The University of Sydney

Faculty of Science Handbook 1999

The University of Sydney

AUSTRALIA

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New South Wales 2006, Australia
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Last Updated: August, 1998

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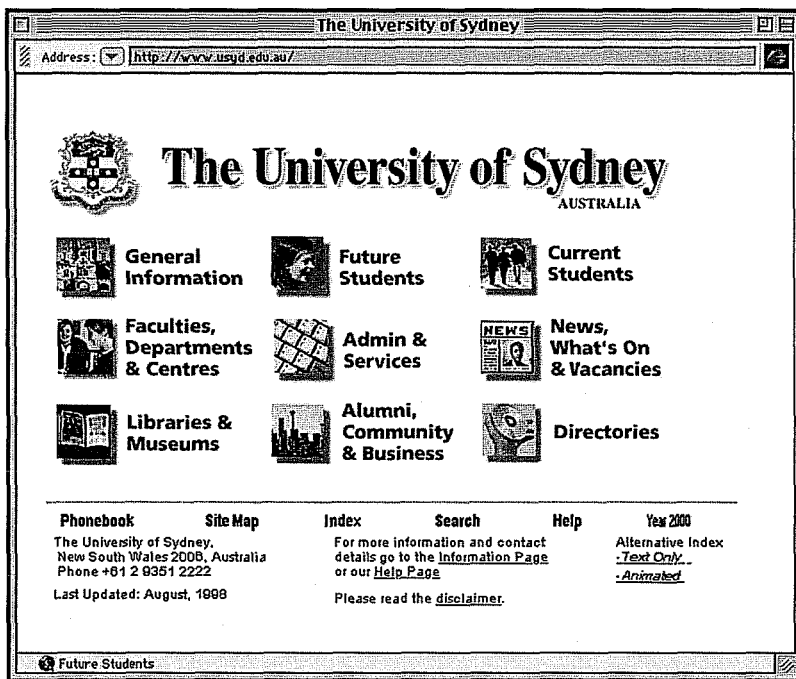
The University's homepage tells you all about courses at Sydney, some careers they can lead to, and what university life is like. The interactive website, with video and sound clips, has links to the University's faculties and departments.

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

Communications should be addressed to:
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Faculty of Science phone: (02) 9351 3021
Faculty of Science fax: (02) 9351 4846

Semester and vacation dates 1999

Academic year information (Academic Board policy and dates 1998-2002) is available at:
http.V/www. usyd. edu. au/su/planning/policy/acad/3_0aca. html

	Day	Date (1999)
First Semester lectures begin	Monday	1 March
Easter recess		
Last day of lectures	Thursday	1 April
Lectures resume	Monday	12 April
Study vacation: 1 week beginning	Monday	14 June
Examinations commence	Monday	21 June
First Semester ends	Saturday	3 July
Second Semester lectures begin	Monday	26 July
Mid-semester recess		
Last day of lectures	Friday	24 September
Lectures resume	Monday	4 October
Study vacation: 1 week beginning	Monday	8 November
Examinations commence	Monday	15 November
Second Semester ends	Saturday	4 December

Last dates for withdrawal or discontinuation 1999

	Day	Date (1999)
Semester 1 Units of Study		
Last day for Withdrawal	Tuesday	30 March
Last day to Discontinue with Permission	Sunday	25 April
Last day to Discontinue	Friday	11 June
Semester 2 Units of Study		
Last day for Withdrawal	Monday	30 August
Last day to Discontinue with Permission	Sunday	12 September
Last day to Discontinue	Friday	5 November
Full Year Units of Study		
Last day for Withdrawal	Tuesday	30 March
Last day to Discontinue with Permission	Friday	30 July
Last day to Discontinue	Friday	5 November

Please note: No discontinuations can be made after 5 November 1999.

Contents

Contents

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 undergraduate 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 (Chapter 8). 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 study in are given at the beginning of the Department's entry in Chapter 5 on units 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.

Should I read the Resolutions?
Definitely. The Resolutions, which control undergraduate and postgraduate degrees, are collected in Chapters 8 and 9 respectively. The information in those Chapters has precedence over all other information in this handbook.

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 'creditpoints'?
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 3 (Junior Mathematics only) 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 'creditpoint'!
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* and *Law, Lawyers and Justice in Australian Society* 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 started 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 emphasizing 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 1999, 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 programs 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 Program provides enormous flexibility in study for students with exceptional ability.

In 1997, the Faculty fully semesterised its courses, increasing the flexibilty for which the Faculty is renowned. Students now have a wide choice of subject options and are able to customise their courses. This choice was 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.

Robert G Hewitt, Dean.

Faculty of Science

Information in this section is accurate as at 31 July 1998.

The Faculty of Science

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http://www.scifac.usyd.edu.au/
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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
Mr Kim P. Schwieters
Faculty Manager
Ms Barbara Chmielewski
Marketing Manager
Ms Adrienne Jerram
Professional Development Course Coordinator
Ms Anne M. Powell
Postgraduate Adviser
vacant
Undergraduate Adviser
Ms Thea Papageorgiou
Faculty Administration Officer
Ms Elisabeth Van de Wetering
Finance Officer
Ms Daniela Viola
Computer Systems Officer
Mr John Twyman
Administrative Assistants
Ms Renee Bartholomeusz
Ms Jasmine Chambers
Ms Lisa N. Jones
Ms Shari Lee
Ms Eva Papas
Ms Sutira Teh

Departments & Schools

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http://www.anatomy.su.oz.au/
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http://www.biochem.usyd.edu.au/
Head of Department: Professor Richard I. Christopherson

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http://www.bio.usyd.edu.au/SOBS/
Head of School: Professor David Joseph Patterson

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Fax:+61 (02)93513329
Email: enquiries@chem.usyd.edu.au
http://www.chem.usyd.edu.au/
Head of School: Professor Leslie D. Field

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Fax:+61 (02)93513838
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Head of Department: Associate Professor Robert J. Kummerfeld

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Email: admin@geosciences.su.oz.au
http://www.es.su.oz.au/ (Geology and Geophysics)
http://www.usyd.edu.au.su/geography/ (Geography)
Head of School: Professor Eric Waddell

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http://www.maths,usyd.edu.au:8000/
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http://www.pharm.usyd.edu.au/
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Head of School: Professor Richard Edward Collins

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Fax:+61 (02)9351 2058
Email: enquiries@physiol.usyd.edu.au
http://www.physiol.su.oz.au/
Head of Department: Associate Professor David Davey

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Fax:+61 (02)9351 2603
Email: hod@psych.su.oz.au
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Head of Department: Professor Stephen Touyz

Units & Centres

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Director: Associate Professor Andrew D. Short

History and Philosophy of Science, F07

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Fax:+61 (02)93514124
Email: hps@scifac.su.oz.au
Director: Dr Paul Griffiths

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Email: i.hopwood@biochem.usyd.edu.au
Boden Professor of Human Nutrition: Professor Ian Douglas Caterson

Institute of Marine Ecology, A11

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Director: Dr Gee Chapman

Marine Studies Centre, F09

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Director: Associate Professor Andrew Short

Ocean Studies Institute, F05

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Fax:+61 (02)93514067
Director: Professor Peter J. Davies

Mathematics Learning Centre, F07

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Email: mlc@mail.usyd.edu.au
http://www.usyd.edu.au/su/mlc/
Director: Ms Jacqueline M. Nicholas

Centre for Research on Ecological Impacts of Coastal Cities, A11

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Director: Professor Antony J. Underwood

Australian Key Centre for Microscopy and Microanalysis, F09

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http://www.kcmm.usyd.edu.au/
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    FRUITFLY/fruitfly.html

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

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 Engineering Science
Nutrition 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), BSc(Molecular Biology and Genetics) and BSc(Nutrition) 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. The Resolutions pertaining to undergraduate award courses are collected in Chapter 8. Postgraduate study is discussed in Chapters 6 and 9.

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, BMedSc, Physiology
Analytical Chemistry *see* Agricultural Chemistry and Soil Science, 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, Biological Sciences, BMedSc, Microbiology
Beach Dynamics *see* Marine Studies, Geography
Biodegradation *see* Microbiology, Agricultural Chemistry and Soil Science
Biological Chemistry *see* Agricultural Chemistry and Soil Science, Biochemistry, Chemistry
Bioremediation *see* Biological Sciences, Microbiology, Agricultural Chemistry and Soil Science
Biotechnology *see* Biochemistry, Biological Sciences, Chemistry, Microbiology, Physiology
Behavioural Genetics *see* Biological Sciences
Behavioural Science *see* Psychology
Biomathematics *see* Mathematics and Statistics
Biophysical Chemistry *see* Biochemistry, Chemistry
Botany *see* Biological Sciences
Carbohydrate Chemistry *see* Agricultural Chemistry and Soil Science, Biochemistry, Chemistry
Catalysis *see* Biochemistry, Chemistry
Category Theory *see* Mathematics and Statistics
Cancer *see* Biochemistry, BMedSc, Cell Pathology, Physiology
Cell Biology *see* Biochemistry, Biological Sciences, BMedSc, Cell Pathology, Histology, Microbiology, Physiology
Chaos *see* Physics, Mathematics and Statistics
Chemotherapy *see* Biochemistry, Chemistry, Microbiology, Pharmacology
Clay Mineralogy *see* Agricultural Chemistry and Soil Science
Coastal Morphodynamics *see* Marine Studies, Geography
Coastal Zone Management *see* Marine Studies, Geography
Cognitive Science *see* Psychology
Colloid Science *see* Chemistry
Communicating Science *see* History and Philosophy of Science
Communications Technology *see* Computer Science
Computational Biology *see* Bioinformatics
Computer-aided Drug Design *see* Biochemistry, BMedSc, Chemistry, Pharmacology
Computational Algebra *see* Mathematics and Statistics
Computational Chemistry *see* Chemistry
Computational Physics *see* Physics
Computer Design *see* Computer Science
Computer Graphics *see* Computer Science
Computer Cartography *see* Geography
Computer Networks *see* Computer Science
Computer Programming *see* Computer Science
Condensed Matter Physics *see* Physics
Conservation *see* Biological Sciences, Geography, Geology and Geophysics
Cosmology *see* Physics, Mathematics and Statistics
Crystallography *see* Biochemistry, Chemistry, Geology and Geophysics
Data Analysis *see* Mathematics and Statistics, Physics
Databases *see* Computer Science
Developmental Biology *see* Biological Sciences, BMedSc, Histology
Dietetics *see* Biochemistry, BMedSc, BSc(Nutrition), Postgraduate study: MNutrSc and MNutrDiet
Disease *see* Biochemistry, BMedSc, Cell Pathology, Microbiology
Drugs *see* Biochemistry, BMedSc, Chemistry, Pharmacology, Pharmacy

DNA Technology *see* Biochemistry, Biological Sciences, BMedSc, Physiology

Earth Evolution *see* Geology and Geophysics, Geography

Ecology *see* Biological Sciences, Microbiology

Economic Geology *see* Geology and Geophysics

Electrochemistry *see* Chemistry

Electromagnetism *see* Physics

Electron Microscopy *see* Histology, Grad Dip (Microscopy and Microanalysis), MSc (Microscopy and Microanalysis), Physics

Embryology see Histology

Endocrinology *see* Biochemistry, BMedSc, Physiology

Energy Conservation *see* Chemistry, Physics

Energy Science *see* Chemistry, Physics

Entomology *see* Biological Sciences

Environmental Pollution *see* Agricultural Chemistry and Soil Science, BSc(Environmental), Chemistry, Geography, Marine Sciences, Microbiology

Environmental Science *see* Agricultural Chemistry and Soil Science, Biological Sciences, BSc (Environmental, Grad Dip (Environmental), MSc (Environmental), Chemistry, Geography, Geology and Geophysics, Microbiology, Physics, Psychology

Enzymes see Agricultural Chemistry and Soil Science, Biochemistry

Epidemiology *see* Mathematics and Statistics, Microbiology

Ergonomics *see* Physiology

Evolution *see* Biological Sciences, Geology and Geophysics

Expert Systems *see* Computer Science

Fish Biology *see* Biological Sciences

Fisheries Biology *see* Marine Sciences

Fluvial Systems *see* Geography

Food Science *see* Agricultural Chemistry and Soil Science, Biochemistry, Chemistry, Microbiology, BSc(Nutrition), Postgraduate study: MNutrSc and MNutrDiet

Forensic Science *see* Biochemistry, BMedSc, Chemistry

Fungal Biology *see* Biological Sciences

General Relativity *see* Physics, Mathematics and Statistics

Genetics *see* Biochemistry, Biological Sciences, BMedSc, BSc (Molecular Biology and Genetics), Cell Pathology, Microbiology

Genetic Engineering *see* Biochemistry, Biological Sciences, BMedSc, BSc (Molecular Biology and Genetics), Microbiology

Geochemistry *see* Chemistry, Geography, Geology and Geophysics

Geographical Information Systems (GIS) *see* Agricultural Chemistry and Soil Science, Geography

Geomagnetism *see* Mathematics and Statistics

Geometry *see* Mathematics and Statistics

Geomorphology *see* Geography

Geostatistics see Agricultural Chemistry and Soil Science, Mathematics and Statistics

Geophysics *see* Geology and Geophysics

Haematology *see* Histology, BMedSc

Histochemistry *see* Histology, BMedSc

History of Science *see* BMedSc, History and Philosophy of Science

Human Life Sciences *see* Anatomy, Biochemistry, BMedSc, Cell Pathology, Histology, Physiology

Human Nutrition *see* Biochemistry, Master of Nutritional Science, Master of Nutrition and Dietetics

Hydrology *see* Agricultural Chemistry and Soil Science, BSc (Environmental), Geography

Image Processing *see* Physics

Immunology *see* Biochemistry, Biological Sciences, BMedSc, Cell Pathology

Industrial Chemistry *see* Chemistry

Infectious Diseases *see* BMedSc, Cell Pathology, Microbiology

Inflammation *see* Cell Pathology

Information Technology *see* Computer Science

Instrumentation *see* Physics

Inorganic Chemistry *see* Chemistry

Intertidal Ecology *see* Biological Sciences, Marine Sciences

Invertebrate Zoology *see* Biological Sciences

Land Resources *see* Agricultural Chemistry and Soil Science, Geography

Lasers see Physics

Macromolecular Structure *see* Biochemistry

Magnetic Resonance see Chemistry

Imaging see Biochemistry, BMedSc

Mammalian Biology *see* Biological Sciences

Marine Biology *see* Biological Sciences, Marine Studies

Marine Ecology *see* Biological Sciences, Marine Sciences

Marine Geology *see* Geology and Geophysics

Marine Geophysics *see* Geology and Geophysics

Marine Science see Biological Sciences, Chemistry, Geography, Geology and Geophysics, Marine Studies

Materials Science see Chemistry, Physics

Mathematical Modeling see Mathematics and Statistics, Physics

Mathematical Statistics see Mathematics and Statistics

Measurement Science see Physics

Medicinal Chemistry *see* Chemistry, Pharmacology, Pharmacy

Medical Biochemistry see Biochemistry, BMedSc, BSc (Molecular Biology and Genetics)

Medical Microbiology *see* BMedSc, Microbiology

Medical Molecular Biology *see* Biochemistry, Microbiology, BMedSc, BSc (Molecular Biology and Genetics

Membrane Biology *see* Biological Sciences

Metabolism see Agricultural Chemistry and Soil Science, Biochemistry, Biological Sciences, BMedSc, Microbiology

Microanalysis *see* Chemistry, Physics, Grad Dip (Microscopy and Microanalysis), MSc (Microscopy and Microanalysis)

Microscopy *see* Agricultural Chemistry and Soil Science, Biological Sciences, BMedSc, Histology, Microbiology, Physics, Grad Dip (Microscopy and Microanalysis), MSc (Microscopy and Microanalysis)

Microtechniques *see* Histology, BMedSc

Mineralogy see Geology and Geophysics

Mineral Physics see Geology and Geophysics

Molecular Biology *see* Biochemistry, Biological Sciences, BMedSc, BSc (Molecular Biology and Genetics), Cell Pathology, Chemistry, Microbiology, Physiology

Molecular Engineering see Chemistry

Molecular Genetics see Biochemistry, Biological Sciences, BMedSc, BSc (Molecular Biology and Genetics)

Molecular Modeling *see* Chemistry, Pharmacology

Molecular Physics see Physics

Morphology see BMedSc

Muscle see Cell Pathology

Mycology *see* Biological Sciences, BMedSc

Natural Hazards see Geography, Geology and Geophysics

Natural Products Chemistry *see* Agricultural Chemistry and Soil Science, Chemistry

Neural Networks see Mathematics and Statistics, Physiology, BMedSc

Neuroanatomy *see* BMedSc

Neurochemistry see Pharmacology

Neurophysiology see BMedSc, Physiology, Anatomy

Neuroscience *see* Anatomy, BMedSc, Physiology, Psychology

Nitrogen Fixation *see* Agricultural Chemistry and Soil Science, Chemistry, Microbiology

Nonlinear Analysis *see* Mathematics and Statistics

Nuclear Magnetic Resonance (NMR) *see* Chemistry, Biochemistry

Nuclear Physics see Physics

Nutrition see Biochemistry, BMedSc, Postgraduate study MNutrSc and MNutrDiet

Oceanography *see* Biological Sciences, Geology and
   Geophysics, Marine Studies
Optics *see* Physics
Organic Chemistry *see* Chemistry
Organometallic Chemistry *see* Chemistry
Paleontology *see* Geology and Geophysics
Parasitology see BMedSc
Pathogenicity *see* Microbiology.
Pedogeomorphology *see* Geography
Pedology *see* Agricultural Chemistry and Soil Science
Pesticide Chemistry *see* Agricultural Chemistry and Soil
   Science, Chemistry
Petrochemicals *see* Chemistry
Petroleum Geology *see* Geology and Geophysics
Petrology *see* Geology and Geophysics
Pharmaceutical Chemistry *see* Chemistry, Pharmacy
Philosophy of Science *see* History and Philosophy of Science
Photonics see Physics
Phycology see Biological Sciences
Physical Chemistry *see* Chemistry
Plant Management *see* Biological Sciences
Plant Metabolism see Agricultural Chemistry and Soil
   Science, Biological Sciences
Plant Molecular Biology *see* Biological Sciences
Plant Physiology *see* Biological Sciences
Plant Science *see* Biological Sciences
Plasma Physics *see* Physics
Plate Tectonics *see* Geology and Geophysics
Polymer Science *see* Chemistry
Programming *see* Computer Science
Proteins *see* Biochemistry, Chemistry
Protozoology *see* Biological Sciences
Public Health see BMedSc
Pure Mathematics *see* Mathematics and Statistics
Quantum Mechanics *see* Chemistry, Physics
Recombinant DNA Technology *see* Biochemistry,
   Biological Sciences, BMedSc, BSc (Molecular Biology
   and Genetics), Microbiology
Resource Management *see* Geography
River Systems *see* BSc (Environmental), Geography
Robotics *see* Computer Science
Scientific Revolution see History and Philosophy of Science
Sedimentology *see* Geography, Geology and Geophysics,
   Marine Studies
Social Relations of Science *see* History and Philosophy of
   Science
Software Engineering *see* Computer Science
Soil Chemistry *see* Agricultural Chemistry and Soil Science
Soil Physics *see* Agricultural Chemistry and Soil Science
Soil Science *see* Agricultural Chemistry and Soil Science
Solar Physics *see* Physics
Solid State Chemistry *see* Chemistry
Solid State Physics *see* Physics
Solid State Science *see* Chemistry, Physics
Spectroscopy *see* Chemistry, Physics
Statistics *see* Mathematics and Statistics
Structural Geology *see* Geology and Geophysics
Surface Science *see* Chemistry, Physics
Systems Analysis *see* Computer Science
Therapeutics see BMedSc, Pharmacology
Theoretical Chemistry *see* Chemistry
Theoretical Physics *see* Physics
Thermal Physics *see* Physics
Toxicology *see* Chemistry, Pharmacology, Pharmacy
Vertebrate Zoology *see* Biological Sciences
Virology *see* BMedSc, BSc (Molecular Biology and
   Genetics), Microbiology
Volcanology *see* Geology and Geophysics
X-Ray Crystallography *see* Chemistry
Zoology see Biological Sciences

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 units 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-DrAlanFekete
BSc(Nutrition) - Associate Professor Jennie Brand Miller

Departmental advisers

Agricultural Chemistry
Associate Professor Les Copeland, Dr Edith M. Lees
Anatomy
Dr John Mitrofanis, Dr Jan Provis
Biochemistry
Intermediate yean Dr Gareth S. Denyer
Senior year: Dr Simon B. Easterbrook-Smith
4th year: Dr Ivan G. Darvey, Dr Merlin Crossley
Biological Sciences
Junior yean Dr Mary Peat
Intermediate year: Dr Jan Marc, Dr Kathy Raphael,
   Dr Michael Thompson, Professor Tony Larkum
Senior year: Associate Professor Bill Allaway, Dr Murray
   Henwood, Professor Ian Hume, Dr Bruce Lyon, Dr Alan
   Meats, Dr Ben Oldroyd
4th yean Dr Chris Dickman
Cell Pathology
Professor Nicholas Hunt, Dr Nicholas King
Chemistry
Junior yean Dr Julia James
Intermediate year: Dr Greg Wan-
Senior yean Associate Professor Trevor Hambley
4th year: Associate Professor Tony Masters
Computer Science
Undergraduate (Junior, Intermediate & Senior years):
   Dr Jeff Kingston
4th year: Dr Michael Wise
Master of Information Technology: Dr Alan Fekete
Course Committee & International Students: Dr Doan Hoang
Research Committee (Research Students): Dr Alan Fekete
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 yean 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
Associate Professor 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 C Macaskill (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 yean 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.

Agricultural Chemistry[1]
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 Pathology[2]
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 +
Mathematics + 24 credit points from other areas 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 1001 + MATH 1002 +
MATH 1004 + (MATH 1003 or MATH 1005) + 24 credit
points of other Junior units of study. (Each of the above units
of study can be replaced by the corresponding Advanced unit
of study.).

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 Sciences'
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 1001 or 1901 + MATH 1002 or 1902 + MATH 1003 or
1903 + MATH 1005 or 1905 + 36 other Junior credit points.

Mathematics
MATH 1001 or 1901 + MATH 1002 or 1902 + MATH 1003 or
1903 + MATH 1004 or 1904 or 1005 or 1905 + 36 other
Junior credit points.

Mechanical 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 MATH 1001 or 1011 or 1901 + MATH
1002 or 1012 or 1902 + MATH 1003 or 1013 or 1903 +
MATH 1005 or 1015 or 1905.

1. Major subject beginning at Intermediate level
2. Major subject beginning at Senior level

Pharmacology[1]
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 1001 or 1901 + MATH 1002 or 1902 + MATH 1003 or 1903 + MATH 1005 or 1905 + 12 credit points of other Junior units of study selected in consultation with an adviser.

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

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.

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 and BCST(Adv)), Bachelor of Psychology (BPsych), the specially designated Bachelor of Science degree programs of Advanced, Advanced Mathematics, Bioinfoimatics, Environmental, Molecular Biology and Genetics and Nutritional Science, and the combined degrees of BSc/BCom, BSc/LLB, BA/BSc, BSc/BA, BSc/BE and BSc/MBBS. The courses for the pass BSc (which includes the Advanced, Advanced Mathematics, Bioinfoimatics, 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, BE/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. The information in this Chapter is in summary form and is subordinate to the provisions of the relevant degree Resolutions, collected in Chapter 8.

Restrictions (general)

(1) A candidate for a degree must satisfy the minimum eligibility requirements before commencing the degree units of study. Units of study taken before satisfying these requirements cannot normally be counted for degree purposes.

(2) A candidate may not take a unit of study in any subject without having previously completed the qualifying unit(s) of study appropriate to that subject. Except with the permission of the Head of Department, he or she must also complete the prerequisites and corequisites as prescribed.

(3) The only combinations of units of study available are those permitted by the timetable. A candidate may attend evening units of study if they are available.

Time limits

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

Suspension

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

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

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
PCON	Concessional Pass*	46-49
F	Fail	Below 46 or 50
AF	Absent Fail	

*A Concessional Pass does not apply for units of study in the Bachelor of Pharmacy degree. A maximum of 28 credit points or equivalent may be counted for all degrees, except BMedSc wliere the maximum is 16 credit points.

For Final Year Honours units of study, the following Honours grades apply from 1999. A grade of Honours is determined by a combination of WAM for years 1-3 and final year mark.

HI	Honours Class I	80+
H21	Honours Class II (Division 1)	75-79
H22	Honours Class II (Division 2)	70-74
H3	Honours Class III	65-69
F	Fail*	below 65
AF	Absent Fail*	

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

Boards of examiners

Boards of examiners formally determine undergraduate results. The University's *Calendar 1998, 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 counseling 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 1998, Vol. I, Statutes and Regulations.* Attention is drawn in particular to Regulations 18 and 19 specifically concerned with the Faculty of Science, and to those headed 'Students in all Faculties and Boards of Studies'.

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

Discontinuation of enrolment and re-enrolment after discontinuation -undergraduate

All Faculties[1] 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 Faculties[1] 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-enrolment[1]

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.
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.

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

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 chapter 8) 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), in Chapter 8).
- 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 without permission.
- before being permitted to enrol in a unit of study, you have to meet any prerequisites and corequisites for that unit of study.
- 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 code. 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. Daytime 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 1998, 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.

Universities Admissions Index (UAI)

The minimum UAI 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.

BSc Degree Resolutions

See Chapter 8.

Table I: Bachelor of Science (see section 3)

(a) (b) Unit of Study	(c) Credit Points	(d)/(c) A) Assumed Knowledge P) Prerequisite & Qualifying C) Corequisite N) Prohibitions and other information	(0 Offered

A. Junior Units of Study

■ Biology

BIOL 1001	Concepts in Biology	6	A) Biology section of the HSC 4-unit Science course. N) May not be counted with Biology 1901	*March*
BIOL 1901	Concepts in Biology (Advanced)	6	A) Biology section of the HSC 4-unit Science course. P) Prerequisite: UAI of at least 93, or at least 75% in HSC 2-unit Biology or equivalent, or by invitation on the basis of the result for Biology 1002, 1902, 1003, 1903. N) May not be counted with Biology 1001	*March*
BIOL 1002	Living Systems	6	A) Biology section of the HSC 4-unit Science course. N) May not be counted with Biology 1902	*July*
BIOL 1902	Living Systems (Advanced)	6	A) Biology section of the HSC 4-unit Science course. P) Prerequisite: UAI of at least 93, or at least 80% in HSC 2-unit Biology or equivalent, or by invitation on the basis of the result for Biology 1001 or 1901. N) May not be counted with Biology 1002	*July*
BIOL 1003	Human Biology	6	A) Biology section of the HSC 4-unit Science course. N) May not be counted with Biology 1903	*July*
BIOL 1903	Human Biology (Advanced)	6	A) Biology section of the HSC 4-unit Science course. P) Prerequisite: UAI of at least 93, or at least 80% in HSC 2-unit Biology or equivalent, or by invitation on the basis of the result for Biology 1001 or 1901. N) May not be counted with Biology 1003	*July*

■ Chemistry

CHEM 1001	Introductory Chemistry 1A	6	A) There is no assumed knowledge of chemistry for this unit of study, but students who have not undertaken an HSC chemistry course are strongly advised to complete a chemistry bridging course before lectures commence. N) May not be counted with Chemistry 1101 or 1901 or 1903	*March*
CHEM 1002	Introductory Chemistry 1B	6	P) Prerequisite: Chemistry 1001 or equivalent. N) May not be counted with Chemistry 1102 or 1902 or 1904	*July*
CHEM 1101	Chemistry 1A	6	A) HSC Mathematics 2 unit course; and the Chemistry component of the 4-unit or 3-unit HSC Science course, or 2-unit Chemistry. C) Recommended concurrent unit of study: Preferred - Mathematics 1001 and 1002 or 1901 and 1902; otherwise - Mathematics 1011 and 1012. N) May not be counted with Chemistry 1001 or 1901 or 1903.	*March & July*
CHEM 1102	Chemistry IB	6	P) Qualifying: Chemistry 1101 or a Distinction in Chemistry 1001 or equivalent. C) Recommended concurrent unit of study: Preferred - Mathematics 1003 and 1005 or 1003 and 1004 or 1903 and 1905 or 1903 and 1904; otherwise- Mathematics 1004 and 1005 or 1013 and 1015. N) May not be counted with Chemistry 1002 or 1902 or 1904.	*March & July*
CHEM 1901	Chemistry 1A (Advanced)	6	P) Prerequisite: UAI of at least 92.5 and at least 75% in HSC 2-unit Chemistry or equivalent; by invitation. C) Recommended concurrent unit of study: Preferred - Mathematics 1001 and 1002 or 1901 and 1902; otherwise - Mathematics 1011 and 1012. N) May not be counted with Chemistry 1001 or 1101 or 1903.	*March*
CHEM 1902	Chemistry IB (Advanced)	6	P) Qualifying: Chemistry 1901 or 1903 or Distinction in Chemistry 1101 or equivalent; by invitation. C) Recommended concurrent unit of study: Preferred — Mathematics 1003 and 1005 or 1003 and 1004 or 1903 and 1905 or 1903 and 1904, otherwise — Mathematics 1013 and 1015 or 1004 and 1005. N) May not be counted with Chemistry 1002 or 1102 or 1904.	*July*
CHEM 1903	Chemistry IA (Special Studies Program)	6	P) Prerequisite: UAI of at least 98.7 and at least 85% in HSC 2-unit Chemistry or equivalent. Entry is by invitation. C) Recommended concurrent unit of study: Preferred — Mathematics 1001 and 1002 or 1901 and 1902; otherwise — Mathematics 1011 and 1012. Students in the Faculty of Science Talented Students Program arc automatically eligible. For the purpose of Resolution 11 this unit of study is deemed to be designated as an Advanced unit of study. N) May not be counted with Chemistry 1001 or 1101 or 1901.	*March*

Table I: Bachelor of Science (see section 3) - continued

(a) Unit of Study	(b)	(c) Credit Points	(d)/(c) A) Assumed Knowledge P) Prerequisite & Qualifying C) Corequisite N) Prohibitions and other information	(0 Offered
CHEM 1904	Chemistry 1B (Special Studies Program)	6	P) Prerequisite: Distinction in Chemistry 1903; by invitation. C) Recommended concurrent unit of study: Preferred — Mathematics 1003 and 1005 or 1003 and 1004 or 1903 and 1905 or 1903 and 1904; otherwise — Mathematics 1013 and 1015 or 1004 and 1005. N) May not be counted with Chemistry 1002 or 1102 or 1902.	*July*

■ Computer Science

COMP 1000	Information Technology Tools	6		*March & July*
COMP 1001	Introductory Programming	6	A) HSC 3-unit Mathematics. C) Students intending to major in Computer Science arc advised to enrol in Mathematics 1003 and 1004 or 1004 and 1005 or 1903 and 1904 or 1904 and 1905 in their first year. N) May not be counted with Computer Science 1901.	*March & July*
COMP 1901	Introductory Programming (Advanced)	6	A) HSC 3-unit Mathematics (Requires permission by the Head of Department). N) May not be counted with Computer Science 1001	*March & July*
COMP 1002	Introductory Computer Science	6	P) Prerequisite: Computer Science 1001 or 1901. N) May not be counted with Computer Science 1902	*March & July*
COMP 1902	Introductory Computer Science (Advanced)	6	P) Prerequisite: Distinction in Computer Science 1901 or 1001. N) May not be counted with Computer Science 1002	*March & July*

■ Geography

GEOG 1001	Biophysical Environments	6		*March*
GEOG 1002	Human Environments	6		*July*

■ Geology

GEOL 1001	Earth and Its Environment	6	A) No previous knowledge of Geology assumed. P) See prerequisites for Intermediate Geology.	*March*
GEOL 1002	Earth Processes and Resources	6	A) No previous knowledge of Geology assumed.	*July*

■ Mathematics

MATH 1011	Life Sciences Calculus	3	A) HSC 2-unit Mathematics. N) May not be counted with Mathematics 1901 or 1001. May not be counted by students enrolled in the BSc/BCom combined award course.	*March*
MATH 1012	Life Sciences Algebra	3	A) HSC 2-unit Mathematics. N) May not be counted with Mathematics 1002 or 1902. May not be counted by students enrolled in the BSc/BCom combined award course.	*July*
MATH 1013	Life Sciences Difference and Differential Equations	3	A) HSC 2-unit Mathematics. N) May not be counted with Mathematics 1003 or 1903. May not be counted by students enrolled in the BSc/BCom combined award course.	*July*
MATH 1015	Life Sciences Statistics	3	A) HSC 2-unit Mathematics. N) May not be counted with Mathematics 1905 or 1005. May not be counted by students enrolled in the BSc/BCom combined award course.	*March*
MATH 1001	Differential Calculus	3	A) HSC 3-unit Mathematics. N) May not be counted with Mathematics 1901 or 1011	*March*
MATH 1002	Linear Algebra	3	A) HSC 3-unit Mathematics. N) May not be counted with Mathematics 1902 or 1012	*March*
MATH 1003	Integral Calculus and Modelling	3	A) HSC 4-unit Mathematics or Mathematics 1001. N) May not be counted with Mathematics 1903 or 1013	*July*
MATH 1004	Discrete Mathematics	3	A) HSC 3-unit Mathematics. N) May not be counted with Mathematics 1904	*July*
MATH 1005	Statistics	3	A) HSC 2-unit Mathematics. N) May not be counted with Mathematics 1905 or 1015	*July*
MATH 1901	Differential Calculus (Advanced)	3	A) HSC 4-unit Mathematics or top decile 3-unit Mathematics. N) May not be counted with Mathematics 1001 or 1011	*March*

Table 1: Bachelor of Science (seei section 3) - continued

(a) (b) Unit of Study		(c) Credit Points	(dV(c) A) Assumed Knowledge P) Prerequisite & Qualifying C) Corequisite N) Prohibitions and other information	(0 Offered
MATH 1902	Linear Algebra (Advanced)	3	A) HSC 4-unit Mathematics or top decile 3-unit Mathematics. N) May not be counted with Mathematics 1002 or 1012	*March*
MATH 1903	Integral Calculus and Modelling (Advanced)	3	A) HSC 4-unit Mathematics or Mathematics 1901. N) May not be counted with Mathematics 1003 or 1013	*July*
MATH 1904	Discrete Mathematics (Advanced)	3	A) HSC 4-unit Mathematics or top decile 3-unit Mathematics. N) May not be counted with Mathematics 1004	*July*
MATH 1905	Statistics (Advanced)	3	A) HSC 3-unit Mathematics (50 percentile). N) May not be counted with Mathematics 1005 or 1015	*July*

■ Physics

PHYS 1001	Physics (Regular)	6	A) HSC Physics or HSC 4-unit Science. P) See prerequisites for Intermediate Physics units of study. C) Recommended concurrent units of study: Mathematics 1001 and 1002 or 1901 and 1902. N) May not be counted with Physics 1002 or 1901.	*March*
PHYS 1002	Physics (Fundamentals)	6	A) No assumed knowledge of Physics. P) See prerequisites for Intermediate Physics units of study. C) Recommended concurrent unit of study: Mathematics 1001 and 1002 or 1901 and 1902. N) May not be counted with Physics 1001 or 1901.	*March*
PHYS 1901	Physics (Advanced) A	6	P) Prerequisite: UAI 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. See prerequisites for Intermediate Physics units of study. C) Recommended concurrent unit of study: Mathematics 1001 and 1002 or 1901 and 1902. N) May not be counted with Physics 1001 or 1002.	*March*
PHYS 1003	Physics (Technological)	6	A) HSC 2-unit Physics or HSC 4-unit Science or Physics 1001 or 1002 or 1902 or equivalent. P) See prerequisites for Intermediate Physics units of study. C) Recommended concurrent unit of study: Mathematics 1003 and 1005 or 1903 and 1905. N) May not be counted with Physics 1004 or 1902.	*March & July*
PHYS 1004	Physics (Environmental and Life Sciences)	6	A) HSC 2-unit Physics or HSC 4-unit Science or Physics 1001 or 1002 or 1901 or equivalent. P) See prerequisites for Intermediate Physics units of study. C) Recommended concurrent unit of study: Mathematics 1003 and 1005 or 1903 and 1905. N) May not be counted with Physics 1003 or 1902.	*July*
PHYS 1500	Astronomy	6	A) No assumed knowledge of Physics.	*July*
PHYS 1902	Physics (Advanced) B	6	P) Prerequisite: UAI 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. Sec prerequisites for Intermediate Physics units of study. C) Recommended concurrent unit of study: Mathematics 1003 and 1005 or 1903 and 1905. N) May not be counted with Physics 1003 or 1004.	*July*

■ Psychology

PSYC 1001	Psychology I00l	6		*March*
PSYC 1002	Psychology 1002	6		*July*

B. Intermediate Units of Study
■ Agricultural Chemistry

AGCH 2001	Molecular Processes in Ecosystems	8	P) Qualifying: Chemistry 1002 or equivalent. Prerequisite: Biology 1002 or 1902 Students who have not satisfied the prerequisites in Biology may enrol with Soil Science 2001 as a corequisite. N) May not be counted with any Intermediate unit of study in Biochemistry.	*March*

Table 1: Bachelor of Science (sees section 3) - continued

(a) Unit of Study	(c) Credit Points	(d)/(c) A) Assumed Knowledge P) Prerequisite & Qualifying C) Corequisite N) Prohibitions and other information	(0 Offered
■ Anatomy and Histology			
ANAT 2001 Principles of Histology	4	P) Prerequisite: 12 credit points of Junior Biology or Junior Psychology.	*March*
ANAT 2002 Comparative Primate Anatomy	4	P) Prerequisite: 12 credit points of Junior Biology or Junior Psychology.	*July*
■ Biochemistry			
BCHM 2001 Genes and Proteins	8	P) Qualifying: 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. N) May not be counted with Agricultural Chemistry 2001 or Biochemistry 2101 or 2901	*March*
BCHM 2002 Molecules, Metabolism and Cells	8	P) Qualifying: Biochemistry 2001 or 2901. N) May not be counted with Agricultural Chemistry 2001 or Biochemistry 2102 or 2902	*July*
BCHM 2101 Genes and Proteins Theory	4	P) Qualifying: 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. N) May not be counted with Agricultural Chemistry 2001 or Biochemistry 2101 or 2901	*March*
BCHM 2102 Molecules, Metabolism and Cells Theory	4	P) Qualifying: Biochemistry 2001, 2101 or 2901. N) May not be counted with Agricultural Chemistry 2001 or Biochemistry 2102 or 2902	*July*
BCHM 2901 Genes and Proteins (Advanced)	8	P) Qualifying: 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. N) May not be counted with Agricultural Chemistry 2001 or Biochemistry 2101 or 2901	*March*
BCHM 2902 Molecules, Metabolism and Cells (Advanced)	8	P) Qualifying: Biochemistry 2001 or 2901 (selected students). N) May not be counted with Agricultural Chemistry 2001 or Biochemistry 2102 or 2902	*July*
■ Biology			
BIOL 2001 Animals A	8	A) The content of Biology 1002/1902 is assumed knowledge and students entering from Biology 1003 or 1903 will need to do some preparatory reading. Sec prerequisites for Senior units of study in Biology. P) Qualifying: Biology 1001 or 1901 and one of Biology 1002, 1902, 1003, 1903. Prerequisite: Chemistry 1102 or 1902 or 1904 or (with the permission of the Head of School) exceptional performance in Chemistry 1002. N) May not be counted with Biology 2101 or 2901.	*March*
BIOL 2901 Animals A (Advanced)	8	A) The content of Biology 1002/1902 is assumed knowledge and students entering from Biology 1003 or 1903 will need to do some preparatory reading. P) Qualifying: Distinction average in Biology 1001 or 1901 and one of Biology 1002, 1902, 1003, 1903. These requirements may be varied and students with lower averages should consult the School's Executive Officer. Prerequisite: Chemistry 1102 or 1902 or 1904 or (with the permission of the Head of School) exceptional performance in Chemistry 1002. N) May not be counted with Biology 2001 or 2101. Sec prerequisites for Senior units of study in Biology	*March*
BIOL 2101 Animals A — Theory	4	A) The content of Biology 1002/1902 is assumed knowledge and students entering from Biology 1003 or 1903 will need to do some preparatory reading. P) Qualifying: Biology 1001 or 1901 and one of Biology 1002, 1902, 1003, 1903. N) May not be counted with Biology 2001 or 2901. Not a prerequisite for Senior units of study in Biology.	*March*
BIOL 2002 Animals B	8	A) The content of Biology 1002/1902 is assumed knowledge and students entering from Biology 1003 or 1903 will need to do some preparatory reading. Sec prerequisites for Senior units of study in Biology. P) Qualifying: Biology 1001 or 1901 and one of Biology 1002, 1902, 1003, 1903. Prerequisite: Chemistry 1102 or 1902 or 1904 or (with the permission of the Head of School) exceptional performance in Chemistry 1002. N) May not be counted with Biology 2102 or 2902.	*July*

Table I: Bachelor of Science (see section 3) - continued

(a) Unit of Study	(b)	(e) Credit Points	(d)/(e) A) Assumed Knowledge P) Prerequisite & Qualifying C) Corequisite N) Prohibitions and other information	(f) Offered
BIOL 2902	Animals B (Advanced)	8	A) The content of Biology 1002/1902 is assumed knowledge and students entering from Biology 1003 or 1903 will need to do some preparatory reading.	*July*
			P) Qualifying: Distinction average in Biology 1001 or 1901 and one of Biology 1002, 1902, 1003, 1903. These requirements may be varied and students with lower averages should consult the School'sExccutivc Officer. Prerequisite: Chemistry 1102 or 1902 or 1904 or (with the permission of the Head of School) exceptional performance in Chemistry 1002.	
			N) May not be counted with Biology 2002 or 2102. Sec prerequisites for Senior units of study in Biology	
BIOL 2102	Animals B — Theory	4	A) The content of Biology 1002/1902 is assumed knowledge and students entering from Biology 1003 or 1903 will need to do some preparatory reading.	*July*
			P) Qualifying: Biology 1001 or 1901 and one of Biology 1002, 1902, 1003, 1903.	
			N) May not be counted with Biology 2002 or 2902. Not a prerequisite for Senior units of study in Biology	
BIOL 2003	Plant Anatomy and Physiology	8	A) The content of Biology 1002/1902 is assumed knowledge and students entering from Biology 1003 or 1903 will need to do some preparatory reading. Sec prerequisites for Senior units of study in Biology.	*March*
			P) Qualifying: Biology 1001 or 1901 and one of Biology 1002, 1902, 1003, 1903.	
			N) May not be counted with Biology 2903.	
BIOL 2903	Plant Anatomy and Physiology (Advanced)	8	A) The content of Biology 1002/1902 is assumed knowledge and students entering from Biology 1003 or 1903 will need to do some preparatory reading.	*March*
			P) Qualifying: Distinction average in Biology 1001 or 1901 and one of Biology 1002, 1902, 1003, 1903. These requirements may be varied and students with lower averages should consult the School's Executive Officer.	
			N) May not be counted with Biology 2003. Sec prerequisites for Senior units of study in Biology	
BIOL 2004	Plant Ecology and Diversity	8	A) The content of Biology 1002/1902 is assumed knowledge and students entering from Biology 1003 or 1903 will need to do some preparatory reading. See prerequisites for Senior units of study in Biology.	*July*
			P) Qualifying: Biology 1001 or 1901 and one of Biology 1002, 1902, 1003, 1903.	
			N) May not be counted with Biology 2904.	
BIOL 2904	Plant Ecology and Diversity (Advanced)	8	A) The content of Biology 1002/1902 is assumed knowledge and students entering from Biology 1003 or 1903 will need to do some preparatory reading.	*July*
			P) Qualifying: Distinction average in Biology 1001 or 1901 and one of Biology 1002, 1902, 1003, 1903. These requirements may be varied and students with lower averages should consult the School's Executive Officer.	
			N) May not be counted with Biology 2004. Sec prerequisites for Senior units of study in Biology	
BIOL 2005	Molecular and General Genetics	8	P) Qualifying: Biology 1001 or 1901 and one of Biology 1002, 1902, 1003, 1903. Prerequisite: 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 arc highly recommended.	*July*
			N) May not be counted with Biology 2105 or 2905. Sec prerequisites for Senior units of study in Biology.	
BIOL 2905	Molecular and General Genetics (Advanced)	8	P) Qualifying: Distinction average in Biology 1001 or 1901 and one of Biology 1002, 1902, 1003, 1903. These requirements may be varied and students with lower averages should consult the School's Executive Officer. Prerequisite: 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 arc highly recommended.	*July*
			N) May not be counted with Biology 2005 or 2105. Sec prerequisites for Senior units of study in Biology	
BIOL 2105	Molecular and General Genetics — Theory	4	P) Qualifying: Biology 1001 or 1901 and one of Biology 1002, 1902, 1003, 1903. Prerequisite: Chemistry 1102 or 1902 or 1904 or (with the permission of the Head of School) exceptional performance in Chemistry 1002.	*July*
			N) May not be counted with Biology 2005 or 2905. Not a prerequisite for Senior units of study in Biology	
BIOL 2006	Cell Biology	8	P) Qualifying: Biology 1001 or 1901 and one of Biology 1002, 1902, 1003, 1903. Prerequisite: Chemistry 1102 or 1902 or 1904 or (with the permission of the Head of School) exceptional performance in Chemistry 1002.	*March*
			N) May not be counted with Biology 2106 or 2906. Sec prerequisites for Senior units of study in Biology	

Table I: Bachelor of Science (see section 3) - continued

(a) Unit of Study		(c) Credit Points	(d)/(e) A) Assumed Knowledge P) Prerequisite & Qualifying C) Corequisite N) Prohibitions and other information		(f) Offered
BIOL 2906	Cell Biology (Advanced)	8	P)	Qualifying: Distinction average in Biology 1001 or 1901 and one of Biology 1002, 1902, 1003, 1903. These requirements may be varied and students with lower averages should consult the School's Executive Officer. Prerequisite: Chemistry 1102 or 1902 or 1904 or (with the permission of the Head of School) exceptional performance in Chemistry 1002.	*March*
			N)	May not be counted with 2006 or 2106. See prerequisites for Senior units of study in Biology	
BIOL 2106	Cell Biology — Theory	4	P)	Qualifying: Biology 1001 or 1901 and one of Biology 1002, 1902, 1003, 1903. Prerequisite: Chemistry 1102 or 1902 or 1904 or (with the permission of the Head of School) exceptional performance in Chemistry 1002.	*March*
			N)	May not be counted with Biology 2006 or 2906. Not a prerequisite for Senior units of study in Biology	
BIOL 2007	Introductory Entomology	8	A)	The content of Biology 1002/1902 is assumed knowledge and students entering from Biology 1003 or 1903 will need to do some preparatory reading. Sec prerequisites for Senior units of study in Biology.	*July*
			P)	Qualifying: Biology 1001 or 1901 and one of Biology 1002, 1902, 1003, 1903. Prerequisite: Chemistry 1102 or 1902 or 1904 or (with the permission of the Head of School) exceptional performance in Chemistry 1002.	

