc Cant.

Nicolae Nicorovici-Poramaru, 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 FRAS 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 A.N.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.)

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 - Staff

Director

Donald B. Melrose, BSc Tas. DPhil Oxf., FAA

Senior Research Fellows

Lewis T. Ball, BSc PhD

Jennifer A. Nicholls, BSc Flin. PhD Durh.

Research Fellows

Simon Johnston, BSc Edin. PhD Mane

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, FRACP FAA

Appointed 1976

Maxwell Richard Bennett, BE MSc PhD Melb. DSc, FAA

Appointed 1983

David Grant Allen, BSc MB BS PhD Lond.

Appointed 1989

Ann E. Sefton, BSc(Med) MB BS PhD DSc

Appointed 1992

Roger A.L. Dampney, PhD DSc

Appointed 1997

Readers

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 (the University of Sydney Medical Foundation Fellow)

David F. Davey, BSc PhD McG.

Rebecca S. Mason, MB BS PhD

Paul Pilowsky, BMedSc BMBS PhD Flinders (at Royal North Shore Hospital)

Senior Lecturers

Simon Carlile, BSc PhD (conjoint appointment in the Dept of Education, Development & Evaluation)

Paul R. Martin, BSc PhD

Lecturers

Lynne J. Cottee, BSc PhD (half-time)

Miriam Frommer, PhD Lond. BSc

William D. Phillips, BSc PhD

Associate Lecturer

Francoise Janod-Groves, BSc N.S.W.I.T. MApplSc U.T.S.

Irene Schneider, BSc U.N.S.W. MSc(Prelim)

Joint Appointees

Christopher O'Neil, BSc PhD N'cle(N.S.W.) (Clinical Associate Professor at Royal North Shore Hospital)

Annick Anselin, BA Macq. MSc PhD (Lecturer)

Honorary Appointments

Emeritus Professor

William Burke, BSc PhD Lond.

Research Affiliates

William Burke, BSc PhD Lond. (Emeritus Professor)

Thomas Fitzgibbon, BSc Vic. PhD (Dept of Clinical Ophthalmology)

Lyn R. Griffiths, BSc U.N.S.W. PhD Griffith (Senior Lecturer at Griffith Uni.)

Honorary Associate Professor

Barry Gow, MDS PhD, FRACDS

Honorary Associates

Nikolas A. Lavidis, BSc PhD (the RD Wright Fellow)

Peter M. Wenderoth, MA PhD DSc

Honorary Research Associates

Michael DL Slater, BSc U.N.S.W. PhD FAIMS

Brett Wells, BSc PhD A.N.U.

Postdoctoral Research Fellows

Allan Coop, BSc PhD A.N.U. (NHMRC)

Margot Day, BSc PhD (NHMRCO)

Anuwat Dinudom, MSc PhD (Medical Foundation)

Ann K Goodchild, BSc PhD (ARC)

Elizabeth Harding, BSc PhD Sheffield (NHMRC)

Xiaohui Xiao, MD PhD Beijing Med Univ

Senior Research Associate

Ulrike Griinert, BSc PhD Frankfurt (ARC)

Senior Research Officers

Permsak Komwatana, MS PhD Charlottesville (NHMRC)

Philip Poronnik, BSc PhD (ARC)

Yi-kun Lou, BMed Qingdao PhD (NHMRC)

Research Officers

Yue-Kun Ju, MD Xian PhD A.N.U. (NHF)

Lucia H Rang, MD MSc Korea PhD (NHF) (part-time)

Angeles Sanchez-Perez, BSc PhD Salamanca (casual)

Research Assistants (full-time)

Weiyi Zhang, BMed Qingdao MSc Shandong (NHMRC)

Jeremy Hogan, BMedSc (NHMRC)

Lauren O Mullane, BBiomedSc W'gong

Mathew Trainey, BTech Macq. (3M)

Research Assistants (part-time)

Stephanie Hyams, BMedSc

Anna Lara, BSc Univ Republic

Honorary

Angela Hamilton, BSc (part-time)

Research laboratory staff (full-time)

Lorraine Kerr (Senior Technical Officer)

Francis JW Lee, PTC STC (Technical Officer)

Jiangbo (Lucia) Gan, BE ME Xidian Uni. (Technical Officer)

Research laboratory staff (part-time)

Judith O Neill, RN BA(Health Sci-Nursing) Charles Shirt

Laboratory assistant

Anandhi Anandan, BSc Bharathiyar Uni. Class (laboratory staff)

John F Cossey, BTC STC (Senior Technical Officer-in-charge)

Adel Mitry, BVSc Cairo ACC STC (Technical Officer)

Electronics workshop staff

Vincent HW Cheung, HND Hong Kong Polytechnic CEI Part 2 UK.
(Senior Technical Officer)

Computing staff

John WA Dodson, HNC Lond. MIEEIE I Eng (Computer Network
Manager)

Yan Li, MEng Beijing Uni. Tech (Computer Systems Officer)

Administrative Officer

Clara K. N. Li, BA Chinese Uni. Hong Kong

Administrative Assistants

Jennifer E Cantrill (part-time)

Michele L Foord

Christine Hermely, BSc

Michelle R Tickle.

Psychology

Professors

Robert Alan Boakes, BA Cant. PhD Harv.

Appointed 1989

Stephen W. Touyz, BSc PhD CapeT. BSc Witw.

Appointed 1996

Ian S. Curthoys, PhD Monash BA

Appointed 1996

Readers

Dale M. Atrens, BA Windsor MA Hollins PhD Rutgers

Lazar Stankov, MA Belgrade PhD Denver

Senior Lecturers

Brian D. Crabbe, BA PhD

Alan E. Craddock, BA PhD

R.F. Soames Job, BA PhD

Cyril R. Latimer, BA PhD

David J. Livesey, BSc PhD W.Aust.

Roslyn H. Markham, MA PhD

Iain McGregor, MA Oxf. PhD

Terence McMullen, BA PhD

Joel B. Michell, BAPhD

John M. Predebon, BA PhD

David E. Schotte, MS PhD Virginia

Robyn Tate, MA MPsych U.N.S.W. PhD N'cle(N.S.W.)

Alison M. Turtle, MA

Michael B. Walker, BSc W.Aust. BA Adel. DPhil Oxf.

Lecturers

Laurel Bornholt, BA Melb. PhD Macq.

Margaret Charles, BA PhD

Timothy Hannan, BA MPsych

Pauline M. Howie, BA PhD U.N.S.W.