■ Chemistry

(a) Unit of Study		(c) Credit Points	(d)/(e)		(f) Offered
CHEM 2001	Chemistry 2 (Life Sciences)	8.	P)	Qualifying: Chemistry 1102 or 1902 or 1904. Prerequisite: 6 credit points of Junior Mathematics.	*March*
			N)	May not be counted with Chemistry 2101 or 2301 or 2502 or 2901	
CHEM 2101	Chemistry 2 (Environmental)	8	P)	Qualifying: Chemistry 1102 or 1902 or 1904. Prerequisite: 6 credit points of Junior Mathematics.	*March*
			N)	May not be counted with Chemistry 2001 or 2301 or 2502 or 2901	
CHEM 2202	Chemistry 2 (Principles)	8	P)	Prerequisite: Chemistry 2001 or 2101 or 2301 or 2502 or 2901.	*July*
			N)	May not be counted with Chemistry 2302 or 2902	
CHEM 2301	Chemistry 2A	8	P)	Qualifying: Chemistry 1102 or 1902 or 1904. Prerequisite: 6 credit points of Junior Mathematics.	*March & July*
			N)	May not be counted with Chemistry 2001 or 2101 or 2502 or 2901	
CHEM 2302	Chemistry 2B	8	P)	Prerequisite: Chemistry 2001 or 2101 or 2301 or 2502 or 2901.	*March & July*
			N)	May not be counted with Chemistry 2202 or 2902	
CHEM 2502	Chemistry 2 (Forensic)	8	P)	Qualifying: Chemistry 1102 or 1902 or 1904. Prerequisite: 6 credit points of Junior Mathematics.	*March*
			N)	May not be counted with Chemistry 2001 or 2101 or 2301 or 2901	
CHEM 2901	Chemistry 2A (Advanced)	8	P)	Qualifying: WAM greater than 80 and Distinction average in Chemistry 1101 or 1901 or 1903 and in Chemistry 1102 or 1902 or 1904). Prerequisite: 6 credit points of Junior Mathematics; by invitation.	*March*
			N)	May not be counted with Chemistry 2001 or2101 or 2301 or 2502. Entry to this unit of study is by invitation. Students in the Faculty of Science Talented Students Program arc automatically eligible.	
CHEM 2902	Chemistry 2B (Advanced)	8	P)	Prerequisite: Chemistry 2901, but sec unit description; by invitation.	*July*
			N)	May not be counted with Chemistry 2202 or 2302	

■ Computer Science

(a) Unit of Study		(c) Credit Points	(d)/(e)		(f) Offered
COMP 2000	System Analysis and Design	4	P)	Prerequisite: Computer Science 1000 or 1001 or 1901.	*March*
COMP 2001	Computer Systems	4	P)	Qualifying: Computer Science 1002 or 1902.	*March*
			N)	May not be counted with Computer Science 2901. See prerequisites for Senior Computer Science units of study. Consult Departmental Handbook	
COMP 2901	Computer Systems (Advanced)	4	P)	Qualifying: Distinction in Computer Science 1902 or 1002.	*March*
			N)	May not be counted with Computer Science 2001	
COMP 2002	Design and Data Structures	4	P)	Qualifying: Computer Science 1002 or 1902.	*March*
			N)	May not be counted with Computer Science 2902. See prerequisites for Senior Computer Science units of study. Consult Departmental Handbook	
COMP 2902	Design and Data Structures (Advanced)	4	P)	Qualifying: Distinction in Computer Science 1902 or 1002.	*March*
			N)	May not be counted with Computer Science 2002	

Table I: Bachelor of Science (see section 3) - continued

(a) (b) Unit of Study	(c) Credit Points	(d)/(e) A) Assumed Knowledge P) Prerequisite & Qualifying C) Corequisite N) Prohibitions and other information	(f) Offered
COMP 2003 Languages and Logic	4	P) Qualifying: Computer Science 1002 or 1902. Prerequisite: Mathematics 1004 or 1904 or Econometrics or Mathematics 2009. N) 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	P) Qualifying: Distinction in Computer Science 1902 or 1002. Prerequisite: Mathematics 1004 or 1904 or Econometrics or Mathematics 2009. N) May not be counted with Computer Science 2003	*July*
COMP 2004 Programming Practice	4	P) Qualifying: Computer Science 1002 or 1902. N) May not be counted with Computer Science 2904. Sec prerequisites for Senior Computer Science units of study. Consult Departmental Handbook	*July*
COMP 2904 Programming Practice (Advanced)	4	P) Qualifying: Distinction in Computer Science 1902 or 1002. N) May not be counted with Computer Science 2004.	*July*
COMP 2005 Personal Database Tools	4	P) Prerequisite: Computer Science 1000 or 1001 or 1901. N) Not available to students who have completed or are enrolled in Computer Science 3005 or 3905 (this applies for 1999 only).	*July*

■ Engineering Science - Civil and Chemical

ENGS 2201 Civil Engineering Science 2A	12	P) Prerequisite: Chemistry 1102 or 1902 or 1904 or 12 credit points of Junior Physics or 12 credit points of Junior Mathematics.	*March*
ENGS 2202 Civil Engineering Science 2B	4		*July*
ENGS 2601 Chemical Engineering Science 2A	8	P) Prerequisite: Chemistry 1102 or 1902 or 1904 or 12 credit points of Junior Physics or 12 credit points of Junior Mathematics. C) Chemistry 2202 or 2902.	*March*
ENGS 2602 Chemical Engineering Science 2B	8	P) Prerequisite: Engineering Science 2601.	*July*
ENGS 2611 Chemical Engineering Science 2A Auxiliary	4	P) Prerequisite: Chemistry 1102 or 1902 or 1904 or 12 credit points of Junior Physics or 12 credit points of Junior Mathematics.	*March*
ENGS 2612 Chemical Engineering Science 2B Auxiliary	4		*July*

■ Geography

GEOG 2001 Processes in Gcomorphology	8	P) Prerequisite: Geography 1001 or Environmental Science 1002. N) 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.	*March*
GEOG 2002 Fluvial and Coastal Geography	8	P) Prerequisite: Geography 1001 or Environmental Science 1002. N) As for Geography 2001	*July*
GEOG 2101 Environmental Change and Human Response	8	P) Prerequisite: Geography 1001 or 1002 or Environmental Science 1002. N) As for Geography 2001	*March*
GEOG 2102 Resource and Environmental Management	8	P) Prerequisite: Geography 1001 or 1002 or Environmental Science 1002. N) As for Geography 2001	*July*
GEOG 2201 Social and Urban Geography	8	P) Prerequisite: Geography 1002 or Environmental Science 1002. N) As for Geography 2001	*March*
GEOG 2202 Economic and Political Geography	8	P) Prerequisite: Geography 1002 or Environmental Science 1002. N) As for Geography 2001	*July*

■ Geology

GEOL 2001 Plate Tectonics and Materials	8	P) Prerequisite: 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.	*March*

Table 1: Bachelor of Science (see(section 3) - continued

(a) Unit of Study	(b)	(c) Credit Points	(d)/(c) A) Assumed Knowledge P) Prerequisite & Qualifying C) Corequisite N) Prohibitions and other information	(f) Offered
GEOL 2002	Resource Exploration	**4**	P) Prerequisite: Geology 2001.	July
GEOL 2003	Fossils and Time	**4**	P) Prerequisite: 24 credit points of Science units of study.	July
GEOL 2004	Environmental Geology: Hazards	**4**	P) Prerequisite: 24 credit points of Science units of study. Sec prerequisites for Senior Geology.	March
GEOL 2005	Environmental Geology: Resources	**4**	P) Prerequisite: 24 credit points of Science units of study. Sec prerequisites for Senior Geology.	July

■ History and Philosophy of Science

HPSC 2001	Introductory Philosophy of Science	**4**	P) Prerequisite: 24 credit points of Junior units of study. This is a qualifying unit of study for Senior History and Philosophy of Science units of study. N) ♦Change to semester availability subject to Faculty approval	March*
HPSC 2002	Introductory History of Science	**4**	P) Prerequisite: 24 credit points of Junior units of study. This is a qualifying unit of study for Senior History and Philosophy of Science units of study. N) *Change to semester availability subject to Faculty approval	July*

■ Marine Sciences

MARS 2001	Introductory Marine Science A	**4**	P) Prerequisite: 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.	March
MARS 2002	Introductory Marine Science B	**4**	N) As for Marine Science 2001	July

■ Mathematics

MATH 2001	Vector Calculus and Complex Variables	**4**	P) Prerequisite: Mathematics (1001 or 1901) and (1002 or 1902) and (1003 or 1903). N) May not be counted with Mathematics 2901	March
MATH 2002	Matrix Applications	**4**	P) Prerequisite: Mathematics 1002 or 1902 or Distinction in Mathematics 1012. N) May not be counted with 2902	March
MATH 2003	Introduction to Mathematical Computing	**4**	P) Prerequisite: Mathematics (1001 or 1901) and (1002 or 1902) and (1003 or 1903). N) May not be counted with Mathematics 2903	March
MATH 2004	Lagrangian Dynamics	**4**	P) Prerequisite: Mathematics 2001 or 2901. N) May not be counted with Mathematics 2904	July
MATH 2005	Fourier Scries and Differential Equations	**4**	P) Prerequisite: Mathematics 2001 or 2901. N) May not be counted with Mathematics 2905	July
MATH 2006	Introduction to Nonlinear Systems and Chaos	**4**	P) Prerequisite: Mathematics (1001 or 1901) and (1002 or 1902) and (1003 or 1903) or (Credit in Mathematics 1011 and 1012 and 1013). N) May not be counted with Mathematics 2906	March
MATH 2007	Analysis	**4**	P) Prerequisite: Mathematics (1001 or 1901) and (1003 or 1903) or Distinction average in Mathematics 1011 and 1013. N) May not be counted with Mathematics 2907	July
MATH 2008	Introduction to Modem Algebra	**4**	P) Prerequisite: Mathematics 2002 or 2902. N) May not be counted with Mathematics 2908	July
MATH 2009	Graph Theory	**4**	P) Prerequisite: 6 credit points of Junior Mathematics (at the Distinction level in Life Sciences units).	March
MATH 2010	Optimisation	**4**	P) Prerequisite: Mathematics (1001 or 1901) and (1002 or 1902) and (1003 or 1903) (strongly advise Mathematics 2002 or 2902). C) The combination of this unit of study with Mathematics 2002 or 2902 is highly recommended. N) May not be counted with Econometrics 3510 Operations Research A.	July
MATH 2033	Financial Mathematics I	**4**	P) Prerequisite: Mathematics 1001, 1002, 1003 and 1005 or Mathematics 1901, 1902, 1903 and 1905.	March
MATH 2901	Vector Calculus and Complex Variables (Advanced)	**4**	P) Prerequisite: Mathematics (1901 or Credit in 1001) and (1902 or Credit in 1002) and (1903 or Credit in 1003). C) Mathematics 2002 or 2902. N) May not be counted with Mathematics 2001	March

Table 1: Bachelor of Science (seei section 3) - continued

(a) Unit of Study	(b)	(c) Credit Points	(d)/(e) A) Assumed Knowledge P) Prerequisite & Qualifying C) Corequisite N) Prohibitions and other information	(f) Offered
MATH 2902	Linear Algebra (Advanced)	4	P) Prerequisite: 12 credit points of Junior Mathematics, including Mathematics 1902 or Credit in 1002. N) May not be counted with Mathematics 2002	*March*
MATH 2903	Introduction to Mathematical Computing (Advanced)	4	P) Prerequisite: (1901 or Credit in 1001) and (1902 or Credit in 1002) and (1903 or Credit in 1003). N) May not be counted with Mathematics 2003	*March*
MATH 2904	Lagrangian Dynamics (Advanced)	4	P) Prerequisite: Mathematics 2901 or Credit in Mathematics 2001. N) May not be counted with Mathematics 2004	*July*
MATH 2905	Mathematical Methods (Advanced)	4	P) Prerequisite: Mathematics 2901 or Credit in Mathematics 2001. N) May not be counted with Mathematics 2005	*July*
MATH 2906	Introduction to Nonlinear Systems and Chaos (Advanced)	4	P) Prerequisite: Mathematics (1901 or Credit in 1001) and (1902 or Credit in 1002) and (1903 or Credit in 1003). N) May not be counted with Mathematics 2006	*March*
MATH 2907	Analysis (Advanced)	4	P) Prerequisite: Mathematics (1901 or Credit in 1001) and (1903 or Credit in 1003) (Mathematics 2901 or 2001 strongly advised). N) May not be counted with Mathematics 2007	*July*
MATH 2908	Differential Equations and Group Theory (Advanced)	4	P) Prerequisite: Mathematics 2902. N) May not be counted with Mathematics 2008	*July*
MATH 2933	Financial Mathematics I (Advanced)	4	P) Prerequisite: Mathematics 1901, 1902, 1903 and 1905 or Credit in Mathematics 1001, 1002, 1003 and 1005.	*March*

■ Engineering Science - Mechanical

MECH 2200	Thermofluids	6	P) Prerequisite: 12 credit points each of Junior Mathematics and Junior Physics. N) May not be counted with MECH 2201 Thermodynamics 1	*March*
MECH 2400	Mechanical Design 1	6	P) Prerequisite: 12 credit points each of Junior Mathematics and Junior Physics.	*July*
MECH 2500	Engineering Dynamics 1	4	P) Prerequisite: 12 credit points each of Junior Mathematics and Junior Physics.	*July*

■ Microbiology

MICR 2001	Introductory Microbiology	8	P) Qualifying: Biology 1002 or 1902 or 1003 or 1903. Prerequisite: Chemistry 1102 or 1902 or 1904. C) Biology 1001 or 1901 and Chemistry 1101 or 1901 or 1903 and Mathematics (1001 or 1011 or 1901) and (1005 or 1015 or 1905). N) May not be counted with Microbiology 2003 or 2901	*March*
MICR 2002	Applied Microbiology	8	P) Prerequisite: Microbiology 2001 or 2901. N) May not be counted with Microbiology 2004 or 2902	*July*
MICR 2003	Theoretical Microbiology A	4	P) Qualifying: Biology 1002 or 1902 or 1003 or 1903. Prerequisite: Chemistry 1102 or 1902 or 1904. C) Biology 1001 or 1901 and Chemistry 1101 or 1901 or 1903 and Mathematics (1001 or 1011 or 1901) and (1005 or 1015 or 1905). N) May not be counted with Microbiology 2001 or 2901	*March*
MICR 2004	Theoretical Microbiology B	4	P) Prerequisite: Microbiology 2001 or 2003 or 2901. N) May not be counted with Microbiology 2002 or 2902	*July*
MICR 2901	Introductory Microbiology (Advanced)	8	P) Qualifying: Credit or better in Biology 1002 or 1902 or 1003 or 1903 and at least a pass in Chemistry 1102 or 1902 or 1904. C) Biology 1001 or 1901 and Chemistry 1101 or 1901 or 1903 and Mathematics (1001 or 1011 or 1901) and (1005 or 1015 or 1905). N) May not be counted with Microbiology 2001 or 2003	*March*
MICR 2902	Applied Microbiology (Advanced)	8	P) Qualifying: Credit or better in Microbiology 2001 or in the equivalent components in Microbiology 2901. N) May not be counted with Microbiology 2002 or 2004	*July*

■ Pharmacology

PCOL 2001	Pharmacology Fundamentals	4	P) Prerequisite: 6 credit points of Junior Chemistry (including Chemistry 1101,1901 or 1903), 6 credit points of Junior Biology, and 6 credit points of units of study from other Science Discipline Areas. N) This is a qualifying unit of study for Pharmacology 3001 or 3002.	*March*

Table I: Bachelor of Science (see section 3) - continued

(a) Unit of Study	(b)	(c) Credit Points	(d)/(e) A) Assumed Knowledge P) Prerequisite & Qualifying C) Corequisite N) Prohibitions and other information	(f) Offered
PCOL 2002	Pharmacology - Drugs and People	4	P) Prerequisite: 6 credit points of Junior Chemistry (including Chemistry 1101, 1901 or 1903), 6 credit points of Junior Biology, and 6 credit points of units of study from other Science Discipline Areas. Students arc strongly advised to complete Pharmacology 2001 before enrolling in Pharmacology 2002.	*July*

■ Physics

PHYS 2001	Physics (Technological) A	8	P) Qualifying: 12 credit points of Junior Physics or Physics IE. Prerequisite: 12 credit points of Junior Mathematics other than Mathematics 1011, 1012, 1013 and 1015 or Credit or better in Mathematics 1011, 1012, 1013 and 1015. This is a qualifying unit of study for Senior Physics. N) May not be counted with Physics 2101 or 2103 or 2901	*March*
PHYS 2002	Physics (Technological) B	8	P) Qualifying: 12 credit points of Junior Physics or Physics IE. Prerequisite: 12 credit points of Junior Mathematics other than Mathematics 1011, 1012, 1013 and 1015 or Credit or better in Mathematics 1011, 1012, 1013 and 1015. This is a qualifying unit of study for Senior Physics. N) May not be counted with Physics 2102 or 2104 or 2902	*July*
PHYS 2101	Physics (Environmental) A	8	P) Qualifying: 12 credit points of Junior Physics or Physics IE. Prerequisite: 12 credit points of Junior Mathematics other than Mathematics 1011, 1012, 1013 and 1015 or Credit or better in Mathematics 1011, 1012, 1013 and 1015. This is a qualifying unit of study for Senior Physics. N) May not be counted with Physics 2001 or 2103 or 2901	*March*
PHYS 2102	Physics (Environmental) B	8	P) Qualifying: 12 credit points of Junior Physics or Physics IE. Prerequisite: 12 credit points of Junior Mathematics other than Mathematics 1011, 1012, 1013 and 1015 or Credit or better in Mathematics 1011, 1012, 1013 and 1015. This is a qualifying unit of study for Senior Physics. N) May not be counted with Physics 2002 or 2104 or 2902	*July*
PHYS 2103	Introduction to Environmental Physics	4	P) Qualifying: 12 credit points of Junior Physics or Physics IE. Prerequisite: 12 credit points of Junior Mathematics other than Mathematics 1011, 1012, 1013 and 1015 or Credit or better in Mathematics 1011, 1012, 1013 and 1015. This is not a qualifying unit of study for Senior Physics. N) May not be counted with Physics 2001 or 2101 or 2901.	*March*
PHYS 2104	Applications of Environmental Physics	4	P) Qualifying: 12 credit points of Junior Physics or Physics IE. Prerequisite: 12 credit points of Junior Mathematics other than Mathematics 1011, 1012, 1013 and 1015 or Credit or better in Mathematics 1011, 1012, 1013 and 1015. This is not a qualifying unit of study for Senior Physics. N) May not be counted with Physics 2002 or 2102 or 2902	*July*
PHYS 2901	Physics (Advanced) A	8	P) Qualifying: Physics 1901 and 1902 or 12 credit points of other Junior Physics units of study with an average of a Credit or better. Prerequisite: 12 credit points of Junior Mathematics other than Mathematics 1011, 1012, 1013 and 1015 or Credit or better in Mathematics 1011, 1012, 1013 and 1015. This is a qualifying unit of study for Senior Physics. N) May not be counted with Physics 2001 or 2101 or 2I03.	*March*
PHYS 2902	Physics (Advanced) B	8	P) Qualifying: Physics 1901 and 1902 or 12 credit points of other Junior Physics units of study with an average of a Credit or better. Prerequisite: 12 credit points of Junior Mathematics other than Mathematics 1011, 1012, 1013 and 1015 or Credit or better in Mathematics 1011, 1012, 1013 and 1015. This is a qualifying unit of study for Senior Physics. N) May not be counted with Physics 2002 or 2102 or 2104.	*July*

H Physiology

PHSI **2001**	Introductory Physiology A	4	P) Prerequisite: 6 credit points of Junior Mathematics plus 12 credit points of Junior Chemistry, plus 18 credit points from Junior Biology and Physics (preferred), Mathematics, Computer Science or Psychology. Other combinations subject to unit of study coordinators approval, especially for combined award courses.	*March*
PHSI 2002	Introductory Physiology B	4	P) Prerequisite: Physiology 2001. N) This is a qualifying unit of study for Senior Physiology units of study	*July*

■ Psychology

PSYC 2111	Perception, Learning and Ncuroscicnce	4	P) Qualifying: Psychology 1001 and 1002 (Note: 16 credit points of Intermediate Psychology is required for Honours entry).	*March*
PSYC 2112	Psychological Statistics	4	P) Qualifying: Psychology 1001 and 1002 (Note: 16 credit points of Intermediate Psychology is required for Honours entry).	*March*

Table 1: Bachelor of Science (see: section 3) - continued

(a) Unit of Study	(b)	(c) Credit Points	(d)/(e) A) Assumed Knowledge P) Prerequisite & Qualifying C) Corequisite N) Prohibitions and other information	(f) Offered
PSYC 2113	Cognitive Processes and Social Psychology	4	P) Qualifying: Psychology 1001 and 1002 (Note: 16 credit points of Intermediate Psychology is required for Honours entry).	*July*
PSYC 2114	Personality and Individual Differences	4	P) Qualifying: Psychology 1001 and 1002 (Note: 16 credit points of Intermediate Psychology is required for Honours entry).	*July*

■ Soil Science

SOIL 2001	Soil Properties and Processes	8	P) Prerequisite: Chemistry 1002 or equivalent and 12 credit points of Junior Mathematics or Physics 1003 or 1004.	*March*
SOIL 2002	Soil Resources and Conservation	8	P) Prerequisite: Soil Science 2001 or Geology 1002 or Geology 2004 or Geography 1001 or Natural Environmental Systems 2001. N) May not be counted with Geography 3002	*July*

■ Statistics

STAT 2001	Probability and Distribution	4	P) Prerequisite: Mathematics (1003 or 1903 or Credit in 1011) and (1005 or 1905 or Credit in 1015). N) May not be counted with Statistics 2901	*March*
STAT 2002	Data Analysis	4	P) Prerequisite: Mathematics 1005 or 1905 or 1015 (or Statistics 1021 for Arts students).	*March*
STAT 2003	Estimation Theory	4	P) Prerequisite: Statistics 2001 or 2901. N) May not be counted with Statistics 2903	*July*
STAT 2004	Hypothesis Testing	4	P) Prerequisite: Statistics 2002.	*July*
STAT 2901	Introduction to Probability (Advanced)	4	P) Prerequisite: (Mathematics 1903 or Credit in Mathematics 1003) and (Mathematics 1905 or Credit in Mathematics 1005). N) May not be counted with Statistics 2001	*March*
STAT 2903	Estimation Theory (Advanced)	4	P) Prerequisite: Statistics 2901 or Credit in Statistics 2001. N) May not be counted with Statistics 2003	*July*

C. Senior Units of Study

■ Agricultural Chemistry

AGCH 3001	Chemistry and Biochemistry of Ecosystems	12	P) Qualifying: Agricultural Chemistry 2001, or Chemistry 2001 or 2011 or 2022, or 2031 or 2032 or 2092 or Biochemistry 2002 or 2092 or Environmental Science 2001 and 2002. N) May not be counted with Agricultural Chemistry 3002	*March*
AGCH 3002	Environmental Plant and Soil Chemistry	12	P) Qualifying: Agricultural Chemistry 2001 or Chemistry 2001 or 2101 or 2202 or 2301 or 2302 or 2902 or Biochemistry 2002 or 2902 or Environmental Science 2001 and 2002. N) May not be counted with Agricultural Chemistry 3001 or 3012	*March*
AGCH 3003	Food Chemistry and Biochemistry	12	P) Qualifying: Agricultural Chemistry 2001 or Biochemistry 2002 or 2902.	*July*

■ Anatomy and Histology

ANAT 3001	Microscopy and Histochemistry	12	P) Qualifying: Anatomy and Histology 2001.	*March*
ANAT 3002	Cells and Development	12	A) (i) an understanding of the basic structure of the vertebrates; (ii) an understanding of elementary biochemistry and genetics. P) Qualifying: Anatomy and Histology 2001. Prerequisite: at least 8 credit points of Intermediate Biochemistry. N) May not be counted with Anatomy and Histology 3003	*July*
ANAT 3003	Transmission and Scanning Electron Microscopy	12	P) Qualifying: Anatomy and Histology 2001. N) May not be counted with Anatomy and Histology 3002	*July*
ANAT 3004	Cranial and Cervical Anatomy	6	P) Qualifying: Anatomy and Histology 2002.	*July*
ANAT 3006	Forensic Osteology	6	P) Prerequisite: Anatomy 2002. N) A quota of 15 exists for this unit of study.	*March*

Table I: Bachelor of Science (see section 3) - continued

(a) Unit of Study		(c) Credit Points	(d)/(c) A) Assumed Knowledge P) Prerequisite & Qualifying C) Corequisite N) Prohibitions and other information	(f) Offered

■ Biochemistry

BCHM 3001	Molecular Biology and Structural Biochemistry	12	P) Qualifying: 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. N) May not be counted with Biochemistry 3901	March
BCHM 3002	Metabolic and Medical Biochemistry	12	P) Qualifying: Biochemistry 2002 or 2902. N) May not be counted with Biochemistry 3902	July
BCHM 3901	Molecular Biology and Structural Biochemistry (Advanced)	12	P) Qualifying: 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. N) May not be counted with Biochemistry 3001	March
BCHM 3902	Metabolic and Medical Biochemistry (Advanced)	12	P) Qualifying: Biochemistry 2002 or 2902 (selected students). N) May not be counted with Biochemistry 3002	July

■ Biology

BIOL 3101	Ecophysiology	12	P) Qualifying: 16 credit points of Intermediate Biology including Biology 2002 or 2003 or 2006 or 2902 or 2903 or 2906. Students are advised to consult the School.	March
BIOL 3901	Ecophysiology (Advanced)	12	P) Qualifying: Distinction avercagc in 16 credit points of Intermediate Biology including Biology 2002 or 2003 or 2006 or 2902 or 2903 or 2906. These requirements may be varied and students with lower averages should consult the School Executive Officer. N) May not be counted with Biology 3101	March
BIOL 3201	Cellular and Systems Physiology	12	P) Qualifying: 16 credit points of 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 arc advised to consult the School.	July
BIOL 3921	Cellular and Systems Physiology (Advanced)	12	P) Qualifying: Distinction average in 16 credit points of Intermediate Biology including Biology 2001 or 2901 and 2002 or 2902 or Biology 2003 or 2006 or 2903 or 2906. These requirements may be varied and students with lower averages should consult the School's Executive Officer. N) May not be counted with Biology 3201	July
BIOL 3102	Evolution and Diversity of the Australian Biota (MS)	12	P) Qualifying: 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. Some modules have specific prerequisites; consult list of modules; students arc advised to consult the School. Marine Science 3001 students may take the Evolutionary Core without taking a module, or Marine Biology module without Core.	March
BIOL 3902	Evolution and Diversity of the Australian Biota (Advanced)	12	P) Qualifying: Distinction average in 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 or 2007. These requirements may be varied and students with lower averages should consult the School's Executive Officer. N) May not be counted with Biology 3102	March
BIOL 3202	Ecology (MS)	12	P) Qualifying: 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 3922	Ecology (Advanced)	12	P) Qualifying: Distinction average in 16 credit points of Intermediate Biology including Biology 2001 or 2901 and 2002 or 2902 or in 16 credit points of Intermediate Biology including Biology 2004 or 2904. These requirements may be varied and students with lower averages should consult the School's Executive Officer. N) May not be counted with Biology 3202	July
BIOL 3103	Molecular Genetics and Recombinant DNA Technology	12	P) Qualifying: 16 credit points of Intermediate Biology including Biology 2005 or 2905 (For BMedSc students Qualifying: Biology 2005 or 2905). N) May not be counted with Biology 3903	March

Table I: Bachelor of Science (see section 3) - continued

(a) Unit of Study	(b)	(c) Credit Points	(d)/(c) A) Assumed Knowledge P) Prerequisite & Qualifying C) Corequisite N) Prohibitions and other information	(f) Offered
BIOL 3903	Molecular Genetics and Recombinant DNA Technology (Advanced)	12	P) Qualifying: Distinction average in 16 credit points of Intermediate Biology including Biology 2005 or 2905. (For BMcdSc students: Qualifying: Distinction in Biology 2005 or 2905.) Those requirements may be varied and students with lower averages should consult the School's Executive Officer. N) May not be counted with Biology 3103	*March*
BIOL 3203	Eukaryotic Genetics and Development	12	P) Qualifying: 16 credit points of Intermediate Biology including Biology 2005 or 2905 (For BMcdSc students Qualifying: Biology 2005 or 2905). N) May not be counted with Biology 3904 or 3905	*July*
BIOL 3904	Eukaryotic Genetics and Development (Advanced)	12	P) Qualifying: Distinction average in 16 credit points of Intermediate Biology including Biology 2005 or 2905. (For BMcdSc students: Distinction in Biology 2005 or 2905) These requirements may be varied and students with lower averages should consult the School's Executive Officer. N) May not be counted with Biology 3203 or 3905	*July*

■ Cell Pathology

(a) Unit of Study	(b)	(c) Credit Points	(d)/(c)	(f) Offered
CPAT 3001	Cell Pathology A	12	P) 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. (For BMedSc, BMED 2101 and 2102.). N) Students must contact the Department before enrolling. Only a small number of students can be accommodated in the laboratory facilities.	*March*
CPAT 3002	Cell Pathology B	12	P) Qualifying: Cell Pathology 3001.	*July*
CPAT 3101	Pathological Basis of Human Disease	12	P) Qualifying: Anatomy and Histology 2001; or Biochemistry 2001 or 2002 or 2101 or 2102 or 2901 or 2902; or Biology 2001 or 2002 or 2005 or 2006 or 2101 or 2102 or 2105 or 2106 or 2901 or 2902 or 2905 or 2906; or History and Philosophy of Science 2001 or 2002; or Microbiology 2001 or 2003 or 2901; or Pharmacology 2001; or Physiology 2001.	*July*

■ Chemistry

(a) Unit of Study	(b)	(c) Credit Points	(d)/(c)	(f) Offered
CHEM 3101	Chemistry 3A	12	P) Qualifying: Chemistry 2202 or 2302 or 2902. N) May not be counted with Chemistry 3901 (but may be counted with Chemistry 3201)	*March*
CHEM 3102	Chemistry 3B	12	P) Qualifying: Chemistry 2202 or 2302 or 2902. N) May not be counted with Chemistry 3902 (but may be counted with Chemistry 3202)	*July*
CHEM 3901	Chemistry 3A (Advanced)	12	P) Qualifying: Distinction average in Chemistry 2001 or2101 or 2301 or 2901 and in Chemistry 2202 or 2302 or 2902; by invitation. N) 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 arc 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.	*March*
CHEM 3902	Chemistry 3B (Advanced)	12	P) Qualifying: Distinction or better in Chemistry 2902 or 3101 or 3901; by invitation. N) 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*
CHEM 3201	Chemistry 3A Additional	12	P) Qualifying: Chemistry 2202 or 2302 or 2902. Prerequisite: or Corcq Chemistry 3101 or 3901.	*March*
CHEM 3202	Chemistry 3B Additional	12	P) Qualifying: Chemistry 2202 or 2302 or 2902. Prerequisite: or Coreq Chemistry 3102 or 3902.	*July*

■ Computer Science

(a) Unit of Study	(b)	(c) Credit Points	(d)/(c)	(f) Offered
COMP 3000	Management of Information Systems	4	P) Prerequisite: Computer Science 2000.	*July 2000*
COMP 3001	Algorithms	4	P) Qualifying: Computer Science 2002 or 2902. Prerequisite: Mathematics 1004 or 1904 and 8 credit points in Intermediate Mathematics and/or Statistics and/or Econometrics. N) May not be counted with Computer Science 3901	*March*

Table I: Bachelor of Science (see section 3) - continued

(a) Unit of Study	(b)	(c) Credit Points	(d)/(c) A) Assumed Knowledge P) Prerequisite & Qualifying C) Corequisite N) Prohibitions and other information	(f) Offered
COMP 3901	Algorithms (Advanced)	4	P) Qualifying: Computer Science 2002 or 2902. Prerequisite: 16 credit points of Intermediate or Senior Computer Science with Distinction average and Mathematics 1004 or 1904 and 8 credit points of Intermediate Mathematics and/or Statistics and/or Econometrics. N) May not be counted with Computer Science 3001	*March*
COMP 3002	Artificial Intelligence	4	P) Qualifying: Computer Science 2004 or 2904. Prerequisite: Computer Science 2003 or 2903 and 8 credit points in Intermediate Mathematics and/or Statistics and/or Econometrics. N) May not be counted with Computer Science 3902	*March*
COMP 3902	Artificial Intelligence (Advanced)	4	P) Qualifying: Computer Science 2004 or 2904. Prerequisite: 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. N) May not be counted with Computer Science 3002	*March*
COMP 3003	Computer Architecture	4	P) Qualifying: Computer Science 2001 or 2901. Prerequisite: Computer Science 2002 or 2902 and 2003 or 2903. N) May not be counted with Computer Science 3903	*July*
COMP 3903	Computer Architecture (Advanced)	4	P) Qualifying: Computer Science 2001 or 2901. Prerequisite: 16 credit points of Intermediate or Senior Computer Science with Distinction average and Computer Science 2002 or 2902 and 2003 or 2903. N) May not be counted with Computer Science 3003	*July*
COMP 3004	Computer Graphics	4	P) Qualifying: Computer Science 2004 or 2904. Prerequisite: Computer Science 2002 or 2902 and Mathematics 1002 or 1902 and 8 credit points in Intermediate Mathematics and/or Statistics and/or Econometrics. N) May not be counted with Computer Science 3904	*July*
COMP 3904	Computer Graphics (Advanced)	4	P) Qualifying: Computer Science 2004 or 2904. Prerequisite: 16 credit points of Intermediate or Senior Computer Science with Distinction average and Computer Science 2002 or 2902 and Mathematics 1002 or 1902 and 8 credit points of Intermediate Mathematics and/or Statistics and/or Econometrics. N) May not be counted with Computer Science 3004	*July*
COMP 3005	Database Systems	4	P) Qualifying: Computer Science 2002 or 2902. N) May not be counted with Computer Science 3905	*July*
COMP 3905	Database Systems (Advanced)	4	P) Qualifying: Computer Science 2002 or 2902. Prerequisite: 16 points of Intermediate or Senior Computer Science with Distinction average. N) May not be counted with Computer Science 3005	*July*
COMP 3006	Declarative Programming Languages	4	P) Qualifying: Computer Science 2004 or 2904. Prerequisite: 8 credit points in Intermediate Mathematics and/or Statistics and/or Econometrics. N) May not be counted with Computer Science 3906	*March*
COMP 3906	Declarative Programming Languages (Advanced)	4	P) Qualifying: Computer Science 2004 or 2904. Prerequisite: 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. N) May not be counted with Computer Science 3006	*March*
COMP 3007	Networked Systems	4	P) Qualifying: Computer Science 2004 or 2904. Prerequisite: Computer Science 2001 or 2901 or ELEC2601. N) May not be counted with Computer Science 3907	*March*
COMP 3907	Networked Systems (Advanced)	4	P) Qualifying: 2004 or 2904. Prerequisite: 16 credit points of Intermediate or Senior Computer Science with Distinction average and Computer Science 2001 or 2901 or ELEC2601. N) May not be counted with Computer Science 3007	*March*
COMP 3008	Object-Oriented Systems	4	P) Qualifying: Computer Science 2004 or 2904. N) May not be counted with Computer Science 3908	*March*
COMP 3908	Object-Oriented Systems (Advanced)	4	P) Qualifying: Computer Science 2004 or 2904. Prerequisite: 16 points of Intermediate or Senior Computer Science with Distinction average. N) May not be counted with Computer Science 3008	*March*
COMP 3009	Operating Systems	4	P) Qualifying: Computer Science 2004 or 2904. Prerequisite: Computer Science 2001 or 2901 or ELEC2601. N) May not be counted with Computer Science 3909	*March*

Table 1: Bachelor of Science (see section 3) - continued

(a) Unit of Study		(c) Credit Points	(d)/(e) A) Assumed Knowledge P) Prerequisite & Qualifying C) Corequisite N) Prohibitions and other information		(f) Offered
COMP 3909	Operating Systems (Advanced)	4	P)	Qualifying: Computer Science 2004 or 2904. Prerequisite: 16 points of Intermediate or Senior Computer Science with Distinction average and Computer Science 2001 or 2901 or ELEC 2601.	*March*
			N)	May not be counted with Computer Science 3009	
COMP 3100	Software Engineering	4	P)	Prerequisite: Computer Science 2004 or 2904.	*March*
			N)	May not be counted with Computer Science 3800	
COMP 3800	Software Engineering (Advanced)	4	P)	Qualifying: Computer Science 2004 or 2904. Prerequisite: 16 points of Intermediate or Senior Computer Science with Distinction average.	*March*
			N)	May not be counted with Computer Science 3100	
COMP 3102	User Interfaces Design and Programming	4	P)	Qualifying: Computer Science 2004 or 2904.	*July*
			N)	May not be counted with Computer Science 3802	
COMP 3802	User Interfaces (Advanced)	4	P)	Qualifying: Computer Science 2004 or 2904. Prerequisite: 16 points of Intermediate or Senior Computer Science with Distinction average.	*July*
			N)	May not be counted with Computer Science 3102	
COMP 3201	Algorithmic Systems Project	4	P)	Prerequisite: Computer Science 3001 or 3901.	*March (only for those with prereq.) & July*
			C)	Students intending to major in Computer Science are advised to enrol in one of Computer Science 3201,3202,3203, 3204 or 3205, 3206 or 3809.	
COMP 3202	Computer Systems Project	4	P)	Prerequisite: Computer Science 3009 or 3909.	*March (only for those with prereq.) & July*
			C)	Students intending to major in Computer Science are advised to enrol in one of Computer Science 3201, 3202, 3203, 3204 or 3205, 3206 or 3809.	
COMP 3203	Intelligence Systems Project	4	P)	Prerequisite: Computer Science 3002 or 3902.	*March (only for those with prereq.) & July*
			C)	Students intending to major in Computer Science are advised to enrol in one of Computer Science 3201, 3202,3203,3204 or 3205,3206 or 3809.	
COMP 3204	Large-Scale Software Project	4	P)	Prerequisite: Computer Science 3100 or 3800.	*March (only for those with prereq.) & July*
			C)	Students intending to major in Computer Science are advised to enrol in one of Computer Science 3201, 3202,3203, 3204 or 3205, 3206 or 3809.	
COMP 3205	Product Development Project	4	P)	Prerequisite: Computer Science 3008.	*March (only for those with prereq.) & July*
			C)	Students intending to major in Computer Science are advised to enrol in one of Computer Science 3201,3202, 3203, 3204 or 3205,3206 or 3809.	
COMP 3206	Bioinformatics Project	4	P)	Qualifying: Computer Science 2004 or 2904. Prerequisite: 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 3809	Software Project (Advanced)	4	P)	Prerequisite: 16 credit points of Intermediate or Senior Computer Science, with Distinction average.	*March & July*
			C)	8 credit points of Senior Computer Science.	

■ Geography

GEOG 3001	Coastal Environments and Dynamics	12	P)	Prerequisite: Geography 2001 or 2002 or 2101 or Marine Science 2001.	*March*
GEOG 3002	Environmental Geomorphology	12	P)	Prerequisite: Geography 2001 or 2002 or 2101.	*July*
GEOG 3101	Environmental Change	12	P)	Prerequisite: Geography 2001 or 2002 or 2101.	*March*
GEOG 3102	Coastal Management and GIS	12	P)	Prerequisite: Geography 2001 or 2002 or 2101 or Marine Science 2001.	*July*
GEOG 3201	Asia-Pacific Development	12	P)	Prerequisite: Geography 2102 or 2201 or 2202.	*March*

Table i: Bachelor of Science (see section 3) - continued

(a) Unit of Study	(b)	(c) Credit Points	(d)/(e) A) Assumed Knowledge P) Prerequisite & Qualifying C) Corequisite N) Prohibitions and other information	(f) Offered
GEOG 3202	Australia in its Global Context	12	P) Prerequisite: Geography 2102 or 2201 or 2202.	*July*

■ Geology and Geophysics

GEOL 3001	Petrology, Basins and Structure	12	P) Prerequisite: Geology 2001 and 2002.	*March*
GEOL 3002	Stratigraphy, Resources and Australian Geology	8	P) Prerequisite: Geology 3001.	*July*
GEOL 3003	Mineral Exploration	8	C) Geology 3001.	*March*
GEOL 3004	Paleobiology	4	P) Prerequisite: Geology 2003 or 8 credit points of Intermediate Biology. N) *Change to semester subject to Faculty approval	*July**
GEOL 3005	Geochemistry and Structure	12	P) Prerequisite: Geology 3001.	*July*
GEOL 3006	Petroleum Exploration	4	P) Prerequisite: Geology 3001. N) ♦Deletion of corequisite subject to Faculty approval	*July*
GEOP 3001	Geophysical Signal Processing	4	P) Prerequisite: 16 credit points of Intermediate Science units of study*. N) ♦Changes to semester and prerequisites subject to Faculty approval	*July**
GEOP 3002	Gcodynamics	4	P) Prerequisite: 16 credit points of Intermediate Science units of study*. N) ♦Change to prerequisites subject to Faculty approval	*March*
GEOP 3003	Geophysical Exploration A	4	P) Prerequisite: 16 credit points of Intermediate Science units of study*. N) ♦Change to prerequisites subject to Faculty approval	*March*
GEOP 3004	Petroleum Geophysics & Basin Analysis*	4	P) Prerequisite: 16 credit points of Intermediate Science units of study*. N) ♦Change to name, semester, prerequisites and corequisites subject to Faculty approval	*March**
GEOP 3005	Environmental Geophysics	4	P) Prerequisite: 16 credit points of Intermediate Science units of study*. N) ♦Change to prerequisites subject to Faculty approval	*July*
GEOP 3006	Geophysical Exploration B	4	P) Prerequisite: Geophysics 3003.	*July*

■ History and Philosophy of Science

HPSC 3001	History of Physical Sciences	6	P) Qualifying: History and Philosophy of Science 2001 and 2002. C) 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. N) *Change to semester availability subject to Faculty approval	*March**
HPSC 3002	History of Biological Sciences	6	P) Qualifying: History and Philosophy of Science 2001 and 2002. N) As for History and Philosophy of Science 3001. *Change to semester availability subject to Faculty approval	*July**
HPSC 3003	Social Relations of Science A	4	P) Qualifying: History and Philosophy of Science 2001 and 2002. N) As for History and Philosophy of Science 3001	*March*
HPSC 3004	Social Relations of Science B	4	P) Qualifying: History and Philosophy of Science 2001 and 2002. Prerequisite: History and Philosophy of Science 3003. N) As for History and Philosophy of Science 3001	*July*
HPSC 3005	History and Philosophy of Medical Science	4	P) Qualifying: History and Philosophy of Science 2001 and 2002. N) As for History and Philosophy of Science 3001	*March*
HPSC 3006	Scientific Controversies	4	P) Qualifying: History and Philosophy of Science 2001 and 2002. N) As for History and Philosophy of Science 3001. *Change to semester availability subject to Faculty approval	*July**
HPSC 3007	Science and Ethics	4	P) Qualifying: History and Philosophy of Science 2001 and 2002. N) As for History and Philosophy of Science 3001. "Change to semester availability subject to Faculty approval	*March**
HPSC 3008	The Nature of Experiment	4	P) Qualifying: History and Philosophy of Science 2001 and 2002. N) As for History and Philosophy of Science 3001	*July*

Table 1: Bachelor of Science (see section 3) - continued

(a) Unit of Study	(b)	(c) Credit Points	(d)/(c) A) Assumed Knowledge P) Prerequisite & Qualifying C) Corequisite N) Prohibitions and other information	(0 Offered
HPSC 3100	Contemporary Issues A	4	P) Qualifying: History and Philosophy of Science 2001 and 2002. N) As for History and Philosophy of Science 3001	*March*
HPSC 3101	Contemporary Issues B	4	P) Qualifying: History and Philosophy of Science 2001 and 2002. N) As for History and Philosophy of Science 3001	*July*
HPSC 3103	Philosophy of the Biological Sciences	4	P) Prerequisite: History and Philosophy of Science 2001 and 2002. N) *Change to semester availability subject to Faculty approval.	*July**

■ Marine Sciences

MARS 3001	Marine Science A	12	P) Prerequisite: Marine Science 2002. Prerequisite: There are prerequisites for some options, sec options entries.	*March*
MARS 3002	Marine Science B	12	P) Prerequisite: Marine Science 2002. Prerequisite: There are prerequisites for some options, see option entries.	*July*

■ Mathematics

MATH 3001	Topology	4	P) Prerequisite: 8 credit points of Intermediate Mathematics. N) May not be counted with Mathematics 3901	*March*
MATH 3002	Rings and Fields	4	P) Prerequisite: 8 credit points of Intermediate Mathematics (strongly advise 2002 or 2902, with 2008 or 2908). N) May not be counted with Mathematics 3902	*March*
MATH 3003	Ordinary Differential Equations	4	P) Prerequisite: 8 credit points of Intermediate Mathematics (strongly advise 2002 or 2902, with 2001 or 2901).	*March*
MATH 3004	History of Mathematical Ideas	4	P) Prerequisite: 8 credit points of Intermediate Mathematics.	*March*
MATH 3005	Logic	4	P) Prerequisite: (for all but BCST students) 8 credit points of Intermediate Mathematics; (for BCST students) 8 credit points of Intermediate Mathematics or 12 credit points of Junior Mathematics at Advanced level.	*March*
MATH 3006	Geometry	4	P) Prerequisite: 8 units of Intermediate Mathematics (strongly advise 1902 or 1002).	*July*
MATH 3007	Coding Theory	4	P) Prerequisite: 8 credit points of Intermediate Mathematics (strongly advise 2002 or 2902).	*July*
MATH 3008	Real Variables	4	P) Prerequisite: 8 credit points of Intermediate Mathematics (strongly advise 2001 or 2007 or 2901 or 2907).	*July*
MATH 3009	Number Theory	4	P) Prerequisite: 8 credit points of Intermediate Mathematics.	*July*
MATH 3010	Information Theory	4	P) Prerequisite: 8 credit points of Intermediate Mathematics (strongly advise 2001 or 2901 and some probability theory).	*July*
MATH 3015	Financial Mathematics 2	4	P) Prerequisite: 8 credit points of Intermediate Mathematics (strongly advise Mathematics 2033 or 2933 or 2010 and some probability theory). N) May not be counted with Mathematics 3933.	*July*
MATH 3016	Mathematical Computing I	4	P) Prerequisite: 8 credit points of Intermediate Mathematics and one of Mathematics 1001 or 1003 or 1901 or 1903. N) May not be counted with Mathematics 3916.	*March*
MATH 3018	Partial Differential Equations and Waves	4	P) Prerequisite: Mathematics 2005 or 2905.	*July*
MATH 3019	Signal Processing	4	P) Prerequisite: Mathematics 2005 or 2905.	*March*
MATH 3020	Nonlinear Systems and Biomathematics	4	P) Prerequisite: 8 credit points of Intermediate Mathematics (strongly advise 2006 or 2906 or 2908 or 3003) and one of Mathematics 1001 or 1003 or 1901 or 1903.	*July*
MATH 3901	Metric Spaces (Advanced)	4	P) Prerequisite: 12 credit points of Intermediate Mathematics (strongly advise Mathematics 2907). N) May not be counted with Mathematics 3001	*March*
MATH 3902	Algebra I (Advanced)	4	P) Prerequisite: 12 credit points of Intermediate Mathematics (strongly advise Mathematics 2902). N) May not be counted with Mathematics 3002	*March*

Table 1: Bachelor of Science (see section 3) - continued

(a) Unit of Study	(b)	(f) (Credit Points	(d)/(c) A) Assumed Knowledge P) Prerequisite & Qualifying C) Corequisite N) Prohibitions and other information	(f) Offered
MATH 3903	Differential Geometry (Advanced)	4	P) Prerequisite: 12 credit points of Intermediate Mathematics (strongly advise Mathematics 2001 or 2901, with Mathematics 3001 or 3901).	March
MATH 3904	Complex Variable (Advanced)	4	P) Prerequisite: 12 credit points of Intermediate Mathematics (strongly advise Mathematics 2001 or 2901, with Mathematics 3001 or 3901).	March
MATH 3905	Categories and Computer Science (Advanced)	4	P) Prerequisite: 12 credit points of Intermediate Mathematics.	March
MATH 3906	Group Representation Theory (Advanced)	4	P) Prerequisite: 12 credit points of Intermediate Mathematics (strongly advise Mathematics 3902).	July
MATH 3907	Algebra II (Advanced)	4	P) Prerequisite: 12 credit points of Intermediate Mathematics (strongly advise Mathematics 3002 or 3902).	July
MATH 3908	Nonlinear Analysis (Advanced)	4	P) Prerequisite: 12 credit points of Intermediate Mathematics (strongly advise Mathematics 3901).	July
MATH 3909	Lebesgue Integration and Fourier Analysis (Advanced)	4	P) Prerequisite: 12 credit points of Intermediate Mathematics (strongly advise Mathematics 2907 and Mathematics 3901).	July
MATH 3911	Differential Analysis (Advanced)	4	P) Prerequisite: 12 credit points of Intermediate Mathematics (strongly advise Mathematics 2901 and 3902).	July
MATH 3912	Combinatorics (Advanced)	4	P) Prerequisite: 12 credit points of Intermediate Mathematics.	July
MATH 3913	Computational Algebra (Advanced)	4	P) Prerequisite: 12 credit points of Intermediate Mathematics (strongly advise Mathematics 3002 or 3902).	July
MATH 3914	Fluid Dynamics (Advanced)	4	P) Prerequisite: Mathematics 2905 or Credit in Mathematics 2005.	March
MATH 3915	Mathematical Methods (Advanced)	4	P) Prerequisite: Mathematics 2905 or Credit in Mathematics 2005.	March
MATH 3916	Mathematical Computing I (Advanced)	4	P) Prerequisite: 8 units of Intermediate Mathematics and one of Mathematics 1903 or Credit in Mathematics 1003. N) May not be counted with Mathematics 3016	March
MATH 3917	Hamiltonian Dynamics (Advanced)	4	P) Prerequisite: Mathematics 2904 or Credit in Mathematics 2004.	July
MATH 3918	Mathematical Computing II (Advanced)	4	P) Prerequisite: Mathematics 3016 or Engineering Mathematics 2052.	July
MATH 3919	Signal Processing (Advanced)	4	P) Prerequisite: Mathematics 2905 or Credit in Mathematics 2005. N) May not be counted with Mathematics 3019	March
MATH 3920	Nonlinear Systems and Biomathcmatics (Advanced)	4	P) Prerequisite: 8 credit points of Intermediate Mathematics (strongly advise 2908 or 3003) and one of Mathematics 1903 adn 1905 or 1903 and 1904 or Credit in Mathematics 1003 and 1005 or 1003 and 1004. N) May not be counted with Mathematics 3020	July
MATH 3933	Financial Mathematics 2 (Advanced)	4	P) Prerequisite: 8 credit points of Intermediate Mathematics (strongly advise Mathematics 2933 or Credit in 2033 and Mathematics 2010 and some probability theory). N) May not be counted with Mathematics 3015.	July

■ Microbiology

MICR 3001	General and Medical Microbiology	12	P) Qualifying: Microbiology 2002 or 2902 or both Microbiology 2001 and 2004 or both Microbiology 2004 and 2901. Prerequisite: Biochemistry 2001 or 2101 or 2901 or Agricultural Chemistry 2001 or Biology 2005 or 2905. N) May not be counted with Microbiology 3901	March
MICR 3002	Molecular and Environmental Microbiology	12	P) Qualifying: Microbiology 2002 or 2902 or both Microbiology 2001 and 2004 or both Microbiology 2004 and 2901. Prerequisite: Biochemistry 2001 or2101 or 2901 or Agricultural Chemistry 2001 or Biology 2005 or 2905. N) May not be counted with Microbiology 3902	July

Table 1: Bachelor of Science (see section 3) - continued

(a)	(b)	(c)	<d)/(<0		(!)
		Credit	A) Assumed Knowledge P) Prerequisite & Qualifying		
Unit of Study		Points	C) Corequisite N) Prohibitions and other information		Offered
MICR **3901**	General and Medical Microbiology (Advanced)	12	P)	Qualifying: Microbiology 2002 or 2902 or both Microbiology 2001 and 2004 or both Microbiology 2004 and 2901. Prerequisite: Biochemistry 2001 or 2101 or 2901 or Agricultural Chemistry 2001 or Biology 2005 or 2905.	*March*
			N)	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	
MICR **3902**	Molecular and Environmental Microbiology (Advanced)	12	P)	Qualifying: Microbiology 2002 or 2902 or both Microbiology 2001 and 2004 or both Microbiology 2004 and 2901. Prerequisite: Biochemistry 2001 or 2101 or 2901 or Agricultural Chemistry 2001 or Biology 2005 or 2905.	*July*
			N)	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	

■ Pharmacology

PCOL **3001**	Molecular Pharmacology and Toxicology	12	P)	Prerequisite: Pharmacology 2001 and 2002. Students arc 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.	*March*
PCOL **3002**	Ncuro- and Cardiovascular Pharmacology	12	P)	Prerequisite: Pharmacology 2001 and 2002. Students arc 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 **3901**	Molecular Pharmacology and Toxicology (Advanced)	12	P)	Prerequisite: 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 3801.	*March*
			N)	May not be counted with Pharmacology 3001.	
PCOL **3902**	Ncuro- and Cardiovascular Pharmacology (Advanced)	12	P)	Prerequisite: Pharmacology 2001 and 2002. Students arc 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 3902.	*July*
			N)	May not be counted with Pharmacology 3002.	

■ Physics

PHYS **3003**	Quantum Mechanics and Relativity	4	P)	Qualifying: 16 credit points of Intermediate Physics. Prerequisite: 8 credit points of Intermediate Mathematics.	*March*
			N)	May not be counted with Physics 3903 or 3200	
PHYS **3004**	Condensed Matter Physics and Photonics	4	P)	Qualifying: 16 credit points of Intermediate Physics. Prerequisite: 8 credit points of Intermediate Mathematics.	*March*
			N)	May not be counted with Physics 3904	
PHYS **3005**	Topics in Modern Physics A	4	P)	Qualifying: 16 credit points of Intermediate Physics. Prerequisite: 8 credit points of Intermediate Mathematics.	*July*
			N)	May not be counted with Physics 3905	
PHYS **3006**	Topics in Modern Physics B	4	P)	Qualifying: 16 credit points of Intermediate Physics. Prerequisite: 8 credit points of Intermediate Mathematics.	*July*
			N)	May not be counted with Physics 3906	
PHYS **3007**	Computational Physics	4	P)	Qualifying: 16 credit points of Intermediate Physics. Prerequisite: 8 credit points of Intermediate Mathematics.	*March*
			N)	May not be counted with Physics 3907	
PHYS **3008**	Experimental Physics A	4	P)	Qualifying: 16 credit points of Intermediate Physics. Prerequisite: 8 credit points of Intermediate Mathematics.	*March*
			N)	May not be counted with Physics 3908 or 3009 or 3909	
PHYS **3009**	Experimental Physics B	8	P)	Qualifying: 16 credit points of Intermediate Physics. Prerequisite: 8 credit points of Intermediate Mathematics.	*March*
			N)	May not be counted with Physics 3008 or 3908 or 3909	
PHYS **3101**	Experimental Physics C	4	P)	Qualifying: 16 credit points of Intermediate Physics. Prerequisite: 8 credit points of Intermediate Mathematics.	*July*
			N)	May not be counted with Physics 3102 or 3801 or 3802	
PHYS **3102**	Experimental Physics D	8	P)	Qualifying: 16 credit points of Intermediate Physics. Prerequisite: 8 credit points of Intermediate Mathematics.	*July*
			N)	May not be counted with Physics 3101 or 3801 or 3802	

Table 1: Bachelor of Science (see section 3) - continued

(a) Unit of Study	(b)	(f) Credit Points	(d)/(c) A) Assumed Knowledge P) Prerequisite & Qualifying C) Corequisite N) Prohibitions and other information	(f) Offered
PHYS 3103	Special Project A	4	P) Qualifying: 16 credit points of Intermediate Physics. Prerequisite: 8 credit points of Intermediate Mathematics. N) May not be counted with Physics 3104 or 3803 or 3804. Approval for this unit must be obtained from the Lecturer in charge of Senior Physics.	*March*
PHYS 3104	Special Project B	4	P) Qualifying: 16 credit points of Intermediate Physics. Prerequisite: 8 credit points of Intermediate Mathematics. N) May not be counted with Physics 3103 or 3803 or 3804	*July*
PHYS 3301	Scientific Computing	4	P) Prerequisite: 16 credit points of Intermediate units of study in Chemistry, Computer Science, Mathematics, Physics or Statistics.	*March*
PHYS 3303	Scientific Visualisation	4	P) Prerequisite: Physics 3301.	*July*
PHYS 3801	Experimental Physics C (Advanced)	4	P) Qualifying: Physics 2901 and 2902, or Credit or better in Physics 2001 or 2101 and Credit or better in Physics 2002 or 2102. Prerequisite: 16 credit points of Intermediate Mathematics. N) May not be counted with Physics 3101 or 3102 or 3802	*July*
PHYS 3802	Experimental Physics D (Advanced)	8	P) Qualifying: Physics 2901 and 2902, or Credit or better in Physics 2001 or 2101 and Credit or better in Physics 2002 or 2102. Prerequisite: 16 credit points of Intermediate Mathematics. N) May not be counted with Physics 3101 or3102or3801	*July*
PHYS 3803	Special Project A (Advanced)	4	P) Qualifying: Physics 2901 and 2902, or Credit or better in Physics 2001 or 2101 and Credit or better in Physics 2002 or 2102. Prerequisite: 16 credit points of Intermediate Mathematics. N) May not be counted with Physics 3103 or 3104 or 3804. Approval for this unit must be obtained from the Lecturer in charge of Senior Physics.	*March*
PHYS 3804	Special Project B (Advanced)	4	P) Qualifying: Physics 2901 and 2902, or Credit or better in Physics 2001 or 2101 and Credit or better in Physics 2002 or 2102. Prerequisite: 16 credit points of Intermediate Mathematics. N) May not be counted with Physics 3103 or 3104 or 3803	*July*
PHYS 3903	Quantum Mechanics and Relativity (Advanced)	4	P) Qualifying: Physics 2901 and 2902 or Credit or better in Physics 2001 or 2101 and Credit or better in Physics 2002 or 2102. Prerequisite: 16 credit points of Intermediate Mathematics. N) May not be counted with Physics 3003 or 3200.	*March*
PHYS 3904	Condensed Matter Physics and Photonics (Advanced)	4	P) Qualifying: Physics 2901 and 2902 or Credit or better in Physics 2001 or2101 and Credit or better in Physics 2002 or 2102. Prerequisite: 16 credit points of Intermediate Mathematics. N) May not be counted with Physics 3004.	*March*
PHYS 3905	Topics in Modem Physics A (Advanced)	4	P) Qualifying: Physics 2901 and 2902 or Credit or better in Physics 2001 or2101 and Credit or better in Physics 2002 or 2102. Prerequisite: 16 credit points of Intermediate Mathematics. N) May not be counted with Physics 3005.	*July*
PHYS 3906	Topics in Modem Physics B (Advanced)	4	P) Qualifying: Physics 2901 and 2902, or Credit or better in Physics 2001 or2101 and Credit or better in Physics 2002 or 2102. Prerequisite: 16 credit points of Intermediate Mathematics. N) May not be counted with Physics 3006.	*July*
PHYS 3907	Computational Physics (Advanced)	4	P) Qualifying: Physics 2901 and 2902, or Credit or better in Physics 2001 or 2101 and Credit or better in Physics 2002 or 2102. Prerequisite: 16 credit points of Intermediate Mathematics. N) May not be counted with Physics 3007	*March*
PHYS 3908	Experimental Physics A (Advanced)	4	P) Qualifying: Physics 2901 and 2902, or Credit or better in Physics 2001 or2101 and Credit or better in Physics 2002 or 2102. Prerequisite: 16 credit points of Intermediate Mathematics. N) May not be counted with Physics 3008 or 3009 or 3909	*March*
PHYS 3909	Experimental Physics B (Advanced)	8	P) Qualifying: Physics 2901 and 2902, or Credit or better in Physics 2001 or 2101 and Credit or better in Physics 2002 or 2102. Prerequisite: 16 credit points of Intermediate Mathematics. N) May not be counted with Physics 3008 or 3009 or 3908	*March*
PHYS 3105	Astrophysics	4	P) Qualifying: 16 credit points of Intermediate Physics. Prerequisite: 8 credit points of Intermediate Mathematics.	*July (check with coord.)*

Table 1: Bachelor of Science (see section 3) - continued

(a) Unit of Study	(b)	(c) Credit Points	(d)/(e) A) Assumed Knowledge P) Prerequisite & Qualifying C) Corequisite N) Prohibitions and other information	(f) Offered
PHYS 3106	Plasma Physics	4	P) Qualifying: 16 credit points of Intermediate Physics. Prerequisite: 8 credit points of Intermediate Mathematics.	*July (check with coord.)*
PHYS 3107	Modern Optics	4	P) Qualifying: 16 credit points of Intermediate Physics. Prerequisite: 8 credit points of Intermediate Mathematics.	*July (check with coord.)*
PHYS 3108	Nuclear and Particle Physics	4	P) Qualifying: 16 credit points of Intermediate Physics. Prerequisite: 8 credit points of Intermediate Mathematics.	*July (check with coord.)*
PHYS 3109	Acoustics and Ultrasonics	4	P) Qualifying: 16 credit points of Intermediate Physics. Prerequisite: 8 credit points of Intermediate Mathematics.	*July (check with coord.)*
PHYS 3200	Quantum Physics	4	P) Qualifying: 16 credit points of Intermediate Physics. Prerequisite: 8 credit points of Intermediate Mathematics. N) May not be counted with Physics 3003 or 3903	*March*

■ Physiology

Unit of Study		Credit Points		Offered
PHSI 3001	Neuroscience	12	P) Qualifying: Human Life Sciences 2101 and 2102 or Physiology 2002 or Anatomy and Histology 2002. Prerequisite: Biochemistry (2001 and 2002) or (2101 and 2102) and an additional 8 or more credit points from any Intermediate units of study in: Anatomy and Histology, Biology, Chemistry, Computer Science, Mathematics, Microbiology, Pharmacology, Physics, Physiology, Psychology or Statistics. N) Students in the Faculty of Engineering who have completed Physiology 2001 and 2002 plus at least one other Intermediate unit of study similar to the prerequisites may also be permitted to enrol.	*March*
PHSI 3002	Neuroscience - Cellular and Integrative	12	P) Prerequisite: 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. N) Students in the Faculty of Engineering who have completed Physiology 2001 and 2002 plus at least one other Intermediate unit of study similar to the prerequisites may also be permitted to enrol	*July*
PHSI 3003	Heart and Circulation	12	P) Qualifying: Human Life Sciences 2101 and 2102 or Physiology 2002. Prerequisite: Biochemistry (2001 and 2002) or (2101 and 2102) and an additional 8 or more credit units of study from any Intermediate units of study in: Anatomy and Histology, Biology, Chemistry, Computer Science, Mathematics, Microbiology, Pharmacology, Physics, Physiology, Psychology or Statistics. N) Students in the Faculty of Engineering who have completed Physiology 2001 and 2002 plus at least one other Intermediate unit of study similar to the prerequisites may also be permitted to enrol.	*July*

■ Psychology

Unit of Study		Credit Points		Offered
PSYC 3201	Statistics and Psychometrics	4	P) Qualifying: 12 credit points of Intermediate Psychology including Psychology 2112 (or Psychology 2001 and 2002).	*July*
PSYC 3202	History and Philosophy of Psychology	4	P) Qualifying: 12 credit points of Intermediate Psychology.	*March*
PSYC 3203	Abnormal Psychology	4	P) Qualifying: 12 credit points of Intermediate Psychology.	*July*
PSYC 3204	Behavioural Neuroscience	4	P) Qualifying: 12 credit points of Intermediate Psychology including Psychology 2111 and 2112 (or Psychology 2001 and 2002).	*July*
PSYC 3205	Cognition and Language	4	P) Qualifying: 12 credit points of Intermediate Psychology including Psychology 2112 and 2113 (or Psychology 2001 and 2002).	*July*
PSYC 3206	Developmental Psychology	4	P) Qualifying: 12 credit points of Intermediate Psychology.	*March*
PSYC 3207	Human Performance & Organisational Psychology	4	P) Qualifying: 12 credit points of Intermediate Psychology including Psychology 2113 (or Psychology 2001 and 2002).	*July*
PSYC 3208	Intelligence	4	P) Qualifying: 12 credit points of Intermediate Psychology including Psychology 2112 and 2114 (or Psychology 2001 and 2002).	*July*
PSYC 3209	Learning & Motivation	4	P) Qualifying: 12 credit points of Intermediate Psychology including Psychology 2111 and 2112 (or Psychology 2001 and 2002).	*March*
PSYC 3210	Perceptual Systems	4	P) Qualifying: 12 credit points of Intermediate Psychology including Psychology 2111 and 2112 (or Psychology 2001 and 2002).	*March*

Table 1: Bachelor of Science (see section 3) - continued

(a) Unit of Study	(b))	(c) Credit Points	(d)/(e) A) Assumed Knowledge P) Prerequisite & Qualifying C) Corequisite N) Prohibitions and other information	(f) Offered
PSYC 3211	Psychological Assessment	4	P) Qualifying: 12 credit points of Intermediate Psychology including Psychology 2112 and 2114(or Psychology 2001 and 2002).	*March*
PSYC 3212	Social Psychology	4	P) Qualifying: 12 credit points of Intermediate Psychology including Psychology 2113 (or Psychology 2001 and 2002).	*March*

■ Soil Science

SOIL 3001	Environmental Soil Science A	12	P) Qualifying: Soil Science 2001.	*March*
SOIL 3002	Environmental Soil Science B	12	P) Qualifying: Soil Science 2001. Prerequisite: Agricultural Chemistry 2001 or Chemistry 2001 or2101 or 2202 or 2301 or 2302 or Biochemistry 2002 or 2902.	*July*

■ Statistics

STAT 3001	Distribution Theory and Inference	4	P) Prerequisite: Mathematics 2001 or 2901 and Statistics 2003 or 2903. N) May not be counted with Statistics 3901	*March*
STAT 3002	Applied Linear Models	4	P) Prerequisite: Statistics 2004 and Mathematics 1002 or 1902 (or Statistics 1022 for Arts students). N) May not be counted with Statistics 3902	*March*
STAT 3003	Time Series Analysis	4	P) Prerequisite: Statistics 2003 or 2903.	*March*
STAT 3004	Design of Experiments	4	P) Prerequisite: Statistics 3002 or 3902.	*July*
STAT 3005	Applied Stochastic Processes	4	P) Prerequisite: (Statistics 2001 or 2901) and (Mathematics 2001 or 2901). N) May not be counted with Statistics 3905	*July*
STAT 3006	Sampling Theory and Categorical Data	4	P) Prerequisite: Statistics 2003 or 2903.	*July*
STAT 3901	Statistical Theory (Advanced)	4	P) Prerequisite: (Mathematics 2001 or 2901) and Statistics 2903. N) May not be counted with Statistics 3001	*July*
STAT 3902	Linear Models (Advanced)	4	P) Prerequisite: Statistics 2004 and (Statistics 2903 or Credit in 2003) and (Mathematics 2002 or 2902). N) May not be counted with Statistics 3002	*March*
STAT 3905	Markov Processes (Advanced)	4	P) Prerequisite: Statistics 2903 and (Mathematics 2001 or 2901) and (Mathematics 2002 or 2902). N) May not be counted with Statistics 3005	*July*
STAT 3907	Multivariate Analysis (Advanced)	4	P) Prerequisite: Statistics 3902 and either 3001 or 3901.	*July (not available in 1999)*

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 1 or General Statistical Methods 2 or Econometrics IA or Econometrics IB or any other unit of study deemed to be mutually exclusive with units of study listed in this Tabic. Students enrolled in the combined BSc/BCom program may enrol in Econometrics IA and/or Econometrics 1 B but they may not enrol in Mathematics 1011, 1012, 1013 or 1015.

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 that 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 (or qualify for admission to 16 credit points of Intermediate or Advanced 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.

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.

UAI

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.

Progression requirements

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

BSc degree resolutions

See Chapter 8.

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 24 credit points of Junior units of study at the Advanced level of which at least 12 must be 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 16 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.

UAI

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.

BSc degree resolutions

See Chapter 8.

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)

UAI

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

Transferring into the BSc(Bioinformatics) degree program

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

Selection is on academic merit and subject to a quota determined by the Dean.

BSc Degree Resolutions

See Chapter 8.

Table II: Bachelor of Science (Bioinformatics)(see section 12)

(a) (b)	(c)	(d)/{c}	(f)
	Credit	A) Assumed Knowledge P) Prerequisite & Qualifying	
Unit of Study	Points	C) Corequisite N) Prohibitions and other information	Offered

A. Junior Units of study

Candidates arc required to enrol in and complete:
(i) at least 12 credit points from Junior units of study in the Science discipline area of Mathematics
(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 area of Computer Science.
(ii) at least $ 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: BCHM 2001, BCHM 2901, BIOL 2005, BIOL 2905

C. Senior Units of Study

Students arc required to 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 Science units of study in the Science discipline areas of Biochemistry, Biology or Pharmacology

| **COMP 3206** | Bioinformatics Project | 4 | P) | Qualifying: Computer Science 2004 or 2904. Prerequisite: 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* |

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. To qualify for this degree, students must complete units of study to the value of 144 credit points, which must include:

- Junior units of study to the value of 12 credit points from each of the Science Discipline areas of Biology, Chemistry, Mathematics and Physics, (the study of Biology, Chemistry or Mathematics units of study at the Advanced level is highly recommended)
- the specialist Environmental Science units of study ENVI 1001, ENVI 1002, ENVI 2003, ENVI 2004, ENVI 2103, ENVI 2104, ENVI 3001 and ENVI 3002,
- at least 16 credit points from Intermediate units of study in the Science Discipline Areas of Agricultural Chemistry, Biology, Chemistry, Geography, Geology and Geophysics, Marine Science, and Soil Science,
- at least 24 credit points from Senior units of study in the Science Discipline Areas of Agricultural Chemistry, Biology, Chemistry, Geography, Geology, Microbiology, Marine Science and Soil Science.

Special arrangements may be made with the Dean of Science to enrol in a Physics major within this degree program.

A typical program of study is:

First Year
12 credit points of Junior Biology.
12 credit points of Junior Chemistry.
A combined total of 12 credit points from Junior Mathematics and Junior Physics.*
ENVI 1001 and ENVI 1002.

Second Year
At least 16 credit points chosen from Intermediate Science units of study.
ENVI 2003, ENVI 2004, ENVI 2103 and ENVI 2104.
A combined total of 12 credit points from Junior Mathematics and Junior Physics.*

Third Year
At least 24 credit points chosen from Senior Science units of study.
ENVI 3001 and ENVI 3002.

*By the end of the second year students should have completed 12 credit points of each of Junior Physics and Junior Mathematics so as to satisfy the entry requirements for a range of Senior units of study.

The Resolutions of the Senate governing candidature for the degree of Bachelor of Science listed in Chapter 8 also govern the BSc (Environmental) degree program. Table III is the Table of units of study for the Bachelor of Science (Environmental) degree program.

UAI

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) degree program with the permission of the Dean.

BSc degree resolutions

See Chapter 8.

Table III: Bachelor of Science (Environmental)(see section 12)

(a) (b)	(c)	(d)/(c)	(f)
	Credit	A) Assumed Knowledge P) Prerequisite & Qualifying	
Unit of Study	Points	C) Corequisite N) Prohibitions and other information	Offered

A. Junior Units of study

Candidates arc required to enrol in and complete:
(i) Environmental Science 1001 and Environmental Science 1002.
(ii) Biology (1001 or 1901) and Biology (1002 or 1902)
(iii) Chemistry (1101 or 1901 or 1903) and Chemistry (1102 or 1902 or 1904)
(iv) 12 credit points of Junior units of study in the Science Discipline areas of Physics or Mathematics.
Note: By the end of the Intermediate year students should have completed 12 credit points of each of Junior Physics and Junior Mathematics.

ENVI 1001	Global Geology	6	N) *Changes to prerequisites and corequisites subject to Faculty approval	*March*
ENVI 1002	Gcomorphic Environments and Change	6	N) *Changes to prerequisites and corequisites subject to Faculty approval	*July*

B. intermediate Units of Study

Candidates are required to enrol in and complete:
(i) Environmental Science 2003 and Environmental Science 2004 and Environmental Science 2103 and Environmental Science '2104
(ii) 16 credit points of Intermediate units of study from the Science Discipline areas of Agricultural Chemistry, Biology (excludirig the units of study on Cell Biology and Molecular and General Genetics), Chemistry, Geography, Geology and Geophysics, Marine Science iind Soil Science. Special arrangements may be made with the Dean of the Faculty of Science to enrol in a Physics major with this award course. When choosing these units, candidates should carefully consider the relevant qualifying units, prerequisites and corequisites of Senior units of study in both Environmental Science and their choice of other major discipline.
Note: By the end of the Intermediate year students should have completed 12 credit points of each of Junior Physics and Junior ^Mathematics

ENVI 2003	Environmental Processes*	6	P) Prerequisite: ENVI 1001 and ENVI 1002. C) ENVI 2004. N) This unit of study can only be taken by students enrolled in the BSc(Environmental). Note: enrolment is limited to 50 students. *Ncw unit of study subject to Faculty approval	*March*
ENVI 2004	Physical and Human Environmental Impacts*	4	P) Prerequisite: ENVI 1001 and ENVI 1002. C) ENVI 2003. N) This unit of study can only be taken by students enrolled in the BSc(Environmental). Note: enrolment is limited to 50 students. *Ncw unit of study subject to Faculty approval	*March*
ENVI 2103	Environmental Sampling and Biology*	6	P) Prerequisite: ENVI 1001 and ENVI 1002 and Biology (1001 or 1901) and Biology (1002 or 1902). C) ENVI 2104. N) This unit of study can only be taken by students enrolled in the BSc(Environmental), and cannot be counted towards BIOL 3202. *New unit of study subject to Faculty approval	*July*
ENVI 2104	Environmental Pollution*	4	P) Prerequisite: ENVI 1001 and ENVI 1002. C) ENVI 2103. N) This unit of study can only be taken by students enrolled in the BSc(Environmental). *Ncw unit of study subject to Faculty approval	*July*

C. Senior Units of Study

Candidates arc required to enrol in and complete:
(i) Environmental Science 3001 and Environmental Science 3002
(ii) 24 Senior units of study from the Science Discipline areas of Agricultural Chemistry, Biology, Chemistry, Geography, Gcology, Marine Science, Microbiology, Soil Science.

ENVI 3001	Environmental Law and Planning	12	P) Prerequisite: ENVI 2003, 2004, 2103 and 2104*. N) *Changcs to prerequisites and corequisites subject to Faculty approval	*March*
ENVI 3002	Environmental Assessment	12	P) Prerequisite: ENVI 2003, 2004, 2103 and 2104*. N) *Changcs to prerequisites and corequisites subject to Faculty approval	*July*
ENVI 3003	Environmental Law and planning	4	P) Prerequisite: ENVI 2001 and ENVI 2002. C) Senior Environmental Science Elective units of study to a minimum value of 4 credit.	*March (may not be offered in 1999)*
ENVI 3004	Environmental Assessment	4	A) ENVI 2001, ENVI 2002, ENVI 2103. P) Prerequisite: ENVI 2001 and ENVI 2002. C) Senior Environmental Science Elective units of study to a minimum value of 4 credit.	*March (may not be offered in 1999)*

Table III: Bachelor of Science (Environmental)(see section 12) - continued

00 Unit of Study	(b)	(c) Credit Points	(d)/(c) A) Assumed Knowledge P) Prerequisite & Qualifying C) Corequisite N) Prohibitions and other information	(f) Offered
AGCH 3012	Introductory Environmental Plant and Soil Chemistry	4	P) Qualifying: Environmental Science 2001 and 2002. C) Environmental Science 3003. N) May not be counted with Agricultural Chemistry 3002. This unit of study is offered only to students enrolled in the BSc(Environmental). A maximum quota of 25 may exist. Contact the Environmental Science advisor.	*March*
CHEM 3601	Chemistry 3A (Environmental)	4	P) Prerequisite: Chemistry 1102 or 1902 and Anthropogenic Impacts on Environments 2002. N) May not be counted with Chemistry 3101 or 3201 or 3901 or 3102 or 3202, or 3902 or 3903	*March*
CHEM 3602	Chemistry 3B (Environmental)	4	P) Prerequisite: Chemistry 1102 or 1902 and Anthropogenic Impacts on Environments 2002. N) 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	P) Prerequisite: Environmental Science 2102 or 12 credit points of Junior Physics.	*March*

00 Unit of Study	(b)	(c) Credit Points	(d)/(c) A) Assumed Knowledge P) Prerequisite & Qualifying C) Corequisite N) Prohibitions and other information	(f) Offered

Bachelor of Science (Molecular Biology and Genetics) degree program

The course offers an integrated and comprehensive coverage of aspects of modem 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 that 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 and performance in Advanced subjects. Students in Advanced Degree programs are expected to obtain a credit average in each year of study.

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 and to the Table of units of study for the BSc.

Sequence of study

First Year

BIOL 1901 and (1904 or 1905)
CHEM (1905 or 1906 or 1907) and (1902 or 1904 or 1909) (The combination of CHEM 1907 and 1909 is the preferred option.)
12 credit points of Junior Mathematics units of study (excluding MATH 1011, 1012, 1013, and 1015) (It is recommended that students include some statistics in their choice of Mathematics units of study.)
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.

Second Year

BCHM (2001 or 2901) and (2002 or 2902)
BIOL 2905 and 2906
CHEM 2903
MICR (2005 and 2906 - this combination is replaced by MICR 2909 and is intended only for pre-1999 students) or 2909.

Third Year

Core (March semester):
BCHM 3901
BIOL 3903
Option (July semester): Two of-
BIOL 3905
BCHM 3904
CHEM 3903
MICR 3904/3004

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 BCHM (2001 or 2901) and (2002 or 2902) and BIOL 2905.

UAI

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

Transferring into the BSc (Molecular Biology and Genetics)

Students with appropriate backgrounds may be permitted to transfer from other degrees offered by the Faculty of Science, or from other universities, into the BSc (Molecular Biology and Genetics), subject to quota limitations.

Progression requirements

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

BSc Degree Resolutions

See Chapter 8.

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

(a) (b)	(c) Credit Points	(d)/(e) A) Assumed Knowledge P) Prerequisite & Qualifying	▪	(f).
Unit of Study		C) Corequisite N) Prohibitions and other information		Offered

For details of content, assumed knowledge, prerequisites, corequisites and qualifying units see also Table I (BSc)

A. Junior Units of study

Students arc required to enrol in and complete:
(i) (a) Biology 1901 and (1904 or 1905).
     (b) Chemistry (1905 or 1906 or 1907) and (1902 or 1904 or 1909) (The combination of Chemistry 1907 and 1909 is the preferred option.)
or
Instead of (a) or (b), qualify for admission to Biochemistry 2901, Biology 2905, Biology 2906, Chemistry 2903 and Microbiology 2005 or 2909.
(ii) 12 credit points in the Science Discipline area of Mathematics (excluding MATH 1011, 1012, 1013 and 1015) (It is recommended that students include some statistics in their choice of Mathematics units)
(iii) 12 credit points of other Junior units of study from Tabic I. (It is recommended that these include Physics or Computer Science.)

BIOL 1902	Living Systems (Advanced)	6	A) Biology section of the HSC 4-unit Science course. P) Prerequisite: UAI of at least 93, or at least 80% in HSC 2-unit Biology or equivalent, or by invitation on the basis of the result for Biology 1001 or 1901. N) May not be counted with Biology 1002	*July*
BIOL 1904	Living Systems Molecular (Advanced)	6	A) Biology section of HSC 4-unit or Biology 1901 or cqiuvalent. N) 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	A) HSC Biology section of HSC 4-unt Science or Biology 1901 or equivalent. N) 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 IA Molecular (Advanced)	6	P) Prerequisite: UAI of at least 92.5 and at least 75% in HSC 2-unit Chemistry or equivalent. N) May not be counted with Chemistry 1001 or 1101 or 1901 or 1903 or 1906.	*March*
CHEM 1906	Chemistry IA Molecular (Special Studies Program)	6	P) Prerequisite: UAI of at least 98 and at least 85% in HSC 2-unit Chemistry or equivalent. N) May not be counted with Chemistry 1001 or 1101 or 1901 or 1903 or 1905	*March*
CHEM 1907	Chemistry 1 Life Sciences A Molecular (Advanced)	6	P) Prerequisite: UAI of at least 92.5 and at least 75% in HSC 2-unit Chemistry or equivalent.	*March*
CHEM 1909	Chemistry 1 Life Sciences B Molecular (Advanced)	6	P) Prerequisite: Chemistry 1907 or 1908 or equivalent.	*July*

B. Intermediate Units of Study

Students are required to complete:
(i) Biochemistry (2001 or 2901) and (2002 or 2902)
(ii) Biology 2905 and 2906
(iii) Chemistry 2903
(iv) Microbiology 2909 (The combination MICR 2005 and 2906 is replaced by MICR 2909 and is intended for prc-1999 Intermediate students.)
Note: Students wishing to major in Molecular Biology or Genetics in their Senior year should have completed both BCHM (2001/2901 and 2002/2902) and BIOL 2905.

CHEM 2903	Chemistry 2 (Life Sciences Advanced)	8	P) Qualifying: Chemistry 1902, 1904 and 1909. Prerequisite: 12 credit points of Junior Mathematics. N) May not be counted with Chemistry 2001 or2101 or 2301 or 2901 or 2502.	*March*
MICR 2909	Fundamental and Applied Microbiology (Advanced)	8	P) Prerequisite: Biology 1901 and 1904/1905 and Chemistry 1902 or 1904 or 1905 or 1906 or 1907 or 1909. N) May not be counted with MICR 2005, 2006, 2906 or 2009	*July*
MICR 2005	Fundamental Microbiology	4	P) Qualifying: Biology 1901 and Biology 1904 or 1905 and Chemistry 1902 or 1904 or 1909.	*March*
MICR 2906	Microbiological Applications and Biotechnology (Advanced)	4	P) Qualifying: Microbiology 2005 and Biology 1901 and (1904 or 1905) and Chemistry 1902 or 1904 or 1909.	*July*

Table IV: Bachelor of Science (Molecular Biology and Genetics)(see section 12) - continued

(a) Unit of Study	(b)	(c) Credit Points	(d)/(e) A) Assumed Knowledge P) Prerequisite & Qualifying C) Corequisite N) Prohibitions and other information	(f) 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 or 3904

BCHM 3904	Metabolic and Medical Biochemistry Molecular (Advanced)	12	P) Qualifying: Biochemistry 2002 or 2902. N) May not be counted with Biochemistry 3002 or 3902	*July*
BIOL 3905	Eukaryotic Genetics and Development Molecular (Advanced)	12	P) Qualifying: 16 credit points of Biology including Biology 2905. N) May not be counted with Biology 3203 or 3904	*July*
CHEM 3903	Chemistry 3 Life Sciences (Advanced)	12	P) Qualifying: Chemistry 2903. N) May not be counted with Chemistry 3102 or 3902	*July*
MICR 3004	Molecular Biology of Pathogens Molecular	12	P) Qualifying: Microbiology 2005 or 2906.	*July*
MICR 3904	Molecular Biology of Pathogens Molecular (Advanced)	12	P) Qualifying: 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.

Bachelor of Science (Nutrition) degree program

If you are interested in a career in nutrition and dietetics the Human Nutrition Unit within the Department of Biochemistry offers 3 specialist courses. These are the BSc(Nutrition) - an Advanced Science degree, the Master of Nutrition & Dietetics and the Master of Nutritional Science.

Bachelor of Science (Nutrition)

This is a new Advanced Science degree. It aims to produce scientists with an interest in all the fields of nutrition, as well as clinical dietetics. It is a four-year course. In the Junior year, the subjects required will be mathematics and a minimum of one semester of chemistry. The normal Advanced Science progression requirements must be satisfied for admission to the Intermediate year, which includes studies in Introductory Nutritional Science, Introductory Food Science and both Biochemistry and Physiology. In the Senior year, Nutrition in Individuals and Nutrition in Populations will be studied together with Biochemistry. In the Honours year, there will be a choice of course work (Clinical Nutrition) or a similar research year to that of Biochemistry. It is anticipated this course will be accredited by the Dietitians Association of Australia by the end of 1999.

BSc Degree Resolutions

See Chapter 8.

Table V: Bachelor of Science (Nutrition)(see section 12)

(a) (b) Unit of Study	(c) Credit Points	(d)/(c) A) Assumed Knowledge P) Prerequisite & Qualifying C) Corequisite N) Prohibitions and other information	Offered

For details of content, assumed knowledge, prerequisites, corcquisitcs and qualifying units see also Table I: Bachelor of Science.

A. Junior Units of Study

Candidates are required to enrol in and complete:
(i) Biology 1901 and (1902 or 1903).
(ii) Chemistry (1101 or 1901 or 1903) and (1102 or 1902 or 1904)
(iii) 12 credit points of Junior Mathematics
(iv) 12 credit points from Junior units of study in the Science Discipline areas of Computer Science, Physics or Psychology
At least 24 credit points of Junior units must be at the Advanced level.

B. Intermediate Units of Study

Candidates are required to complete:
(i) Biochemistry (2001 or 2901) and (2002 or 2902)
(ii) Nutritional Science 2901 and 2902
(iii) Physiology 2001 and 2002
(iv) At least 8 credit points from Intermediate units of study from the Science Discipline areas of Chemistry, Microbiology or Pharmacology

NUTR 2901	Introductory Food Science (Advanced)	8	P) Prerequisite: Biology 1901 and (1902 or 1903) and Chemistry (1101 or 1901 or 1903) and (1102 or 1902 or 1904). N) Subject to Faculty approval.	*March*
NUTR 2902	Introductory Nutritional Science (Advanced)	8	P) Prerequisite: Nutritional Science 2901. N) Subject to Faculty approval	*July*

C. Senior Units of Study

Candidates are required to complete:
(i) Biochemistry 3902
(ii)Nutritiona! Science 3901 and 3902
And one of the following Senior units of study
(iv) Biochemistry 3001 or 3901, Physiology 3001 or Agricultural Chemistry 3003

NUTR 3901	Nutrition in Individuals (Advanced)	12	P) Prerequisite: Nutritional Science 2902. N) Subject to Faculty approval	*March*
NUTR 3902	Nutrition in Populations (Advanced)	12	P) Prerequisite: Nutritional Science 2902. N) Subject to Faculty approval	*July*

D. Honours Units of Study

Candidates for the Honours degree must pass the Senior units of study at credit level
Honours year by coursework: (i) Nutritional Science 4001, (ii) Nutritional Science 4002
Honours by research: Nutritional Science 4003

NUTR 4001	Clinical Nutritional Science A	24	P) Prerequisite: Nutritional Science 3901 and 3902. N) Subject to Faculty approval	*March*
NUTR 4002	Clinical Nutritional Science B	24	P) Prerequisite: Nutritional Science 3901 and 3902. N) Subject to Faculty approval	*July*
NUTR 4003	Nutrition Research	48	P) Prerequisite: Nutritional Science 3901 and 3902. N) Subject to Faculty approval	*March*

Combined Science/Law degrees (BSc/LLB)

The University offers a combined Science/Law course similar to the combined courses of Aits/Law, Economics/Law, Economics(Social Sciences)/Law and Commerce/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, which should be consulted by students. A summary of the relevant LLB and BSc Resolutions is:

(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) and Torts (10 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 60 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) 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 (St James campus) over a period of two years. Full details of the units of study to be completed during this time are included in the Faculty of Law Handbook.