Rick van der Zwan, BSc PhD

Associate Lecturers

Kate Baggs, BA MPsych

Neeru Chadda, BA Delhi MA Kampur

Dianne Clark, BA U.N.S.W.

James Dalziel, BA

Fiona Hibberd, BA

Olivier Piguët, BPsych Gva MA(Clin.Neuropsych.) Melb.

Gina Sartore, BSc GradDip A.N.U.

Mark Yates, BA

Honorary Clinical Lecturers

Phyllis N. Butow, BA PhD

Nicholas Marlowe, BA PhD

Michael Nicholas, BA PhD

Michael Young, BA Macq. MPsych PhD U.N.S.W.

Honorary Clinical Supervisors

Gregory Aldridge, MPsych

Sally V. Arpadi, BA MPsych U.N.S.W.

Gary Banks, BA MPsych MQA

Christopher Basten, BA MPsych

Carol Boland, BA MPsych

Philippa Bowden, BA MPsych

Diana Caine, BA N.E. MSc Melb.

Bob Duncan, BE BA MPsych U.N.S.W.

Megan Forbes, BSc U.N.S.W. MA MPsych

Eleanor Gait, BA DipPsych

Lean Giarratano, BA MPsych

Fernando Gomez, MPsych

Brian Kearney, BA MPsych

Deborah Knight, BA MPsych

E.W Kobylnska. MA DipPsych Poland, MPsych PhD

Roy Laube, BSc MA Loyola

Kaye Matthews, BA MPsych

Helen McCathie, BA MPsych

Antonia McKinnon, MA DipPsych

Michael McMahon, MA Melb.

Roslyn Montague, DipTMed BA MPsych

Kevin O'Sullivan, PhD

Jon Plapp, PhD

Gail Purkiss, BSc U.N.S.W. DipPsych

Fernando Roldan, PhD

Dieter Schlosser, BSc U.N.S.W. MPsych

Marie-Leonie Sequeira, DipPsych

Melissa Staples, BA MPsych

Gill Stott, BA MCLinPsych Flin.

Fazileh Zolfaghari, PhD

Computer Systems Officers

John Holden

Yoichi Takayama, MSc Tohoku PhD Niigata

Administrative Officers

Sandra Cheng, BBus U.T.S. CPA

Kathy Pearce, BA U.N.S.W.

Honorary Appointments

Helen Beh, BA PhD N.E.

Pierre J. Beumont, MB ChB Pretoria DPM (RCP) Lond. MRCP Edin.

M Phil Lond. MRCPsych U.K. MSc Oxf. FRC Psych U.K. FRACP FRANZCP FRCP Edin.

Olga Katchan, BA

David Kavanagh, PhD Stanf. BA Dip Psychol.

George Oliphant, BA PhD

Emeritus Professors

Richard Annells Champion, MA, FASSA

Philip Ley, BA Mane. PhD Liv. DipPsychol Lond.

Joh Philip Sutcliffe, MA PhD, FASSA.

Staff in Other Units

Centre for Research on Ecological Impacts of Coastal Cities

Director

Antony J. Underwood, PhD DSc Brist., FAA FLS FIBiol FAIBiol CBiol

Deputy Director

Brian L. Bayne, BSc PhD University of Wales

Associate Director

M Gee Chapman, BSc Natal MSc PhD

Postdoctoral Fellows

Laura Airoidi, MSc Milan PhD Genova

Sean Connell, BSc Cant. MSc Auckland PhD

Tim Glasby, BSc PhD

Miles Hoskin, BSc Hons Plymouth PhD W'gong

Mats Lindegarth, MSc PhD Goteborg

Research Support Staff

Edwin Aguirre, BSc Visayas State College of Agric. Philip. MSc Asian Instit. of Tech.

Peter Barnes, BSc U.N.S.W.

Jennifer Beckett

Joanne Cunningham, BSc

Jillian Grayson, BSc GradDipEnvSci.

Jane Harris, BSc

Catherine Hemery, BA (Hons) Augustana College Illinois, GradDipSocEcol U.W.S

Grahame Housefield, BSc C. Sturt

Vanessa Mathews, BSc

Samantha Neal, BSc(Hons) LaTrobe

Danielle O'Connor, BSc GradDipEnvSci

Coastal Studies Unit

Director

Andrew D. Short, MA Hawaii PhD Louisiana State BA

History and Philosophy of Science

Associate Professor

Alan F. Chalmers, BSc Brist. MSc Mane. PhD Lond.

Administrative Assistant

Shari Lee, BA Sing.

Institute of Marine Ecology

Director

Maura G. Chapman, BSc Natal MSc PhD

Associate Director

Rosalind T. Hinde, BSc PhD

Members

Ove Hoegh-Guldberg, PhD Calif. BSc

Michael J. Kingsford, BSc Cant. MSc PhD Auckland.

Anthony W.D. Larkum, BSc Lond. DPhil Oxf., ARCS

Antony J. Underwood, PhD DSc Brist., FAA FLS FIBiol FAIBiol CBiol

Research Fellows

Michael Beck, BA MS U.Va PhD F.S.U.

Ian Montgomery, BSc Dub. PhD

Research Assistants

Peter Barnes, BSc U.N.S.W.

Joanne Cunningham, BSc

Jillian Grayson, BSc GradDip(Env Sci)

Jane Harris, BSc

Grahame Housefield, BSc C. Sturt

Vanessa Mathews, BSc

Samantha Neal, BSc(Hons) LaTrobe

Danielle O'Connor, BSc Grad.Dip. Env Sci

Honorary Appointments

Honorary Associate

J. Howard Choat, MSc PhD Qld

Research Affiliates

Steven J. Kennelly, BSc PhD

Nicholas M. Otway, BSc PhD

Marine Studies Centre

Director

Andrew D. Short, MA Hawaii PhD Louisiana State BA

Administrative Assistant

Shari Lee, BA Singapore

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. Zurich

Senior Research Fellow

Christopher Jenkins, BSc PhD Camb.

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 Wits. DipEd DipDatametrics S. A.

Associate Lecturer

Collin G. Phillips, BSc DipEd PhD

Administrative Assistant (part-time)

Cathy Kennedy

Australian Key Centre for Microscopy and Microanalysis

Director

David John Augh Cockayne MSc Melb., DPhil Oxf.

Deputy Directors

David R. McKenzie, BSc PhD U.N.S.W.

Carol J. Cogswell, MA MArch Oregon

Research Director

Colin J. R. Sheppard, BSc PhD U.N.S.W.

9. General Information

Admissions Office

Student Centre
Ground Floor
F07 - Carslaw
The University of Sydney
NSW 2006 Australia
Phone: +612 93514117
+612 93514118
+61 2 9351 3615 - Special Admissions (including Mature Age)
Fax: +612 93514869
E-mail: admissions@records.usyd.edu.au

This office services prospective local undergraduate students. Applicants without Australian citizenship or permanent residency should contact the International Office. Postgraduate students should contact the appropriate faculty.

Assessment

For matters regarding assessment, refer to the relevant Department.

Co-op Bookshop
Transient Building
F1 2-Transient
The University of Sydney
NSW 2006 Australia

Phone: +612 93513705
+612 93512807
Fax: +61 2 9660 5256
E-mail: sydu@mail.coop-bookshop.com.au

Website <http://mail.coop-bookshop.com.au/coop.html>

Sells textbooks and general books. Special order services available.

Enrolment and pre-enrolment

Students entering first year

Details of the enrolment procedures will be sent with the UAC Offer of Enrolment. Enrolment takes place at a specific time and date, depending on your surname and the Faculty in which you are enrolling, but is usually within the last two weeks of January. You must attend the University in person or else nominate, in writing, somebody to act on your behalf. On the enrolment day, you pay the compulsory fees for joining the student Union, the Students' Representative Council and sporting bodies. You also choose your first-year units of study, so it's important to consult the Handbook before enrolling.

All other students

The Student Information Bulletin is sent to all enrolled students in early to mid-October, and contains instructions on the procedure for pre-enrolment.

Examinations

Examinations and Exclusions Office

Student Centre
Level 1
F07 - Carslaw
The University of Sydney
NSW 2006 Australia
Phone: +612 93514005
+61 2 93514006
Fax: +612 93517330
E-mail: Exams.Office@exams.usyd.edu.au

The Examinations and Exclusions Office looks after exam papers, timetables and exclusions.

First-year timetable

A print-out of first-year lecture and tutorial times is available from the Faculty Office.

Graduations

Ground Floor, Student Centre
F07 - Carslaw
The University of Sydney
NSW 2006 Australia
Phone: +612 93514009
Fax: +612 93515072
E-mail: Naomi@records.usyd.edu.au

(Grievances) Appeals

Many decisions about academic and non-academic matters are made each year and you may consider that a particular decision affecting your candidature for a degree or other activities at the University may not have taken into account all the relevant matters. In some cases the by-laws or resolutions of the Senate (see Calendar Volume 1) specifically provide for a right of appeal against particular decisions; for example, there is provision for appeal against academic decisions, disciplinary decisions and exclusion after failure.

Normally a matter should be resolved by discussing it with the academic staff member concerned, or with a senior member of staff within the department. However, a situation could arise where you might wish to have a decision reviewed or to draw attention to additional relevant information. In this case you should put your case in writing to the head of department and if you're still not satisfied with the result you should contact your Dean. Only after following these steps can you appeal to the Senate. In the case of examination results the appeal may be made to the department. Parking appeals should be addressed to the Manager, Campus Services. You may wish to seek assistance or advice from the SRC regarding an appeal; if so, contact the

Education/Research Officer

Level 1
Wentworth Building
Phone: +61 2 9660 5222
HECS, fees, other charges
Phone: +61 2 9351 5659, 9351 2086, 9351 5499 and 9351 5062
Fax: +612 93515081
+612 93515350

Library (Fisher)

F03 - Fisher Library
The University of Sydney
NSW 2006 Australia
+612 93512993 — Enquiries - Information Desk
+612 93513711 — Library Hours
+61 2 9351 7273 — Borrowers' Cards
+612 93516692 — Holds Enquiries
+612 93517277 — Inter-library Loans
+612 93512265 — Loans, overdue enquiries
+612 93512890 — Administration
+612 93517278 — Renewals
E-mail: loaneng@library.usyd.edu.au — Loan and Library enquiries
reqill@library.usyd.edu.au — Inter-library Loans
Website <http://www.library.usyd.edu.au/> — Fisher Library Home Page
<http://www.library.usyd.edu.au/Services/Libraries/Fisher/index.html>

Student Centre

Ground Floor
F07 - Carslaw Building
The University of Sydney
NSW 2006 Australia
Phone: +61 2 9351 3023 — General Enquiries
+61 2 9351 4109 — Academic Records
+61 2 9351 3023 — Discontinuation of Enrolment
+61 2 9351 4109 — Handbooks
+61 2 93515060 — Prizes
Fax: +612 93515081
+612 93515350
E-mail: admissions@records.usyd.edu.au

Part-time, full-time

A student is normally considered as full-time if they have a HECS weighting of at least .375 per semester. Anything under this amount is considered a part-time study load. Note that some faculties have minimum study load requirements for satisfactory progress.

Privacy and Freedom of Information

The NSW Freedom of Information (FOI) Act 1989 provides the public with a legally enforceable right of access to University documents, subject to particular exemptions. In addition, the Act enables individuals to ensure that information held about them is accurate, up-to-date and complete. The University has a number of policies permitting access by individuals to information about themselves without recourse to the Freedom of Information Act.

The University necessarily accumulates a great deal of information on individuals; within the Uni, access to this is restricted to staff who need the information to carry out their duties. As regards external requests for personal information, it is policy that the University will disclose information to a third party if the subject of the information has consented in writing to the disclosure, or if the University has a legal obligation to respond to a request, including a subpoena, and the request is in the appropriate written form. Enquiries should be directed to the:

Freedom of Information Coordinator and Privacy Officer

c/-Archives A14
Phone: +61 2 93514263
Fax: +612 93517304
E-mail: trobins@mail.usyd.edu.au
Website <http://www.usyd.edu.au/su/foi>.