General enquiries about the combined Science/Law course 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 or year for the degree of Bachelor of Laws. Graduation with Honours in Law is based on weighted average marks (including failures) and requires a high standard of performance in all units of study for the LLB degree. 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.

BSc Degree Resolutions

See Chapter 8.

Table VI: Law Units of Study (see section 13)

(a) Unit of Study	(b)	(c) Credit Points	(d)/(e) A) Assumed Knowledge P) Prerequisite C) Corequisite N) Prohibitions and other information	(f) Offered
LAWS 1006	Legal Institutions	6		*March*
LAWS 1007	Law, Lawyers and Justice in Australian Society	6	P) Legal Institutions.	*July*
LAWS 1002	Contracts	8		*March*
LAWS 1003	Criminal Law	8		*July*
LAWS 3000	Federal Constitutional Law	10	P) Legal Institutions; Law, Lawyers and Justice in Australian Society.	*March*
LAWS 3001	Torts	10	P) Legal Institutions; Law, Lawyers and Justice in Australian Society.	*July*

Combined Arts/Science degrees

BA/BSc Resolutions of the Faculty
See Chapter 8.

BSc/BA Resolutions
See Chapter 8.

Combined Science/Engineering degrees

BSc/BE Resolutions
See Chapter 8.

BE/BSc Resolutions
See Chapter 8.

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

Resolutions
See Chapter 8.

Degree of Bachelor of Liberal Studies (BLibStud)
Summary of requirements
In the Bachelor of Liberal Studies students will undertake a broad liberal education which emphasises communication and problem-solving skills. The Faculties of Arts and Science jointly administer the degree. 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 (currently, ENGL 1050 Language in Context).
- 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
See Chapter 8.

Degree of Bachelor of Computer Science and Technology (BCST)
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 of the Resolutions (see Chapter 8).

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 two of MATH 1001 or 1002 or 1011 or 1901 or 1902 in February semester, and two more mathematics units of study including either MATH 1004 or 1904 in July 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 University Admission Index (UAI)
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 1001, 1002, 1003, 1004, 1005, 1011, 1012, 1901, 1902, 1903, 1904, 1905 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 are some of the main career paths; detailed advice on relevant units of study can be found on the web site of the Computer Science department.
- Network manager, system administrator or programmer for embedded systems
- Programmer for commercial applications
- Information system consultant
- Programmer for scientific applications
- Programmer for bioinformatics
- Programmer for geographic information systems
- Computer scientist with interest in mathematics.

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. Daytime 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 1998, 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.

BCST Degree Resolutions
See Chapter 8.

Degree of Bachelor of Computer Science and Technology (Advanced)
The Bachelor of Computer Science and Technology (Advanced) degree aims to provide a highly technologically relevant and attractive degree to high-quality students. It is intended to meet the demand of students who do exceptionally well in the NSW HSC (or equivalent), or those who have substantial computer programming experience and aptitude. The degree program offers top students the opportunity to study areas which they find most interesting and valuable. The degree is based on Computing where a core of Computing subjects can be combined with other subjects from a range of Faculties (especially Engineering and Commerce subjects).

The resolutions of the Senate governing candidature for the degree of Bachelor of Computer Science and Technology also govern the Bachelor of Computer Science and Technology (Advanced) degree program. Essentially, the degree has the same structure as the BCST (144 units with a major in Computer Science; either 12 extra computer-related credits at third year or 12 senior credits in a single other Science; a minor in Mathematics and/or Statistics) but it requires that a substantial amount of this work be done in Advanced units of study (the total Advanced credits demanded is 64, the same as in the BSc(Adv), however this must include 24 Senior units in Computer Science, including an Advanced project).

The degree is composed of individual units of study, with great flexibility in the choice among those offered in Faculties of Science, Arts, Economics and from Engineering).

Table VII: Bachelor of Computer Science and Technology (see section 3)

(a) (b) Unit of Study	(c) Credit Points	(d)/(c) A) Assumed Knowledge P) Prerequisite & Qualifying C) Corequisite N) Prohibitions and other information	(f) Offered
Senior Units of Study (i)			
COMP 3201 Algorithmic Systems Project	4	P) Prerequisite: Computer Science 3001 or 3901. C) Students intending to major in Computer Science arc advised to enrol in one of Computer Science 3201, 3202, 3203, 3204 or 3205,3206 or 3809.	*March (only for those with prereq.) & July*
COMP 3202 Computer Systems Project	4	P) Prerequisite: Computer Science 3009 or 3909. C) Students intending to major in Computer Science arc advised to enrol in one of Computer Science 3201, 3202, 3203, 3204 or 3205, 3206 or 3809.	*March (only for those with prereq.) & July*
COMP 3203 Intelligence Systems Project	4	P) Prerequisite: Computer Science 3002 or 3902. C) Students intending to major in Computer Science arc advised to enrol in one of Computer Science 3201, 3202, 3203, 3204 or 3205, 3206 or 3809.	*March (only for those with prereq.) & July*
COMP 3204 Large-Scale Software Project	4	P) Prerequisite: Computer Science 3100 or 3800. C) Students intending to major in Computer Science arc advised to enrol in one of Computer Science 3201, 3202, 3203, 3204 or 3205, 3206 or 3809.	*March (only for those with prereq.) & July*
COMP 3205 Product Development Project	4	P) Prerequisite: Computer Science 3008. C) Students intending to major in Computer Science are advised to enrol in one of Computer Science 3201, 3202, 3203, 3204 or 3205, 3206 or 3809.	*March (onlyfor those with prereq.) & July*
COMP 3206 Bioinformatics Project	4	P) Qualifying: Computer Science 2004 or 2904. Prerequisite: 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 3809 Software Project (Advanced)	4	P) Prerequisite: 16 credit points of Intermediate or Senior Computer Science, with Distinction average. C) 8 credit points of Senior Computer Science.	*March & July*
Senior Units of Study (ii)			
EMCT 3510		Sec 1999 Faculty of Economics Handbook for details of EMCT units.	
EMCT 3520		See 1999 Faculty of Economics Handbook for details of EMCT units.	
ELEC 3501		Sec 1999 Faculty of Engineering Handbook for details of ELEC units.	
ELEC 3601		See 1999 Faculty of Engineering Handbook for details of ELEC units.	
ELEC 4302		Sec 1999 Faculty of Engineering Handbook for details of ELEC units.	
ELEC 4303		See 1999 Faculty of Engineering Handbook for details of ELEC units.	
ELEC 4501		See 1999 Faculty of Engineering Handbook for details of ELEC units.	
ELEC 4601		Sec 1999 Faculty of Engineering Handbook for details of ELEC units.	
ELEC 4602		Sec 1999 Faculty of Engineering Handbook for details of ELEC units.	
ELEC 5501		Sec 1999 Faculty of Engineering Handbook for details of ELEC units.	
ELEC 5601		Sec 1999 Faculty of Engineering Handbook for details of ELEC units.	
ELEC 5602		See 1999 Faculty of Engineering Handbook for details of ELEC units.	

Table VII: Bachelor of Computer Science and Technology (see section 3) - continued

<»> Unit of Study	(b)	(c) Credit Points	(d)/(e) A) Assumed Knowledge P) Prerequisite & Qualifying C) Corequisite N) Prohibitions and other information	. (f) Offered
ELEC 5603			See 1999 Faculty of Engineering Handbook for details of ELEC units.	
ELEC 5604			Sec 1999 Faculty of Engineering Handbook for details of ELEC units.	
ELEC 5605			Sec 1999 Faculty of Engineering Handbook for details of ELEC units.	
ELEC 5606			See 1999 Faculty of Engineering Handbook for details of ELEC units.	
ELEC 5607			See 1999 Faculty of Engineering Handbook for details of ELEC units.	
GEOG 3102	Coastal Management and GIS	12	P) Prerequisite: Geography 2001 or 2002 or 2101 or Marine Science 2001.	*July*
MATH 3005	Logic	4	P) Prerequisite: (for all but BCST students) 8 credit points of Intermediate Mathematics; (for BCST students) 8 credit points of Intermediate Mathematics or 12 credit points of Junior Mathematics at Advanced level.	*March*
MATH 3007	Coding Theory	4	P) Prerequisite: 8 credit points of Intermediate Mathematics (strongly advise 2002 or 2902).	*July*
MATH 3010	Information Theory	4	P) Prerequisite: 8 credit points of Intermediate Mathematics (strongly advise 2001 or 2901 and some probability theory).	*July*
MATH 3016	Mathematical Computing I	4	P) Prerequisite: 8 credit points of Intermediate Mathematics and one of Mathematics 1001 or 1003 or 1901 or 1903. N) May not be counted with Mathematics 3916.	*March*
MATH 3019	Signal Processing	4	P) Prerequisite: Mathematics 2005 or 2905.	*March*
MATH 3020	Nonlinear Systems and Biomathcmatics	4	P) Prerequisite: 8 credit points of Intermediate Mathematics (strongly advise 2006 or 2906 or 2908 or 3003) and one of Mathematics 1001 or 1003 or 1901 or 1903.	*July*
MATH 3905	Categories and Computer Science (Advanced)	4	P) Prerequisite: 12 credit points of Intermediate Mathematics.	*March*
MATH 3912	Combinatorics (Advanced)	4	P) Prerequisite: 12 credit points of Intermediate Mathematics.	*July*
MATH 3913	Computational Algebra (Advanced)	4	P) Prerequisite: 12 credit points of Intermediate Mathematics (strongly advise Mathematics 3002 or 3902).	*July*
MATH 3916	Mathematical Computing I (Advanced)	4	P) Prerequisite: 8 units of Intermediate Mathematics and one of Mathematics 1903 or Credit in Mathematics 1003. N) May not be counted with Mathematics 3016	*March*
PHYS 3301	Scientific Computing	4	P) Prerequisite: 16 credit points of Intermediate units of study in Chemistry, Computer Science, Mathematics, Physics or Statistics.	*March*
PHYS 3303	Scientific Visualisation	4	P) Prerequisite: Physics 3301.	*July*
STAT 3004	Design of Experiments	4	P) Prerequisite: Statistics 3002 or 3902.	*July*

Degree of Bachelor of Medical Science (BMedSc)

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 1003 and 1004 or 1903 and 1904 is not recommended in this degree. Students wishing to study Statistics/Calculus are advised to select from MATH 1003, 1005, 1903, 1905, 1013, 1015.

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 (Anatomy and Histology, Pharmacology, Physiology, and Cell Pathology). Such students may find it necessary to complete additional Intermediate units of study in the Faculty of Science before undertaking Senior units of study.

BMedSc Degree Resolutions

See Chapter 8.

Table VIII: Bachelor of Medical Science (see section 3)

(a) Unit of Study		(c) Credit Points	(d)/(e) A) Assumed Knowledge P) Prerequisite & Qualifying C) Corequisite N) Prohibitions and other information	(f) Offered

A. Junior Units of Study

BIOL 1001	Concepts in Biology	6	A) Biology section of the HSC 4-unit Science course. N) May not be counted with Biology 1901	*March*
BIOL 1002	Living Systems	6	A) Biology section of the HSC 4-unit Science course. N) May not be counted with Biology 1902	*July*
BIOL 1003	Human Biology	6	A) Biology section of the HSC 4-unit Science course. N) May not be counted with Biology 1903	*July*
BIOL 1901	Concepts in Biology (Advanced)	6	A) Biology section of the HSC 4-unit Science course. P) Prerequisite: UAI of at least 93, or at least 75% in HSC 2-unit Biology or equivalent, or by invitation on the basis of the result for Biology 1002, 1902, 1003, 1903. N) May not be counted with Biology 1001	*March*
BIOL 1902	Living Systems (Advanced)	6	A) Biology section of the HSC 4-unit Science course. P) Prerequisite: UAI of at least 93, or at least 80% in HSC 2-unit Biology or equivalent, or by invitation on the basis of the result for Biology 1001 or 1901. N) May not be counted with Biology 1002	*July*
BIOL 1903	Human Biology (Advanced)	6	A) Biology section of the HSC 4-unit Science course. P) Prerequisite: UAI of at least 93, or at least 80% in HSC 2-unit Biology or equivalent, or by invitation on the basis of the result for Biology 1001 or 1901. N) May not be counted with Biology 1003	*July*
CHEM 1101	Chemistry 1A	6	A) HSC Mathematics 2 unit course; and the Chemistry component of the 4-unit or 3-unit HSC Science course, or 2-unit Chemistry. C) Recommended concurrent unit of study: Preferred - Mathematics 1001 and 1002 or 1901 and 1902; otherwise - Mathematics 1011 and 1012. N) May not be counted with Chemistry 1001 or 1901 or 1903.	*March & July*
CHEM 1102	Chemistry IB	6	P) Qualifying: Chemistry 1101 or a Distinction in Chemistry 1001 or equivalent. C) Recommended concurrent unit of study: Preferred - Mathematics 1003 and 1005 or 1003 and 1004 or 1903 and 1905 or 1903 and 1904; otherwise - Mathematics 1004 and 1005 or 1013 and 1015. N) May not be counted with Chemistry 1002 or 1902 or 1904.	*March & July*
CHEM 1901	Chemistry 1A (Advanced)	6	P) Prerequisite: UAI of at least 92.5 and at least 75% in HSC 2-unit Chemistry or equivalent; by invitation. C) Recommended concurrent unit of study: Preferred - Mathematics 1001 and 1002 or 1901 and 1902; otherwise - Mathematics 1011 and 1012. N) May not be counted with Chemistry 1001 or 1101 or 1903.	*March*
CHEM 1902	Chemistry IB (Advanced)	6	P) Qualifying: Chemistry 1901 or 1903 or Distinction in Chemistry 1101 or equivalent; by invitation. C) Recommended concurrent unit of study: Preferred — Mathematics 1003 and 1005 or 1003 and 1004 or 1903 and 1905 or 1903 and 1904, otherwise — Mathematics 1013 and 1015 or 1004 and 1005. N) May not be counted with Chemistry 1002 or 1102 or 1904.	*July*
CHEM 1903	Chemistry 1A (Special Studies Program)	6	P) Prerequisite: UAI of at least 98.7 and at least 85% in HSC 2-unit Chemistry or equivalent. Entry is by invitation. C) Recommended concurrent unit of study: Preferred — Mathematics 1001 and 1002 or 1901 and 1902; otherwise — Mathematics 1011 and 1012. Students in the Faculty of Science Talented Students Program arc automatically eligible. For the purpose of Resolution 11 this unit of study is deemed to be designated as an Advanced unit of study. N) May not be counted with Chemistry 1001 or 1101 or 1901.	*March*
CHEM 1904	Chemistry IB (Special Studies Program)	6	P) Prerequisite: Distinction in Chemistry 1903; by invitation. C) Recommended concurrent unit of study: Preferred — Mathematics 1003 and 1005 or 1003 and 1004 or 1903 and 1905 or 1903 and 1904; otherwise — Mathematics 1013 and 1015 or 1004 and 1005. N) May not be counted with Chemistry 1002 or 1102 or 1902.	*July*
CHEM 1908	Chemistry 1 Life Sciences A (Advanced)	6	P) Prerequisite: UAI of at least 92.5 and at least 75% in HSC 2-unit Chemistry or equivalent; by invitation. C) (Recommended concurrent unit of study) Preferred - Mathematics 1001 and 1002 or 1901 and 1902; otherwise Mathematics 1011 and 1012. N) May not be counted with Chemistry 1001 or 1101 or 1903.	*March*

Table VIM: Bachelor of Medical Science (see section 3) - continued

(a) Unit of Study	(b)	(c) Credit Points	(d)/(c) A) Assumed Knowledge P) Prerequisite & Qualifying C) Corequisite N) Prohibitions and other information	(f) Offered
CHEM 1909	Chemistry l Life Sciences B Molecular (Advanced)	6	P) Prerequisite: Chemistry 1907 or 1908 or equivalent.	*July*
COMP 1001	Introductory Programming	6	A) HSC 3-unit Mathematics. C) Students intending to major in Computer Science arc advised to enrol in Mathematics 1003 and 1004 or 1004 and 1005 or 1903 and 1904 or 1904 and 1905 in their first year. N) May not be counted with Computer Science 1901.	*March & July*
COMP 1002	Introductory Computer Science	6	P) Prerequisite: Computer Science 1001 or 1901. N) May not be counted with'Computer Science 1902	*March & ■ July*
COMP 1901	Introductory Programming (Advanced)	6	A) HSC 3-unit Mathematics (Requires permission by the Head of Department). N) May not be counted with Computer Science 1001	*March & July*
COMP 1902	Introductory Computer Science (Advanced)	6	P) Prerequisite: Distinction in Computer Science 1901 or 1001. N) May not be counted with Computer Science 1002	*March & July*
MATH 1001	Differential Calculus	3	A) HSC 3-unit Mathematics. N) May not be counted with Mathematics 1901 or 1011	*March*
MATH 1002	Linear Algebra	3	A) HSC 3-unit Mathematics. N) May not be counted with Mathematics 1902 or 1012	*March*
MATH 1003	Integral Calculus and Modelling	3	A) HSC 4-unit Mathematics or Mathematics 1001. N) May not be counted with Mathematics 1903 or 1013	*July*
MATH 1004	Discrete Mathematics	3	A) HSC 3-unit Mathematics. N) May not be counted with Mathematics 1904	*July*
MATH 1005	Statistics	3	A) HSC 2-unit Mathematics. N) May not be counted with Mathematics 1905 or 1015	*July*
MATH 1011	Life Sciences Calculus	3	A) HSC 2-unit Mathematics. N) May not be counted with Mathematics 1901 or 1001. May not be counted by students enrolled in the BSc/BCom combined award course.	*March*
MATH 1012	Life Sciences Algebra	3	A) HSC 2-unit Mathematics. N) May not be counted with Mathematics 1002 or 1902. May not be counted by students enrolled in the BSc/BCom combined award course.	*July*
MATH 1013	Life Sciences Difference and Differential Equations	3	A) HSC 2-unit Mathematics. N) May not be counted with Mathematics 1003 or 1903. May not be counted by students enrolled in the BSc/BCom combined award course.	*July*
MATH 1015	Life Sciences Statistics	3	A) HSC 2-unit Mathematics. N) May not be counted with Mathematics 1905 or 1005. May not be counted by students enrolled in the BSc/BCom combined award course.	*March*
MATH 1901	Differential Calculus (Advanced)	3	A) HSC 4-unit Mathematics or top decile 3-unit Mathematics. N) May not be counted with Mathematics 1001 or 1011	*March*
MATH 1902	Linear Algebra (Advanced)	3	A) HSC 4-unit Mathematics or top decile 3-unit Mathematics. N) May not be counted with Mathematics 1002 or 1012	*March*
MATH 1903	Integral Calculus and Modelling (Advanced)	3	A) HSC 4-unit Mathematics or Mathematics 1901. N) May not be counted with Mathematics 1003 or 1013	*July*
MATH 1904	Discrete Mathematics (Advanced)	3	A) HSC 4-unit Mathematics or top decile 3-unit Mathematics. N) May not be counted with Mathematics 1004	*July*
MATH 1905	Statistics (Advanced)	3	A) HSC 3-unit Mathematics (50 percentile). N) May not be counted with Mathematics 1005 or 1015	*July*
PHYS 1001	Physics (Regular)	6	A) HSC Physics or HSC 4-unit Science. P) See prerequisites for Intermediate Physics units of study. C) Recommended concurrent units of study: Mathematics 1001 and 1002 or 1901 and 1902. N) May not be counted with Physics 1002 or 1901.	*March*

Table VIII: Bachelor of Medical Science (see section 3) - continued

(a) Unit of Study	(b)	(c) Credit Points	(d)/(c) A) Assumed Knowlege P) Prerequisite & Qualifying C) Corequisite N) Prohibitions and other information	(f) Offered
PHYS 1002	Physics (Fundamentals)	6	A) No assumed knowledge of Physics. P) See prerequisites for Intermediate Physics units of study. C) Recommended concurrent unit of study: Mathematics 1001 and 1002 or 1901 and 1902. N) May not be counted with Physics 1001 or 1901.	*March*
PHYS 1003	Physics (Technological)	6	A) HSC 2-unit Physics or HSC 4-unit Science or Physics 1001 or 1002 or 1902 or equivalent. P) See prerequisites for Intermediate Physics units of study. C) Recommended concurrent unit of study: Mathematics 1003 and 1005 or 1903 and 1905. N) May not be counted with Physics 1004 or 1902.	*March & July*
PHYS 1004	Physics (Environmental and Life Sciences)	6	A) HSC 2-unit Physics or HSC 4-unit Science or Physics 1001 or 1002 or 1901 or equivalent. P) See prerequisites for Intermediate Physics units of study. C) Recommended concurrent unit of study: Mathematics 1003 and 1005 or 1903 and 1905. N) May not be counted with Physics 1003 or 1902.	*July*
PHYS 1901	Physics (Advanced) A	6	P) Prerequisite: UAI 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. See prerequisites for Intermediate Physics units of study. C) Recommended concurrent unit of study: Mathematics 1001 and 1002 or 1901 and 1902. N) May not be counted with Physics 1001 or 1002.	*March*
PHYS 1902	Physics (Advanced) B	6	P) Prerequisite: UAI 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. See prerequisites for Intermediate Physics units of study. C) Recommended concurrent unit of study: Mathematics 1003 and 1005 or 1903 and 1905. N) May not be counted with Physics 1003 or 1004.	*July*
PSYC 1001	Psychology 1001	6		*March*
PSYC 1002	Psychology 1002	6		*July*

B. Intermediate Units of Study

■ Core Units of Study

(a) Unit of Study	(b)	(c) Credit Points	(d)/(c)	(f) Offered
BMED 2101	Human Life Sciences A	12	P) Qualifying: 12 credit points of Junior Mathematics, 12 credit points of Junior Chemistry, 12 credit points of Junior Physics, and 12 credit points of Junior Biology or 12 credit points of Junior Computer Science or 12 credit points of Junior Psychology.	*March*
BMED 2102	Human Life Sciences B	12	P) Prerequisite: BMED 2101.	*July*
BCHM 2101	Genes and Proteins Theory	4	P) Qualifying: 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. N) May not be counted with Agricultural Chemistry 2001 or Biochemistry 2101 or 2901	*March*
BCHM 2102	Molecules, Metabolism and Cells Theory	4	P) Qualifying: Biochemistry 2001, 2101 or 2901. N) May not be counted with Agricultural Chemistry 2001 or Biochemistry 2102 or 2902	*July*
PCOL 2001	Pharmacology Fundamentals	4	P) Prerequisite: 6 credit points of Junior Chemistry (including Chemistry 1101, 1901 or 1903), 6 credit points of Junior Biology, and 6 credit points of units of study from other Science Discipline Areas. N) This is a qualifying unit of study for Pharmacology 3001 or 3002.	*March*
PCOL 2002	Pharmacology - Drugs and People	4	P) Prerequisite: 6 credit points of Junior Chemistry (including Chemistry 1101, 1901 or 1903), 6 credit points of Junior Biology, and 6 credit points of units of study from other Science Discipline Areas. Students are strongly advised to complete Pharmacology 2001 before enrolling in Pharmacology 2002.	*July*

Table VIII: Bachelor of Medical Science (see section 3) - continued

(a)	(b)	(c)	(d)/(e)	(f)
		Credit	A) Assumed Knowledge P) Prerequisite & Qualifying	
Unit of Study		Points	C) Corequisite N) Prohibitions and other information	Offered

■ Elective Units of Study (Select one subject)
Biochemistry

BCHM 2001	Genes and Proteins	8	P) Qualifying: 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. N) May not be counted with Agricultural Chemistry 2001 or Biochemistry 2101 or 2901	March
BCHM 2002	Molecules, Metabolism and Cells	8	P) Qualifying: Biochemistry 2001 or 2901. N) May not be counted with Agricultural Chemistry 2001 or Biochemistry 2102 or 2902	July
BCHM 2901	Genes and Proteins (Advanced)	8	P) Qualifying: 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. N) May not be counted with Agricultural Chemistry 2001 or Biochemistry 2101 or 2901	March
BCHM 2902	Molecules, Metabolism and cells (Advanced)	8	P) Qualifying: Biochemistry 2001 or 2901 (selected students). N) May not be counted with Agricultural Chemistry 2001 or Biochemistry 2102 or 2902	July

Biology

BIOL 2005	Molecular and General Genetics	8	P) Qualifying: Biology 1001 or 1901 and one of Biology 1002, 1902, 1003, 1903. Prerequisite: 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. N) 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	P) Prerequisite: 24 credit points of Junior units of study. This is a qualifying unit of study for Senior History and Philosophy of Science units of study. N) "Change to semester availability subject to Faculty approval	March*
HPSC 2002	Introductory History of Science	4	P) Prerequisite: 24 credit points of Junior units of study. This is a qualifying unit of study for Senior History and Philosophy of Science units of study. N) ""Change to semester availability subject to Faculty approval	July*

C. Senior Units of Study

■ Senior Core Units of Study - March semester

BMED 3001	Human Life Sciences	4	P) Qualifying: BMED 2101 and 2102. Prerequisite: Pharmacology 2001 and 2002, and Biochemistry 2101 and 2102 or Biochemistry 2001 and 2002 or Biochemistry 2901 and 2902.	March
BMED 3002	Microbiology and Immunology	8	P) Qualifying: BMED 2101 and 2102. Prerequisite: Pharmacology 2001 and 2002, and Biochemistry 2101 and 2102 or Biochemistry 2001 and 2002 or Biochemistry 2901 and 2902.	March

■ Elective units of Study - March semester
Anatomy and Histology

ANAT 3001	Microscopy and Histochemistry	12	P) Qualifying: Anatomy and Histology 2001.	March

Biochemistry

BCHM 3001	Molecular Biology and Structural Biochemistry	12	P) Qualifying: 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. N) May not be counted with Biochemistry 3901	March
BCHM 3901	Molecular Biology and Structural Biochemistry (Advanced)	12	P) Qualifying: 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. N) May not be counted with Biochemistry 3001	March

Biology

BIOL 3103	Molecular Genetics and Recombinant DNA Technology	12	P) Qualifying: 16 credit points of Intermediate Biology including Biology 2005 or 2905 (ForBMedSc students Qualifying: Biology 2005 or 2905). N) May not be counted with Biology 3903	March

Table VIII: Bachelor of Medical Science (see section 3) - continued

(a) Unit of Study	(b)	(c) Credit Points	(d)/(e) A) Assumed Knowledge P) Prerequisite & Qualifying C) Corequisite N) Prohibitions and other information	(f) Offered
BIOL 3903	Molecular Genetics and Recombinant DNA Technology (Advanced)	12	P) Qualifying: Distinction average in 16 credit points of Intermediate Biology including Biology 2005 or 2905. (For BMedSc students: Qualifying: Distinction in Biology 2005 or 2905.) These requirements may be varied and students with lower averages should consult the School's Executive Officer. N) May not be counted with Biology 3103	*March*
Cell Pathology				
CPAT 3001	Cell Pathology A	12	P) 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. (For BMedSc, BMED 2101 and 2102.). N) Students must contact the Department before enrolling. Only a small number of students can be accommodated in the laboratory facilities.	*March*
History and Philosophy of Science				
HPSC 3012	History of the Biomedical Sciences	12	P) Qualifying: History and Philosophy of Science 2001 and 2002.	*March*
Pharmacology				
PCOL 3001	Molecular Pharmacology and Toxicology	12	P) Prerequisite: 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.	*March*
Physiology				
PHSI 3001	Neuroscience	12	P) Qualifying: Human Life Sciences 2101 and 2102 or Physiology 2002 or Anatomy and Histology 2002. Prerequisite: Biochemistry (2001 and 2002) or (2101 and 2102) and an additional 8 or more credit points from any Intermediate units of study in: Anatomy and Histology, Biology, Chemistry, Computer Science, Mathematics, Microbiology, Pharmacology, Physics, Physiology, Psychology or Statistics. N) Students in the Faculty of Engineering who have completed Physiology 2001 and 2002 plus at least one other Intermediate unit of study similar to the prerequisites may also be permitted to enrol.	*March*
■ **Elective Units of Study – July semester**				
BMED 3003	Immunology	12	P) Qualifying: BMED 2101 and 2102. Prerequisite: 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	P) Qualifying: BMED 2101 and 2102. Prerequisite: Pharmacology 2001 and 2002, and Biochemistry 2101 and 2102 or Biochemistry 2001 and 2002 or Biochemistry 2901 and 2902. C) Coreq Microbiology 3003.	*July*
Anatomy and Histology				
ANAT 3002	Cells and Development	12	A) (i) an understanding of the basic structure of the vertebrates; (ii) an understanding of elementary biochemistry and genetics. P) Qualifying: Anatomy and Histology 2001. Prerequisite: at least 8 credit points of Intermediate Biochemistry. N) May not be counted with Anatomy and Histology 3003	*July*
ANAT 3005	Topographical Anatomy	12	P) Qualifying: BMED 2101 and 2102.	*July*
Biochemistry				
BCHM 3002	Metabolic and Medical Biochemistry	12	P) Qualifying: Biochemistry 2002 or 2902. N) May not be counted with Biochemistry 3902	*July*
BCHM 3902	Metabolic and Medical Biochemistry (Advanced)	12	P) Qualifying: Biochemistry 2002 or 2902 (selected students). N) May not be counted with Biochemistry 3002	*July*
Biology				
BIOL 3203	Eukaryotic Genetics and Development	12	P) Qualifying: 16 credit points of Intermediate Biology including Biology 2005 or 2905 (For BMedSc students Qualifying: Biology 2005 or 2905). N) May not be counted with Biology 3904 or 3905	*July*
BIOL 3904	Eukaryotic Genetics and Development (Advanced)	12	P) Qualifying: Distinction average in 16 credit points of Intermediate Biology including Biology 2005 or 2905. (For BMedSc students: Distinction in Biology 2005 or 2905) These requirements may be varied and students with lower averages should consult the School's Executive Officer. N) May not be counted with Biology 3203 or 3905	*July*

Table VIII: Bachelor of Medical Science (see section 3) - continued

(a) (b) Unit of Study	(c) Credit Points	(d)/(e) A) Assumed Knowledge P) Prerequisite & Qualifying C) Corequisite N) Prohibitions and other information	(f) Offered
Cell Pathology			
CPAT 3002 Cell Pathology B	12	P) Qualifying: Cell Pathology 3001.	*July*
CPAT 3101 Pathological Basis of Human Disease	12	P) Qualifying: Anatomy and Histology 2001; or Biochemistry 2001 or 2002 or 2101 or 2102 or 2901 or 2902; or Biology 2001 or 2002 or 2005 or 2006 or 2101 or 2102 or 2105 or 2106 or 2901 or 2902 2905 or 2906; or History and Philosophy of Science 2001 or 2002; or Microbiology 2001 or 2003 or 2901; or Pharmacology 2001; or Physiology 2001.	*July*
Microbiology			
MICR 3003 Molecular Biology of Pathogens	12	N) 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	P) Prerequisite: 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	P) Prerequisite: 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. N) Students in the Faculty of Engineering who have completed Physiology 2001 and 2002 plus at least one other Intermediate unit of study similar to the prerequisites may also be permitted to enrol	*July*
PHSI 3003 Heart and Circulation	12	P) Qualifying: Human Life Sciences 2101 and 2102 or Physiology 2002. Prerequisite: Biochemistry (2001 and 2002) or (2101 and 2102) and an additional 8 or more credit points from any Intermediate units of study in: Anatomy and Histology, Biology, Chemistry, Computer Science, Mathematics, Microbiology, Pharmacology, Physics, Physiology, Psychology or Statistics. N) Students in the Faculty of Engineering who have completed Physiology 2001 and 2002 plus at least one other Intermediate unit of study similar to the prerequisites may also be permitted to enrol.	*July*

Degree of Bachelor of Pharmacy (BPharm)

Note: The Senate has approved the following Resolutions for the Bachelor of Pharmacy. These Resolutions take effect for new enrolments from 1999. 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 (www.scifac.usyd.edu.au). For students first enrolling in 1997 or 1998, the Resolutions governing their candidature for the first and second years of study are contained in the 1997 or 1998 *Faculty of Science Handbook.* The 1999 Resolutions will govern their candidature in the year 1999 and in subsequent years **Candidates should note** that section 10 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 degree 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 may be awarded at the Pass or Honours level.

To satisfy the requirement for the degree candidates must gain a minimum of 192 credit points by completing the units of study prescribed for the degree (see Section 2 of the Resolutions). The basic requirements are contained in Sections 2, 3, and 4.

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

Concepts in Biology, Human Biology, Chemistry A (Pharmacy), Chemistry B (Pharmacy), Introductory Pharmacy, Mathematics/Statistics (Pharmacy), Psychology 1001 and Psychology 1002.

Assumed knowledge

It should be noted that most of the above First Year (first year) units of study will be taught on the assumption that students have reached the standard specified in Table IX below at the Higher School Certificate examination or equivalent level.

Prerequisites and corequisites

To be eligible to enrol in Second Year, Third Year and Fourth Year units of study, students must have completed 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 course has been successfully 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.

BPharm Degree Resolutions

See Chapter 8.

Table IX: Bachelor of Pharmacy (Pass and Honours degrees)

(a) Unit of Study	(b)	(c) Credit Points	(d)/(e) A) Assumed Knowledge P) Prerequisite & Qualifying C) Corequisite N) Prohibitions and other information	(f) Offered

First Year Units of Study

BIOL 1001	Concepts in Biology	6	A) Biology section of the HSC 4-unit Science course. N) May not be counted with Biology 1901	*March*
BIOL 1003	Human Biology	6	A) Biology section of the HSC 4-unit Science course. N) May not be counted with Biology 1903	*July*
CHEM 1611	Chemistry A (Pharmacy)	6	A) HSC Chemistry 2-unit or the chemistry component of the 3/4-unit Science course and the 2-unit Mathematics course.	*March*
CHEM 1612	Chemistry B (Pharmacy)	6	A) HSC Chemistry 2-unit or the chemistry component of the 3/4-unit Science course and the 2-unit Mathematics course. P) Prerequisite: Chemistry 1611 Chemistry A (Pharmacy).	*July*
PHAR 1603	Introductory Pharmacy	6	A) HSC 2-unit Chemistry or equivalent and see below.	*July*
MATH 1604	Mathematics/Statistics (Pharmacy)	6	A) HSC 2-unit Mathematics or equivalent (Students without this assumed knowledge are advised to attend a bridging course in February).	*March*
PSYC 1001	Psychology 1001	6		*March*
PSYC 1002	Psychology 1002	6		*July*

Second Year Units of Study

BCHM 2611	Proteins, Enzymes and Metabolism 1	3	P) Prerequisite: Chemistry 1611 Chemistry A (Pharmacy) and Chemistry 1612 Chemistry B (Pharmacy).	*March*
BCHM 2612	Metabolism 2 and Genes	3	P) Prerequisite: BCHM 2611 Proteins, Enzymes & Metabolism I.	*July*
PCOL 2603	Pharmacology 2A (Pharmacy)*	2	P) Prerequisite: CHEM 1611 Chemistry A (Pharmacy) and CHEM 1612 Chemistry B (Pharmacy). C) BCHM 2611 Proteins, Enzymes and Metabolism 1 and PHAR 2611 Pharmacy Practice 2A. N) *Unit of study subject to Faculty approval	*March*
PCOL 2604	Pharmacology 2B (Pharmacy)*	2	P) Qualifying: PCOL 2603 Pharmacology 2A (Pharmacy). C) BCHM 2612 Metabolism 2 and Genes and PHAR 2612 Pharmacy Practice 2B. N) *Unit of study subject to Faculty approval	*July*
PHSI 2604	Physiology 2A (Pharmacy)*	3	P) Prerequisite: Biology 1001 and 1003. N) ♦Unit of study subject to Faculty approval	*March*
PHSI 2605	Physiology 2B (Pharmacy)*	3	P) Prerequisite: PHSI 2604. N) ♦Unit of study subject to Faculty approval	*July*
MICR 2605	Microbiology (Pharmacy)	3	P) Prerequisite: Biology 1001 and 1003.	*March*
PHAR 2607	Pharmaceutical Microbiology	4	P) Prerequisite: PHAR 1603 Introductory Pharmacy. C) MICR 2605 Microbiology (Pharmacy).	*July*
PHAR 2609	Medicinal Chemistry 2A*	6	P) Prerequisite: MATH 1604 Mathematics/Statistics (Pharmacy), CHEM 1612 Chemistry A (Pharmacy), CHEM 1612 Chemistry B (Pharmacy) and PHARI603 Introductory Pharmacy. C) BCHM 2611 Proteins, Enzymes and Metabolism 1, PCOL 2603 Pharmacology 2A (Pharmacy). N) *Unit of study subject to Faculty approval	*March*
PHAR 2610	Medicinal Chemistry 2B*	4	P) Prerequisite: PHAR 2609 Medicinal Chemistry 2A. N) *Unit of study subject to Faculty approval	*July*
PHAR 2611	Pharmacy Practice 2A*	2	P) Prerequisite: Psychology 1001 and 1002, Introductory Pharmacy 1603. C) PCOL 2603 Pharmacology 2A (Pharmacy). N) *Unit of study subject to Faculty approval	*March*
PHAR 2612	Pharmacy Practice 2B*	3	P) Prerequisite: PHAR 2611 Pharmacy Practice 2A. N) ♦Unit of study subject to Faculty approval	*July*

Table IX: Bachelor of Pharmacy (Pass and Honours degrees) - continued

(a) Unit of Study	(b)	(c) Credit Points	(d)/(c) A) Assumed Knowledge P) Prerequisite & Qualifying C) Corequisite N) Prohibitions and other information	(f) Offered
PHAR 2613	Physical Pharmaceutics A*	5	P) Prerequisite: MATH 1604 Mathematics/ Statistics (Pharmacy), CHEM 1611 Chemistry A (Pharmacy), CHEM 1612 Chemistry B (Pharmacy), PHAR 1603 Introductory Pharmacy. N) *Unit of study subject to Faculty approval	*March*
PHAR 2614	Physical Pharmaceutics B*	5	P) Prerequisite: PHAR 2613 Physical Pharmaceutics A. N) *Unit of study subject to Faculty approval	*July*

Third Year Units of Study

(a) Unit of Study	(b)	(c) Credit Points	(d)/(c)	(f) Offered
PCOL 3603	Pharmacology 3A (Pharmacy)	6	P) Prerequisite: PCOL 2603 Pharmacology 2A, PCOL 2604 Pharmacology 2B (Pharmacy), PHSI 2604 Physiology 2A (Pharmacy) and PHSI2605 Physiology 2B (Pharmacy). C) PHAR 3609 Medicinal Chemistry 3A and PHAR 3613 Pharmacy Practice 3A.	*March*
PCOL 3604	Pharmacology 3B (Pharmacy)	2	P) Qualifying: PCOL 3603 Pharmacology 3A (Pharmacy). C) PHAR 3610 Medicinal Chemistry 3B and PHAR 3614 Pharmacy Practice 3B.	*July*
PHAR 3601	Dispensing	4	P) Prerequisite: PHAR 2613 Physical Pharmaceutics A , PHAR 2614 Physical Pharmaceutics B, and PHAR 2607 Pharmaceutical Microbiology. C) PHAR 3608 Formulation B.	*July*
PHAR 3607	Formulation A*	3	P) Prerequisite: PHAR 2607 Pharmaceutical Microbiology, PHAR 2613 Physical Pharmaceutics A and PHAR 2614 Pharmaceutics B. C) PHAR 3601 Dispensing. N) *Unit of study subject to Faculty approval	*March*
PHAR 3608	Formulation B*	2	P) Prerequisite: PHAR 3607 Formulation A. N) *Unit of study subject to Faculty approval	*July*
PHAR 3609	Medicinal Chemistry 3A*	6	P) Prerequisite: BCHM 2611 Proteins, Enzymes and Metabolism and BCHM 2612 Metabolism 2 and Genes. C) PCOL 3603 Pharmacology 3A (Pharmacy) and PHAR 3613 Pharmacy Practice 3A. N) *Unit of study subject to Faculty approval	*March*
PHAR 3610	Medicinal Chemistry 3B*	6	P) Prerequisite: PHAR 3609 Medicinal Chemistry 3A. C) PCOL 3604 Pharmacology 3A(Pharmacy)and PHAR 3614 Pharmacy Practice3B. N) *Unit of study subject to Faculty approval	*July*
PHAR 3611	Pharmacokinetics A*	3	P) Prerequisite: PHAR 2613 Physical Pharmaceutics A and PHAR 2614 Physical Pharmaceutics B. N) *Unit of study subject to Faculty approval	*March*
PHAR 3612	Pharmacokinetics B*	3	P) Prerequisite: PHAR 3611 Pharmacokinetics A. N) *Unit of study subject to Faculty approval	*July*
PHAR 3613	Pharmacy Practice 3A*	6	C) PHAR 3603 Pharmacology 3A (Pharmacy), PHAR 3611 Pharmacokinetics 3A. N) *Unit of study subject to Faculty approval	*March*
PHAR 3614	Pharmacy Practice 3B	7	P) Prerequisite: PHAR 3613 Pharmacy Practice 3A.	*July*

Fourth Year Units of Study

(a) Unit of Study	(b)	(c) Credit Points	(d)/(c)	(f) Offered
PHAR 4601	Integrated Dispensing	4	P) Prerequisite: PHAR 3601 Dispensing, PHAR 3613 Pharmacy Practice 3A and PHAR 3614 Pharmacy Practice 3B.	*March*
PHAR 4602	New Drug Technologies	4	P) Prerequisite: PHAR 3609 Medicinal Chemistry 3A and PHAR 3610 Medicinal Chemistry 3B.	*March*
PHAR 4603	Pharmaceutics Workshop	4	P) Prerequisite: PHAR 3611 Pharmacokinetics A, PHAR 3612 Pharmacokinetics B, PHAR 3607 Formulation A and PHAR 3608 Formulation B.	*March*
PHAR 4606	Clinical Information/Technology	2	P) Prerequisite: PHAR 3613 Pharmacy Practice 3A, PHAR 3614 Pharmacy Practice 3B, PCOL 3603 Pharmacology 3A (Pharmacy), PCOL 3604 Pharmacology 3B (Pharmacy), PHAR 3611 Pharmacokinetics A, and PHAR 3612 Pharmacokinetics B.	*July*
PHAR 4607	Clinical Pathology	4	P) Prerequisite: PHAR 3613 Pharmacy Practice 3A, PHAR 3614 Pharmacy Practice 3B, PHAR 3609 Medicinal Chemistry 3A and PHAR 3610 Medicinal Chemistry 3B.	*July*

Table IX: Bachelor of Pharmacy (Pass and Honours degrees) - continued

(a) Unit of Study	(b)	(c) Credit Points	(d)/(e) A) Assumed Knowledge P) Prerequisite & Qualifying C) Corequisite N) Prohibitions and other information	(f) Offered
PHAR 4608	Ethics and History of Pharmacy	2		*July*
PHAR 4609	Pharmaceutical Management	4		*July*
PHAR 4610	Pharmacothcrapeutics B	6	P) Prerequisite: PHAR 4612 Pharmacothcrapeutics A.	*July*
PHAR 4611	Clinical Practice B	6	P) Prerequisite: PHAR 4613 Clinical Practice A.	*July*
PHAR 4612	Pharmacotherapeutics A	6	P) Prerequisite: PHAR 3613 Pharmacy Practice 3A, PHAR 3614 Pharmacy Practice 3B, PCOL 3603 Pharmacology 3A (Pharmacy), PCOL 3604 Pharmacology 3B (Pharmacy), PHAR 3611 Pharmacokinetics 3A and PHAR 3612 Pharmacokinetics 3B.	*March*
PHAR 4613	Clinical Practice A	6	P) Prerequisite: PHAR 3613 Pharmacy Practice 3A, PHAR 3614 Pharmacy Practice 3B, PCOL 3603 Pharmacology 3A (Pharmacy), PCOL 3604 Pharmacology 3B (Pharmacy), PHAR 3611 Pharmacokinetics 3A and PHAR 3612 Pharmacokinetics 3B.	*March*
Students will enrol in one pair of units (one in each semester) from the following advanced units of study, by invitation only.				
PCOL 4907	Pharmacology A Advanced (Pharmacy)	IO	P) Prerequisite: PCOL 3604 Pharmacology 3B (Pharmacy).	*March (2000)*
PCOL 4908	Pharmacology B Advanced (Pharmacy)	10	P) Prerequisite: PCOL 4907 Pharmacology A Advanced (Pharmacy).	*July (2000)*
PHAR 4921	Pharmaceutics A (Advanced)	10	P) Prerequisite: all third year pharmacy units of study. Enrolment by invitation to those with a high WAM.	*March*
PHAR 4922	Pharmaceutical Chemistry A (Advanced)	10	P) Prerequisite: all third year pharmacy units of study. Enrolment by invitation to those with a high WAM.	*March*
PHAR 4923	Pharmacy Practice A (Advanced)	10	P) Prerequisite: all third year pharmacy units of study. Enrolment by invitation to those with a high WAM.	*March*
PHAR 4924	Pharmaceutics B (Advanced)	10	P) Prcrequisite: PHAR 4921 Pharmaceutics A (Advanced) at a credit level or better.	*July*
PHAR 4925	Pharmaceutical Chemistry B (Advanced)	10	P) Prerequisite: PHAR 4922 Pharmaceutical Chemistry A (Advanced) at a credit level or better.	*July*
PHAR 4926	Pharmacy Practice B (Advanced)	10	P) Prerequisite: PHAR 4923 Pharmacy Practice A (Advanced) at a credit level or better.	*July*

Degree of Bachelor of Psychology (BPsych)

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, 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 and maintaining a WAM of 65 or greater. 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 program 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 Chapter 8). 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.