Student Services

Room 711, Level 7
A35 - Education Building
The University of Sydney
NSW 2006 Australia
Website <http://www.usyd.edu.au/su/stuserv/> Student Services

Accommodation Service

Phone: +612 93513312
Fax: +612 93517055
E-mail: larthur@mail.usyd.edu.au
Website <http://www.usyd.edu.au/su/accom/> Student Accommodation

Casual Employment

Phone: +612 9552 2589
Fax: +61 2 9552 2589
E-mail: mross@mail.usyd.edu.au
Website http://www.usyd.edu.au/su/cas_emp/ Casual Employment

Counselling Service

Phone: +612 93512228
Fax: +612 93517055
E-mail: myoung@mail.usyd.edu.au

Disability and Welfare Services

Phone: +612 93514554
Fax: +612 93517055
E-mail: cstuckin@mail.usyd.edu.au
Website <http://www.usyd.edu.au/su/disability/> Disability Services

Financial Assistance

Phone: +61 2 9351 2416
Fax: +612 93517055
Refer to the University of Sydney Calendar 1996, Volume 2, for a listing of all undergraduate and postgraduate sources, conditions and benefits or financial support funded by the University.
E-mail: psweet@mail.usyd.edu.au
Website http://www.usyd.edu.au/su/fin_assist/ Financial Assistance

Learning Assistance Centre

Phone: +612 93513853
Fax: +612 93514865
E-mail: lewalker@mail.usyd.edu.au
Website <http://www.usyd.edu.au/su/lac/>

Other student assistance

Careers Centre
Room 147, Ground Level
KOI - Mackie Building (Arundel St, Forest Lodge)
The University of Sydney
NSW 2006 Australia
Phone: +612 93513481
Fax: +612 93515134
E-mail: srawling@careers.usyd.edu.au — General Enquiries
asharp@careers.usyd.edu.au — Library
Website <http://www.usyd.edu.au/homepage/exterel/careers/index.htm>
Provides careers advice and information, Graduate Employment Services and graduate Labour market information to students and staff.

Centre for Continuing Education (bridging courses)

KOI-Mackie
The University of Sydney
NSW 2006 Australia
Phone: +612 93512907
Fax: +612 93515022
E-mail: info@cce.usyd.edu.au
Website http://www.usyd.edu.au/homepage/exterel/cont_edu/cont_edu.htm

Health service

Level 3, G01 - Wentworth
The University of Sydney
NSW 2006 Australia
Phone: +61 2 9351 3484 — Wentworth
+612 93514095 — Holme
+612 93510636 — Mallett
Fax: +61 2 9351 4110 — Wentworth
+61 2 93514338 — Holme
+612 93510580 — Mallett
E-mail: P.Brown@unihealdi.usyd.edu.au
Provides full general practitioner services and emergency medical care to the University community

Koori Centre

Room U201
A22 - Old Teachers' College
The University of Sydney
NSW 2006 Australia
Phone: +61 2 9351 2046 — General Enquiries
+61 2 9351 7001 — Liaison Officer
+61 2 9351 7073 — Student Counsellor
Fax: +61 2 9351 6923

E-mail: adminoff@koori.usyd.edu.au

Website <http://www.koori.usyd.edu.au/centre/>

The Koori Centre runs the AEA training program, supports Aboriginal and Torres Strait Islander students on campus and during enrolment. There is also an educational unit which supports Aboriginal studies in the University.

Language Centre

Room 312, A19 - Griffith Taylor
A18 - Christopher Brennan
The University of Sydney
NSW 2006 Australia
Phone: +61 2 9351 2683
Fax: +61 2 9351 4724

E-mail: Langcent.Enquiries@language.usyd.edu.au

Website <http://www.arts.su.edu.au/language/centre/intro.html>

Provides self-access course materials in over 100 languages; beginners and intermediate courses in Spanish language and Culture; beginners and advanced courses in Celtic languages and cultures.

Mathematics Learning Centre

Room 441
F07 - Carslaw
The University of Sydney
NSW 2006 Australia
Phone: +61 2 9351 4061
Fax: +61 2 9351 5797

E-mail: MLC@mail.usyd.edu.au

Website <http://www.usyd.edu.au/su/mlc/MLC.html>

Scholarships

Research and Scholarships Office
Scholarships Administration Room N410.1, A14
A14 - Main Quadrangle
The University of Sydney
NSW 2006 Australia
Phone: +61 2 9351 3250
Fax: +61 2 9351 3256

E-mail: scholars@reschols.usyd.edu.au

Website: <http://www.usyd.edu.au/homepage/exterel/su/reschols/index.html>

International students

International Office
Level 2
K07-Margaret Telfer
The University of Sydney
NSW 2006 Australia

Phone: +61 2 9351 4161
+61 2 9351 4079

Fax: +61 2 9351 4013

E-mail: info@io.usyd.edu.au

International Student Services Unit

Level 2
K07 - Margaret Telfer Building
The University of Sydney
NSW 2006 Australia
Phone: +61 2 9351 4749
Fax: +61 2 9351 4013
E-mail: info@issu.usyd.edu.au

Website

<http://www.usyd.edu.au/su/issu/> International Student Services Unit

Website

http://www.usyd.edu.au/homepage/exterel/internat/int_student_centre.html

Provides an advisory and counselling service to international students at The University of Sydney.

Student organisations

Students' Representative Council

Level 1, Wentworth G01

The University of Sydney

NSW 2006 Australia

Phone: +61 2 9351 2871 — President, Honi Soit

+61 2 9660 4756 — Bookshop

+61 2 9660 5222 — Legal Aid

Fax: +61 2 9660 4260

University of Sydney Union

Box 500 Holme Building

A09 - Holme

The University of Sydney

NSW 2006 Australia

Phone: +61 2 9563 6000 — Switchboard/Enquiries

+61 2 9563 6282 — Academic Dress

+61 2 9563 6103 — ACCESS Centre, Manning

+61 2 9563 6269 — Campus Store, Holme

+61 2 9563 6016 — Campus Store, Wentworth

+61 2 9563 6160 — Clubs and Societies Office

+61 2 9563 6010 — School Tutoring Co-ordinator

+61 2 9563 6032 — Union Broadcasting Studio

+61 2 9563 6115 — Welfare and Information Services Manager

Fax: +61 2 9563 6239

E-mail: enquiries@union.usyd.edu.au

Website <http://www.usu.usyd.edu.au/>

Provides welfare, social and recreational services to the University community.

Sydney University Sports Union

G09 - Sports and Aquatic Centre

The University of Sydney

NSW 2006 Australia

Phone: +61 2 9351 4960

Fax: +61 2 9351 4962

Provides services, facilities and clubs for sport, recreation and fitness.