HSC aggregate

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

Transfer into the BPsych degree after Junior year

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 as prescribed for the BPsych degree, and has obtained minimum grades of Pass, including 12 credit points of Psychology with an average grade of Distinction (75%) or better, may apply to the Dean for permission to 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.

BPsych Degree Resolutions

See Chapter 8.

Table X: Bachelor of Psychology

(a) Unit of Study	(b)	(c) Credit Points	(d)/(e) A) Assumed Knowledge P) Prerequisite & Qualifying C) Corequisite N) Prohibitions and other information	(f) Offered

For details of content, assumed knowledge, prerequisites, corequisites and qualifying units see also Table 1 (BSc).

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 subject area listed within Table I (Bachelor of Science)

PSYC 1001	Psychology 1001	6		*March*
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 2111	Perception, Learning and Neuroscience	4	P)	Qualifying: Psychology 1001 and 1002 (Note: 16 credit points of Intermediate Psychology is required for Honours entry).	*March*
PSYC 2112	Psychological Statistics	4	P)	Qualifying: Psychology 1001 and 1002 (Note: 16 credit points of Intermediate Psychology is required for Honours entry).	*March*
PSYC 2113	Cognitive Processes and Social Psychology	4	P)	Qualifying: Psychology 1001 and 1002 (Note: 16 credit points of Intermediate Psychology is required for Honours entry).	*July*
PSYC 2114	Personality and Individual Differences	4	P)	Qualifying: Psychology 1001 and 1002 (Note: 16 credit points of Intermediate Psychology is required for Honours entry).	*July*

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 16 credit points of 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 credit points of Senior Psychology AND
(ii) Either an additional 24 credit points in Senior Psychology OR an additional 12 credit points in Senior 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

PSYC 3201	Statistics and Psychometrics	4	P)	Qualifying: 12 credit points of Intermediate Psychology including Psychology 2112 (or Psychology 2001 and 2002).	*July*
PSYC 3202	History and Philosophy of Psychology	4	P)	Qualifying: 12 credit points of Intermediate Psychology.	*March*
PSYC 3203	Abnormal Psychology	4	P)	Qualifying: 12 credit points of Intermediate Psychology.	*July*
PSYC 3204	Behavioural Neuroscience	4	P)	Qualifying: 12 credit points of Intermediate Psychology including Psychology 2111 and 2112 (or Psychology 2001 and 2002).	*July*
PSYC 3205	Cognition and Language	4	P)	Qualifying: 12 credit points of Intermediate Psychology including Psychology 2112 and 2113 (or Psychology 2001 and 2002).	*July*
PSYC 3206	Developmental Psychology	4	P)	Qualifying: 12 credit points of Intermediate Psychology.	*March*
PSYC 3207	Human Performance & Organisational Psychology	4	P)	Qualifying: 12 credit points of Intermediate Psychology including Psychology 2113 (or Psychology 2001 and 2002).	*July*
PSYC 3208	Intelligence	4	P)	Qualifying: 12 credit points of Intermediate Psychology including Psychology 2112 and 2114 (or Psychology 2001 and 2002).	*July*
PSYC 3209	Learning & Motivation	4	P)	Qualifying: 12 credit points of Intermediate Psychology including Psychology 2111 and 2112 (or Psychology 2001 and 2002).	*March*
PSYC 3210	Perceptual Systems	4	P)	Qualifying: 12 credit points of Intermediate Psychology including Psychology 2111 and 2112 (or Psychology 2001 and 2002).	*March*

Table X: Bachelor of Psychology - continued

(a) Unit of Study	(b)	(c) Credit Points	(d)/(c) A) Assumed Knowledge P) Prerequisite & Qualifying C) Corequisite N) Prohibitions and other information	(f) Offered
PSYC 3211	Psychological Assessment	4	P) Qualifying: 12 credit points of Intermediate Psychology including Psychology 2112 and 2114(or Psychology 2001 and 2002).	*March*
PSYC 3212	Social Psychology	4	P) Qualifying: 12 credit points of Intermediate Psychology including Psychology 2113 (or Psychology 2001 and 2002).	*March*
PSYC 3213	Special Topics in Psychology	4	P) Qualifying: 16 credit points of Intermediate Psychology (or Psychology 2001 and 2002). N) Available only to BPsych or Talented Student Program students with permission of the Head of Department.	*March & July (check with coord.)*

D. Fourth Year (Psychology Honours)

PSYC 4001	Psychology Honours	48	P) Department permission required.	*March (year-long)*

Honours in the Faculty of Science

Honours units of study in BSc, BCST, BMedSc, BPharm or BPsych

The regulations governing Honours units of study in the Faculty of Science are Sections 16-18 (BSc), 12-14 (BCST), 11-13 (BMedSc), 9 (BPharm) and 10-11 (BPsych) of the Senate Resolutions. Candidates should note particularly Section 16 (BSc), 12 (BCST), 11 (BMedSc), or 10 (BPsych) and that approval both from Faculty and the Head of the Department concerned is required. To obtain permission from the Faculty, applicants must have gained an average of 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). 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, Section 12(2)(ii) of the Senate Resolutions for the degree of Bachelor of Computer Science and Technology or Section 1 l(2)(ii) of the Senate Resolutions for the degree of Bachelor of Medical Science, 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.

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:

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

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

In calculating the WAM for a student transferring from another university, units of study are assigned level weightings and credit point values consistent with their equivalent units of study at the University of Sydney. A mark is assigned to each unit of study credited based on the results provided on a validated academic transcript from that university. Where no mark is provided by the institution the bottom of the range for the equivalent grade is used initially (this mark may be revised at the Board of Examiners in light of additional information), unless additional evidence of a higher mark is provided eg. marks or rankings from subject coordinators.

The Faculty is aware that, because the Honours units of study in some Departments are wholly or predominantly formal course work and in others a research project, and because some subjects are not taught until well into the undergraduate program, the way in which Departments take cognisance of performance in the 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 mark of less than 90 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. Students 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 unit of study.

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 cases with the Dean, or the Dean's nominee, early in their Honours enrolment and in any event before the beginning of their second semester.

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 mark.

CHAPTER 4
Talented student program

Overview

The Talented Student Program is a special program of study intended for students "of exceptional merit" who are enrolled in degrees administered by the Faculty of Science (BSc, BMedSc, BCST, BPsych and their specialist streams or joint degrees). It is also available for the science component of the BLibStud. If other Faculties grant permission, TSP options may be taken for science components that are part of other degree programs.

The aim of the program is to offer students of exceptional merit additional challenging material to enable them to maximise their intellectual growth and potential.

A major benefit of participation in the Talented Student Program is that students receive special supervision by academic staff and often engage in studies with small numbers of fellow students, all of whom have particular interest in the subject. In general, the TSP caters for students whose talent is broad-based across science. There are two main aspects of a student's involvement in the TSP. Students can have great flexibility in their choice of study (beyond that normally allowed by degree rules), and they have a mentor, a member of the academic staff who assists them in choosing from the great range of possibilities.

Studies undertaken in the Talented Student Program are included separately on the student's academic transcript so that all potential employers are aware that the student has completed challenging courses of study.

Further information on the operation of the Talented Student Program may be obtained from the Departmental coordinators listed below or from the Undergraduate Clerk, Faculty of Science.

Selection

Entry to the Talented Student Program is by invitation from the Dean. Invitations to participate in the TSP are made each year for that year. The following guidelines apply generally, although Departments may have additional (and more stringent) requirements for entry to the activities they offer in the program:

- to be considered for the program in their first year, students should normally have a UAI (or equivalent) over 98.7 and a mark of over 90 in at least one science subject area and/or over 95 in 4-unit Mathematics; or demonstrate exceptional performance in scientific study (e.g., at the level of participation in an International Olympiad).
- 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 an appropriate Science subject area. Intermediate level entry to TSP is available only to students who have been enrolled full-time in units of study totaling at least 48 credit points.

A student who feels that they satisfy these criteria, but who has not received an invitation to participate in the TSP that year, should contact the Dean.

Range of TSP structures

The relevant Senate Resolutions (e.g., Resolution 6(2) of the BSc degree) authorise the Dean to give approval for students of exceptional merit to enrol in units of study or in combinations of units of study not normally available within the degree.

In very exceptional cases, particularly for students who have excelled in Olympiad Programs, application of these Resolutions may permit accelerated progress toward the completion of the BSc degree.

Students will arrange a suitable pattern of study for the year, in consultation with their mentor (who will also consider the entire degree program). For some students, the TSP activities will be in a single discipline, for others there will be separate TSP activities in several disciplines. Still others will choose interdisciplinary activities that relate several fields to one another. Some students choose TSP activities that involve additional work beyond the normal amount for a student in the degree; for others, the TSP activities replace prescribed work, giving a normal total credit point load. Many disciplines have an organised activity for a whole group of TSP students studying that field, such as a weekly seminar or group project. In other disciplines, TSP activity involves participation by each TSP student in a research group of staff and postgraduates. Every student is treated individually; however, there are some common patterns that we describe below.

For many TSP students who are interested in several fields, (especially if they aren't really sure about their eventual direction), a suitable arrangement might be for them to join in separate TSP activities of each discipline.

Students might elect to study a broader range of fields than usual, by studying more than the normal load of 24 credit points per semester.

Another pattern is to accelerate a student who (say through Olympiad participation) has already learnt most of the topics in the usual first-year units in a discipline. Such a student can go directly to second year study in that field and in related fields, when they begin their degree. By studying more than the usual workload each semester, they may be able to complete their Honours degree in less than 4 years full-time.

Some students have particular interests that can best be served by specially planned activities combining different disciplines.

Constraints on TSP structure

When a TSP activity replaces normal activity within a unit of study, the student will enrol in that unit, but the transcript will be annotated to reflect the TSP activity. When a TSP activity differs from the normal workload, the student will be enrolled in specially designated TSP units. The TSP allows a student to enrol in up to 40 credit points designated as TSP units of study that are not listed in the Faculty handbook. This 40-credit point total covers all three years of study, and perhaps several different disciplines, so it is important to plan carefully to leave enough TSP possibilities in later years.

It is also important that the student meets all the usual degree requirements, involving numbers of credit points at various levels and in a range of disciplines. Each TSP activity is assigned a number of credit points, a level (Junior, Intermediate or Senior) and a Discipline area, so it can contribute to meeting the degree requirements.

The TSP process

At the start of each year, the Dean chooses students to be invited to participate in the TSP. A welcome is held in Orientation week, and at that time, each student who is new to the TSP will meet briefly with the Faculty TSP coordinator, who assigns a mentor for the student. The mentor is usually a departmental TSP coordinator, from a department closest to the student's interest(s). The mentor and the student then plan special activities for the year, covering all fields (this may involve discussions with coordinators from other departments). A proposal is put to the Dean, who can approve enrolment in special TSP units of study. During the year the student will meet several times with the mentor, to make sure that everything is going well. Whatever TSP activities have been arranged will be carried out by the student with others (staff and possibly students too). Assessment will be through the mentor and the staff involved in the activities. At the end of the year the mentor will report results and the Dean will also arrange for special notes to be placed on the student's transcript, recording the TSP activity.

TSP coordinators

Faculty of Science
Coordinator: Dr Alan Fekete

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

Chemistry
Coordinator: Dr Scott Kable
The Chemistry School offers Junior TSP students a challenging program based on the 'Chemistry 1 (Special Studies Program)'. The program comprises the Junior Chemistry (Advanced) lecture series, special tutorials, and special project-based laboratory exercises. Admission to Chemistry l(SSP) is by invitation only, and is limited to 20 students each year.

TSP students in Intermediate Chemistry take the Intermediate Chemistry (Advanced) units of study. The units of study comprise lectures, tutorials and special project-based laboratory exercises that complement the other Intermediate Chemistry units of study. Admission to Intermediate Chemistry (Advanced) units of study is by invitation only, and is limited to 30 students each year. TSP students are automatically eligible.

The Senior Chemistry TSP program consists of Chemistry 3A and 3B and four special 7-meeting modules (one per half-semester). In each module, students work as a group to solve a substantial real-life problem in contemporary Chemistry. In addition, the normal Senior Chemistry laboratory subjects 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 15 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
Coordinator: 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 units of study 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 unit of study components
- various combinations of the above options.

Medical Science
Coordinator: Dr Ian Spence

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.

Physics
Coordinators: Dr Richard Hunstead and Professor David McKenzie
Junior students may take extra seminars and special laboratory project work in addition to, or in lieu of, parts of Physics (Advanced) units of study. Intermediate students may take extra seminars and special laboratory project work in addition to, or in lieu of, parts of Intermediate Physics units of study. Senior students may take extra seminars and special research project work in addition to, or in lieu of, parts of Senior Physics units of study.

Psychology
Coordinator: Associate Professor Helen Beh
The program is available in Intermediate and Senior Psychology. Students admitted to the program have the following options available to them:
- additional options in Psychology either in lieu of, or in addition to, other units of study in Science
- 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.

Undergraduate units of study

Department of Agricultural Chemistry and Soil Science

Agricultural Chemistry

Units of study in Agricultural Chemistry for Science students cover aspects of chemistry and biochemistry which are relevant in basic and applied biological sciences including agriculture and the environment. Emphasis is placed on the chemistry of molecules of biological, agricultural and environmental significance both naturally occurring (e.g. in foods and 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 AGCH 2001 Molecular Processes in Ecosystems (8 credit points Intermediate), AGCH 3001 Chemistry and Biochemistry of Ecosystems, AGCH 3002 Environmental Plant and Soil Chemistry, and AGCH 3003 Food Chemistry and Biochmistry (12 credit points Senior), and Agricultural Chemistry Honours.

AGCH 2001 Molecular Processes in Ecosystems
8 credit points
Dr Lees, Dr Caldwell (Coordinator)
Qualifying: Chemistry 1002 or equivalent. **Prerequisite:** Biology 1002 or 1902 Students who have not satisfied the prerequisites in Biology may enrol with Soil Science 2001 as a corequisite.
Prohibition/other: May not be counted with any Intermediate unit of study in Biochemistry. **Offered:** March. **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: 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.

AGCH 3001 Chemistry and Biochemistry of Ecosystems
12 credit points
Prof. Kennedy (Coordinator), Dr Caldwell, Dr Lees, Assoc. Prof. Copeland
Qualifying: Agricultural Chemistry 2001, or Chemistry 2001 or 2011 or 2022, or 2031 or 2032 or 2092 or Biochemistry 2002 or 2092 or

Environmental Science 2001 and 2002. **Prohibition/other:** May not be counted with Agricultural Chemistry 3002. **Offered:** March. **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 is for students with interests in environmental science and should prove attractive to students seeking a career in environmental protection in the public or private sectors. 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: 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 absorption spectrometry, electrochemical methods, mass spectrometry and the use of immunoassays (ELISA). Students will also carry out a practical assignment equivalent to 4 credit points which will include a literature search and a practical exercise on a topic selected in consultation with the coordinator, and with consideration given to their overall program of study.
Reference books
Manahan SE. Environmental Chemistry. 5th edn, Lewis Publisher, 1991
Kennedy IR. Acid Soil and Acid Rain. 2nd edn, Wiley Research Studies Press, 1992

AGCH 3002 Environmental Plant and Soil Chemistry
12 credit points
Prof. Kennedy (Coordinator), Dr Caldwell, Assoc. Prof. Copeland, Mr Geering, Dr Lees
Qualifying: Agricultural Chemistry 2001 or Chemistry 2001 or 2101 or 2202 or 2301 or 2302 or 2902 or Biochemistry 2002 or 2902 or Environmental Science 2001 and 2002. **Prohibition/other:** May not be counted with Agricultural Chemistry 3001 or 3012. **Offered:** March. **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 or 3012. 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 autotrophy and heterotrophy, photosynthesis, fermentation, eutrophication; the mineral nutrient cycles, uptake and utilisation by organisms, pH balancing; the biological/environmental nitrogen cycle; ammonification, nitrification of ammonia, denitrification of nitrate, nitrogen fixation, ammonia and nitrate assimilation; the biological/environmental sulfur cycle; sulfate

assimilation, sulfate reduction and dissimilation in soil and water; the role of the nitrogen and sulfur cycles in the acidification of ecosystems; effects of acidification on plants and animals; pesticides and herbicides, chemistry, modes of action, metabolism and detoxification; environmental chemistry and fate of pesticides; the design of new pesticides and means of pest control; heavy metals and plants, mechanisms of tolerance, hyperaccumulators, and halophytes.

Practical: Field trip: A one-week field trip in orientation week before the commencement of Semester 1 to examine and assess rural landscapes for environmental impacts and methods of remediation. Amongst the issues to be examined in a field setting (the Namoi and Macquarie valleys) will be salinisation, acidification, soil properties and erosion and the potential for transport of pesticides from farms to riverine ecosystems. A range of portable instruments to monitor key parameters of environmental health (e.g. pH, salinity, nutrient content, pesticide immunoassays) will be employed in this field work. Laboratory exercises: 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 absorption spectrometry, electrochemical methods, mass spectrometry and the use of immunoassays (ELISA).

Reference books

Manahan SE. Environmental Chemistry. 5th edn, Lewis Publisher, 1991

Kennedy IR. Acid Soil and Acid Rain. 2nd edn, Wiley Research Studies Press, 1992

AGCH 3003   Food Chemistry and Biochemistry
12 credit points
Assoc. Prof. Copeland (Coordinator), Dr Lees, Dr Caldwell
Qualifying: Agricultural Chemistry 2001 or Biochemistry 2002 or 2902. **Offered:** July. **Classes:** 3 lec, 1 tut & 8hr prac/wk.
Assessment: One 3hr exam, prac, assignments.
This unit of study aims to:

(i) give students an understanding of the constituents of foods and fibres and

(ii) teach students practical skills in chemical and biochemical methods of analysis used in laboratories of enterprises concerned with the processing of agricultural products, and in the food and beverage industries.

The lecture topics cover, in a context of foods, the main principles of the regulation of metabolic processes; properties, behaviour and metabolism of carbohydrates, including photosynthetic carbon assimilation, sucrose and other oligosaccharides, starch and non-starchy polysaccharides; properties, behaviour and metabolism of fatty acid and lipids; properties, behaviour and metabolism of proteins; toxic and anti-nutritional constituents of foods; characteristics of cereal and legume grains in relation to quality and end use of products; solution properties of biological macromolecules, natural fibrous and gel-forming macromolecules, uses in foods and other commercial produts; chemistry of doughs and breadmaking; chemistry of fermentation processes in food industries.

Practical: The laboratory exercises will include sample preparation and analyses of foods and other biological materials using spectroscopic, enzymic, and chromatographic (including GC and HPLC) and electophoretic methods. Students also undertake a short analytical project, which takes into account their interests and the objectives of the unit of study.

AGCH 4001   Agricultural Chemistry Honours
48 credit points
Offered: March.
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 chem-

istry; 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 phototoxicity, 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
Dr Cattle
Prerequisite: Chemistry 1002 or equivalent and 12 credit points of Junior Mathematics or Physics 1003 or 1004. **Offered:** March.
Classes: 3 lec, 1 tut, 3hr prac/wk; and 2 days of fieldwork.
Assessment: One 3hr exam, coursework, and prac 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.
Textbooks

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

SOIL 2002   Soil Resources and Conservation
8 credit points
Dr Singh
Prerequisite: Soil Science 2001 or Geology 1002 or Geology 2004 or Geography 1001 or Natural Environmental Systems 2001.
Prohibition/other: May not be counted with Geography 3002.
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.

Practical: Thirty-six hours of laboratory work involves routine physical, chemical and statistical analyses of samples taken in

the field relevant to assessment of the land-use potential and the quantification of the soil variability and soil degradation at the survey site.

SOIL 3001 Environmental Soil Science A
12 credit points
Prof. McBratney (Coordinator), Dr Cattle
Qualifying: Soil Science 2001. Offered: March. Classes: 3 lec, 1 tut & 6hr prac)/wk, 10 days in the field. Assessment: Two 2hr exams, field and prac reports, problem sets, essay.
The soil science specialisation trains people for careers in professional soil science and extension. It provides an excellent background for entry into all aspects of soil science research ranging from physics through mineralogy and chemistry to pedology. Increasing emphasis is being given to aspects of soil sustainability and environmental soil science in order that graduates can meet the growing national demands in this area.

This 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.

Reference books
FitzPatrick EA. Soils. Longman, 1980
FitzPatrick EA. Micromorphology of Soils. Chapman & Hall, 1984
Kirkman D, & Powers WL. Advanced Soil Physics. Wiley 1972
Loveday J (ed.). Methods for Analysis of Irrigated Soils. C.A.B., 1974
Richler J. The Soil as a Reactor. Catena Verlag, 1987
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

SOIL3002   Environmental Soil Science B
12 credit points
Dr Singh
Qualifying: Soil Science 2001. **Prerequisite:** Agricultural Chemistry 2001 or Chemistry 2001 or 2101 or 2202 or 2301 or 2302 or Biochemistry 2002 or 2902. **Offered:** July. **Classes:** 3 lec, 1 tut & 8hr prac/wk. **Assessment:** Two 2hr exams, lab reports, problem sets, essays.

This soil science specialisation trains people for careers in professional soil science and extension. It provides an excellent background for entry into all aspects of soil science research ranging from physics through mineralogy and chemistry to pedology. Increasing emphasis is being given to aspects of soil sustainability and environmental soil science in order that graduates can meet the growing national demands in this area. This 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 soil moisture content, gamma and neutron probe methods for field measurements of moisture content and bulk density and time-domain reflectometry. Measurement of oxidation-reduction status, O_2 diffusion rate and $O_2 . CO_2$ concentrations in soil, selective ion-electrodes for measurements of ion activities in soil solution. Mechanical measurements of soil properties including Atterberg limits, unconfined compression, penetrometer, Proctor and compaction, torsion shear box, dynamometer, rupture-test and drop shatter test, sampling and testing procedures for determining physical properties of swelling soils. Soil structure and stability tests in relation to aggregate size and soil micro-aggregates. Fractionation of soil organic matter and determination of principal functional groups COOH, OH involved in CEC and complexation of heavy metals.

Reference books
Barber SA. Soil Nutrient Bioavailability. Wiley, 1984
Dixon JB, & Weed SB (eds). Minerals in Soil Environments. 1989
Fitzpatrick EA. Soils. Longman: London, 1980
Lindsay WL. Chemical Equilibria in Soils. 1979
Loveday J (ed.). Methods for Analysis of Irrigated Soils. CAB, 1974
McBride MB. Environmental Chemistry of Soils. 1994
Sparks DL. Environmental Soil Chemistry. 1995
Sposito G. The Chemistry of Soils. Oxford, 1989

SOIL4001   Soil Science Honours
48 credit points
Offered: March.
This unit if study consists of several parts:
    (i) Supplementary lectures and seminars.
    (ii) Unit if 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.

ANAT2001   Principles of Histology
4 credit points
Dr Byrne
Prerequisite: 12 credit points of Junior Biology or Junior Psychology. **Offered:** March. **Classes:** 4hr/wk, usually 2 lec & 2 prac. **Assessment:** One 1hr exam, one 1hr prac 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 MH, Romrell LJ, & Kaye G I. Histology: A Text and Atlas. (3rd edn), Williams & Wilkins, 1995
Histology Practical Book (consult Departmental noticeboards)
Reference Books
Gilbert SF. Developmental Biology. (5th edn), Sinauer, 1997
Alberts B et al. Molecular Biology of the Cell. Garland: N. Y, 1994
The histology text and practical book are to be purchased before the first practical class

ANAT 2002 Comparative Primate Anatomy
4 credit points
Dr Donlon
Prerequisite: 12 credit points of Junior Biology or Junior Psychology. **Offered:** July. **Classes:** 4hr/wk, usually 2 lec & 2 prac/tut. **Assessment:** One 1 hr theory exam (40%), one 1 hr 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, & Dean C. An Introduction to Human Evolutionary Anatomy. Academic Press, 1990
Zihlman AL. The Human Evolution Colouring Book. Barnes & Noble Books: Sydney, 1982

ANAT 3001 Microscopy and Histochemistry
12 credit points
Assoc. Prof. Murphy, Ms Arnold
Qualifying: Anatomy and Histology 2001. Offered: March.
Classes: 4hr lec & 8hr lab/wk. Assessment: 5hr theory exam, 2hr prac 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 JA. Histological and Histochemical Methods. (2nd edn), Pergamon, 1990

ANAT 3002   Cells and Development
12 credit points
Dr McAvoy
Qualifying: Anatomy and Histology 2001. **Prerequisite:** 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.
Prohibition/other: May not be counted with Anatomy and Histology 3003. **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 SF. Developmental Biology. (5th edn) Sinauer Associates Inc: Sunderland, Mass. 1997

ANAT 3003 Transmission and Scanning Electron Microscopy
12 credit points
Ms Arnold
Qualifying: Anatomy and Histology 2001. **Prohibition/other:** May not be counted with Anatomy and Histology 3002. **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, cryoultramicrotomy and electron diffraction.

Textbooks
Bozzola JJ, & Russell LD. 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
Dr Provis
Qualifying: Anatomy and Histology 2002. **Offered:** July. **Classes:** 1 lec, 2hr dissection, 3hr prac/tut. **Assessment:** One 1.5hr theory exam, one 1hr prac exam, one 2500 word essay, continuous assessment (10%).

This 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 are encouraged and assessed in a major assignment.

Textbooks
Berkovitz & Moxham. A Textbook of Head and Neck Anatomy. Wolfe Publishing, 1988
McMinn & Hutchings. A Colour Atlas of Human Anatomy. Wolfe Medical Publications: London
or
Rohen & Yokochi. Colour Atlas of Anatomy. Ikagu-Shoin

ANAT 3006   Forensic Osteology

6 credit points
Dr Donlon

Prerequisite: Anatomy 2002. **Prohibition/other:** A quota of 15 exists for this unit of study. **Offered:** March. **Classes:** 2 lec, 2hr tut & 2hr prac/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. (A quota of 15 exists for this unit of study.)

Textbooks
Bass WM. Human Osteology: A laboratory and field manual. 3rd edition. Missouri Archaeological Society: Missouri, 1995

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 year's 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.

Anatomy and Histology Higher Degrees

The award courses of Master of Science and Doctor of Philosophy by research are offered in the Faculty of Science by the Department of Anatomy and Histology. There are no higher award courses by coursework.

Department of Biochemistry

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

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
Dr Denyer, Dr Hancock, Biochemistry staff
Qualifying: 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. **Prohibition/other:** May not be counted with Agricultural Chemistry 2001 or Biochemistry 2101 or 2901.
Offered: March. **Classes:** 3 lec & 5 prac/wk & voluntary tutorials.
Assessment: One 3hr exam, one 2hr theory of prac 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 mechanisms 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: 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

StryerL. Biochemistry (4th edn). Freeman, 1995 (preferred
  textbook)

or

Garrett RH & Grisham CM. Biochemistry. Saunders 1995 (both
  textbooks also suitable for BCHM 2002)

Resource Manual for Biochemistry 2 Practical Sessions, Semester
  I

Study Resource for Biochemistry 2001 (Style Guides and Past
  Papers)

BCHM 2002 Molecules, Metabolism and Cells

8 credit points

Dr Denyer, Dr Hancock, Biochemistry staff

Qualifying: Biochemistry 2001 or 2901. **Prohibition/other:** May not
be counted with Agricultural Chemistry 2001 or Biochemistry 2102
or 2902. **Offered:** July. **Classes:** 3 lec & 5 prac/wk & voluntary
tutorials. **Assessment:** One 3hr exam, one 2hr theory of prac exam,
prac tasks.

This unit of study aims to describe how cells work at the molec-
ular 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 individ-
ual cell is coordinated and integrated with other cells, especially
in humans.

Cellular Metabolism: How cells extract energy from fuel
molecules like fatty acids and carbohydrates. The regulation of
energy metabolism. How the body selects which fuels to use
under different circumstances such as starvation and exercise.
The metabolic inter-relationships of the muscle, brain, adipose
tissue and liver. The role of hormones in coordinating the regu-
lation 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 strate-
gies and mechanisms involved in biochemical reactions and the
involvement of coenzymes and vitamins in biological inter-con-
versions.

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 be-
tween cells via cell surface receptors. The molecular mechanism
of hormone action and the transduction of cellular signals.

Practical: The practical component complements the theory
component of BCHM 2002 by exposing students to experiments
which investigate the effects of diet on the constituents of urine,
the diagnosis of chronic disease using blood enzyme patterns,
the measurement of glucose metabolism using radioactive trac-
ers 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 gener-
ic skills will be extended by the introduction of exercises de-
signed to teach oral communication, instruction writing and
feedback articulation skills. The techniques of radioisotope han-
dling, 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

Garrett RH & Grisham CM. Biochemistry. Saunders 1995

  (preferred text)

Stryer L. Biochemistry (4th edn). Freeman, 1995

(both textbooks also suitable for BCHM 2001)

Resource Manual for Biochemistry 2 Practical Sessions, Semester
  2

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

BCHM 2101 Genes and Proteins Theory

4 credit points

Dr Denyer, Biochemistry staff

Qualifying: 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. **Prohibition/other:** May not be counted
with Agricultural Chemistry 2001 or Biochemistry 2101 or 2901.
Offered: March. **Classes: 3 lec /wk. Assessment:** One 3hr exam.
This unit of study comprises just the lecture component of Bio-
chemistry 2001.

Textbooks

Stryer L. Biochemistry (4th edn). Freeman, 1995 (preferred
  textbook)

or

Garrett RH & Grisham CM. Biochemistry. Saunders 1995 (both
  textbooks also suitable for BCHM 2102)

Study Resource for Biochemistry 2001 (Style Guides and Past
  Papers)

BCHM 2102 Molecules, Metabolism and Cells Theory

4 credit points

Dr Denyer, Biochemistry staff

Qualifying: Biochemistry 2001, 2101 or 2901. **Prohibition/other:**
May not be counted with Agricultural Chemistry 2001 or
Biochemistry 2102 or 2902. **Offered:** July. **Classes:** 3 lec/wk.
Assessment: One 3hr exam.

This unit of study comprises just the lecture component of Bio-
chemistry 2002.

Textbooks

Garrett RH & Grisham CM. Biochemistry. Saunders 1995
  (preferred text)

StryerL. Biochemistry (4th edn). Freeman, 1995

(both textbooks also suitable for BCHM 2001)

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

BCHM 2901 Genes and Proteins (Advanced)

8 credit points

Dr Denyer, Dr Hancock, Biochemistry staff

Qualifying: 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. **Prohibition/other:** May not be counted
with Agricultural Chemistry 2001 or Biochemistry 2101 or 2901.
Offered: March. **Classes:** 3 lec & 5 prac/wk & voluntary tutorials.
Assessment: One 3hr & one 1 hr theory exam, one 2hr theory of
prac exam, prac tasks, assignments.

The lecture and practical components are the same as for Bio-
chemistry 2001. Selected students will be set special advanced
assignments, and attend advanced tutorials.

Textbooks

StryerL. Biochemistry (4th edn). Freeman, 1995 (preferred
  textbook)

or

Garrett RH & Grisham CM. Biochemistry. Saunders 1995 (both
  textbooks also suitable for BCHM 2902)

Resource Manual for Biochemistry 2 Practical Sessions, Semester
  1

Study Resource for Biochemistry 2001 (Style Guides and Past
  Papers)

BCHM 2902 Molecules, Metabolism and Cells (Advanced)

8 credit points

Dr Denyer, Dr Hancock, Biochemistry staff

Qualifying: Biochemistry 2001 or 2901 (selected students).
Prohibition/other: May not be counted with Agricultural Chemistry
2001 or Biochemistry 2102 or 2902. **Offered:** July. **Classes:** 3 lec &
5 prac/wk, voluntary tutorials & advanced tutorials. **Assessment:**
One 3hr & one 1 hr theory exam, one 2hr theory of prac exam, prac
tasks, special assignments.

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

Textbooks

Garrett RH & Grisham CM. Biochemistry. Saunders 1995
  (preferred text)

StryerL. Biochemistry (4th edn). Freeman, 1995
(both textbooks also suitable for BCHM 2001)
Resource Manual for Biochemistry 2 Practical Sessions, Semester 2
Study Resource for Biochemistry 2002 (Style Guides and Past Papers)

BCHM 3001   Molecular Biology and Structural Biochemistry

12 credit points
Dr Easterbrook-Smith, Mrs Johnston, Dr Weiss, Biochemistry staff
Qualifying: 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. **Prohibition/other:** May not be counted with Biochemistry 3901. **Offered:** March. Classes: 4 lec & 8 prac/wk.
Assessment: Two 3hr exams, 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: 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
Lewin B.Genes VI. 1997

BCHM 3002   Metabolic and Medical Biochemistry

12 credit points
Dr Easterbrook-Smith, Mrs Johnston, Professor Kuchel, Biochemistry staff
Qualifying: Biochemistry 2002 or 2902. **Prohibition/other:** May not be counted with Biochemistry 3902. **Offered:** July. **Classes:** 4 lec & 8 prac/wk. **Assessment:** Two 3hr exams, 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
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, xenobiotica.
Practical: The practical component is designed to complement the lecture series and provide students with experience in sophisticated biochemical techniques.
Textbooks
Cooper GM. The Cell: A Molecular Approach. OUP, 1997

BCHM 3901   Molecular Biology and Structural Biochemistry (Advanced)

12 credit points
Dr Easterbrook-Smith, Mrs Johnston, Dr Weiss, Biochemistry staff
Qualifying: 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.
Prohibition/other: May not be counted with Biochemistry 3001.
Offered: March. **Classes:** 4 lec & 8 prac/wk & 4 seminars.
Assessment: Two 3hr exams, one 1 hr exam, prac work.
The lecture and practical components of this unit of study are the same as for Biochemistry 3001. Selected students will attend seminars related to the topics covered in the core lectures in this unit of study.
Textbooks
Lewin B. Genes VI. 1997

BCHM 3902   Metabolic and Medical Biochemistry (Advanced)

12 credit points
Dr Easterbrook-Smith, Mrs Johnston, Professor Kuchel, Biochemistry staff
Qualifying: Biochemistry 2002 or 2902 (selected students).
Prohibition/other: May not be counted with Biochemistry 3002.
Offered: July. **Classes:** 4 lec & 8 prac/wk & 4 seminars.
Assessment: Two 3hr exams, one 1 hr exam, prac work.
The lecture and practical components of this units of study are the same as for Biochemistry 3002. Selected students will attend seminars related to the topics covered in the core lectures in this unit of study.
Textbooks
Cooper GM. The Cell: A Molecular Approach. OUP 1997

BCHM 4001   Biochemistry Honours

48 credit points
Dr Darvey and Dr Crossley
Offered: March.
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 atherosclerosis

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

Eukaryotic transcription factors

Bioavailability of trace elements and biochemical indicators of their nutritional status

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.

BIOL 1001 Concepts in Biology
6 credit points
Assumed knowledge: Biology section of the HSC 4-unit Science course. **Prohibition/other:** May not be counted with Biology 1901. **Offered:** March. **Classes:** 3 lec & 3 prac/wk. **Assessment:** One 2hr exam, assignments, classwork.

'Concepts in Biology' is an introduction to the major themes of modern biology. Starting with interactions between organisms in biological communities, we move on to the diversity of microorganisms, plants and animals. This is followed by introductory cell biology, which particularly emphasises how cells obtain and use energy, and leads into an introduction to molecular biology through the role of DNA in protein synthesis and development. The genetics of organisms is then discussed, leading to consideration of theories of evolution and the origins of the diversity of modern organisms. It is recommended that this unit of study be taken before all other Junior units of study in Biology.

Textbooks

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

BIOL 1901 Concepts in Biology (Advanced)
6 credit points
Dr G M Wardle, Dr Raphael
Prerequisite: UAI of at least 93, or at least 75% in HSC 2-unit Biology or equivalent, or by invitation on the basis of the result for Biology 1002,1902,1003,1903. **Assumed knowledge:** Biology section of the HSC 4-unit Science course. **Prohibition/other:** May not be counted with Biology 1001. **Offered:** March. **Classes:** 3 lec & 3 hrs prac/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: Biology section of the HSC 4-unit Science course. **Prohibition/other:** May not be counted with Biology 1902. **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, together with Biology 1001 or 1901, provides entry to all Intermediate units of study in biology in the School of Biological Sciences.

Textbooks

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

BIOL 1902 Living Systems (Advanced)
6 credit points
Dr G M Wardle, Dr Raphael
Prerequisite: UAI of at least 93, or at least 80% in HSC 2-unit Biology or equivalent, or by invitation on the basis of the result for Biology 1001 or 1901. **Assumed knowledge:** Biology section of the HSC 4-unit Science course. **Prohibition/other:** May not be counted with Biology 1002. **Offered:** July. **Classes:** 3 lec & 3 hrs 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: Biology section of the HSC 4-unit Science course. Prohibition/other: May not be counted with Biology 1903. Offered: July. Classes: 2 lec, 1 session independent study & 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, together with Biology 1001 or 1901, provides entry to Intermediate units of study in genetics and cell biology in the School of Biological Sciences, and with good performance or permission the School's other Intermediate units of study.

Textbooks
Benjamin CL. et al. Human Biology. McGraw Hill, 1997

BIOL 1903   Human Biology (Advanced)
6 credit points
DrGMWardle
Prerequisite: UAI of at least 93, or at least 80% in HSC 2-unit Biology or equivalent, or by invitation on the basis of the result for Biology 1001 or 1901. **Assumed knowledge:** Biology section of the HSC 4-unit Science course. **Prohibition/other:** May not be counted with Biology 1003. **Offered:** July. **Classes:** 2 lec, 1 session independent study & 3 hrs 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.

Biology Intermediate Units of Study

Students who wish to take Intermediate Biology units of study should obtain Information for Students Considering Intermediate Biology Units of Study from the School Office (Room 234, Macleay Building, A12). Students should discuss their preferences, together with the other units of study they propose to study, with a Biology staff member before enrolling.

The following Intermediate units of study are offered:
February Semester
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 296 Cell Biology (Advanced)
    July Semester
    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 8 credit points Intermediate Biology units of study (see the Senior unit of study descriptions or Information for Students booklets).

BIOL 2001 Animals A
8 credit points
Dr M B Thompson and other Biological Sciences staff
Qualifying: Biology 1001 or 1901 and one of Biology 1002,1902, 1003,1903. **Prerequisite:** Chemistry 1102 or 1902 or 1904 or (with the permission of the Head of School) exceptional performance in Chemistry 1002. **Assumed knowledge:** The content of Biology 1002/1902 is assumed knowledge and students entering from Biology 1003 or 1903 will need to do some preparatory reading. See prerequisites for Senior units of study in Biology. **Prohibition/other:** May not be counted with Biology 2101 or 2901. **Offered:** March. **Classes:** 3 lec, 1 discussion group & 3 prac/wk or 4 lec & 3 prac/wk. **Assessment:** One 3hr exam, one 3hr prac exam, 1 essay, discussion group work, 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
Coordinator: Biology 2001 Executive Officer
Qualifying: Distinction average in Biology 1001 or 1901 and one of Biology 1002,1902,1003,1903. These requirements may be varied and students with lower averages should consult the School's Executive Officer. **Prerequisite:** Chemistry 1102 or 1902 or 1904 or (with the permission of the Head of School) exceptional performance in Chemistry 1002. **Assumed knowledge:** The content of Biology 1002/1902 is assumed knowledge and students entering from Biology 1003 or 1903 will need to do some preparatory reading. **Prohibition/other:** May not be counted with Biology 2001 or 2101. See prerequisites for Senior units of study in Biology. **Offered:** March.

Qualified students will participate in alternative components of Biology 2001 Animals A. The content and nature of these components may vary from year to year.

BIOL 2101   Animals A-Theory
4 credit points
Dr M B Thompson and other Biological Sciecnes staff
Qualifying: Biology 1001 or 1901 and one of Biology 1002,1902, 1003,1903. **Assumed knowledge:** The content of Biology 1002/1902 is assumed knowledge and students entering from Biology 1003 or 1903 will need to do some preparatory reading. **Prohibition/other:** May not be counted with Biology 2001 or 2901. Not a prerequisite for Senior units of study in Biology. **Offered:** March. **Classes:** 3 lec & 1 prac/wk. **Assessment:** One 2hr theory exam, quizzes, one 1 hr prac exam.

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.

BIOL2002   Animals B
8 credit points
Dr M.B. Thompson, and other Biological Sciences staff
Qualifying: Biology 1001 or 1901 and one of Biology 1002,1902, 1003,1903. Prerequisite: Chemistry 1102 or 1902 or 1904 or (with the permission of the Head of School) exceptional performance in Chemistry 1002. Assumed knowledge: The content of Biology 1002/1902 is assumed knowledge and students entering from Biology 1003 or 1903 will need to do some preparatory reading. See prerequisites for Senior units of study in Biology. Prohibition/other: May not be counted with Biology 2102 or 2902. Offered: July. Classes: 3 lec, 1 discussion group & 3 prac/wk or 4 lectures & 3 prac/wk & one field trip. Assessment: One 3hr theory exam, one 3hr prac exam, 1 poster assignment, 1 essay, quizzes.
This unit of study completes the grounding in the diversity of animals at the level of phylum introduced in B iology 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 2001 Animals A. Lectures and discussion groups further explore concepts of evolution, phylogeny biodiversity 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
Coordinator: Biology 2002 Executive Officer
Qualifying: Distinction average in Biology 1001 or 1901 and one of Biology 1002,1902,1003,1903. These requirements may be varied and students with lower averages should consult the School'sExecutive Officer. **Prerequisite:** Chemistry 1102 or 1902 or 1904 or (with the permission of the Head of School) exceptional performance in Chemistry 1002. **Assumed knowledge:** The content of Biology 1002/1902 is assumed knowledge and students entering from Biology 1003 or 1903 will need to do some preparatory reading. **Prohibition/other:** May not be counted with Biology 2002 or 2102. See prerequisites for Senior units of study in Biology. **Offered:** July.

Qualified students will participate in alternative components of Biology 2002 Animals B. The content and nature of these components may vary from year to year.

BIOL 2102 Animals B-Theory
4 credit points
Dr M B Thompson and other Biological Sciences staff
Qualifying: Biology 1001 or 1901 and one of Biology 1002,1902, 1003,1903. **Assumed knowledge:** The content of Biology 1002/1902 is assumed knowledge and students entering from Biology 1003 or 1903 will need to do some preparatory reading. **Prohibition/other:** May not be counted with Biology 2002 or 2902. Not a prerequisite for Senior units of study in Biology. **Offered:** July. **Classes:** 3 lec & 1 prac/wk. **Assessment:** One 2hr theory exam, quizzes, one 1hr prac exam.

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 phytogeny 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
Assoc. Prof. Allaway, Dr McGee, Dr Overall, Dr Quinnell
Qualifying: Biology 1001 or 1901 and one of Biology 1002,1902, 1003,1903. **Assumed knowledge:** The content of Biology 1002/1902 is assumed knowledge and students entering from Biology 1003 or 1903 will need to do some preparatory reading. See prerequisites for Senior units of study in Biology. **Prohibition/other:** May not be counted with Biology 2903. **Offered:** March. **Classes:** 2 lec, 1 prac/audiovisual & 1 tut/wk. **Assessment:** 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
Coordinator: Biology 2003 Executive Officer
Qualifying: Distinction average in Biology 1001 or 1901 and one of Biology 1002,1902,1003,1903. These requirements may be varied and students with lower averages should consult the School's Executive Officer. **Assumed knowledge:** The content of Biology 1002/1902 is assumed knowledge and students entering from Biology 1003 or 1903 will need to do some preparatory reading. **Prohibition/other:** May not be counted with Biology 2003. See prerequisites for Senior units of study in Biology. **Offered:** March. Qualified students will participate in alternative components of Biology 2003. The content and nature of these components may vary from year to year.

BIOL 2004 Plant Ecology and Diversity
8 credit points
Dr Henwood, Prof. Larkum, Dr McGee, Dr Marc, Dr Quinnell, Dr Wardle
Qualifying: Biology 1001 or 1901 and one of Biology 1002,1902, 1003,1903. **Assumed knowledge:** The content of Biology 1002/1902 is assumed knowledge and students entering from Biology 1003 or 1903 will need to do some preparatory reading. See prerequisites for Senior units of study in Biology. **Prohibition/other:** May not be counted with Biology 2904. **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
Coordinator: Biology 2004 Executive Officer
Qualifying: Distinction average in Biology 1001 or 1901 and one of Biology 1002,1902,1003,1903. These requirements may be varied and students with lower averages should consult the School's Executive Officer. **Assumed** knowledge: The content of Biology 1002/1902 is assumed knowledge and students entering from Biology 1003 or 1903 will need to do some preparatory reading. **Prohibition/other:** May not be counted with Biology 2004. See prerequisites for Senior units of study in Biology. **Offered:** July. Qualified students will participate in alternative components of Biology 2004. The content and nature of these components may vary from year to year.

BIOL 2005 Molecular and General Genetics
8 credit points
Dr K Raphael
Qualifying: Biology 1001 or 1901 and one of Biology 1002,1902, 1003, 1903. **Prerequisite:** 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. **Prohibition/other:** May not be counted with Biology 2105 or 2905. See prerequisites for Senior units of study in Biology. **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
Coordinator: Biology 2005 Executive Officer
Qualifying: Distinction average in Biology 1001 or 1901 and one of Biology 1002,1902,1003,1903. These requirements may be varied and students with lower averages should consult the School's Executive Officer. **Prerequisite:** 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. **Prohibition/other:** May not be counted with Biology 2005 or 2105. See prerequisites for Senior units of study in Biology. **Offered:** July.
Qualified students will participate in alternative components of Biology 2005 Molecular and General Genetics. The content and

nature of these components may vary from year to year. This is a core Intermediate unit of study in the BSc (Molecular Biology and Genetics) award course.

BIOL 2105   Molecular and General Genetics - Theory

4 credit points
Dr K Raphael
Qualifying: Biology 1001 or 1901 and one of Biology 1002,1902, 1003,1903. **Prerequisite:** Chemistry 1102 or 1902 or 1904 or (with the permission of the Head of School) exceptional performance in Chemistry 1002. **Prohibition/other:** May not be counted with Biology 2005 or 2905. Not a prerequisite for Senior units of study in Biology. **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
Professor A W Larkum
Qualifying: Biology 1001 or 1901 and one of Biology 1002,1902, 1003,1903. **Prerequisite:** Chemistry 1102 or 1902 or 1904 or (with the permission of the Head of School) exceptional performance in Chemistry 1002. **Prohibition/other:** May not be counted with Biology 2106 or 2906. See prerequisites for Senior units of study in Biology. **Offered:** March. **Classes:** 3 lec, 1 tut & 3-4 prac hrs/wk. **Assessment:** One 3hr theory exam, one 2hr theory of prac exam, pracs & assignments.

A unit of study on cell biology and development in plants and animals, emphasizing the functioning of the cell and favouring the molecular perspective. Topics include cell and organelle structure and function, cellular development and differentiation, and embryonic development. The 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
Coordinator: Biology 2006 Executive Officer
Qualifying: Distinction average in Biology 1001 or 1901 and one of Biology 1002,1902,1003,1903. These requirements may be varied and students with lower averages should consult the School's Executive Officer. **Prerequisite:** Chemistry 1102 or 1902 or 1904 or (with the permission of the Head of School) exceptional performance in Chemistry 1002. **Prohibition/other:** May not be counted with 2006 or 2106. See prerequisites for Senior units of study in Biology. **Offered:** March.

Qualified students will participate in alternative components of Biology 2006. The content and nature of these components may vary from year to year. This is a core Intermediate unit of study in the BSc (Molecular Biology and Genetics) award course.

BIOL 2106   Cell Biology-Theory

4 credit points
Professor A W Larkum
Qualifying: Biology 1001 or 1901 and one of Biology 1002,1902, 1003,1903. **Prerequisite:** Chemistry 1102 or 1902 or 1904 or (with the permission of the Head of School) exceptional performance in Chemistry 1002. **Prohibition/other:** May not be counted with Biology 2006 or 2906. Not a prerequisite for Senior units of study in Biology. **Offered:** March. **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
Dr Meats, Dr Rose
Qualifying: Biology 1001 or 1901 and one of Biology 1002,1902, 1003,1903. **Prerequisite:** Chemistry 1102 or 1902 or1904 or (with the permission of the Head of School) exceptional performance in Chemistry 1002. **Assumed knowledge:** The content of Biology 1002/1902 is assumed knowledge and students entering from Biology 1003 or 1903 will need to do some preparatory reading. See prerequisites for Senior units of study in Biology. **Offered:** July. **Classes:** 2 lec, 1-2 tut & 4 prac/wk. **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.

Biology Senior Units of Study

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

(a) obtain Information for Students Considering Senior Biology Units of Study from the School Office (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 before 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 J
BIOL 3101F Ecophysiology February Semester
   Ecophysiology
   BIOL 320IS 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 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, BuildingA12.

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 Al 2.

BIOL 3101 Ecophysiology
12 credit points
Dr M B Thompson and other Biological Sciences staff
Qualifying: 16 credit points of Intermediate Biology including Biology 2002 or 2003 or 2006 or 2902 or 2903 or 2906. Students are advised to consult the School. **Offered:** March. **Classes:** 4 lec and 8 prac/wk, one 3-day field trip. Timetable 1. **Assessment:** One 3hr exam, field trip quiz, assignments.

Ecophysiology covers physiological interactions between organisms and their environments. The range of environments in habited by organisms is outlined and the influences of important environmental parameters including temperature, water, salt, pH, and respiratory gases are investigated. Physiological interactions among animals, plants and fungi are discussed. More in depth topics in animal physiology includes thermal biology, digestive physiology, water and salt balance, scaling metabolism and energetics of locomotion. The focus is on vertebrates, but invertebrate examples are used also. Further detailed analysis of plant and fungal ecophysiology concerns understanding of mechanisms that determine the function of plants and/or fungi in their environments. Plants from different environments and, in particular, their interaction with fungi are examined. We are concerned with the reaction of plants/fungi and plant/fungal associations to environmental stress and how we assess the importance of these factors on plant growth and development.

BIOL 3901   Ecophysiology (Advanced)
12 credit points
Dr M B Thompson
Qualifying: Distinction avereage in 16 credit points of Intermediate Biology including Biology 2002 or 2003 or 2006 or 2902 or 2903 or 2906. These requirements may be varied and students with lower averages should consult the School Executive Officer. **Prohibition/other:** May not be counted with Biology 3101. **Offered:** March. **Classes:** 4 lec, 6hrs prac, 2hr project/wk. **Assessment:** One 3hr exam, field trip quiz, assignments and project report.
Qualified students will participate in alternative components of the Biology 3101 Ecophysiology unit of study. The content and nature of these components may vary from year to year.

BIOL 3201 Cellular and Systems Physiology
12 credit points
Assoc. Prof. Allaway and other Biological Sciences staff
Qualifying: 16 credit points of 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. **Offered:** July. **Classes:** 4 lec & 4 prac/wk, excursion. Timetable 1. **Assessment:** One 3hr exam, assignments, prac quiz.

Cellular and Systems Physiology Core
The core occupies the lectures and laboratories for weeks 1-6 before students elect one of the modules below. The core covers aspects of physiology at the cellular level common to most organisms. The nature of cell membranes, permeability, active transport and the importance of these processes in producing electrical gradients are discussed and examples provided, relating these to both plant and animal models. The interactions between cells are an important theme in the cell physiology core which provides important background on cell signalling and the concepts of immunity. Recent ideas on the cytoskeleton and the control of the cell cycle are discussed. The core includes an introduction to molecular techniques as used in contemporary physiology.

Animal Physiology module
Dr Hoegh-Guldberg, Dr Meats, Dr Morris
   Qualifying: Biology 2001 and 2002 or 2901 and 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

   Prerequisite: 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 3921 Cellular and Systems Physiology
            (Advanced)
12 credit points
Biology 3201 Executive Officer
Qualifying: Distinction average in 16 credit points of Intermediate Biology including Biology 2001 or 2901 and 2002 or 2902 or Biology 2003 or 2006 or 2903 or 2906. These requirements may be varied and students with lower averages should consult the School's Executive Officer. **Prohibition/other:** May not be counted with Biology 3201. **Offered:** July. **Classes:** 4hrs lees, 6hrs pracs, 2hrs project/wk. **Assessment:** Project seminar 5%, Assignment 40%, Project Report 15%, Exam 40%.
Qualified students will participate in alternative components of the Biology 3201 Cellular and Systems Physiology. The content and nature of these components may vary from year to year.

BIOL 3102   Evolution and Diversity of the Australian Biota (MS)

12 credit points
Dr M.Henwood and other Biological Sciences staff
Qualifying: 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. 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. **Offered:** March. **Classes:** 4 lec and 8 prac/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

    Qualifying: 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
    Qualifying: 16 credit points of Intermediate Biology including Biology 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
    Qualifying: 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
    Qualifying: 16 credit points of Intermediate Biology including any two of the following: Biology 2001, 2901, 2002, 2902, 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 3902 Evolution and Diversity of the Australian Biota (Advanced)

12 credit points
Dr M Henwood
Qualifying: Distinction average in 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 or 2007. These requirements may be varied and students with lower averages should consult the School's Executive Officer. **Prohibition/other:** May not be counted with Biology 3102. **Offered:** March.

Qualified students will participate in alternative components of the Biology 3102 Evolution and Diversity of the Australian Biota. The content and nature of these components may vary from year to year.

BIOL 3202 Ecology (MS)

12 credit points
Dr Meats and other Biological Sciences staff
Qualifying: 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. **Offered:** July. **Classes:** 4 lec & 8 prac/wk, one 8-day field trip in vacation before July Semester. Timetable 2.

Ecology Core (MS)
The core covers topics on theory, quantification and experimentation in ecology and analysis of patterns of distribution, abundance, dynamics, demography and life histories of natural populations. Multi-species interactions in animal communities are considered. An integrated part of the core is the application of ecological theory and methods to testing hypotheses and solving practical problems. The core is followed, after the first five weeks, by one of three modules: Marine Ecology, Terrestrial Ecology or Plant Ecology.

Marine Ecology module (MS)
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 3922 Ecology (Advanced)
12 credit points
Qualifying: Distinction average in 16 credit points of Intermediate Biology including Biology 2001 or 2901 and 2002 or 2902 or in 16 credit points of Intermediate Biology including Biology 2004 or 2904. These requirements may be varied and students with lower averages should consult the School's Executive Officer.
Prohibition/other: May not be counted with Biology 3202. **Offered:** July. **Classes:** 4hrs lees, 4hrs pracs, 1 tute/wk + field trip.
Assessment: 2 x 2hr exams, project reports, and practical reports.
Qualified students will participate in alternative components of the Biology 3202 Ecology. The content and nature of these components may vary from year to year.

BIOL 3103 Molecular Genetics and Recombinant DNA Technology
12 credit points
Dr Lyon, Dr Raphael, Prof. Skurray and others
Qualifying: 16 credit points of Intermediate Biology including Biology 2005 or 2905 (For BMedSc students **Qualifying:** Biology 2005 or 2905). **Prohibition/other:** May not be counted with Biology 3903. **Offered:** March. **Classes:** 4 lec & 8 prac/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 gene isolation, characterisation and manipulation, eukaryotic gene organisation, regulation and expression, the molecular basis of immune diversity, monoclonal antibody technology and antibody engineering, and the use of molecular genetic 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 and vaccines including human gene therapy, new diagnostic techniques for human and veterinary disease, the transformation of animal and plant cells and 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, DNA sequencing and computer analysis of gene sequences, and immuno-detection of proteins. The current uses and potential impact of bioinformatics in scientific research and development are supported by opportunities for students to access and search biological databases on the network.
Textbooks

Watson J D, Gilman M, Witkowski J, & Zoller M. Recombinant DNA (2nd Ed.). Freeman, 1992.

BIOL 3903 Molecular Genetics and Recombinant DNA Technology (Advanced)
12 credit points
Coordinator: Biology 3103 Executive Officer
Qualifying: Distinction average in 16 credit points of Intermediate Biology including Biology 2005 or 2905. (For BMedSc students:

Qualifying: Distinction in Biology 2005 or 2905.) These requirements may be varied and students with lower averages should consult the School's Executive Officer. Prohibition/other: May not be counted with Biology 3103. Offered: March.
Qualified students will 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.

BIOL 3203 Eukaryotic Genetics and Development
12 credit points
Dr Oldroyd, Assoc. Prof. Gillies, Dr Raphael, Assoc. Prof. Armati and others
Qualifying: 16 credit points of Intermediate Biology including Biology 2005 or 2905 (For BMedSc students Qualifying: Biology 2005 or 2905). Prohibition/other: May not be counted with Biology 3904 or 3905. Offered: July. Classes: 4 lec & 8 prac/wk. Assessment: One 3hr 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
Coordinator: Biology 3203 Executive Officer
Qualifying: Distinction average in 16 credit points of Intermediate Biology including Biology 2005 or 2905. (For BMedSc students: Distinction in Biology 2005 or 2905) These requirements may be varied and students with lower averages should consult the School's Executive Officer. **Prohibition/other:** May not be counted with Biology 3203 or 3905. **Offered:** July. **Classes:** 4 lec &8 prac/wk & one 2 day excursion. Assessment: One 3hr exam, prac reports, seminars, projects.

Qualified students will participate in alternative components of Biology 3203 Eukaryotic Genetics and Development. The content and nature of these components may vary from year to year.

BIOL 4001 Biology Honours
48 credit points
Dr C R Dickman
Offered: March & July.

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 after the publication of the second semester Senior examination results. Honours students are expected to start their academic year at the beginning of February or in July.

With the permission of the Head of School and the Faculty of Science, students who have qualified to take Honours and passed 12 credit points of Junior Biology may take Biology Honours without having taken Intermediate or Senior Biology units of study. The concession is intended for students who have majored in physics, chemistry or biochemistry and wish to study biophysics or plant physiology; they should first discuss their qualifications with Associate Professor R. L. Overall.

The Honours unit of study comprises:

(a) a project in which the student investigates a problem and presents oral and written accounts of his or her research.

(b) coursework units chosen from a program offered by the School.

(c) instruction in experimental design, and other technical instruction.

Part (c) is run in the February semester and must be taken in the calendar year of first enrolment by all students starting in February or July of that year.

The degree will be awarded on the basis of:

(a) written assignments and essays from coursework units.

(b) marks awarded for a thesis on the subject of the project.

Graduate Diploma in Science (Biology)

Dr C R Dickman

Offered: March & July.

The Graduate Diploma program in Biology is available as a one year full-time or two year part-time course. Information about qualifications for entry into the Graduate Diploma is available from the School Office (Room 234, Macleay Building A12).

The course is intended for students wishing to progress beyond a pass degree but not via the Honours degree, or who are ineligible for admission to Honours. Students enrolled in the one year course will follow the same program as Biology Honours students and be assessed using similar criteria. Students may therefore elect to specialise in any area within the research interests of the School. Projects jointly supervised by staff in other Schools or Departments within the University may also be considered. Students undertaking the two year course (part-time) will follow the same curriculum but will satisfactorily complete the instructed elements of the course before progressing to the project element at the end of the Junior year.

Students who have signified their intention to enter the Graduate Diploma course will be notified of acceptance after the publication of the second semester Senior examination results. Graduate Diploma students are expected to start their academic year at the beginning of February or in July.

Instruction in experimental design, and other technical instruction is run early in the February semester, and must be taken in the calendar year of first enrolment by all students starting in February or July of that year.

The composition of the Graduate Diploma course is identical to that for Honours (see Biology Honours).

Postgraduate study

Dr A Meats

MSc and PhD degrees by research are available in the School.

On completion of an Honours degree (at first or second class level), MSc Preliminary course or Graduate Diploma in Science, students may pursue candidature for MSc degrees by research. The range of research fields offered and the Fields of each member of academic staff are listed in the School's Research Interests Handbook, which is available from the School Office (Room 234, Macleay Building A12).

Department of Cell Pathology

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

CPAT 3001   **Cell Pathology A**

12 credit points

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. (For BMedSc, BMED 2101 and 2102.). **Prohibition/other:** Students must contact the Department before enrolling. Only a small number of students can be accommodated in the laboratory facilities. **Offered:** March. **Classes:** 1 tut & 11 prac/wk. **Assessment:** One 2.15hr exam, 6 prac 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, immunopafhology, 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.

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

Prof. Hunt, Dr Gibbins, Dr Hambly, Dr King

Qualifying: Cell Pathology 3001. **Offered:** July. **Classes:** 1 tut & 11 prac/wk. **Assessment:** One 1.5hr 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, immunopafhology, 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.

Unit 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 3101   Pathological Basis of Human Disease

12 credit points

Prof. Hunt, Dr Gibbins, Dr Hambly, Dr King

Qualifying: Anatomy and Histology 2001; or Biochemistry 2001 or 2002 or 2101 or 2102 or 2901 or 2902; or Biology 2001 or 2002 or 2005 or 2006 or 2101 or 2102 or 2105 or 2106 or 2901 or 2902 or 2905 or 2906; or History and Philosophy of Science 2001 or 2002; or Microbiology 2001 or 2003 or 2901; or Pharmacology 2001; or Physiology 2001. **Offered:** July. **Classes:** 3hr lec, 6 hrs self directed learning or museum sessions, & 3 hr microscopic specimen prac class/wk (Total 12 hrs/wk). **Assessment:** Essay (10%), Theory exam (60%), Practical exam (30%).

The Pathological Basis of Human Disease unit of study requires a minimum of one semester of study. The unit of study modules

will provide a practical and theoretical background to the scientific basis of the pathogenesis of disease, including elements of forensic pathology. Areas covered in Theoretical modules include: tissue responses to exogenous factors, adaptive responses to foreign agents, cardiovascular/pulmonary responses to disease, forensic science, neuropathology and cancer. Practical modules include disease specimen evaluation on a macroscopic and microscopic basis as well as optical and confocal microscopy. The unit of study would be appropriate for those who intend to proceed to Honours research or to careers in biomedical areas such as hospital science. It fulfils the Pathology requirements for the Centre for Chiropractic at Macquarie University.

Textbooks

Kumar, Cotran & Robbins. Basic Pathology. 6th edition, W B Saunders, 1997

CPAT4001 Cell Pathology Honours
48 credit points
DrHambly
Offered: March.

Civil Engineering

The Department of Civil Engineering is part of the Faculty of Engineering. In addition to providing professional training in this branch of engineering, it 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 the February 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. **Offered:** March.

Properties of Materials

Classes: Feb Sem: 3 lec/wk & four 3hr prac/sem
    Assessment: one 3hr exam, coursework
    Production, solidification and bonding in metals. Elastic-plastic deformation of metals. Microstructural effects relating to mechanical properties of metals. Welding. Hydrogen embrittlement, lamellar tearing. Fatigue and brittle fracture. Hardened cement paste, mortar, concrete, timber, masonary. Cements and their hydration, minerals and other admixtures in concrete, mix design.

Textbooks

Callister (Jr) WD. Materials Science and Engineering - An Introduction. 4th edn, John Wiley &Sons 1997

Statics

Classes: Feb Sem: 2 lec & 2hr tut/wk
    Assessment: one 2hr exam, class
    Basic concepts; scalars and vectors; units; the SI system; forces and moments in 2D and 3D. Statics of the rigid body: systems isolation; free body diagrams, and equilibrium criteria. Distributed force systems: cables and hydrostatics; statically determinate, pinjointed structures and machines.

Textbook

Meriam. Engineering Mechanics. 4th edn, Vol. 1, Statics, Wiley, 1997 (SI version)

    Structural Mechanics
    Classes: Feb Sem: 3 lec & one 2hr tut/wk
    Assessment: one 3hr exam, class
    Statics, shear, moment and axial force diagrams. Elementary elasticity, stresses, strains, deformations, compatibility. Bending and shear stresses in beams. Deflection of beams. Analysis of triangulated frames. Torsion. Elementary instability. Combined stresses, failure theories. Influence lines.
    Textbook
    Megson Structural and Stress Analysis, Arnold, 1996

ENGS 2202 Civil Engineering Science 2B
4 credit points
Offered: July. **Classes:** two 1 hr lec & one 2hr prac/wk.
Assessment: One 3hr exam, class.
Structural Design
    Philosophy of design. Loads. Design of simple elements of steel and concrete structures. Design project.

Textbooks

Buckle. Elements of Structure. 2nd edn, Pitman
SAA HB22. - 1995 Australian Standards for Civil Engineering Students Part 2: Structural Engineering.

Chemical Engineering

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 Science 2A

8 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. **Offered:** March. **Classes:** 4 lec, one 1 hr tut & one 2hr tut/wk; and three 3hr prac/semester.
Assessment: One 3hr exam, project and lab assessment.

As for Chemical Engineering Science Auxiliary with, in addition, the following:

An integrated introductory treatment of the transport of momentum, heat and mass.

Fluid statics', application to pressure measurement and forces on storage vessels. Inviscid flow theory: application to flow measurement. Conservation of momentum; forces on fittings. Laminar flow of Newtonian fluids in pipes: derivation of velocity profile, flow rate and frictional loss. Turbulent flow in pipes: application of dimensional analysis, friction factors; energy balances for pipe flow systems. Pumps: theory of reciprocating and centrifugal pumps; cavitation and NPSH.

Heat conduction: rectilinear and cylindrical geometry. Convection: concept and use of the heat transfer coefficient. Dimensional analysis and dimensionless correlations for heat transfer in pipe flow. Natural convection. Simple heat exchangers.

Diffusion models and examples. Convection and dilute diffusion. Diffusion coefficients in gases, liquids and polymers. Mass transfer coefficients, interfacial conditions. Dimensional analysis, correlations. Heat and mass transfer analogies. Absorption of dilute and concentrated vapours. Heat and mass transfer, wet-bulb temperature.

Textbooks

As for Chemical Engineering Science Auxiliary; and
Hewitt, Shire, & Bott. Process Heat Transfer. CRC Press: Begel House, 1994
Others as advised during classes

ENGS 2602   Chemical Engineering Science 2B

8 credit points

Prerequisite: Engineering Science 2601. **Offered:** July. Classes: 4 lec, one 1 hr tut, one 2hr tut/wk; and three 3hr prac/semester.
Assessment: One 3hr exam, project and lab assessment.
See description under Chemical Engineering Science 2A.

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. **Offered:** March. Classes: 2 lec & one 2hr tut/wk. **Assessment:** Two 3hr exams, tutorial and project assessment.

Introduction to large-scale chemical processing; discussion of typical flowsheets for the manufacture of basic chemicals. The application of physicochemical principles to material and energy balance calculations.

There are major assignments in both semesters involving the computation of material and energy balances for a complete flowsheet.

Textbooks

Felder and Rousseau Elementary Principles of Chemical Processes (2nd Ed), Wiley, 1986

ENGS 2612   Chemical Engineering Science 2B Auxiliary

4 credit points

Offered: July. Classes: 2 lec & one 2hr tut/wk. **Assessment:** Two 3hr exams, tutorial and project assessment.
See description under Chemical Engineering Science 2A Auxiliary.

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 Ghernistry 1A

6 credit points

Assumed knowledge: There is no assumed knowledge of chemistry for this unit of study, but students who have not undertaken an HSC chemistry course are strongly advised to complete a chemistry bridging course before lectures commence. **Prohibition/other:** May notbe counted with Chemistry 1101 or 1901 or 1903. **Offered:** March. **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.

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: 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. **Prohibition/other:** May not be counted with Chemistry 1102 or 1902 or 1904. **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: 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

Corequisite: Recommended concurrent unit of study: Preferred - Mathematics 1001 and 1002 or 1901 and 1902; otherwise- Mathematics 1011 and 1012. **Assumed knowledge:** HSC Mathematics 2 unit course; and the Chemistry component of the 4-unit or 3-unit HSC Science course, or 2-unit Chemistry. **Prohibition/other:** May not be counted with Chemistry 1001 or 1901 or 1903.

Offered: March & 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 IA is built on a satisfactory prior knowledge of the chemistry component of the 4-unit or3-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: 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
Qualifying: Chemistry 1101 or a Distinction in Chemistry 1001 or equivalent. **Corequisite:** Recommended concurrent unit of study: Preferred - Mathematics 1003 and 1005 or 1003 and 1004 or 1903 and 1905 or 1903 and 1904; otherwise - Mathematics 1004 and 1005 or 1013 and 1015. **Prohibition/other:** May not be counted with Chemistry 1002 or 1902 or 1904. **Offered:** March & 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: 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: UAI of at least 92.5 and at least 75% in HSC 2-unit Chemistry or equivalent; by invitation. **Corequisite:** Recommended concurrent unit of study: Preferred - Mathematics 1001 and 1002 or 1901 and 1902; otherwise-Mathematics 1011 and 1012. **Prohibition/other:** May not be counted with Chemistry 1001 or 1101 or 1903. **Offered:** March. **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 IA (Advanced) is available to students with a very good HSC performance (typically a UAI of 92.5+) 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: 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
Qualifying: Chemistry 1901 or 1903 or Distinction in Chemistry 1101 or equivalent; by invitation. **Corequisite:** Recommended concurrent unit of study: Preferred - Mathematics 1003 and 1005 or 1003 and 1004 or 1903 and 1905 or 1903 and 1904, otherwise - Mathematics 1013 and 1015 or 1004 and 1005. **Prohibition/other:** May not be counted with Chemistry 1002 or 1102 or 1904. **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 1B (Advanced) is built on a satisfactory prior knowledge of Chemistry IA (Advanced) and covers inorganic and organic chemistry. Chemistry 1B (Advanced) is an acceptable prerequisite for entry into Intermediate Chemistry units of study.

Lectures: A series of about 42 lectures, three per week throughout the semester.

Practical: A series of 10 three-hour laboratory sessions, one per week for 10 weeks of the semester.

Textbooks

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

CHEM 1903   Chemistry 1A (Special Studies Program)
6 credit points
Prerequisite: UAI of at least 98.7 and at least 85% in HSC 2-unit Chemistry or equivalent. Entry is by invitation. **Corequisite:** Recommended concurrent unit of study: Preferred - Mathematics 1001 and 1002 or 1901 and 1902; otherwise- Mathematics 1011 and 1012. 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. **Prohibition/other:** May not be counted with Chemistry 1001 or 1101 or 1901. **Offered:** March. **Classes:** 3 lec & 1 tut/wk & 3hrs prac/wk.

Entry to Chemistry IA (Special Studies Program) is restricted to students with a UAI of 98.7 and an excellent school record in chemistry or science. 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).

A Distinction in 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: Distinction in Chemistry 1903; by invitation. **Corequisite:** Recommended concurrent unit of study: Preferred - Mathematics 1003 and 1005 or 1003 and 1004 or 1903 and 1905 or 1903 and 1904; otherwise - Mathematics 1013 and 1015 or 1004 and 1005. **Prohibition/other:** May not be counted with Chemistry 1002 or 1102 or1902. **Offered:** July. **Classes:** 3 lec & 1 tut/wk & 3hrs prac/wk.

Entry to Chemistry IB (Special Studies Program) is restricted to students who have gained a Distinction in Chemistry IA (Special Studies Program). 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 1B (Special Studies Program) is an acceptable prerequisite for entry into Intermediate Chemistry units of study.

Intermediate Chemistry Units of Study
DrGGWarr
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 2902 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
Qualifying: Chemistry 1102 or 1902 or 1904. **Prerequisite:** 6 credit points of Junior Mathematics. **Prohibition/other:** May not be counted with Chemistry 2101 or 2301 or 2502 or 2901. **Offered:** March. **Classes:** 4 lec & 4hr prac/wk. **Assessment:** Exam (67%), lab exercises (33%).

Lectures and tutorials: In addition to the core, the remaining 20 lectures are distinct for this 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: 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.

CHEM 2101   Chemistry 2 (Environmental)
8 credit points
Qualifying: Chemistry 1102 or 1902 or 1904. **Prerequisite:** 6 credit points of Junior Mathematics. **Prohibition/other:** May not be counted with Chemistry 2001 or 2301 or 2502 or 2901. **Offered:** March. **Classes:** 4 lec & 4hr prac/wk. **Assessment:** Exam (67%), lab exercises (33%).

Lectures: In addition to the core, the remaining 20 lectures are distinct for this 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: As for Chemistry 2001.

CHEM 2202   Chemistry 2 (Principles)
8 credit points
Prerequisite: Chemistry 2001 or 2101 or 2301 or 2502 or 2901. **Prohibition/other:** May not be counted with Chemistry 2302 or 2902. **Offered:** July. **Classes:** 4 lec & 4hr prac/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: As for Chemistry 2001.

CHEM 2301   Chemistry 2A
8 credit points
Qualifying: Chemistry 1102 or 1902 or 1904. **Prerequisite:** 6 credit points of Junior Mathematics. **Prohibition/other:** May not be counted with Chemistry 2001 or 2101 or 2502 or 2901. **Offered:** March & July. **Classes:** 4 lec & 4hr prac/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: As for Chemistry 2001.

CHEM 2302   Chemistry 2B
8 credit points
Prerequisite: Chemistry 2001 or 2101 or 2301 or 2502 or 2901. **Prohibition/other:** May not be counted with Chemistry 2202 or 2902. **Offered:** March & July. **Classes:** 4 lec & 4hr prac/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: As for Chemistry 2001.

CHEM 2502   Chemistry 2 (Forensic)
8 credit points
Qualifying: Chemistry 1102 or 1902 or 1904. **Prerequisite:** 6 credit points of Junior Mathematics. **Prohibition/other:** May not be counted with Chemistry 2001 or 2101 or 2301 or 2901. **Offered:** March. **Classes:** 4 lec & 4hr prac/wk. **Assessment:** Exam (67%), lab exercises (33%).

Lectures: In addition to the core, the remaining 20 lectures are distinct for this 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: As for Chemistry 2001.

CHEM 2901   Chemistry 2A (Advanced)
8 credit points
Qualifying: WAM greater than 80 and Distinction average in Chemistry 1101 or 1901 or 1903 and in Chemistry 1102 or 1902 or 1904). **Prerequisite:** 6 credit points of Junior Mathematics; by invitation. **Prohibition/other:** May not be counted with Chemistry 2001 or 2101 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. **Offered:** March. **Classes:** 5 lec & 3hr prac/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: 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.

CHEM 2902   Chemistry 2B (Advanced)
8 credit points
Prerequisite: Chemistry 2901, but see unit description; by invitation. **Prohibition/other:** May not be counted with Chemistry 2202 or 2302. **Offered:** July. **Classes:** 5 lec & 3hr prac/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: 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.

Senior Chemistry Units of Study

Associate Professor T W Hambley

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 3A 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

Qualifying: Chemistry 2202 or 2302 or 2902. **Prohibition/other:** May not be counted with Chemistry 3901 (but may be counted with Chemistry 3201). **Offered:** March. **Classes:** 4 lec & 8hr prac/wk. **Assessment:** 45min exam per module and prac assessment.

The lectures will be presented in modules (each module runs for a half-semester and comprises 7 lectures). A provisional 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
  Electronic spectroscopy
• Organic chemistry modules:
  Stereochemistry in organic chemistry
  Natural products
  Modern methods of organic synthesis
  Organic reaction mechanisms
  Organmetallic reagents in organic synthesis

• Physical/Theoretical chemistry modules:
  Quantum chemistry
  Surface chemistry
  Liquids and solutions
  Nuclear and radiation chemistry
  Molecular spectroscopy and symmetry
  There may be some interchange of modules between Chemistry 3101 and Chemistry 3102. As well, some modules may not be offered.

Practical: 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

Qualifying: Chemistry 2202 or 2302 or 2902. **Prohibition/other:** May not be counted with Chemistry 3902 (but may be counted with Chemistry 3202). **Offered:** July. **Classes:** 4.5 lec & 7.5 hr prac/ average wk. **Assessment:** 45min exam per module and prac assessment.

The lectures will be presented in modules (each module runs for a half-semester and comprises 7 lectures). A provisional 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:
  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
  Bioorganic chemistry 1: Amino acids and polypeptides
  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:
  Atmospheric chemistry
  Biophysical chemistry
  Molecular spectroscopy 1: electronic
  High temperature chemistry
  Polymer chemistry
  Intermolecular forces and phase transitions
  Applied quantum chemistry
  Materials chemistry
  Lasers and photo chemistry
  There may be some interchange of modules between Chemistry 3101 and Chemistry 3102. As well, some modules may not be offered.

Practical: 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

Qualifying: Distinction average in Chemistry 2001 or 2101 or 2301 or 2901 and in Chemistry 2202 or 2302 or 2902; by invitation. **Prohibition/other:** 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. **Offered:** March. **Classes:** 5 lec & 8hr prac/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 1998 were:
'Does nanotechnology have a future?'
'A combinatorial approach to synthesis.'

Practical: As for Chemistry 3101.

Textbooks

See the Senior Chemistry handbook available from the School of Chemistry

CHEM 3902   Chemistry 3B (Advanced)

12 credit points

Qualifying: Distinction or better in Chemistry 2902 or 3101 or 3901; by invitation. **Prohibition/other:** 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. **Offered:** July. **Classes:** 5.5 lec & 7.5hr prac/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 July semester 1998 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: As for Chemistry 3101.

Textbooks

See the Senior Chemistry handbook available from the School of Chemistry

CHEM 3201   Chemistry 3A Additional

12 credit points

Qualifying: Chemistry 2202 or 2302 or 2902. **Prerequisite:** or Coreq Chemistry 3101 or 3901. **Offered:** March. **Classes:** 4 lec & 8hr prac/wk. **Assessment:** 45min exam per module and prac 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 or 3901 or 3902 or 3202.

Practical: As for Chemistry 3101.

Textbooks

See the Senior Chemistry handbook available from the School of Chemistry

CHEM 3202 Chemistry 3B Additional

12 credit points

Qualifying: Chemistry 2202 or 2302 or 2902. **Prerequisite:** or Coreq Chemistry 3102 or 3902. **Offered:** July. **Classes:** 4 lec & 8hr prac)/wk. **Assessment:** 45min exam per module and prac 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 or 3201 or 3901 or 3902.

Practical: 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

Chemistry Honours

Offered: March.

Includes:

CHEM 4001 Inorganic Chemistry Honours
CHEM 4002 Organic Chemistry Honours
CHEM 4003 Physical Chemistry Honours
CHEM 4004 Theoretical Chemistry Honours
48 credit points.

The Honours program in the School of Chemistry gives students the opportunity to get involved in a research program in an area that is of interest to them. It provides training in research techniques and experience using modem research instrumentation. The Honours program adds a new dimension to the skills that the students have acquired during their undergraduate years and enhances their immediate employment prospects and, more significantly, their future career potential. All students with a sound record in Chemistry are encouraged to apply for entry to the Honours program.

The School of Chemistry offers a wide range of possible projects in the areas of Inorganic Chemistry, Organic Chemistry, Physical Chemistry or Theoretical Chemistry. Details of available projects are contained in the School's Honours Booklet that is available from the School's Information Desk.

In the Honours year, each student undertakes a research project under the supervision of a member of staff; writes a thesis which explains the problem, outlines the research undertaken and the results obtained; attends advanced lecture courses, normally given by leaders in their field from overseas or Australia; attends research seminars and undertakes additional written assessment.

Further information is available from the Administrative Officer (Academic).

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, the design of information systems, 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.

COMP1000 Information Technology Tools
6 credit points
Offered: March & July. Classes: 1 lec, 1 tut & 4 prac/wk.
Assessment: Assignments, written exam, prac exam.
A critical study of common computer applications (including word processors, spreadsheets, databases, image processing packages and web browsers). Emphasis will be given to acquiring a sophisticated level of skills in the usage of these tools. This will include: examining common concepts within and between classes of applications, the ability to transfer skills between releases and alternative packages, customisation and automation of environments, and the ability to design solutions to problems and use a tool to implement that solution. A central focus of this unit of study will be the application of critical thinking to the problems of tool use, including the evaluation of tools and the selection of a suitable tool, and the evaluation of information produced by tools (including knowledge of common sources of error or misunderstanding, and ways to avoid them).

NOTE: Students intending to proceed to professional 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
Corequisite: Students intending to major in Computer Science are advised to enrol in Mathematics 1003 and 1004 or 1004 and 1005 or 1903 and 1904 or 1904 and 1905 in their first year. **Assumed knowledge:** HSC 3-unit Mathematics. **Prohibition/other:** May not be counted with Computer Science 1901. **Offered:** March & 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 modem 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
Assumed knowledge: HSC 3-unit Mathematics (Requires permission by the Head of Department). **Prohibition/other:** May not be counted with Computer Science 1001. **Offered:** March & 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. **Prohibition/other:** May not be counted with Computer Science 1902. **Offered:** March & 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 parsing 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. Prohibition/other: May not be counted with Computer Science 1002. Offered: March & 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.

Computer Science Intermediate Units of Study

COMP 2000 System Analysis and Design
4 credit points
Prerequisite: Computer Science 1000 or 1001 or 1901. **Offered:** March. **Classes:** 2 lec and 1 tut or 1 prac /wk; 1 unscheduled lab work with a CASE tool. **Assessment:** Written and practical assignments + written exam.

The syllabus covers data-centred, process-oriented and object-centred methodologies for requirements analysis and system description to address organisational needs, including the gathering of facts, diagnosis of problems, recommendation of appropriate and feasible solutions. A CASE tool will be used to develop practical skills.

COMP 2001 Computer Systems
4 credit points
Qualifying: Computer Science 1002 or 1902. Prohibition/other: May not be counted with Computer Science 2901. See prerequisites for Senior Computer Science units of study. Consult Departmental Handbook. Offered: March. 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
Qualifying: Distinction in Computer Science 1902 or 1002. **Prohibition/other:** May not be counted with Computer Science 2001. **Offered:** March. **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
Qualifying: Computer Science 1002 or 1902. **Prohibition/other:** May not be counted with Computer Science 2902. See prerequisites for Senior Computer Science units of study. Consult Departmental Handbook. **Offered:** March. **Classes:** 2 lec & 1 tut/wk. **Assessment:** Assessment assignments, written exam.

When there is a large amount of data, its structure (arrangement) determines what operations can be done with it efficiently. For example, the Sydney Phone: directory may be used to find out a subscriber's Phone: 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. Object-oriented programmers often make use of class libraries which contain implementations of important data structures. This unit of study is concerned with the most frequently used data structures, from both the view of a programmer who uses a library of collection classes, and also the programmer who writes the library. This unit of study covers the most frequently used structures, including the array, linked list, binary tree, B-tree, hash table, heap, and adjacency lists. Particular attention is given to understanding the correctness and scalability of different structures. Examples will be in several languages including Java.

COMP 2902 Design and Data Structures (Advanced)
4 credit points
Qualifying: Distinction in Computer Science 1902 or 1002. **Prohibition/other:** May not be counted with Computer Science 2002. **Offered:** March. **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
Qualifying: Computer Science 1002 or 1902. **Prerequisite:** Mathematics 1004 or 1904 or Econometrics or Mathematics 2009. **Prohibition/other:** May not be counted with Computer Science 2903. See prerequisites for Senior Computer Science units of study. Consult Departmental Handbook. **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
Qualifying: Distinction in Computer Science 1902 or 1002. **Prerequisite:** Mathematics 1004 or 1904 or Econometrics or Mathematics 2009. **Prohibition/other:** May not be counted with Computer Science 2003. **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
Qualifying: Computer Science 1002 or 1902. **Prohibition/other:** May not be counted with Computer Science 2904. See prerequisites for Senior Computer Science units of study. Consult Departmental Handbook. **Offered:** July. **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
Qualifying: Distinction in Computer Science 1902 or 1002. **Prohibition/other:** May not be counted with Computer Science 2004. **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.

COMP 2005 Personal Database Tools
4 credit points
Prerequisite: Computer Science 1000 or 1001 or 1901. **Prohibition/other:** Not available to students who have completed or are enrolled in Computer Science 3005 or 3905 (this applies for 1999 only). **Offered:** July. **Classes:** 2 lec, 1 tut/wk; 1 unscheduled lab work. **Assessment:** Written and practical assignments + written exam.

The syllabus covers use of databases through forms and through SQL language; data representation and basic interfaces; good design of tables through normalisation. Use of a variety of data modelling techniques. A PC based database system will be used to develop practical skills.

Computer Science Senior 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 3000 Management of Information Systems
4 credit points
Prerequisite: Computer Science 2000. **Offered:** July 2000. **Classes:** 2 lec, 1 tut/wk; 1 unscheduled lab work. **Assessment:** Written and practical assignments and written exam.
The syllabus covers applications in business and management, managing information technology, planning and implementation of information systems, end user computing, system approach, strategic planning, operations management, control and audit and quality management, strategic information systems.
   (*Unit of study available from July semester Year 2000)

COMP 3001 Algorithms
4 credit points
Qualifying: Computer Science 2002 or 2902. **Prerequisite:** Mathematics 1004 or 1904 and 8 credit points in Intermediate Mathematics and/or Statistics and/or Econometrics. **Prohibition/other:** May not be counted with Computer Science 3901. **Offered:** March. **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
Qualifying: Computer Science 2002 or 2902. **Prerequisite:** 16 credit points of Intermediate or Senior Computer Science with Distinction average and Mathematics 1004 and 1904 and 8 credit points of Intermediate Mathematics and/or Statistics and/or Econometrics. **Prohibition/other:** May not be counted with Computer Science 3001. **Offered:** March. **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.

COMP3002 Artificial Intelligence
4 credit points
Qualifying: Computer Science 2004 or 2904. **Prerequisite:** Computer Science 2003 or 2903 and 8 credit points in Intermediate Mathematics and/or Statistics and/or Econometrics. **Prohibition/other:** May not be counted with Computer Science 3902. **Offered:** March. **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
Qualifying: Computer Science 2004 or 2904. **Prerequisite:** 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. **Prohibition/other:** May not be counted with Computer Science 3002. **Offered:** March. **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
Qualifying: Computer Science 2001 or 2901. **Prerequisite:** Computer Science 2002 or 2902 and 2003 or 2903. **Prohibition/other:** May not be counted with Computer Science 3903. **Offered: July. Classes:** 2 lec, 1 tut & 2 prac/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
Qualifying: Computer Science 2001 or 2901. **Prerequisite:** 16 credit points of Intermediate or Senior Computer Science with Distinction average and Computer Science 2002 or 2902 and 2003 or 2903. **Prohibition/other:** May not be counted with Computer Science 3003. **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
Qualifying: Computer Science 2004 or 2904. **Prerequisite:** Computer Science 2002 or 2902 and Mathematics 1002 or 1902 and 8 credit points in Intermediate Mathematics and/or Statistics and/or Econometrics. **Prohibition/other:** May not be counted with Computer Science 3904. **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 pic-

ture 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. Typically in making pictures, a round ball is modelled by the unit sphere $r \times r = 1$ (after Pythagoras), and a point on a tumbling football by the affine transform $p = A.p' + T$, where A is a non-singular matrix, p' is a point on the unit sphere, and T is a translation vector. The unit of study therefore assumes an understanding of vector and matrix methods.

COMP 3904 Computer Graphics (Advanced)
4 credit points
Qualifying: Computer Science 2004 or 2904. **Prerequisite:** 16 credit points of Intermediate or Senior Computer Science with Distinction average and Computer Science 2002 or 2902 and Mathematics 1002 or 1902 and 8 credit points of Intermediate Mathematics and/or Statistics and/or Econometrics. **Prohibition/other:** May not be counted with Computer Science 3004. **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.

COMP 3005 Database Systems
4 credit points
Qualifying: Computer Science 2002 or 2902. **Prohibition/other:** May not be counted with Computer Science 3905. **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 (DBMS). 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 data modelling. 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 3905 Database Systems (Advanced)
4 credit points
Qualifying: Computer Science 2002 or 2902. **Prerequisite:** 16 points of Intermediate or Senior Computer Science with Distinction average. **Prohibition/other:** May not be counted with Computer Science 3005. **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 Declarative Programming Languages
4 credit points
Qualifying: Computer Science 2004 or 2904. Prerequisite: 8 credit points in Intermediate Mathematics and/or Statistics and/or Econometrics. Prohibition/other: May not be counted with Computer Science 3906. Offered: March. Classes: 2 lec & 1 tut/wk. Assessment: Assessment assignments, written exam.
What distinguishes Declarative Programming Languages is the way in which programmers specify the logic of a problem (what is to be done) rather than the mechanics of solving the problem (how to do it). It is this aspect that has led to these sorts of languages being extensively used for Artificial Intelligence software systems. In addition, they are also often used for rapid prototyping of novel software systems, and many of the ideas and techniques employed in declarative programming language systems-have found broader application.