Women's Sports Association

Room 214

A30 - Sports Centre

The University of Sydney

NSW 2006 Australia

Phone: +61 2 9660 6355

+61 2 9351 2057

Fax: +61 2 9660 0921

E-mail: jlawler@mail.usyd.edu.au

Website <http://www.usyd.edu.au/su/suwsa/welcome.html>

Provides for students, predominantly women, to participate in sport and recreation through the provision of facilities, courses and personnel.

10. Glossary of Terms

Applying for a course

Admissions

The Admissions Office is responsible for overseeing the distribution of offers of enrolment and can advise prospective students regarding admission requirements.

Application

Prospective (intending) students must lodge an application form with the Universities Admissions Centre (UAC) by the last working day of September of the year before enrolment. Note that some faculties, such as Dentistry and Sydney College of the Arts, have additional application procedures.

Mature age

A category of Special Admission applicants who are 21 years or older on 1 March of the year in which they want to study and who do not have the high school qualifications normally required for entry into a course.

Special Admission

Certain categories of applicants, such as mature-age applicants, students who have experienced educational disadvantage or Aboriginal or Torres Strait Islander applicants, may apply for admission to the University under one of several Special Admission schemes. Contact the Special Admissions office for further information.

TER

The Tertiary Entrance Rank (TER) is the numerical expression of a student's performance in the NSW Higher School Certificate (HSC), which takes into account both assessment and examination results.

TER cut-off

The TER of the last student admitted to a course. Some courses have a minimum TER.

Universities Admissions Centre (UAC)

The organisation that processes applications for most NSW undergraduate university and TAFE courses.

Enrolment and general terms

Academic year

The period during which teaching takes place, from February to November. The academic year is divided into two semesters.

Advanced standing

(See also: Credit) Recognition of previous experience or studies, meaning that the candidate has satisfied the entry requirements for a unit. Advanced standing does not reduce the number of credit points required to complete the degree course.

Associate Diploma

The undergraduate award granted following successful completion of Associate Diploma course requirements. An Associate Diploma course usually requires less study than a Diploma course.

Assumed knowledge

The level of knowledge expected for entry to a Unit of Study. Unlike prerequisites, levels of assumed knowledge are not compulsory for entry to a Unit. Students who do not have the assumed knowledge may, however, be at a considerable disadvantage and may consider completing a bridging course prior to enrolment. Contact the Learning Assistance Centre, Mathematics Learning Centre, Language Centre or Centre for Continuing Education for further information.

Bachelor's degree

The highest undergraduate award offered at the University of Sydney (other undergraduate awards are Associate Diploma and Diploma).

A Bachelor's degree course normally requires three or four years of full-time study (or the part-time equivalent).

Campus

The grounds on which the University is situated. There are eleven campuses of the University of Sydney: Burren Street (Graduate School of Business), Camperdown and Darlington ("Main campus"), Camden (Agriculture and Veterinary Science), Conservatorium (Conservatorium of Music), Cumberland (Health Sciences and Nursing), Mallett Street (Nursing), Orange Agricultural College, Rozelle (Sydney College of the Arts), St James (Law) and Surry Hills (Dentistry).

Chancellor

(See also: Vice-Chancellor) The non-resident head of the University.

Combined degree course

A program consisting of two degree courses taken together, which usually requires less time than if the courses were taken separately.

Core

(See also: Elective/Option) A Unit of Study that is compulsory for the course or subject area.

Corequisite

A Unit of Study that must be taken with a given Unit. If a corequisite is not successfully completed, it becomes a prerequisite for further study in that subject area.

Course

A complete degree or diploma program.

Credit

(See also: Advanced standing) Recognition of previous studies or studies completed at another institution. If credit is granted then the number of credit points required for completion of the degree course is reduced.

Credit point

A measure of value indicating the contribution each Unit of Study provides towards meeting course completion requirements stated as total credit point value.

Dean

The head of a faculty.

Deferment of enrolment

Persons who have not previously attended a recognised tertiary institution are normally able to defer commencement of their candidature for one year. Applications are handled by the Admissions Office of the University. Application for deferment must be made during the UAC enrolment week at the "Deferment" desk in MacLaurin Hall and be accompanied by the "offer of enrolment" card.

Degree

The award conferred following successful completion of a degree course (for example Bachelor's degree or Master's degree).

Department/School

The academic unit responsible for teaching in a given subject area.

Diploma

The award granted following successful completion of Diploma course requirements. A Diploma course usually requires less study than a degree course. Graduate Diploma courses are for graduates only.

Doctorate

(See also: PhD) The Doctorate awards and the PhD are the highest awards available at the University of Sydney. A Doctorate course normally involves research and coursework; the candidate submits a thesis that is an original contribution to the field of study. Entry to a Doctorate course often requires completion of a Master's degree course. Note that the Doctorate course is not available in all Departments of the University of Sydney.

Elective/Option

(See also: Core) A Unit of Study that may be taken towards, but is not compulsory for, a course or subject area.

Enrolment

The process whereby an applicant officially accepts the offer of a place in a particular course. If UAC application is successful, an "offer of enrolment" card is mailed to the applicant, along with instructions for enrolment. In most cases, the applicant must attend the University on a particular enrolment day or, if unable to attend, must appoint somebody to enrol on their behalf. Units of Study [for February Semester or whole of First Year?] must be nominated on enrolment day. Academic records and HECS liability calculations are based on the enrolment details, so students must ensure that the Faculty holds correct enrolment information (see also: Variation of enrolment).

Entry requirement

The level of knowledge and/or experience required for entry to a particular Unit of Study.

Faculty

The administrative unit responsible for overseeing satisfactory progress during a degree or diploma course.

Full-time

A study load usually defined in terms of HECS weighting of at least .375 per semester.

Intermediate

Faculty of Science: Second-year level.

Junior

First-year level.

Laboratory practical

See: Practical.

Lecture

(See also: Tutorial) A class given to a large group of students, during which the lecturer speaks or presents audiovisual material and students take notes.

Major

The subject area(s) in which a student specialises at Senior level. Students usually specialise in one (single major) or two (double major) subject areas. The major is usually recorded on the testamur.

Master's degree

A postgraduate award. Master's degree courses may be offered by coursework, research only or a combination of coursework and research. Entry to the course often requires completion of an Honours year at undergraduate level.

Minor

Subject areas in which a student studies, but does not specialise at Senior level.

Orientation period

"O' Week" takes place during the week prior to lectures in February semester. During O' Week, students can join various clubs, societies and organisations, register for courses with Departments and take part in activities provided by the University of Sydney Union.

Part-time

A study load usually defined in terms of HECS weighting of less than .375 per semester.

PhD

(See also: Doctorate) The Doctor of Philosophy (PhD) and other Doctorate awards are the highest awards available at the University of Sydney. A PhD course is normally purely research-based; the candidate submits a thesis that is an original contribution to the field of study. Entry to a PhD course often requires completion of a Master's degree course. Note that the PhD course is available in most Departments of the University of Sydney.

Postgraduate

The term used to describe a course leading to an award such as Graduate Diploma, Master's degree or PhD, which usually requires prior completion of a relevant undergraduate degree (or diploma) course. A "postgraduate" is a student enrolled in such a course.

Practical

Similar to a tutorial, during which experiments or other relevant applied activities are carried out.

Prerequisite

A Unit of Study that must be taken prior to entry to a given Unit.

Recommended reading

Reading material that is suggested but not compulsory for a Unit of Study.

Registrar

The head of the administrative divisions of the University.

Registration

In addition to enrolling (with the Faculty) in Units of Study, students must register with the Department responsible for teaching each Unit. This is normally done during the Orientation period (O' Week). Note that unlike enrolment, registration is not a formal record of Units attempted by the student.

Resolutions of Senate

Regulations determined by the Senate of the University of Sydney that pertain to degree and diploma course requirements and other academic matters.

School

Similar to a large Department, otherwise a grouping of Departments.

Semester

A period of fourteen weeks during which teaching takes place. There are two semesters per year for most faculties.

Senior

Second-year level or higher.
Faculty of Science: third-year level.

Subject area

One or more Units of Study that comprise a particular field of study (eg Japanese or Chemistry).

Textbook

Reading material that the student is expected to own.

Tutorial

(See also: Lecture) A small class consisting of a tutor and up to about 25 students, during which concepts raised in lectures are discussed in detail and may be supplemented with readings, demonstrations and presentations.

Undergraduate

The term used to describe a course leading to a diploma or Bachelor's degree. An "undergraduate" is a student enrolled in such a course.

Unit of Study

A stand-alone component of a degree or diploma course that is recordable on the academic transcript.

Variation of enrolment

The process whereby students officially notify the Faculty of changes regarding the Units of Study they are attending. This must be done by a certain deadline in each semester, to avoid penalties such as "discontinued" results on the academic transcript (see: Results) or unnecessary HECS charges.

Vice-Chancellor

(See also: Chancellor) The administrative head of the whole University, including academic and administrative divisions.

Costs

Bursary

A sum given to a student who has limited resources or is experiencing financial hardship, ranging from \$100 to \$1,000.

Fees (full-fee undergraduate/postgraduate)

Tuition, examination or other fees payable to the University by an enrolled or enrolling student in connection with a course of study or attendance at the University and includes fees payable in respect of the granting of a degree, diploma, associate diploma or other award. It does not include annual subscription to organisations such as the Union or SRC or fees payable in respect of residential accommodation.

HECS

All Australian undergraduate students are currently required to contribute to the cost of tertiary education through the Higher Education Contribution Scheme (HECS) which is administered under the Higher Education Funding Act 1988. Under HECS students pay for part of the cost of their higher education and the Commonwealth pays the rest. The amount payable is determined by the units of study a student chooses to undertake in the case of coursework awards, or the attendance (full-time or part-time) in the case of research students.

Prize

Matriculation, undergraduate and postgraduate funding automatically awarded on academic results in courses, yearly examinations or on the recommendation of the Head of Department. There are also prizes for essay writing and composition by anonymous application. Prize values range from \$100 to \$6,250.

Scholarship

Matriculation and undergraduate funding by application awarded on TER results for students enrolling in the first year of a degree course. Postgraduate funding for full-time candidates enrolled in a research degree course with scholarship conditions and benefits varying according to specific awards. The intention is to encourage and support scholarship at the University in general or in targeted areas.

Assessment, Examination, Satisfactory Progress and Graduation

Academic transcript/record

The official record of results for each student (see: Results).

Appeals

The process whereby a student may raise objections regarding results, Faculty decisions or other academic matters.

Assessment

(See also: Examination) The appraisal of a student's ability throughout the semester, by various means such as essays, practical reports or presentations, which counts towards the final mark or grade.

Candidate

Someone studying for a degree or diploma. The term may also be used to describe someone sitting for an examination.

Examination

(See also: Assessment) The appraisal of a student's ability, usually at the end of semester. Most examinations take place on campus under strictly supervised conditions but some Units make use of take-home or open-book examinations.

Exclusion

A ruling by the Faculty, which declares the student ineligible for further enrolment for reasons such as lack of satisfactory progress. Students who wish to re-enrol must show good cause why they should be allowed to re-enrol (see: Show cause and Satisfactory progress).

Grievances

see appeals

Grade

A category into which a student's final mark falls (see: Results).

Graduand

A person who has fulfilled the requirements of a degree but is yet to graduate.

Graduate

(See also: Postgraduate) A person who has graduated. Also a term used to describe a course leading to an award such as Master's degree or PhD or a student enrolled in such as course.

Graduation

The ceremony during which degrees are conferred and diplomas awarded.

Honours degree

A Bachelor's degree for which extra work (course work and/or thesis) has been completed, usually requiring an extra year of study.

Mark

(See also: Grade) The numerical result of assessments and/or examinations for a Unit of Study, which may be converted to a grade.

Pass degree

A Bachelor's degree.

Re-enrolment

The process by which continuing students enrol in Units of Study.

Results

The official statement of the student's performance in each Unit of Study attempted, as recorded on the academic transcript, usually expressed as a grade:

High Distinction	a mark of 85% and above
Distinction	a mark of 75-84%
Credit	a mark of 65-74%
Pass	a mark of 50-64%

Terminating Pass whereby the student is deemed to have completed Unit requirements, but is not permitted to re-enrol in order to attempt to achieve a higher grade.

Fail	a mark of less than 50%
------	-------------------------

Withdrawn This is the same as if the candidate had not enrolled in the course concerned. Although the University has a record of the withdrawal, the course and result will not appear on the official academic transcript. There is no HECS liability either. In order to have a course recorded as "withdrawn", notice must be given by the candidate to the Faculty office on or before the deadline. Refer to the section on degree regulations.