The unit of study focuses on two languages: Prolog and Lisp. Through a combination of workshops, lectures and assignment students will gain practical skills and come away with significant new tools with which to tackle future software development projects.

COMP 3906   Declarative Programming Languages (Advanced)

4 credit points

Qualifying: Computer Science 2004 or 2904. **Prerequisite:** 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. **Prohibition/other:** May not be counted with Computer Science 3006. **Offered:** March. **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

Qualifying: Computer Science 2004 or 2904. **Prerequisite:** Computer Science 2001 or 2901 or ELEC 2601. **Prohibition/other:** May not be counted with Computer Science 3907. **Offered:** March. **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: 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

Qualifying: 2004 or 2904. **Prerequisite:** 16 credit points of Intermediate or Senior Computer Science with Distinction average and Computer Science 2001 or 2901 or ELEC 2601. **Prohibition/other:** May not be counted with Computer Science 3007. **Offered:** March. **Classes:** 2 lec & 2 prac/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

Qualifying: Computer Science 2004 or 2904. **Prohibition/other:** May not be counted with Computer Science 3908. **Offered:** March. **Classes:** 2 lec & 1 tut/wk. **Assessment:** Assessment assignments, written exam.

Provides further study of the object-oriented paradigm in all stages of the software lifecycle.

COMP 3908   Object-Oriented Systems (Advanced)

4 credit points

Qualifying: Computer Science 2004 or 2904. **Prerequisite:** 16 points of Intermediate or Senior Computer Science with Distinction average. **Prohibition/other:** May not be counted with Computer Science 3008. **Offered:** March. 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

Qualifying: Computer Science 2004 or 2904. **Prerequisite:** Computer Science 2001 or 2901 or ELEC 2601. **Prohibition/other:** May not be counted with Computer Science 3909. **Offered:** March. **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

Qualifying: Computer Science 2004 or 2904. **Prerequisite:** 16 points of Intermediate or Senior Computer Science with Distinction average and Computer Science 2001 or 2901 or ELEC 2601. **Prohibition/other:** May not be counted with Computer Science 3009. **Offered: March. 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: Computer Science 2004 or 2904. **Prohibition/other:** May not be counted with Computer Science 3800. **Offered:** March. **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

Qualifying: Computer Science 2004 or 2904. **Prerequisite:** 16 points of Intermediate or Senior Computer Science with Distinction average. **Prohibition/other:** May not be counted with Computer Science 3100. **Offered:** March. **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 3102   User Interfaces Design and Programming

4 credit points

Qualifying: Computer Science 2004 or 2904. **Prohibition/other:** May not be counted with Computer Science 3802. **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 visu-

al programming environment and the Python scripting language and TK toolkit for building graphical interfaces.

COMP3802   User Interfaces (Advanced)
4 credit points
Qualifying: Computer Science 2004 or 2904. **Prerequisite:** 16 points of Intermediate or Senior Computer Science with Distinction average. **Prohibition/other:** May not be counted with Computer Science 3102. **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 or 3901. **Corequisite:** Students intending to major in Computer Science are advised to enrol in one of Computer Science 3201, 3202, 3203, 3204 or 3205, 3206 or 3809. **Offered:** March (only for those with prereq.) & 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 or 3909. **Corequisite:** Students intending to major in Computer Science are advised to enrol in one of Computer Science 3201, 3202, 3203, 3204 or 3205, 3206 or 3809. **Offered:** March (only for those with prereq.) & 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, VO, etc, will be encountered.

COMP 3203   Intelligence Systems Project
4 credit points
Prerequisite: Computer Science 3002 or 3902. **Corequisite:** Students intending to major in Computer Science are advised to enrol in one of Computer Science 3201, 3202, 3203, 3204 or 3205, 3206 or 3809. **Offered:** March (only for those with prereq.) & 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 or 3800. **Corequisite:** Students intending to major in Computer Science are advised to enrol in one of Computer Science 3201, 3202, 3203, 3204 or 3205, 3206 or 3809. **Offered:** March (only for those with prereq.) & 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. **Corequisite:** Students intending to major in Computer Science are advised to enrol in one of Computer Science 3201, 3202, 3203, 3204 or 3205, 3206 or 3809. **Offered:** March (only for those with prereq.) & 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
Qualifying: Computer Science 2004 or 2904. **Prerequisite:** 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. **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. **Offered:** March & 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.

COMP4001   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 fore-taste of, and a means of assessing a student's potential for, post-graduate research work.

Coursework currently offered covers: advanced operating systems, amortised complexity, computer networks, distributed algorithms, discrete event simulation systems, graph algorithms and related topics; history of computing; linear geometry and signal processing; performance evaluation of computer systems; queuing systems; semantics; symbolic and algebraic computa-tion; advanced spacial geometry, commercial applications of AI and classification and machine learning.

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.

School of Geosciences

The School of Geosciences includes three discipline areas with separate course codes: Geography (GEOG), Geology (GEOL) and Geophysics (GEOP). Students may major in any one of the three areas. The School is located in the Edgeworth David Building (Geology and Geophysics) and in the Madsen Building (Geography).

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 Division. 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 Geography.
Geography handbook
Further details of activities, units of study, excursions, and other relevant material are contained in the Geography Handbook available from the Enquiry Office in the Madsen 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   Biophysical Environments
6 credit points
Assoc. Prof. Short, Dr Gale
Offered: March. **Classes:** 3 lec & 3hr prac/wk. **Assessment:** One 3hr exam, 1500w report, prac assignments.

This unit of study is an introduction to the earth's physical envi-ronment. 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 environmen-tal 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 atmos-pheric and ocean processes with the earth's surface, including fluvial, arid, coastal and glacial systems.
Practical: Field excursion one half day/sem.

GEOG 1002   Human Environments
6 credit points
Assoc. Prof. Connell & Dr W Pritchard
Offered: July. **Classes:** 3 lec & 3hr prac/wk. **Assessment:** One 3hr exam, 2000w essay, prac exercises.

Environmental and Human Geography develops understanding of processes and consequences of interactions among people and between people and their environments. Questions, challenges and issues that stem from the relationships and transformations in the built, natural, social and spatial environments are intro-duced and scrutinised. Social structures and development are explored and principles of human geography are presented through study of the location and distribution of economic ac-tivities 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 lectures 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   Processes in Geomorphology
8 credit points
Associate Professor D Dragovich
Prerequisite: Geography 1001 or Environmental Science 1002.
Prohibition/other: 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. **Offered:** March. **Classes:** 3 lec & 5 prac or field/wk. **Assessment:** One 3hr exam or 1500w essay or prac papers.

Geomorphology 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   Fluvial and Coastal Geography
8 credit points
Dr P Cowell & Mr G Doyle
Prerequisite: Geography 1001 or Environmental Science 1002.
Prohibition/other: As for Geography 2001. **Offered:** July. **Classes:** 3 lec & 5 prac or field/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
Associate Professor D Dragovich & Dr Chapman
Prerequisite: Geography 1001 or 1002 or Environmental Science 1002. **Prohibition/other:** As for Geography 2001. **Offered:** March. **Classes:** 3 lec & 2 prac & field/wk. **Assessment:** One 3hr exam, 1500w essay or prac reports.

Environmental Geography stream: Environmental change occurs at time scales from seconds to centuries or longer, from the
• sudden and catastrophic to gradual transformations barely noticeable at human time scales. Some kinds of environmental change are largely caused by humans, but in other cases humans are helpless before the uncontrollable forces of nature. Environmental change is explored in all of these categories. Consideration is given to land degradation problems such as soil erosion and desertification, and how humans are both implicated in these problems and respond to them. We also study environmental hazards like floods, earthquakes and bushfires, and how we may (or in some cases may not) effectively manage them. Included in the unit of study will be a variety of techniques for the analysis of environmental problems.

GEOG 2102   Resource and Environmental Management
8 credit points
Dr Hirsch. Lecturer to be determined
Prerequisite: Geography 1001 or 1002 or Environmental Science 1002. Prohibition/other: As for Geography 2001. Offered: July. Classes: 3 lec & 5hr tut or prac or fieldwork/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 Urban Geography
8 credit points
Assoc Prof Connell
Prerequisite: Geography 1002 or Environmental Science 1002. Prohibition/other: As for Geography 2001. Offered: March. Classes: 3 lec & 5hr tut or prac or fieldwork/wk. Assessment: One 3hr exam, 2000w essay, tut papers, prac and fieldwork reports.
Human Geography stream: This unit of study examines how people conceive and construct space in various contexts, with an emphasis on urban spaces. Topics examined include the subjectivity of geography, mental maps, language, religion and music. Two themes dominate: firstly, the manner in which social values and ideologies shape rural and urban space in different cultural contexts; and secondly, the manner in which landscapes are perceived and used in very different ways, according to social variables including gender and cultural location. A section on urban social geography focuses on consumer culture and shopping malls, suburban images, sport, sexual spaces, ethnicity and the contrast between gentrification and suburban Utopias. This is then broadened to an analysis of spatial processes and patterns of cities in both the western and post-colonial worlds.

GEOG 2202   Economic and Political Geography
8 credit points
Dr W Pritchard
Prerequisite: Geography 1002 or Environmental Science 1002. Prohibition/other: As for Geography 2001. Offered: July. Classes: 3 lec & 5hr tut or prac or fieldwork/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

Geography offers seven Senior units of study in 3 streams - namely geomorphology, environmental geography and human geography. The streams and their units of study are:

Geomorphology Geography: 3001 and 3002

Environmental Geography: 3101 and 3102

Human Geography: 3201 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.

GEOG 3001 Coastal Environments and Dynamics
12 credit points
Assoc. Prof. Short, Dr Cowell
Prerequisite: Geography 2001 or 2002 or 2101 or Marine Science 2001. **Offered:** March. **Classes:** 3 lec & 6hr prac or field/wk.
Assessment: One 3hr exam, two 1500w essays, prac reports.
Senior 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: Field excursion one 1-day, two 3-day.

GEOG 3002 Environmental Geomorphology
12 credit points
Associate Professor D Dragovich
Prerequisite: Geography 2001 or 2002 or 2101. **Offered:** July.
Classes: 3 lec & 6 prac or field/wk. **Assessment:** One 3hr exam, two 1500w essays, prac and field reports.
Senior 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 Environmental Change
12 credit points
Dr Gale. Lecturer to be determined
Prerequisite: Geography 2001 or 2002 or 2101. **Offered:** March.
Classes: 3 lec & 1 tut & 8 prac or field/wk. **Assessment:** One 3hr exam, two 1500w essays.
Senior Environmental stream

This unit of study consists of two parts, one concerned with ancient environments and the other with the environments of today's and tomorrow's river systems. 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 Management and GIS
12 credit points
Dr Chapman, Dr Cowell
Prerequisite: Geography 2001 or 2002 or 2101 or Marine Science 2001. **Offered:** July. **Classes:** 3 lec & 6 prac or field/wk.
Assessment: One 3hr exam, two 1500w essay, prac or reports.
Senior 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: Field excursion one 2-day.

GEOG 3201 Asia-Pacific Development
12 credit points
Assoc. Prof. Connell, Dr Hirsch
Prerequisite: Geography 2102 or 2201 or 2202. **Offered:** March.
Classes: 3 lec & 9hr tut or prac or fieldwork/wk. **Assessment:** One 3hr exam, two 2000w essays, tut papers, prac and fieldwork reports.
Senior 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. The field study option may not be available in all years.

GEOG 3202 Australia in its Global Context
12 credit points
Professor Waddell & Dr W Pritchard
Prerequisite: Geography 2102 or 2201 or 2202. **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.
Senior 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.

GEOG4001 Geography Honours
48 credit points
Offered: March.

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 pre-registered will be invited to formally enrol. They are required to consult the Head of Geography as soon as possible after the publication of the results concerning choice of topic and the appointment of a staff supervisor. Preliminary work should begin shortly after the publication of these results.

Honours students are required to undertake formal coursework during their first semester and to participate in seminars throughout the year as arranged. They will be required to study original problems, working as appropriate in the field, the laboratory, libraries, and in some instances in conjunction with other university or government departments. A dissertation of not more than 20 000 words must be submitted during the second semester, followed by an examination that may include both written and oral work.

GEOG 4101 Geomorphology Honours
48 credit points
Offered: March.

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.

Geology and Geophysics

Location
Geology and Geophysics are housed in the Edgeworth David Building, immediately south of Fisher Library on Eastern Avenue. First year lectures and laboratories are held in the Carslaw Building.

Noticeboard
Information for Junior Geology students is posted on the noticeboard inside Carslaw Laboratory 1. Noticeboards for students in Intermediate and later years are in the foyer and corridors of the Edgeworth David Building. Students should consult the 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 Enquiry Office, Room 312 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.

Geology Junior 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.

GEOL1001   Earth and Its Environment
6 credit points
Prof P Davies
See prerequisites for Intermediate Geology. **Assumed knowledge:** No previous knowledge of Geology assumed. **Offered:** March.
Classes: 3 lec & prac or tut/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
Dr Keene
Assumed knowledge: No previous knowledge of Geology assumed. Offered: July. Classes: 3 lec & prac or tut/wk. Assessment: One 3hr exam, class and field work.
The aim of this unit of study is to examine the chemical and physical processes involved in mineral formation, the interior of the Earth, volcanoes, and metamorphism. Lectures and laboratory sessions on mountain building processes and the formation of ore deposits will lead to an understanding of the driving forces in geology. Processes such as weathering, erosion and nature of sedimentary environments are related to the origin of the Australian landscape. In addition to laboratory classes there 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.

Geology Intermediate 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
Dr Klepeis
Prerequisite: 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. **Offered:** March.
Classes: 4 lec & 2 prac or tut/wk. **Assessment:** Two 2hr theory, lab exam, class work, field work.

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.

GEOL2002   Resource Exploration
4 credit points
Dr Birch
Prerequisite: Geology 2001. **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 processess 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.

GEOL2003   Fossils and Time
4 credit points
Dr Buick
Prerequisite: 24 credit points of Science units of study. **Offered:** July. **Classes:** 2 lec & 1 prac or tut/wk. **Assessment:** One 3hr theory, class work.
This palaeontology and stratigraphy unit of study is aimed at geoscientists, archaeologists, biologists, marine and environmental scientists who use fossils or stratigraphic data to determine ages, environments or evolutionary lineages. It provides an overview of fossil biodiversity, concentrating on invertebrate animals but also covering vertebrates, plants and microorganisms, with the emphasis on those groups that are most environmentally or stratigraphically useful. It also considers the main methods of stratigraphic correlation and age determination, concentrating on litho- and bio-stratigraphy but also covering the more modern techniques of chemo-, magneto- and sequence-stratigraphy as well as radiometric age dating.

GEOL 2004   Environmental Geology: Hazards
4 credit points
Dr Hughes
Prerequisite: 24 credit points of Science units of study. See prerequisites for Senior Geology. **Offered:** March. **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
Dr Birch
Prerequisite: 24 credit points of Science units of study. See prerequisites for Senior Geology. **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.

Geology Senior 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
Dr Clarke
Prerequisite: Geology 2001 and 2002. **Offered:** March. **Classes:** 12hr of lec & prac/wk. **Assessment:** Two 2hr theory, lab exam, class work, 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
Dr Wilkins
Prerequisite: Geology 3001. **Offered:** July. **Classes:** 8hr of lec & 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
Dr Wilkins
Corequisite: Geology 3001. **Offered:** March. **Classes:** 8hr of lec & 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.

GEOL3004   Paleobiology
4 credit points
DrBuick
Prerequisite: Geology 2003 or 8 credit points of Intermediate Biology. **Prohibition/other:** "Change to semester subject to Faculty approval. **Offered:** July*. **Classes:** 4hr of lec & prac/wk.
Assessment: One 3000-5000W essay, class work, field work.
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 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.

GEOL3005   Geochemistry and Structure
12 credit points
Dr Klepeis
Prerequisite: Geology 3001. **Offered:** July. Classes: 12hr of lec & prac/wk & field work. **Assessment:** One 3hr exam, lab and class work and/or field work.
This unit of study involves two main modules: geochemistry and advanced structure. The geochemistry module examines topics such as the age and origin of the elements, their cosmic abundance, planet-forming processes, the evolution of the Earth's core and mantle, distribution of trace elements in magmatic rocks, geochronology and isotope geochemistry. This module also examines analytical techniques commonly used in the geosciences including X-ray fluorescence, X-ray diffraction, mass spectrometry, atomic absorption spectrometry, microprobe analysis, neutron activation, and scanning electron microscopy. A portion of the geochemistry module is also dedicated to teaching the techniques and tools used in air-photo interpretation. The structural geology module is designed to give students advanced practical experience in the analysis of multiply deformed terrains. It provides students with advanced techniques in quantitative stress and strain analysis with applications to both brittle and ductile regimes. This unit of study also includes field work and/or a research project involving the geology of New Zealand.

GEOL3006   Petroleum Exploration
4 credit points
Dr Birch
Prerequisite: Geology 3001. **Prohibition/other:** "Deletion of corequisite subject to Faculty approval. **Offered:** July. **Classes:** 4hr of lec & prac/wk. **Assessment:** One 1 hr 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 log-

ging, source rock 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.

GEOL4001   Geology Honours
48 credit points
Dr Clarke
Offered: March.

Suitably qualified students may take Honours in Geology. They are required to undertake a research project under the direction of a supervisor, submit a thesis embodying the results of the investigation and undertake such coursework as may be prescribed.

Students not eligible to take Honours may be given permission to enrol in the Graduate Diploma in Science.

Further details are available from the Head of School.

Geophysics

GEOP3001   Geophysical Signal Processing
4 credit points
Professor Mason
Prerequisite: 16 credit points of Intermediate Science units of study*. **Prohibition/other:** 'Changes to semester and prerequisites subject to Faculty approval. **Offered:** July*. **Classes:** 4hr lec & prac/wk. **Assessment:** One 2hr exam, class work.
Starting with a discussion of what signals are and how geophysical data are collected, this 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.

GEOP3002   Geodynamics
4 credit points
Dr Mijller
Prerequisite: 16 credit points of Intermediate Science units of study*. **Prohibition/other:** 'Change to prerequisites subject to Faculty approval. **Offered:** March. Classes: 4hr 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

GEOP3003   Geophysical Exploration A
4 credit points
Prof. Mason
Prerequisite: 16 credit points of Intermediate Science units of study*. **Prohibition/other:** "Change to prerequisites subject to Faculty approval. **Offered:** March. **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, televiewers, nuclear methods, crosshoie correlation, borehole transient electrical method, fundamentals of VSP and reservoir development.

GEOP3004 **Petroleum Geophysics & Basin Analysis***

4 credit points
Dr Muller
Prerequisite: 16 credit points of Intermediate Science units of study*. **Prohibition/other:** "Change to name, semester, prerequisites and corequisites subject to Faculty approval. **Offered:** March*. **Classes:** 4hr lec & prac/wk. **Assessment:** One 3hr exam, lab and class work and/or field work.

Basin analysis is essential for understanding the formation of petroleum source rocks and traps. This course introduces an integrated up-to-date approach to sedimentary basin modelling by combining geophysical and geological data as input for computer models. The course considers different types of basins, such as rift basins formed by lithospheric extension and foreland basins formed near mountain belts, and their relevance for petroleum exploration. Particular emphasis is placed on reconstructing the history of a sedimentary basin by using stratigraphic data derived from wells and seismic reflection profiles. Computer exercises introduce a variety of thermal and mechanical basin models, whose output is compared with observations.

GEOP 3005 **Environmental Geophysics**

4 credit points
Prof. Mason
Prerequisite: 16 credit points of Intermediate Science units of study*. **Prohibition/other:** "Change to prerequisites subject to Faculty approval. **Offered:** July. **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
Prof. Mason
Prerequisite: Geophysics 3003. **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
Offered: March.

Suitably qualified students may take Honours in Geophysics. They are required to undertake a research project under the direction of a supervisor, submit a thesis embodying the results of the investigation and undertake such coursework as may be prescribed.

Students not eligible to take Honours may be given permission to enrol in the Graduate Diploma in Science.

Further details are available from the Head of School.

Geology & Geophysics Postgraduate Study

Details concerning fields of postgraduate study in Geology and Geophysics may be obtained from Associate Professor Keene or the Head of School.

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, science reporting or education.

Location
Carslaw Building, Level 4.

Advise 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
Assoc. Prof. Chalmers
Prerequisite: 24 credit points of Junior units of study. This is a qualifying unit of study for Senior History and Philosophy of Science units of study. **Prohibition/other:** "Change to semester availability subject to Faculty approval. **Offered: March*. Classes:** 2 lec & 2 tut/wk. **Assessment:** One take-home exam, tutorial assignments.

HPSC 2002 **Introductory History of Science**

4 credit points
Dr Neal
Prerequisite: 24 credit points of Junior units of study. This is a qualifying unit of study for Senior History and Philosophy of Science units of study. **Prohibition/other:** "Change to semester availability subject to Faculty approval. **Offered:** July*. **Classes: 2** lec **& 2** tut/wk. **Assessment:** One take-home exam, tutorial assignments.

History and Philosophy of Science Senior Units of Study

Qualifying: History and Philosophy of Science 2001 and 2002. 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
Assoc. Prof. Chalmers
Qualifying: History and Philosophy of Science 2001 and 2002. **Corequisite:** 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. **Prohibition/other:** "Change to semester availability subject to Faculty approval. **Offered:** March*. **Classes:** Two 1hr lec & one 2hr tut/wk. **Assessment:** One take-home exam, tutorial work.

HPSC 3002   History of Biological Sciences
6 credit points
Dr Griffiths
Qualifying: History and Philosophy of Science 2001 and 2002. **Prohibition/other:** As for History and Philosophy of Science 3001. 'Change to semester availability subject to Faculty approval. **Offered: July*. Classes:** two **1** hr lec **&** one 2hr tut/wk. **Assessment:** One take-home exam, tutorial work.

HPSC 3003   Social Relations of Science A
4 credit points
Qualifying: History and Philosophy of Science 2001 and 2002. **Prohibition/other:** As for History and Philosophy of Science 3001. **Offered:** March. **Classes: 1** lec **& 1** tut/wk. **Assessment:** One take-home exam, tutorial work.

HPSC 3004   Social Relations of Science B
4 credit points
Dr Neal
Qualifying: History and Philosophy of Science 2001 and 2002. **Prerequisite:** History and Philosophy of Science 3003. **Prohibition/other:** As for History and Philosophy of Science 3001. **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
Dr Hardy
Qualifying: History and Philosophy of Science 2001 and 2002. **Prohibition/other:** As for History and Philosophy of Science 3001. **Offered:** March. **Classes:** 1 lec & 1 tut/wk. **Assessment:** Class work, essay.

HPSC 3006   Scientific Controversies
4 credit points
Dr Griffiths
Qualifying: History and Philosophy of Science 2001 and 2002. **Prohibition/other:** As for History and Philosophy of Science 3001. 'Change to semester availability subject to Faculty approval. **Offered: July*. Classes:** 1 lec & 1 tut/wk. **Assessment:** Classwork, one 2500w essay.

HPSC 3007   Science and Ethics
4 credit points
Dr Neal
Qualifying: History and Philosophy of Science 2001 and 2002. **Prohibition/other:** As for History and Philosophy of Science 3001. "Change to semester availability subject to Faculty approval. **Offered:** March*. **Classes:** 2hr/wk. **Assessment:** Classwork (50%), take-home exam (50%).

HPSC 3008   The Nature of Experiment
4 credit points
Qualifying: History and Philosophy of Science 2001 and 2002. **Prohibition/other:** As for History and Philosophy of Science 3001. **Offered: July. Classes:** 2hr/wk. **Assessment:** Classwork (50%), take-home exam (50%).

HPSC 3100   Contemporary Issues A
4 credit points
Dr Gaukroger
Qualifying: History and Philosophy of Science 2001 and 2002. **Prohibition/other:** As for History and Philosophy of Science 3001. **Offered:** March. **Classes:** 2 lec/wk. **Assessment:** Classwork, take-home exam.

HPSC 3101   Contemporary Issues B
4 credit points
Qualifying: History and Philosophy of Science 2001 and 2002. **Prohibition/other:** As for History and Philosophy of Science 3001. **Offered:** July. **Classes:** 2 lec/wk. **Assessment:** Classwork, take-home exam.

HPSC 3103   Philosophy of the Biological Sciences
4 credit points
Dr Griffiths
Prerequisite: History and Philosophy of Science 2001 and 2002. **Prohibition/other:** "Change to semester availability subject to Faculty approval. **Offered:** July*. **Classes:** 1 lec & 1 tut/wk. **Assessment:** One tut presentation (50%), one take-home exam.
Textbooks
Sterelny, K & Griffith, P.E. Sex and Death: An Introduction to the Philosophy of Biology

HPSC 4001   History and Philosophy of Science Honours
48 credit points
Offered: March.
Students of sufficient merit may be admitted to Honours. They are required to:

(a) carry out research work under the direction of a supervisor;

(b) submit a thesis of about 15 000 words on this work;

(c) complete four two-hour per week single semester units of study including the assessment required;

(d) attend a fortnightly seminar.

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 and the School of Geosciences 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. This is a qualifying unit of study for Marine Science 3001 and 3002. Some options in Senior Marine Science have additional prerequisites. **Offered:** March. **Classes:** 3 lec & 1 tut/wk, 1 day excursion, 1/2 day excursion. **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
Prohibition/other: As for Marine Science 2001. **Offered:** July. **Classes:** 3 lec & 1 tut/wk, 1 day excursion, 1/2 day excursion. **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.

Marine Sciences Senior Units of Study

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 Sedimentrary 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 School of Geosciences 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 two contributing Schools (Biological Sciences and Geosciences).

Descriptions of options

- MS 1 Coastal Depositional Environments
   Assoc. Prof. Short
   Classes: February Semester - Weeks 1-7: 3 lec & 1 3hr prac/wk, excursions (over 2 weekends, 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 Semester - 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 Semester - 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 Semester - 4 lec & 8hr prac/wk. Timetable 2.

Assessment: One 1.5hr exam, assignments, projects.

See Evolution and Diversity of the Australian Biota entry under School of Biological Sciences.

• MS 5 Marine Biology Module

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

Qualifying: 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.

Classes: February Semester - 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 Semester - Weeks 1-7: 3 lec, lhr prac & 1 tut/ wk, excursion (over 1 weekend).

Assessment: assignments, 1.5hrexam.

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

DrCowell

Classes: July Semester - 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

Prerequisite: 12 credit points of Chemistry

Drlsern

Classes: July Semester - Weeks 1-6: 4 lec, 1 tut & 2hrprac/ wk.

Assessment: One 1.5hrexam, 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 Semester - 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

Dr Dickman, Dr Kingsford, Dr Meats, Prof. Underwood and others

Qualifying: Biology 2001 or 2901 and 2002 or 2902.

Classes: July Semester - 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. **Prerequisite:** There are prerequisites for some options, see options entries. **Offered:** March. **Classes:** See options. **Assessment:** Assessment see individual options.
See individual option descriptions.

MARS 3002 Marine Science B
12 credit points
Prerequisite: Marine Science 2002. **Prerequisite:** There are prerequisites for some options, see option entries. **Offered:** July. **Classes:** see individual options. **Assessment:** See individual options.
See individual option descriptions.

MARS 4001 Marine Sciences Honours
48 credit points
Offered: March.

The structure of Honours will be about one third formal course-work, 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 a knowledge of statistical methods and techniques for students specialising in other fields.

Pure Mathematics units of study have two main aims. One of these is to equip students with the background of mathematical knowledge, understanding and skill necessary for units of study in many branches of science. The other is the provision of training in pure mathematics necessary for those who wish to make a career in mathematics. This might be either in teaching or research or in one of the many avenues where highly developed mathematical ability and a thorough knowledge of modern mathematical techniques are required, such as computing, operations research, management, finance and economics.

Mathematics Junior Units of Study

Various combinations of Junior units of study may be taken, subject to the prerequisites listed. Often specific Junior units of study are prerequisites for Mathematics and Statistics units in the Intermediate and Senior years.

Before deciding on a particular combination of Junior units of study, students are advised to check carefully the prerequisites relating to mathematics for all units of study.

Life Sciences Units of Study

Life Sciences units of study are designed to provide students with an overview of the necessary mathematical and statistical background for studies in the life sciences. They are provided for students in the Faculty of Science whose major interest lies outside mathematics. Each unit of study uses both computers and graphics calculators as aids to the development of mathematical ideas.

There are comprehensive details in the Junior Mathematics Handbook, available from the School at the time of enrolment.
Assumed knowledge
Knowledge equivalent to the HSC 2-unit Mathematics course is assumed. Students who do not have this knowledge are strongly advised to attend a bridging course conducted jointly by the School and the Mathematics Learning Centre in February.
Relation to other units of study and recommendations
The four Life Science units of study together give 12 credit points of mathematics, which is the minimum required by the

BSc degree regulations. Students obtaining a Distinction in MATH 1011 are encouraged to enrol in normal units of study in subsequent semesters. Students obtaining a Distinction or better in MATH 1011, 1012 or 1013 may proceed to Intermediate units of study in the Mathematics Discipline Area. Students with a Credit or better in MATH 1011 and a Pass or better in MATH 1015 may proceed to Intermediate units of study in the Statistics discipline area. Students with a Pass in only MATH 1015 are limited to the Intermediate Statistics units of study STAT 2002 and STAT 2004.

MATH 1011 Life Sciences Calculus
3 credit points
Assumed knowledge: HSC 2-unit Mathematics. **Prohibition/ other:** May not be counted with Mathematics 1901 or 1001. May not be counted by students enrolled in the BSc/BCom combined award course. **Offered:** March. **Classes:** 2 lec & 1 tut/wk. **Assessment:** One two hour examination, assignments, quizzes and practical work.

MATH 1011 is designed to provide calculus for students of the life sciences who do not intend to undertake higher year mathematics and statistics.

This unit of study looks at the fitting of data to various functions, introduces finite difference methods, and demonstrates the use of calculus in optimisation problems. It extends differential calculus to functions of two variables and develops integral calculus, including the definite integral and multiple integrals.

There are comprehensive details of this unit of study in the Junior Mathematics Handbook distributed at the time of enrolment.
Textbooks
As set out in the Junior Mathematics Handbook

MATH 1012 Life Sciences Algebra
3 credit points
Assumed knowledge: HSC 2-unit Mathematics. **Prohibition/ other:** May not be counted with Mathematics 1002 or 1902. May not be counted by students enrolled in the BSc/BCom combined award course. **Offered:** July. **Classes:** 2 lec & 1 tut/wk. **Assessment:** One two hour examination, assignments, quizzes and practical work.

MATH 1012 is designed to provide algebra for students of the life sciences who do not intend to undertake higher year mathematics and statistics.

This unit of study introduces matrices, systems of linear equations and linear programming, counting techniques and numerical integration.

There are comprehensive details of this unit of study in the Junior Mathematics Handbook distributed at the time of enrolment.
Textbooks
As set out in the Junior Mathematics Handbook

MATH 1013 Life Sciences Difference and Differential Equations
3 credit points
Assumed knowledge: HSC 2-unit Mathematics. **Prohibition/ other:** May not be counted with Mathematics 1003 or 1903. May not be counted by students enrolled in the BSc/BCom combined award course. **Offered:** July. **Classes:** 2 lec & 1 tut/wk. **Assessment:** One two hour examination, assignments, quizzes and practical work.

MATH 1013 is designed to provide the theory of difference and differential equations for students of the life sciences who do not intend to undertake higher year mathematics and statistics.

This unit of study looks at the solution of equations by bisection and iteration, first and second order difference equations where chaos is met, and examples of modelling using simple first and second order differential equations.

There are comprehensive details of this unit of study in the Junior Mathematics Handbookdistributed at the time of enrolment.
Textbooks
As set out in the Junior Mathematics Handbook

MATH 1015   Life Sciences Statistics
3 credit points
Assumed knowledge: HSC 2-unit Mathematics. **Prohibition/ other:** May not be counted with Mathematics 1905 or 1005. May not be counted by students enrolled in the BSc/BCom combined award course. **Offered:** March. **Classes:** 2 lec & 1 tut/wk. **Assessment:** One two hour examination, assignments, quizzes and practical work.

MATH 1015 is designed to provide a thorough preparation in statistics for students of the Life Sciences. It is a unit of study providing three of the twelve credit points required by the Faculty of Science.

This unit of study offes a comprehensive first introduction to data analysis, probability and sampling, and inference including confidence intervals, chi-squared tests and goodness to fit.

There are comprehensive details of this unit of study in the Junior Mathematics Handbook distributed at the time of enrolment.
Textbooks
As set out in the Junior Mathematics Handbook

Mathematics & Statistics Normal Units of Study

Normal units of study are designed for students who have both the necessary background and the interest in mathematics and who need to study mathematics beyond Junior units of study in order to satisfy their own aspirations or degree requirements.

There are comprehensive details of these units of study in the Junior Mathematics Units of Study Handbook, available from the School at the time of enrolment.
Assumed knowledge
For the units MATH 1001, MATH 1002 and MATH 1004, knowledge equivalent to the HSC 3-unit MAthematics course is assumed. The assumed knowledge for MATH 1005 is HSC 2-unit Mathematics. For MATH 1003 the assumed knowledge is MATH 1001 or HSC 4-unit Mathematics. Students who have a very good result in the equivalent of the HSC 2-unit course are encouraged to enrol in the Normal units of study but should discuss their plans with a Mathematics adviser.
Relation to other units of study and recommendations
Students should take at least four units of study in each semester in order to meet the minimum requirement of 12 credit points of Mathematics in the BSc award course. The usual enrolment for Normal level students is in the three units MATH 1001, MATH 1002, MATH 1003 and (at least) one of MATH 1004 and MATH 1005. Passes in Junior units of study at this level qualify students to proceed to Intermediate units of study in mathematics and statistics. Students should note however that some Intermediate units of study in both mathematics and statistics require specific Junior units of study to be passed as prerequisites. Students obtaining a Credit or better in Normal units of study are encouraged to enrol in other Advanced units of study.

MATH 1001   Differential Calculus
3 credit points
Assumed knowledge: HSC 3-unit Mathematics. Prohibition/ other: May not be counted with Mathematics 1901 or 1011. Offered: March. Classes: 2 lec & 1 tut/wk. Assessment: One two hour examination, assignments, quizzes and practical work.
MATH 1001 is designed to provide a thorough preparation for further study in mathematics and statistics. It is a core unit of study providing three of the twelve credit points required by the Faculty of Science as well as a Junior level requirement in the Faculty of Engineering.

This unit of study looks at 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.

There are comprehensive details of this unit of study in the Junior Mathematics Handbook distributed at the time of enrolment.
Textbooks
As set out in the Junior Mathematics Handbook

MATH 1002 Linear Algebra
3 credit points
Assumed knowledge: HSC 3-unit Mathematics. Prohibition/ other: May not be counted with Mathematics 1902 or 1012. Offered: March. Classes: 2 lec & 1 tut/wk. Assessment: One two hour examination, assignments, quizzes and practical work.
MATH 1002 is designed to provide a thorough preparation for further study in mathematics and statistics. It is a core unit of study providing three of the twelve credit points required by the Faculty of Science as well as a Junior level requirement in the Faculty of Engineering.

This unit of study introduces vectors and vector algebra, complex numbers and linear algebra, including matrices, determinants, eigenvalues and eigenvectors.

There are comprehensive details of this unit Of study in the Junior Mathematics Handbook distributed at the time of enrolment.
Textbooks
As set out in the Junior Mathematics Handbook

MATH 1003   Integral Calculus and Modelling
3 credit points
Assumed knowledge: HSC 4-unit Mathematics or Mathematicsl 001. **Prohibition/other:** May not be counted with Mathematics 1903 or 1013. **Offered:** July. **Classes:** 2 lec & 1 tut/ wk. **Assessment:** One two hour examination, assignments, quizzes and practical work.
MATH 1003 is designed to provide a thorough preparation for further study in mathematics and statistics. It is a core unit of study providing three of the twelve credit points required by the Faculty of Science as well as a Junior level requirement in the Faculty of Engineering.

This unit of study first develops the idea of the definite integral from Riemann sums, leading to the Fundamental Theorem of Calculus. 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.

There are comprehensive details of this unit of study in the Junior Mathematics Handbook distributed at the time of enrolment.
Textbooks
As set out in the Junior Mathematics Handbook

MATH 1004   Discrete Mathematics
3 credit points
Assumed knowledge: HSC 3-unit Mathematics. **Prohibition/ other:** May not be counted with Mathematics 1904. **Offered:** July. Classes: 2 lec & 1 tut/wk. Assessment: One two hour examination, assignments, quizzes and practical work.
MATH 1004 is designed to provide a thorough preparation for further study in Mathematics. It is a core unit of study providing three of the twelve credit points required by the Faculty of Science as well as a Junior level requirements in the Faculty of Engineering.

This unit provides an introduction to fundamental aspects of discrete mathematics, which deals with 'things that come in chunks that can be counted'. It focuses on the enumeration of a set of numbers, viz. Catalan numbers. Topics include sets and functions, counting principles, Boolean expressions, mathematical induction, generating functions and linear recurrence relations, graphs and trees.

There are comprehensive details of this unit of study in the Junior Mathematics Handbook distributed at the time of enrolment.
Textbooks
As set out in the Junior Mathematics Handbook

MATH 1005   Statistics
3 credit points
Assumed knowledge: HSC 2-unit Mathematics. Prohibition/ other: May not be counted with Mathematics 1905 or 1015. Offered: July. Classes: 2 lec & 1 tut/wk. Assessment: One two hour examination, assignments, quizzes and practical work.
MATH 1005 is designed to provide a thorough preparation for further study in mathematics and statistics. It is a core unit of

study providing three of the twelve credit points required by the Faculty of Science as well as a Junior level requirement in the Faculty of Engineering.

This unit offers a comprehensive first introduction to data analysis, probability and sampling, and inference including confidence intervals, chi-squared tests and goodness to fit.

There are comprehensive details of this unit of study in the Junior Mathematics Handbook distributed at the time of enrolment.

Textbooks
As set out in the Junior Mathematics Handbook

Mathematics & Statistics Junior Advanced Units of Study

Advanced units of study are designed for students who have a strong background and a keen interest in mathematics and who need to study mathematics at a higher level to satisfy their own aspirations or degree requirements. All students aiming for high achievement, such as an Honours degree or postgraduate study, are advised to enrol in Advanced units of study.

Content
The unit of study content is similar in outline to that of the Normal units of study above but proceeds at a faster rate and covers more difficult material.

There are comprehensive details of these units of study in the Junior Mathematics Unit of Study Handbook, available from the School at the time of enrolment.

Assumed knowledge
Knowledge equivalent to the HSC 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 recommendation
Students should take two units of study in each semester in order to meet the minimum requirement of 12 credit points of mathematics in the BSc award course. The usual enrolment for Advanced level students is in the units MATH 1901, MATH 1902, MATH 1903 and (at least) one of the units MATH 1904 and MATH 1905. Passes in Junior units of study at this level qualify students to proceed to Intermediate units of study in Mathematics and Statistics at either the Normal or the Advanced level. Students should note however that some Intermediate and Senior units of study in both Mathematics and Statistics require specific Junior units of study as prerequisites.

MATH 1901   Differential Calculus (Advanced)
3 credit points
Assumed knowledge: HSC 4-unit Mathematics or top decile 3-unit Mathematics. **Prohibition/other:** May not be counted with Mathematics 1001 or 1011. **Offered:** March. **Classes: 2** lec **& 1** tut/wk. **Assessment:** One two hour examination, assignments, quizzes and practical work.
MATH 1901 is designed to provide a thorough preparation for further study in mathematics and statistics. It is a core unit of study providing three of the twelve credit points required by the Faculty of Science as well as a Junior level requirement in the Faculty of Engineering.

This unit of study parallels the normal unit MATH 1001 but goes more deeply into the subject matter and requires more mathematical sophistication.

There are comprehensive details of this unit of study in the Junior Mathematics Handbook distributed at the time of enrolment.

Textbooks
As set out in the Junior Mathematics Handbook

MATH 1902   Linear Algebra (Advanced)
3 credit points
Assumed knowledge: HSC 4-unit Mathematics or top decile 3-unit Mathematics. **Prohibition/other:** May not be counted with Mathematics 1002 or 1012. **Offered:** March. **Classes: 2** lec **& 1** tut/wk. **Assessment:** One two hour examination, assignments, quizzes and practical work.
MATH 1902 is designed to provide a thorough preparation for further study in mathematics and statistics. It is a core unit of study providing three of the twelve credit points required by the Faculty of Science as well as a Junior level requirement in the Faculty of Engineering.

This unit of study parallels the normal unit MATH 1002 but goes more deeply into the subject matter and requires more mathematical sophistication.

There are comprehensive details of this unit of study in the Junior Mathematics Handbook distributed at the time of enrolment.

Textbooks
As set out in the Junior Mathematics Handbook

MATH 1903   Integral Calculus and Modelling (Advanced)
3 credit points
Assumed knowledge: HSC 4-unit Mathematics or Mathematics1901. **Prohibition/other:** May not be counted with Mathematics 1003 or 1013. **Offered:** July. **Classes: 2** lec **& 1** tut/wk. **Assessment:** One two hour examination, assignments, quizzes and practical work.
MATH 1903 is designed to provide a thorough preparation for further study in mathematics and statistics. It is a core unit of study providing three of the twelve credit points required by the Faculty of Science as well as a Junior level requirement in the Faculty of Engineering.

This unit of study parallels the normal unit MATH 1003 but goes more deeply into the subject matter and requires more mathematical sophisticaton.

There are comprehensive details of this unit of study in the Junior Mathematics Handbook distributed at the time of enrolment.

Textbooks
As set out in the Junior Mathematics Handbook

MATH 1904   Discrete Mathematics (Advanced)
3 credit points
Assumed knowledge: HSC 4-unit Mathematics or top decile 3-unit Mathematics. **Prohibition/other:** May not be counted with Mathematics 1004. **Offered:** July. **Classes:** 2 lec & 1 tut/wk. **Assessment:** One two hour examination, assignments, quizzes and practical work.
MATH 1904 is designed to provide a thorough preparation for further study in mathematics. It is a core unit of study providing three of the twelve credit points required by the Faculty of Science as well as a Junior level requirement in the Faculty of Engineering.

This unit of study parallels the normal unit MATH 1004 but goes more deeply into the subject matter and requires more mathematical sophistication.

There are comprehensive details of this unit of study in the Junior Mathematics Handbook distributed at the time of enrolment.

Textbooks
As set out in the Junior Mathematics Handbook

MATH 1905   Statistics (Advanced)
3 credit points
Assumed knowledge: HSC 3-unit Mathematics (50 percentile). **Prohibition/other:** May not be counted with Mathematics 1005 or 1015. **Offered:** July. **Classes:** 2 lec & 1 tut/wk. **Assessment:** One two hour examination, assignments, quizzes and practical work.
MATH 1905 is designed to provide a thorough preparation for further study in mathematics and statistics. It is a core unit of study providing three of the twelve credit points required by the Faculty of Science as well as a Junior level requirement in the Faculty of Engineering.

This Advanced level unit of study parallels the normal unit MATH 1005 but goes more deeply into the subject matter and requires more mathematical sophistication.

There are comprehensive details of this unit of study in the Junior Mathematics Handbook distributed at the time of enrolment.

Textbooks
As set out in the Junior Mathematics Handbook

Mathematics Intermediate Units of Study

The School of Mathematics provides a range of Intermediate units of study, each worth 4 credit points covering a variety of topics in Pure and Applied Mathematics. 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 Second Year 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. The standard combination of units of study for students wishing to take a full load of Intermediate Applied Mathematics is as follows:

At Normal level: 2001+ (2003 or 2006) + 2005 + (2004 or 2010)

At Advanced level: 2901 + (2903 or 2906) + 2905 + 2904

Students intending to specialise in Pure Mathematics should choose at least 4 units of study from the Pure list above and should include MATH 2002 or 2902 and 2008 or 2908. Other recommended choices would be 2007 or 2907. The standard combination of units of study for students wishing to take a full load of Intermediate Pure Mathematics is as follows:

At Normal level: (2001 or 2009) + 2002 + (2005 or 2007) + 2008

At Advanced level: 2901 + 2902 + 2907 + 2908

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 (1001 or 1901) and (1002 or 1902) and (1003 or 1903). **Prohibition/other:** May not be counted with Mathematics 2901. **Offered:** March. **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.