Discontinued with Permission This does not count as an attempt at the particular course, but does appear on the candidate's academic record. A candidate may have enrolment recorded as "discontinued with permission" where: 1. notice is given to the faculty office on or before the deadline or; 2. after the deadline, evidence is produced of serious illness or misadventure. Refer to the section on degree regulations for deadlines. Discontinuation with permission does not mean that the student's progress is considered to be satisfactory.

Discontinued This counts as an unsuccessful attempt at the course concerned and appears on the candidate's academic record. Where notice is given after the deadline for "discontinued with permission" but before the last day of lectures for the course, the result is "Disc". Refer to the section on degree regulations for deadlines.

Absent Fail If the candidate misses the deadline for "discontinued" and does not sit the final exam, the result is "absent fail".

Satisfactory progress

A minimum standard of performance required for continuation of enrolment. Senate resolutions rule that if a student fails or discontinues a year of candidature or a Unit of Study more than once then he or she is ineligible for re-enrolment (see: Exclusion and Show cause). Note that some faculties may have alternative or additional requirements for satisfactory progress.

Show cause

The Faculty may require a student to show good cause why he or she may be allowed to continue in the degree or diploma course, where requirements for satisfactory progress have not been met (see: Exclusion and Satisfactory progress).

Special consideration

The process whereby enrolled students who have experienced significant educational disadvantage may have their assessment deadlines or grades revised.

Study Vacation (Stuvac)

The week prior to the examination period in each semester, during which no classes are held.

Supplementary examination

An extra or alternative examination taken by a student who has experienced significant educational disadvantage during semester or the examination period. Note that some faculties do not offer supplementary examinations (see also: Special consideration).

Suspension of candidature

A complete break in the studies of an enrolled student, usually for a period of one year. Applications are handled by the Faculty office. (Those wishing to postpone commencement of a course need to apply for deferment, see: Deferment of enrolment).

Testamur

The document given to the graduand at graduation.

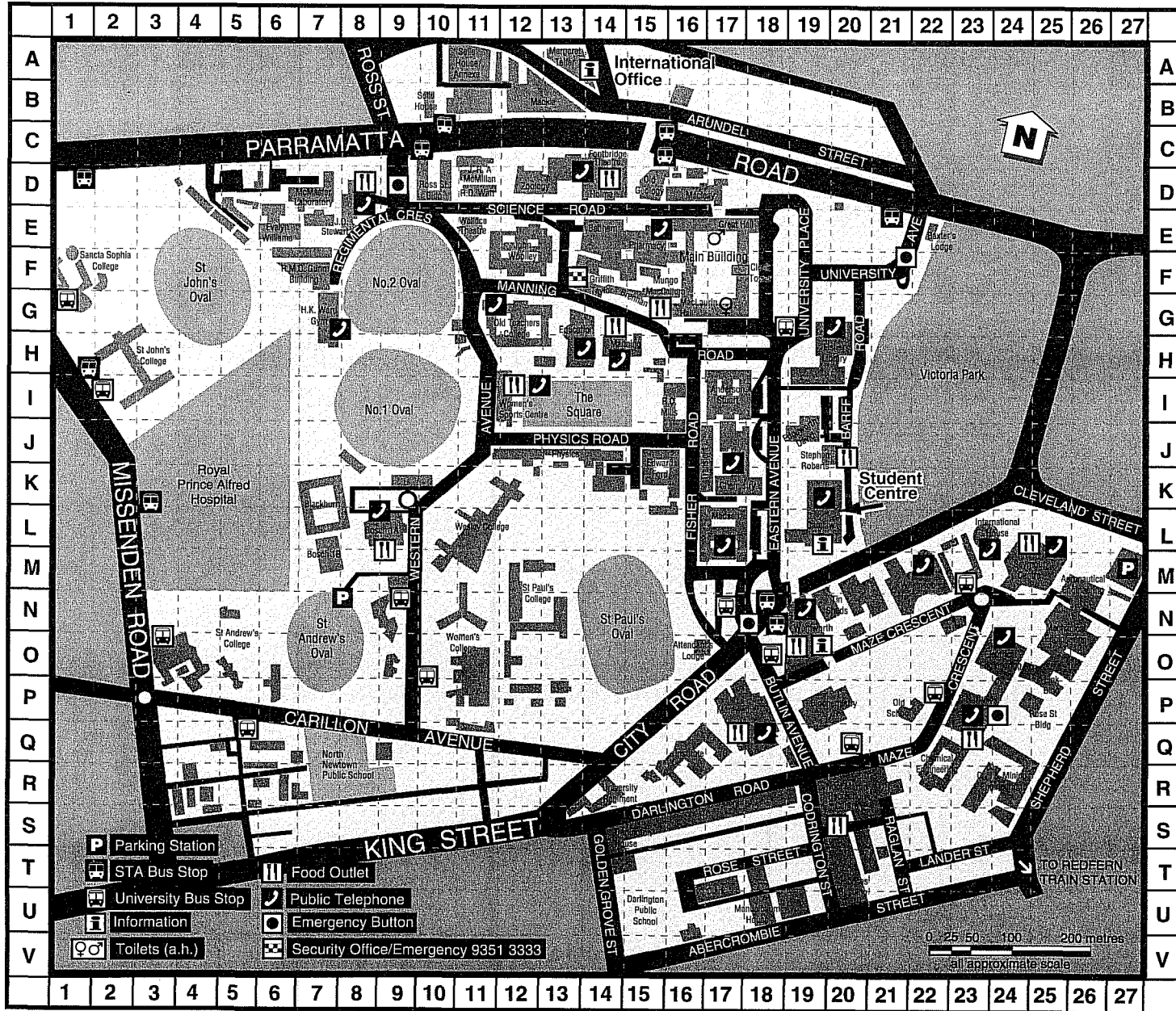
Thesis

A piece of written work (sometimes called a dissertation) by a student, normally a candidate for an Honours degree or a higher award (such as Master's degree or PhD).

Weighted Average Mark (WAM)

A numerical expression of a student's performance throughout their degree program, usually assigning more "weight" to Senior or Honours years. Note that the WAM calculation may differ for purposes such as eligibility to various scholarships and will vary from faculty to faculty.

University of Sydney - Map of Main Campus



Academic S Executive Services 16E
Accounting 17P
Accommodation Service 13G
Administrative Policy & Strategic Planning Division 16E
Administrative Support Services Division 16E
Aeronautical Engineering 26M
Agricultural Chemistry & Soil Science 10D
Agricultural Economics 11D
Agriculture Faculty Office 11C
Alma Street Glasshouse 23N
Anaesthesia 7K
Anderson Stuart Bldg 17I
Anatomy & Histology 17I
Animal Health Cam
Animal Science 7F
Anthropology 16F
Archaeology, Classics & Ancient History 16F
Architectural & Design Science 22M
Architecture, Dept & Faculty Office 22M
Archives 19H
Art Workshop 20M
Arts Faculty Office 16F
Asset Management 13A
Asian Studies 14F
Attendant's Lodge 16D
Badham Bldg & Library 14E
Banks (see Financial institutions)
Baxter's Lodge 22E
Behavioural & Social Sciences in Nursing MapB
Behavioural Science Cumb
Behavioural Sciences in Medicine 7K
Btochemistry 20P
Biological Sciences 16D
Biomedical Science Cumb
Blackburn Bldg 7K
Bookshops-
Medical 7K
SRC Secondhand 19N
University Co-operative 16J
Bosch 1A (lecture theatres) 8L
Bosch 1B Bldg 7M
Brennan, C, Bldg 15F
Budget Office 16E
Business Liaison Office 11E
Business Services 19U
Campus Services 20T
Careers Centre 13B
Carslaw Bldg 19L
Cashiers 13A
Central Services 22E
Central Records Office 16E
Centre for Teaching & Learning 19L
Chancellor's Committee Shop 17F
Chaplains' Centre 10G
Chemical Engineering 22Q
Chemistry 17K
Child Cam:
Boundary Lane 16U
Canillon Avenue 9Q
Laurel Tree House (Glebe) 16B
Union (Darlington) 21S
Civil & Mining Engineering 24R
Clark Bldg 17T
Clock Tower 17F
Communication Disorders Cumb
Community & Alumni Relations 16D
Community & Mental Health Nursing Cumb
Community Health Cumb
Community Medicine 15K
Computer Science, Basser Dept 17L
Continuing Education, Centre (or 13B
Coppleson Postgraduate Medical Institute 9K
Counselling Service 13G
Crop Sciences 13F
Darlington House 14S

Development Office 16D
Disability & Welfare Services 13G
Econometrics 17P
Economic History 17P
Economics, Dept & Faculty Office 17P
Edgeworth David Bldg 130
Education Bldg & Faculty Office 13G
Educational Development & Evaluation 15K
Educational Psych., Measurement & Technology 13G
Edward Ford Bldg 15K
Electrical Engineering 24D
Employment Service, Casual 14C
Engineering Faculty Office 25D
English 12E
Equal Employment Opportunity Unit 16S
Evelyn Williams Bldg 6E
Experimental Medicine 7K
External Relations Division 16E
Facilities Planning, Office of 20T
Financial institutions:
Commonwealth 14C
Credit Union 14D
National Australia 15E
National Australia 19N
financial Services Division 16E
Finance, Dept of 16Q
Financial Management & Reporting 13A
Financial Services Division 16E
Fine Arts 15I
Fisher Library 19G
Footbridge Theatre 14C
French Studies 15F
Garage, University 21T
Geography 16Q
Geology & Geophysics 19J
Germanic Studies 15F
Government & Public Administration 17P
Great Hall 18E
Greek, Modern 14F
Griffith Taylor Bldg 14F
Gunn, R.M.C, Bldg 7F
Health Information Management Cumb
Health Sciences Faculty Office Cumb
Health Service (Holme Bldg, Wentworth Bldg) 14C, 19N
History 15G
History & Philosophy of Science 19L
Holme Bldg 14C
Industrial Relations, Dept of 16Q
Infectious Diseases 7K
Information Technology Services 19U
Institute Bldg 16Q
International Office & International Student Services 13A
International House 23L
International Preparation Program 20T
Italian 15I
Koori Centre 12G
Learning Assistance Centre 13G
Linguistics 16J
Link Bldg 25D
Lost Property 14F
Mackie Bldg 13B
MacLaurin Hall 16G
Macleay Bldg SMuseum 16D
Madsen Bldg 17L
Mail Room (Internal) 20T
Main Bldg 17F
Mandelbaum House 18U
Manning House 14H
Margaret Teifer Bldg 13A
Marketing, Dept of 16Q
Marketing & Publications 16E
Mathematics & Statistics 19L
McMaster Laboratory CSIRO 7D
McMillan, J.R.A., Bldg 11C
Mechanical & Aeronautical Engineering Bldg 25N

Mechanical Engineering 25N
Media Office 16E
Medical Radiation Technology Cumb
Medicine 7K
Medicine, Dept of 7K
Medicine Faculty Office 15K
Merewether Bldg 17P
Microbiology 20P
Mills, R.C., Bldg 15
Mungo MacCallum Bldg 15G
Music 24M
Nicholson Museum 16G
Nursing Therapeutics Cumb
Obstetrics & Gynaecology 9K
Occupational Health 15K
Occupational Therapy Cumb
Old Geology Bldg 15D
Old School Bldg 21
Old Teachers' College Bldg 12G
Operations Accounting 13A
Orange Agricultural College OrA
Orthoptics Cumb
Pathology 7K
Personnel Services 13A
Pharmacology 7M
Pharmacy 15
Philosophy 17G
Photowise Imaging 20
Physics 13
Physiology 17
Physiotherapy Cumb
Planning Support Office 16
Post Office 15
Printing Services, University 20
Properties & Investments 13
Psychology 14
Purchasing 13A
Publications Unit 16
Public Health & Community Medicine 15
Quadrangle 17
Queen Elizabeth II Research Institute 9
Regiment, University 14
Religion, School of Studies in 12
Research & Scholarships 16
Revenue Services 13
Risk Management 13
Rose Street Bldg 24
Ross Street Bldg 10
Russell, Peter Nicol, Bldg 23
St Andrew's College 5
St John's College 3
St Paul's College 12
Sancta Sophia College 1
Schools Liaison 12
Science Faculty Office 19
Security & Bldg Services 14
Selle House 10
Semitic Studies 17
Senate Room 17
Services Bldg 20
Seymour Theatre Centre 24
Shepherd St Parking Station 27
Sir Hermann Black Gallery 19
Social & Policy Studies in Education 13
Social Work & Social Policy 1
Sociology 1
Solicitor, University 16
Sports:
Noel Martin Recreation Centre 20
Sports Union 7
Swimming Pool 20
Tennis courts 20
Ward, H.K., Gymnasium 7
Women's Sports Association 1
Statistics Unit 16