Textbooks
Stewart J. Calculus. Brooks/Cole Publishing Co, 1995
Kreyszig. Advanced Engineering Mathematics. Wiley

MATH 2002 Matrix Applications
4 credit points
Prerequisite: Mathematics 1002 or 1902 or Distinction in Mathematics 1012. **Prohibition/other:** May not be counted with 2902. **Offered:** March. **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.

MATH 2003   Introduction to Mathematical Computing
4 credit points
Prerequisite: Mathematics (1001 or 1901) and (1002 or 1902) and (1003 or 1903). **Prohibition/other:** May not be counted with Mathematics 2903. **Offered:** March. **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 model-

ling 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 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. **Prohibition/other:** May not be counted with Mathematics 2904. **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. **Prohibition/other:** May not be counted with Mathematics 2905. **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 (1001 or 1901) and (1002 or 1902) and (1003 or 1903) or (Credit in Mathematics 1011 and 1012 and 1013). **Prohibition/other:** May not be counted with Mathematics 2906. **Offered:** March. **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.
Textbooks
Kaplan D & Glass L. Understanding Nonlinear Dynamics. Springer-Verlag, 1995

MATH 2007   Analysis
4 credit points
Prerequisite: Mathematics (1001 or 1901) and (1003 or 1903) or Distinction average in Mathematics 1011 and 1013. **Prohibition/other:** May not be counted with Mathematics 2907. **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. **Prohibition/other:** May not be counted with Mathematics 2908. **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: 6 credit points of Junior Mathematics (at the Distinction level in Life Sciences units). **Offered:** March. **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...; 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 (1001 or 1901) and (1002 or 1902) and (1003 or 1903) (strongly advise Mathematics 2002 or 2902). **Corequisite:** The combination of this unit of study with Mathematics 2002 or 2902 is highly recommended. **Prohibition/other:** May not be counted with Econometrics 3510 Operations Research A. **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 2033   Financial Mathematics I
4 credit points
Prerequisite: Mathematics 1001,1002,1003 and 1005 or Mathematics 1901,1902,1903 and 1905. **Offered:** March. **Classes:** 2 lec, 1 tut & 0.5 comp lab/wk. **Assessment:** 2hr exam (50%, quizzes (25%), assignment (10%), Computer project (15%).

This unit of study is an introduction to financial mathematics with the main emphasis being on mathematical and statistical techniques used to solve problems of relevance to the finance industry. Topics covered include: riskless interest rate models, present and future value factors, arbitrage, solution of general cash-flow problems in both discrete and continuous time, analysis of bonds, simple optimisation problems in finance, modelling of risky assets, expectations hypothesis, utility theory, state space security price modelling, introduction to options. Mathematical techniques include: solving difference and differential equations, advanced integration and summation techniques, lin-

ear and dynamic programming, method of Lagrange multipliers, calculation of distributions and expectations of random variables, linear algebra methods, analysis of simple random walks.

MATH 2901 Vector Calculus and Complex Variables (Advanced)

4 credit points
Prerequisite: Mathematics (1901 or Credit in 1001) and (1902 or Credit in 1002) and (1903 or Credit in 1003). **Corequisite:** Mathematics 2002 or 2902. **Prohibition/other:** May not be counted with Mathematics 2001. **Offered:** March. **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: 12 credit points of Junior Mathematics, including Mathematics 1902 or Credit in 1002. **Prohibition/other:** May not be counted with Mathematics 2002. **Offered:** March. **Classes:** 3 lec & 1 tut/wk. **Assessment:** One 2hr exam, assignments, quizzes.

This unit of study is primarily concerned with linear transformations. Abstract vector spaces are introduced as the correct context in which to discuss linear transformations, and the basic structure theorems for finite dimensional vector spaces are proved. The connections between matrices and linear transformations are investigated. Determinants, introduced in first year, are revised and investigated further. 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: (1901 or Credit in 1001) and (1902 or Credit in 1002) and (1903 or Credit in 1003). **Prohibition/other:** May not be counted with Mathematics 2003. **Offered:** March. **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. **Prohibition/other:** May not be counted with Mathematics 2004. **Offered:** July. **Classes:** 2 lec, 1 prac & 1 tut/wk. **Assessment:** One 2hr 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. **Prohibition/other:** May not be counted with Mathematics 2005. **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 equa-

tions 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 (1901 or Credit in 1001) and (1902 or Credit in 1002) and (1903 or Credit in 1003). **Prohibition/other:** May not be counted with Mathematics 2006. **Offered:** March. **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.

Textbooks

Kaplan D & Glass L. Understanding Nonlinear Dynamics. Spinger-Verlag, 1995

MATH 2907 Analysis (Advanced)

4 credit points
Prerequisite: Mathematics (1901 or Credit in 1001) and (1903 or Credit in 1003) (Mathematics 2901 or 2001 strongly advised). **Prohibition/other:** May not be counted with Mathematics 2007. **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. **Prohibition/other:** May not be counted with Mathematics 2008. **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.

MATH 2933 Financial Mathematics I (Advanced)

4 credit points
Prerequisite: Mathematics 1901,1902,1903 and 1905 or Credit in Mathematics 1001,1002,1003 and 1005. **Offered:** March. **Classes:** 2 lec, 1 tut & 0.5 comp lab/wk. **Assessment:** 2hr exam (50%), quizzes (25%), assignment (10%), Computer project (15%).

The content of this unit of study parallels that of MATH 2003, but students will be required to undertake all problem solving and assessment tasks at a more advanced level. Some additional topics may also be included.

Statistics Intermediate Units of Study

The School of Mathematics and Statistics provides Intermediate units of study, each worth 4 credit points, in Statistics. 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 the 4 units of study (16 credit points) of Intermediate Statistics.

Some topics are offered at Normal and Advanced levels and may not be counted together. 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.

Relation 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. Mathematics 2002 or 2902 is desirable, in addition.

If your major interest is statistics, then you are encouraged to enrol in 4 units of study (16 credit points) in Intermediate Statistics. If you are considering doing Honours in Statistics, these units of study should include some Advanced units of study, and choices from Intermediate Mathematics should include at least Mathematics 2001 or 2901 and Mathematics 2002 or 2902.

If you do not intend to major in Statistics but want a solid introduction to Applied Statistics, you should take STAT 2002 in your first semester and STAT 2004 in your second semester. This allows you the option of continuing with STAT 3002 and STAT 3004 at Senior level.

STAT 2001 Probability and Distribution
4 credit points
Prerequisite: Mathematics (1003 or 1903 or Credit in 1011) and (1005 or 1905 or Credit in 1015). **Prohibition/other:** May not be counted with Statistics 2901. **Offered:** March. **Classes:** 2 lec & 1tut/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 1005 or 1905 or 1015 (or Statistics 1021 for Arts students). **Offered:** March. **Classes:** 2 lec & 1tut & 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. **Prohibition/other:** May not be counted with Statistics 2903. **Offered:** July. **Classes:** 2 lec & 1tut/wk. **Assessment:** 2hr exam, assignments.
Bivariate distribution theory, estimation, dependence, maximum likelihood estimation and sampling theory.

STAT 2004 Hypothesis Testing
4 credit points
Prerequisite: Statistics 2002. **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, and regression theory.

STAT 2901 Introduction to Probability (Advanced)
4 credit points
Prerequisite: (Mathematics 1903 or Credit in Mathematics 1003) and (Mathematics 1905 or Credit in Mathematics 1005).
Prohibition/other: May not be counted with Statistics 2001.
Offered: March. **Classes:** 2 lec & 2 tut/wk. **Assessment:** 3hr 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.
Prohibition/other: May not be counted with Statistics 2903.
Offered: July. **Classes:** 2 lec & 1 tut/wk. **Assessment:** 2hr exam, assignments.
Topics in STAT 2003 are treated at an Advanced level, with extensions.

Mathematics Senior Units of Study
The School of Mathematics and Statistics provides a range of Senior units of study, each worth 4 credit points, covering a wide variety of topics in Pure and Applied Mathematics. Students may take up to 12 units of study (48 credit points) at Senior level. Those intending to proceed to Honours or simply to major in mathematics must take a minimum of 6 units of study (24 credit points) from the Science Discipline Area of Mathematics.

The units of study are taught at either the Normal or the Advanced level. Entry into the advanced units of study is restricted to students who have met various prerequisite conditions. Students should consult the list below for requirements of individual Advanced units of study, and seek advice from the Senior year coordinators.

The School encourages students undertaking an Advanced program to choose 3 or 4 units of study at the Advanced level.

Students wishing to keep open the possibility of undertaking an Honours year are strongly advised to consult a Senior year adviser about their choice of units of study.

For ease of overview, the units of study are arranged under Pure, for students wishing to specialise in Pure Mathematics, and Applied, for those wishing to specialise in Applied Mathematics. Several units of study are suitable to either. Details for each unit of study appear below, whilst full details of the unit of study structure, content and assessment procedures are provided in the Senior 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 II (Advanced) MATH 3907
Coding Theory MATH 3007
Combinatorics (Advanced) MATH 3912
Computational Algebra (Advanced) MATH 3913
Differential Analysis (Advanced) MATH 3911
Financial Mathematics 2 MATH 3015
Financial Mathematics 2 (Advanced) MATH 3933
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
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 2 MATH 3015
Financial Mathematics 2 (Advanced) MATH 3933
Hamiltonian Dynamics (Advanced) MATH 3917
Information Theory MATH 3010
Mathematical Computing II (Advanced) MATH 3916
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(s) of study and seek advice from a Senior year coodinator.

Students intending to major in Pure Mathematics should choose at least 6 units of study from the Pure list above; 3 units of study each semester is the normal choice. Intending Honours students are strongly encouraged to include Mathematics 3901 and 3902.

Students intending to major in Applied Mathematics should choose at least 6 units of study from the Applied list above.

A double major would require a choice of 12 units of study from the lists above.

Particular combinations would be suitable for students with special interests.

Computer Science students: Mathematics 3001, 3002 or 3902, 3005, 3905, 3006, 3007, 3009, 3010, 3912, 3015 or 3933, 3016 or 3916, 3019 or 3919.

Engineering (BSc/BE) students: Mathematics 3001 or 3901, 3003, 3005, 3019 or 3919, 3903, 3904, 3007, 3008, 3010, 3908, 3909, 3015 or 3933, 3016 or 3916, 3018, 3020 or 3920, 3914, 3915, 3917

Physics or Chemistry students: Mathematics 3001 or 3901, 3002, 3003, 3914, 3917, 3903, 3904, 3006, 3008, 3009, 3010, 3908, 3909, 3015 or 3933, 3016 or 3916, 3018, 3019 or 3919, 3020 or 3920, 3906, 3915.

Prospective teachers of Mathematics: Mathematics 3001 or 3901, 3002 or 3902, 3003, 3004, 3005, 3006, 3007, 3008, 3009, 3010, 3016 or 3916, 3018, 3019 or 3919, 3020 or 3920.

MATH 3001 Topology
4 credit points
Prerequisite: 8 credit points of Intermediate Mathematics.
Prohibition/other: May not be counted with Mathematics 3901.
Offered: March. **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). **Prohibition/other:** May not be counted with Mathematics 3902. **Offered:** March. **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). **Offered:** March. 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. **Offered:** March. **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; (for BCST students) 8 credit points of Intermediate Mathematics or 12 credit points of Junior Mathematics at Advanced level. **Offered:** March. **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 units of Intermediate Mathematics (strongly advise 1902 or 1002). **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). **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 modem 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). **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. **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 $x*2+y*2=z*2$, $x*2-21y*2=l$). 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). **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 3015   Financial Mathematics 2
4 credit points
Prerequisite: 8 credit points of Intermediate Mathematics (strongly advise Mathematics 2033 or 2933 or 2010 and some probability theory). **Prohibition/other:** May not be counted with Mathematics 3933. **Offered:** July. Classes: 2 lec & 1 tut/wk. **Assessment:** One 2hr exam, quizzes, assignment, computer project.
This unit is a follow-on from the Intermediate unit MATH 2033 (Financial Mathematics 1). The first part deals with modern portfolio theory, the second part with options and derivative securities. Topics covered include: mean-variance Markowitz portfolio theory, the Capital Asset Pricing Model, Arbitrage Pricing Theory, log-optimal portfolios and the Kelly criterion; calls and puts, profit-loss profiles for option strategies, arbitrage from mispricing, binomial random walk and the CRR-option pricing model, risk-neutrality, limit to the continuous time Black-Scholes model, sensitivity analysis, introduction to exotic options and derivative securities. Mathematical and statistical methods required: theory of quadratic programming, Lagrange parameters and Kuhn-Tucker theory, linear factor models in a statistical setting, advance probability theory including distributions and expectations, introduction to random walks and stochastic processes.

MATH 3016   Mathematical Computing I
4 credit points
Prerequisite: 8 credit points of Intermediate Mathematics and one of Mathematics 1001 or 1003 or 1901 or 1903. **Prohibition/other:** May not be counted with Mathematics 3916. **Offered:** March. **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. **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. **Offered:** March. **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 aliassing, filter design and the basics of image processing.

MATH 3020   Nonlinear Systems and Biomathematics
4 credit points
Prerequisite: 8 credit points of Intermediate Mathematics (strongly advise 2006 or 2906 or 2908 or 3003) and one of Mathematics 1001 or 1003 or 1901 or 1903. **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). **Prohibition/other:** May not be counted with Mathematics 3001. **Offered:** March. **Classes:** 2 lec & 1 tut/wk. **Assessment:** One 2hr exam, assignments.
Topology was invented by Poincare 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). **Prohibition/other:** May not be counted with Mathematics 3002. Offered: March. **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, fractorisation, 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 Mathematics 2001 or 2901, with Mathematics 3001 or 3901). **Offered:** March. **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 R3, following Do Carmo's book, leading to the celebrated Gauss-Bonnet Theorem. If time allows, either the language of differential forms will be introduced or some global theory of differential geometry will be developed.

MATH 3904   Complex Variable (Advanced)
4 credit points
Prerequisite: 12 credit points of Intermediate Mathematics (strongly advise Mathematics 2001 or 2901, with Mathematics 3001 or 3901). **Offered:** March. **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. **Offered:** March. **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). **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). **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 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). **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 I9th century with the work of Poincare 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 modem 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). **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 in 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). **Offered:** July. **Classes:** 2 lec & 1 tut/wk. **Assessment:** One 2hr exam, assignments.
Two functions defined in a neighbourhood of the origin of Rn 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. **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). **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 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. **Offered:** March. **Classes:** 2 lec & 1 tut/wk. **Assessment:** One 2hr exam, assignments.
This unit of study provides an introduction to fluid dynamics, starting with a description of the governing equations and the simplifications gained by using stream functions or potentials. It develops elementary theorems and tools, including Bernoulli's equation, the role of vorticity, the vorticity equation, Kelvin's circulation theorem and Helmholtz's theorem. Topics covered include viscous flows, boundary layers, potential theory and 2-D airfoils, and complex variable methods. The unit of study concludes with an introduction to hydrodynamic stability and the transition to turbulent flow.

MATH 3915   Mathematical Methods (Advanced)
4 credit points
Prerequisite: Mathematics 2905 or Credit in Mathematics 2005. **Offered:** March. **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 units of Intermediate Mathematics and one of Mathematics 1903 or Credit in Mathematics 1003. **Prohibition/ other:** May not be counted with Mathematics 3016. **Offered:** March. **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 2004. **Offered:** July. **Classes: 2** lec **& 1** hr **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. **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. **Prohibition/other:** May not be counted with Mathematics 3019. **Offered:** March. **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 1903 adn 1905 or 1903 and 1904 or Credit in Mathematics 1003 and 1005 or 1003 and 1004. **Prohibition/other:** May not be counted with Mathematics 3020. **Offered:** July. **Classes:** 2 lec & 1 tut/wk. **Assessment:** One 2hr exam, assignments.

See entry for Mathematics 3020 Nonlinear Systems and Biomathematics.

MATH 3933 Financial Mathematics 2 (Advanced)
4 credit points
Prerequisite: 8 credit points of Intermediate Mathematics (strongly advise Mathematics 2933 or Credit in 2033 and Mathematics 2010 and some probability theory). **Prohibition/other:** May not be counted with Mathematics 3015. **Offered:** July. **Classes:** 2 lec & 1 tut/wk. **Assessment:** One 2hr exam, quizzes, assignment, computer project.   !
As for Math 3015 but with more advanced problem solving and assessment tasks. Some additional topics may also be included.

Statistics Senior Units of Study
The School of Mathematics and Statistics provides several Senior units of study, each worth 4 credit points, in Statistics. Students wishing to specialise in Statistics should take 6 units of study (24 credit points) of Senior Statistics.

Some topics are offered at Normal and Advanced levels and may not be counted together. Entry to 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 1999)

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 expected 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 2003 or 2903. **Prohibition/other:** May not be counted with Statistics 3901. **Offered:** March. **Classes:** 2 lec & 1 tut/wk. **Assessment:** One 2hr exam, assignments.
Multivariate distribution theory and linear transformations of variables. Properties of estimators, uniformly most powerful tests and likelihood ratio tests.

STAT 3002 Applied Linear Models
4 credit points
Prerequisite: Statistics 2004 and Mathematics 1002 or 1902 (or Statistics 1022 for Arts students). **Prohibition/other:** May not be counted with Statistics 3902. **Offered:** March. **Classes:** 2 lec & 1 tut & 1 computer lab/wk. **Assessment:** One 2hr exam, assignments, one 1 hr computer practical exam.
Multiple regression, principal components, MANOVA, discriminant analysis.

STAT 3003 Time Series Analysis
4 credit points
Prerequisite: Statistics 2003 or 2903. **Offered:** March. **Classes:** 2 lec & 1 tut/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. **Offered:** July. **Classes:** 2 lec & 1 tut & 1 computer lab/wk. Assessment: One 2hr exam, assignments, one 1 hr 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 2001 or 2901) and (Mathematics 2001 or 2901). **Prohibition/other:** May not be counted with Statistics 3905. **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 2003 or 2903. **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 2903. **Prohibition/other:** May not be counted with Statistics 3001. **Offered:** July. **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 2004 and (Statistics 2903 or Credit in 2003) and (Mathematics 2002 or 2902). **Prohibition/other:** May not be counted with Statistics 3002. **Offered:** March. **Classes:** 2 lec, 1 tut & 1 computer lab/wk. **Assessment:** One 2hr exam, assignments, one 1 hr 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 2903 and (Mathematics 2001 or 2901) and (Mathematics 2002 or 2902). **Prohibition/other:** May not be counted with Statistics 3005. **Offered:** July. **Classes: 2** lec **& 2** 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. Offered: July (not available in 1999). 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.
   (This unit of study is not available in 1999.)

Mathematics & Statistics Honours
The School of Mathematics and Statistics offers three Honours programs for students who have completed at least 24 credit points of Senior units of study in appropriate subject areas and who are of sufficient merit. The programs are:
   Applied Mathematics
   Mathematical Statistics
   Pure Mathematics
   Honours units of study consist of both formal coursework and an essay or project. There is provision for students to take

approved units of study from other research areas within the School and from other Departments. The essay or project is a substantial part of the year's assessment and is closely supervised by a staff member. As part of the essay or project, students are required to prepare a talk about their essay or 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
Offered: March & July.

MATH 4200   Applied Mathematics Honours
48 credit points
Offered: March & July.

STAT 4100   Mathematical Statistics Honours
48 credit points
Offered: March & July.

Mechanical Engineering

The Department of Mechanical and Mechatronic Engineering is part of the Faculty of Engineering. In addition to providing professional training in mechanical and mechatronics engineering, the Department offers 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 mechatronic 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 may obtain a Bachelor of Engineering degree in Mechanical or Mechatronic 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
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.

MECH2200   Thermofluids
6 credit points
Prerequisite: 12 credit points each of Junior Mathematics and Junior Physics. **Prohibition/other:** May not be counted with MECH 2201 Thermodynamics 1. **Offered:** March. **Classes:** 3 lec & one 3hr lab or tut/wk. **Assessment:** Two 2hr exams, one 1.5hr exam, assignments and lab work.

Consult Faculty of Engineering Handbook for unit description.
Textbooks
Cengel & Boles. Thermodynamics: an Engineering Approach. 3rd edn, McGraw-Hill
Potter H C, & Wiggert D C. Mechanics of Fluids. Prentice Hall

MECH 2400   Mechanical Design 1
6 credit points
Prerequisite: 12 credit points each of Junior Mathematics and Junior Physics. **Offered:** July. **Classes:** 2 lec & two 2hr drawing office sessions/wk. **Assessment:** Assignments, quizzes.
Consult Faculty of Engineering Handbook for unit description.
Textbooks
Boudny. Engineering Drawing. McGraw-Hill
Shigley. Mechanical Engineering Design. McGraw-Hill

MECH 2500   Engineering Dynamics 1
4 credit points
Prerequisite: 12 credit points each of Junior Mathematics and Junior Physics. **Offered: July. Classes:** 2 lec/wk, three 3hr labs & ten 2hr tuts. **Assessment:** Exam and assignments.
Consult Faculty of Engineering Handbook for unit description.
Reference books
Smith & Smith. Mechanics. 2nd edn, Wiley, 1990
Mabie & Reinholtz. Mechanisms and Dynamics of Machinery. 4th edn, Wiley, 1987
Shigley & Vicker. Theory of Machines and Mechanisms. International edn, McGraw-Hill, 1981
Bedford & Fowler. Engineering Mechanics: Dynamics (Vol 2). SI edn, Addison Wesley

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
Mrs Dalins (Coordinator), Prof. Reeves, Dr New, Dr Carter, Dr Duxbury
Qualifying: Biology 1002 or 1902 or 1003 or 1903. **Prerequisite:** Chemistry 1102 or 1902 or 1904. **Corequisite:** Biology 1001 or 1901 and Chemistry 1101 or 1901 or 1903 and Mathematics (1001 or 1011 or 1901) and (1005 or 1015 or 1905). **Prohibition/other:** May not be counted with Microbiology 2003 or 2901. **Offered:** March. **Classes:** 3 lec, 1 tut & 4 prac/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 micro-organisms (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 agri-cultural 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 trie use of these to study examples of microbial activity which are illustrative of the lecture series.

Textbooks

Prescott L M et al. Microbiology. 3rd edn, W.C. Brown, 1996.

MICR2002   Applied Microbiology
8 credit points

Mrs Dalins (Coordinator), Dr Carter, Prof. Reeves, Dr Humphery-Smith, Dr Duxbury

Prerequisite: Microbiology 2001 or 2901. **Prohibition/other:** May not be counted with Microbiology 2004 or 2902. **Offered:** July. **Classes:** 3 lec, 1 tut & 4 prac/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 procaryotic cells and aspects of microbial taxonomy and microbial evolution.

The microbial biotechnology section covers food microbiology (production, spoilage and preparation, as well as the safety of foods) and aspects of public health and medical microbiology (host parasite relationships, host defences, epidemiology of selected diseases, prevention of disease). Industrial microbiology deals with large scale production, traditional products, recombinant DNA products, biosensors and biocontrol agents, biodeterioration and bioremediation.

Practical classes enable the study of material which both complements and supplements the lecture topics. Excursions to industrial concerns are included.

Work experience

On completion of 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

Mrs Dalins (Coordinator), Dr Carter, Prof Reeves, Dr New, Dr Duxbury

Qualifying: Biology 1002 or 1902 or 1003 or 1903. **Prerequisite:** Chemistry 1102 or 1902 or 1904. **Corequisite:** Biology 1001 or 1901 and Chemistry 1101 or 1901 or 1903 and Mathematics (1001 or 1011 or 1901) and (1005 or 1015 or 1905). **Prohibition/other:** May not be counted with Microbiology 2001 or 2901. **Offered:** March. **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 a broad 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

Mrs Dalins (Coordinator), Dr Carter, Prof. Reeves, Dr Humphery-Smith, Dr Duxbury

Prerequisite: Microbiology 2001 or 2003 or 2901. **Prohibition/other:** May not be counted with Microbiology 2002 or 2902. **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

Mrs Dalins (Coordinator), Prof. Reeves, Dr New, Dr Carter, Dr Duxbury

Qualifying: Credit or better in Biology 1002 or 1902 or 1003 or 1903 and at least a pass in Chemistry 1102 or 1902 or 1904. **Corequisite:** Biology 1001 or 1901 and Chemistry 1101 or 1901 or 1903 and Mathematics (1001 or 1011 or 1901) and (1005 or 1015 or 1905). **Prohibition/other:** May not be counted with Microbiology 2001 or 2003. **Offered:** March. **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

Mrs Dalins (Coordinator), Dr Carter, Prof. Reeves, Dr Humphery-Smith, Dr Duxbury, Dr Ferenci

Qualifying: Credit or better in Microbiology 2001 or in the equivalent components in Microbiology 2901. **Prohibition/other:** May not be counted with Microbiology 2002 or 2004. **Offered:** July. **Classes:** 4 lec, 1 tut & 3 prac/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

Dr Duxbury (Coordinator), Dr New, Dr Carter, Dr Humphery-Smith, Dr Ferenci and others

Qualifying: Microbiology 2002 or 2902 or both Microbiology 2001 and 2004 or both Microbiology 2004 and 2901. **Prerequisite:** Biochemistry 2001 or 2101 or Agricultural Chemistry 2001 or Biology 2005 or 2905. **Prohibition/other:** May not be counted with Microbiology 3901. **Offered:** March. **Classes:** 3 lec, 6-7 prac & 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.

MICR 3002   Molecular and Environmental Microbiology
12 credit points

Dr Duxbury (Coordinator), Dr New, Dr Ferenci, Prof. Reeves, Dr Carter, Dr Humphery-Smith

Qualifying: Microbiology 2002 or 2902 or both Microbiology 2001 and 2004 or both Microbiology 2004 and 2901. **Prerequisite:** Biochemistry 2001 or 2101 or 2901 or Agricultural Chemistry 2001

or Biology 2005 or 2905. **Prohibition/other:** May not be counted with Microbiology 3902. **Offered:** July. **Classes:** 3 lec, 6-7 prac & 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.

MICR 3901 General and Medical Microbiology (Advanced)

12 credit points
Dr Duxbury (Coordinator), Dr New, Dr Carter, Dr Humphery-Smith, Dr Ferenci and others
Qualifying: Microbiology 2002 or 2902 or both Microbiology 2001 and 2004 or both Microbiology 2004 and 2901. **Prerequisite:** Biochemistry 2001 or 2101 or 2901 or Agricultural Chemistry 2001 or Biology 2005 or 2905. **Prohibition/other:** 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. **Offered:** March. **Classes:** 4 lec, 6-7 prac & 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.

MICR 3902 Molecular and Environmental Microbiology (Advanced)

12 credit points
Dr Duxbury (Coordinator), Dr New, Dr Ferenci, Prof. Reeves, Dr Carter, Dr Humphery-Smith
Qualifying: Microbiology 2002 or 2902 or both Microbiology 2001 and 2004 or both Microbiology 2004 and 2901. **Prerequisite:** Biochemistry 2001 or 2101 or 2901 or Agricultural Chemistry 2001 or Biology 2005 or 2905. **Prohibition/other:** 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. **Offered:** July. **Classes:** 4 lec, 6-7 prac & 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.

MICR 4001 Microbiology Honours

48 credit points
Dr Ferenci
Offered: March.
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 BSc, 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.

PCOL2001 Pharmacology Fundamentals

4 credit points
Dr Lloyd
Prerequisite: 6 credit points of Junior Chemistry (including Chemistry 1101,1901 or 1903), 6 credit points of Junior Biology, and 6 credit points of units of study from other Science Discipline Areas. **Prohibition/other:** This is a qualifying unit of study for Pharmacology 3001 or 3002. **Offered:** March. **Classes:** 2 lec/wk & 4 prac/computer 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 molecular sites of action of drugs are described and the relationships between drug activity and chemical structure explored. The roles of absorption, distribution, metabolism and elimination of drugs in determining the actions of drugs in the body are also considered.

Textbooks
Foster RW. Basic Pharmacology.4th edn, Butterworth Heinmann, 1996
OR
Rang HP et al. Pharmacology. 3rd edn, Churchill Livingstone, 1995
Study aids
Dale MM etal. Companion to Pharmacology. 2nd edn, Churchill Livingstone, 1996
Neal MJ. Medical Pharmacology at a Glance. 3rd edn, Blackwell Scientific Publications, 1997
Reference books
Hardman JG et al. Goodman and Gilman's The Pharmacological Basis of Therapeutics. 9th edn, Pergamon Press, 1990
Patrick GL. An Introduction to Medicinal Chemistry. Oxford Uni Press, 1995

PCOL 2002 Pharmacology - Drugs and People

4 credit points
Dr Robin Allan
Prerequisite: 6 credit points of Junior Chemistry (including Chemistry 1101,1901 or 1903), 6 credit points of Junior Biology, and 6 credit points of units of study from other Science Discipline Areas. Students are strongly advised to complete Pharmacology 2001 before enrolling in Pharmacology 2002. **Offered:** July. **Classes:** 2 lec/wk & 4 prac/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 aids
Dale MM et al. Companion to Pharmacology. 2nd edn, Churchill
Livingstone, 1995
Neal M J Medical Pharmacology at a Glance. 3rd edn, Blackwell
Scientific Publications, 1997
Reference books
Hardman JG et al (eds). Goodman and Gilman's The
Pharmacological Basis of Therapeutics. 9th edn, Pergamon
Press, 1996
Dale MM et al. Companion to Pharmacology. 2nd edn, Churchill
Livingstone, 1996

PCOL 3001 Molecular Pharmacology and Toxicology

12 credit points
Dr Ian Spence
Prerequisite: 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. **Offered:** March. **Classes:** 4 lec, 2
tut & 6 prac/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 examina-
tion of selected issues in toxicology. Drug design and develop-
ment looks at the principles guiding the development of new
therapeutic agents, for example new histamine antagonists, and
the use of new methods to study drug distribution and action
such as positron emission tomography (PET) and single photon
emission computerised tomography (SPECT) scanning.
Textbooks
Patrick GL. An Introduction to Medicinal Chemistry. Oxford Uni
Press, 1995
Reference books
Hardman J G et al (eds). Goodman and Gilman's The
Pharmacological Basis of Therapeutics. 9th edn, Pergamon
Press, 1996
Klaasen C D. Casarett & Doull's Toxicology: The Basic Science
of Poisons. Macmillan
Krogsgaard-Larsen P & Bundgard H (eds). A Textbook of Drug
Design and Development. Harwood Academic Publishers, 1991

PCOL 3002 Neuro- and Cardiovascular Pharmacology

12 credit points
Professor Graham Johnston
Prerequisite: 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. **Offered:** July. **Classes:** 4 lec, 2 tut
& 6 prac/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 pharma-
cology. The neuropharmacology component examines the ac-
tions 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 hy-
pertension and asthma, and the mechanisms of drug action. As
part of the unit of study all students prepare a drug profile - a
document similar to that required by regulatory authorities when
a new drug is introduced. This provides students with the oppor-
tunity to become familiar with, firstly, regulatory procedures
and, secondly, with the detailed pharmacology of one particular
compound.

In addition to the core component students choose an elective
selected from a number offered by the Department. These cover
specific topics in depth and some are laboratory based. Details
of these are available from the Department before the com-
mencement of the July semester.
Textbooks
Rang HP, 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. 3rd edn, Blackwell
Scientific Publications, 1997
Reference books
Cooper J R, et al. The Biochemical Basis of Neuropharmacology.
Oxford, 1991
Hardman JG, et al (eds). Goodman and Gilman's The
Pharmacological Basis of Therapeutics. 9th edn, Pergamon
Press, 1996

PCOL 3901 Molecular Pharmacology and Toxicology (Advanced)

12 credit points
Dr Ian Spence
Prerequisite: 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 3801. **Prohibition/other:** May not be
counted with Pharmacology 3001. **Offered:** March. **Classes:** 4 lec,
2 tut & 6 prac/wk. **Assessment:** Two 3hr exams, classwork.
This unit will consist of the lecture and practical components of
PCOL 3001. Students selected for PCOL 3901 will be set spe-
cial advanced assignments related to the material covered in core
areas. These may also involve advanced practical work or de-
tailed investigation of a theoretical problem.
Reference books
Hardman JG et al (eds). Goodman and Gilman's The
Pharmacological Basis of Therapeutics. 9th edn, Pergamon
Press, 1997
Klaasen C D. Casarett & Doull's Toxicology: The Basic Science
of Poisons. Macmillan
Krogsgaard-Larsen P & Bundgard H (eds). A Textbook of Drug
Design and Development. Harwood Academic Publishers, 1991

PCOL 3902 Neuro-and Cardiovascular Pharmacology (Advanced)

12 credit points
Professor Graham Johnston
Prerequisite: 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 3902. **Prohibition/other:** May not be
counted with Pharmacology 3002. **Offered:** July. **Classes:** 4 !ec, 2
tut & 6 prac/wk. **Assessment:** Two 3hr exams, classwork.
This unit will consist of the lecture and practical components of
PCOL 3002. Students selected for PCOL 3902 will be set spe-
cial advanced assignments related to the material covered in core
areas. These may also involve advanced practical work or de-
tailed investigation of a theoretical problem.
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. 3rd edn, Blackwell
Scientific Publications, 1997
Reference books
Cooper J R et al. The Biochemical Basis of Neuropharmacology.
Oxford, 1991
Hardman J G et al (eds). Goodman and Gilman's The
Pharmacological Basis of Therapeutics. 9th edn, Pergamon
Press, 1996

PCOL4001   Pharmacology Honours

48 credit points
Assoc. Prof. R. Einstein
Offered: March.

Subject to a satisfactory standard being attained in Pharmacolo-
gy, a student may arrange to read for the Honours degree in this
subject area. Much of the work will be arranged to suit the inter-
est of the individual. The student will participate in a research
project in progress in the Department. A research plan, literature
review and a 50 page thesis on the research project must be pre-

pared. 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.

Physics Junior Units of Study

Lecturer in charge Mrs R.M. Millar, Head of Junior Physics

There are seven 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 1004 (Environmental and Life Sciences), Physics 1902 (Advanced) and Physics 1500 (Astronomy) are offered in the July semester only. Physics 1003 (Technological) is offered in both February and July semesters. 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.

Physics 1500 Astronomy cannot be counted towards the 12 credit points of Junior Physics needed as a prerequisite for Intermediate Physics.

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
See prerequisites for Intermediate Physics units of study. **Corequisite:** Recommended concurrent units of study: Mathematics 1001 and 1002 or 1901 and 1902. **Assumed knowledge:** HSC Physics or HSC 4-unit Science. **Prohibition/ other:** May not be counted with Physics 1002 or 1901. **Offered:** March. **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

Halliday D, Resnick R, & Walker J. Fundamentals of Physics. 5th edn, John Wiley, 1996

Physics Laboratory Manuals - School of Physics Publication

PHYS 1002   Physics (Fundamentals)
6 credit points
See prerequisites for Intermediate Physics units of study. **Corequisite:** Recommended concurrent unit of study: Mathematics 1001 and 1002 or 1901 and 1902. **Assumed knowledge:** No assumed knowledge of Physics. **Prohibition/other:** May not be counted with Physics 1001 or 1901. **Offered:** March. **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

Halliday D, Resnick R, & Walker J. Fundamentals of Physics. 5th edn, John Wiley, 1996

Physics Laboratory Manuals - School of Physics Publication

PHYS 1901   Physics (Advanced) A
6 credit points
Prerequisite: UAI 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. See prerequisites for Intermediate Physics units of study. **Corequisite:** Recommended concurrent unit of study: Mathematics 1001 and 1002 or 1901 and 1902. **Prohibition/other:** May not be counted with Physics 1001 or 1002. **Offered:** March. **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

Halliday D, Resnick R, & Walker J. Fundamentals of Physics. 5th edn, John Wiley, 1996

Physics Laboratory Manuals - School of Physics Publication

PHYS 1003   Physics (Technological)
6 credit points
See prerequisites for Intermediate Physics units of study. **Corequisite:** Recommended concurrent unit of study: Mathematics 1003 and 1005 or 1903 and 1905. **Assumed knowledge:** HSC 2-unit Physics or HSC 4-unit Science or Physics 1001 or 1002 or 1902 or equivalent. **Prohibition/other:** May not be counted with Physics 1004 or 1902. **Offered:** March & 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

Halliday D, Resnick R, & Walker J. Fundamentals of Physics. 5th edn, John Wiley, 1996

Physics Laboratory Manuals - School of Physics Publication

PHYS 1004   Physics (Environmental and Life Sciences)

6 credit points

See prerequisites for Intermediate Physics units of study.
Corequisite: Recommended concurrent unit of study: Mathematics 1003 and 1005 or 1903 and 1905. **Assumed knowledge:** HSC 2-unit Physics or HSC 4-unit Science or Physics 1001 or 1002 or 1901 or equivalent. **Prohibition/other:** May not be counted with Physics 1003 or 1902. **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, & Walker J. Fundamentals of Physics. 5th edn, John Wiley, 1996

Physics Laboratory Manuals - School of Physics Publication

PHYS 1500   Astronomy

6 credit points

Assumed knowledge: No assumed knowledge of Physics.
Offered: July. **Classes:** 3 lec, 1 tut & 2 lab/wk. **Assessment:** 1 hr 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 day and night sky observing sessions.

This unit of study cannot be counted as part of the 12 credit points of Junior Physics necessary for enrolment in Intermediate Physics.

Textbooks

Seeds MA. Horizons: Exploring the Universe. 5th edn, Wadsworth Publishing Company: Belmont CA USA, 1998

PHYS 1902   Physics (Advanced) B

6 credit points

Prerequisite: UAI 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. See prerequisites for Intermediate Physics units of study. **Corequisite:** Recommended concurrent unit of study: Mathematics 1003 and 1005 or 1903 and 1905. **Prohibition/other:** May not be counted with Physics 1003 or 1004. **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, & Walker J. Fundamentals of Physics. 5th edn, John Wiley, 1996

Physics Laboratory Manuals - School of Physics Publication

Physics Intermediate 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

Qualifying: 12 credit points of Junior Physics or Physics 1E.
Prerequisite: 12 credit points of Junior Mathematics other than Mathematics 1011,1012,1013 and 1015 or Credit or better in Mathematics 1011,1012,1013 and 1015. This is a qualifying unit of study for Senior Physics. **Prohibition/other:** May not be counted with Physics 2101 or 2103 or 2901. **Offered:** March. **Classes:** 3 lec, 3 prac & 2 microlab/wk. **Assessment:** One 3hr exam, four computer based assignments, microlab (report & test), prac report.

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 an intoduction to instrumentation for the physical and environmental sciences.

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: 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, & Resnick R. Quantum Physics. 2nd edn, 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

Qualifying: 12 credit points of Junior Physics or Physics 1E.
Prerequisite: 12 credit points of Junior Mathematics other than Mathematics 1011,1012,1013 and 1015 or Credit or better in Mathematics 1011,1012,1013 and 1015. This is a qualifying unit of study for Senior Physics. **Prohibition/other:** May not be counted with Physics 2102 or 2104 or 2902. **Offered:** July. **Classes:** 3 lec, 3 prac & 2 microlab/wk. **Assessment:** One 3hr exam, 2 prac reports, four computer based lab assignments, microlab (report & test), prac report.

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: 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

Qualifying: 12 credit points of Junior Physics or Physics 1E.
Prerequisite: 12 credit points of Junior Mathematics other than Mathematics 1011,1012,1013 and 1015 or Credit or better in Mathematics 1011,1012,1013 and 1015. This is a qualifying unit of

study for Senior Physics. **Prohibition/other:** May not be counted with Physics 2001 or 2103 or 2901. **Offered:** March. **Classes:** 3 lec, 3 prac & 2 microlab/wk. **Assessment:** One 3hr exam, four computer based assignments, microlab (report & test), prac report.

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 instrumentation for the physical and environmental sciences.

Microlab: As for Physics 2001.
Practical: As for Physics 2001.
Textbooks
Eisberg R. & 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
Qualifying: 12 credit points of Junior Physics or Physics 1E.
Prerequisite: 12 credit points of Junior Mathematics other than Mathematics 1011,1012,1013 and 1015 or Credit or better in Mathematics 1011,1012,1013 and 1015. This is a qualifying unit of study for Senior Physics. **Prohibition/other:** May not be counted with Physics 2002 or 2902. Offered: July. **Classes:** 3 lec, 3 prac & 2 microlab/wk. **Assessment:** One 3hr exam, four computer based assignments, microlab (report & test), prac report.

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: As for Physics 2002.
Textbooks
O'Byrne J (ed). Experimental Physics Notes. School of Physics

PHYS 2103   Introduction to Environmental Physics
4 credit points
Qualifying: 12 credit points of Junior Physics or Physics 1E.
Prerequisite: 12 credit points of Junior Mathematics other than Mathematics 1011,1012,1013 and 1015 or Creditor better in Mathematics 1011,1012,1013 and 1015. This is not a qualifying unit of study for Senior Physics. **Prohibition/other:** May not be counted with Physics 2001 or 2101 or 2901. **Offered:** March.
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.

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: As for Physics 2001 except that students work for half the semester only.

PHYS 2104   Applications of Environmental Physics
4 credit points
Qualifying: 12 credit points of Junior Physics or Physics 1E.
Prerequisite: 12 credit points of Junior Mathematics other than Mathematics 1011,1012,1013 and 1015 or Credit or better in Mathematics 1011,1012,1013 and 1015. This is not a qualifying unit of study for Senior Physics. **Prohibition/other:** May not be counted with Physics 2002 or 2102 or 2902. **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.

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: 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
Qualifying: Physics 1901 and 1902 or 12 credit points of other Junior Physics units of study with an average of a Credit or better.
Prerequisite: 12 credit points of Junior Mathematics other than Mathematics 1011,1012,1013 and 1015 or Credit or better in Mathematics 1011,1012,1013 and 1015. This is a qualifying unit of study for Senior Physics. **Prohibition/other:** May not be counted with Physics 2001 or 2101 or 2103. **Offered:** March. **Classes:** 3 lec, 3 prac & 2 microlab/wk. **Assessment:** One 3hr exam, four computer based assignments, microlab (report & test), prac report.

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 instrumentation for the physical and environmental sciences.

Microlab: As for Physics 2001.
Practical: As for Physics 2001.
Textbooks
Eisberg R, & Resnick R. Quantum Physics. 2nd edn, Wiley, 1985
O'Byrne J (ed). Experimental Physics Notes. School of Physics
Smith, R. Observational Astrophysics. Cambridge 1995

PHYS 2902   Physics (Advanced) B
8 credit points
Qualifying: Physics 1901 and 1902 or 12 credit points of other Junior Physics units of study with an average of a Credit or better.
Prerequisite: 12 credit points of Junior Mathematics other than Mathematics 1011,1012,1013 and 1015 or Credit or better in Mathematics 1011,1012,1013 and 1015. This is a qualifying unit of study for Senior Physics. **Prohibition/other:** May not be counted with Physics 2002 or 2102 or 2104. **Offered:** July. **Classes:** 3 lec, 3 prac & 2 microlab/wk. **Assessment:** One 3hr exam, four computer based assignments, microlab (report & test),prac report.

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: As for Physics 2002.
Textbooks
Griffiths DJ. Introduction to Electrodynamics. Prentice Hall, 1989
O'Byrne J (ed). Experimental Physics Notes. School of Physics

Physics Senior Units of Study
Lecturer in charge: Dr N 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 Physics: PHYS 3105 Astrophysics, PHYS 3106 Plasma Physics, PHYS 3107 Modern Optics, PHYS 3108 Nuclear and Particle Physics, PHYS 3109 Acoustics and Ultrasonics, and PHYS 3004 Condensed Matter Physics and Photonics is 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, or (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
Qualifying: 16 credit points of Intermediate Physics. **Prerequisite:** 8 credit points of Intermediate Mathematics. **Prohibition/other:** May not be counted with Physics 3903 or 3200. **Offered:** March. **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, & Resnick R. Quantum Physics of Atoms, Molecules, Solids, Nuclei and Particles. 2nd edn
Reference books
Griffiths DJ. Introduction to Electrodynamics. 2nd edn
Taylor EF, & Wheeler JA. Spacetime Physics. 2nd edn

PHYS 3004   Condensed Matter Physics and Photonics
4 credit points
Qualifying: 16 credit points of Intermediate Physics. **Prerequisite:** 8 credit points of Intermediate Mathematics. **Prohibition/other:** May not be counted with Physics 3904. **Offered:** March. **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, as well as topics in photonic technology such as optical fibres.
Reference book
Kittel C. Introduction to Solid State Physics. 6th edn

PHYS 3005   Topics in Modern Physics A
4 credit points
Qualifying: 16 credit points of Intermediate Physics. **Prerequisite:** 8 credit points of Intermediate Mathematics. **Prohibition/other:** May not be counted with Physics 3905. **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, Modem Optics, Nuclear and Particle Physics, and Acoustics and Ultrasonics. Not all of these option subjects may be offered in the one year.
Textbooks
Eisberg R, & Resnick R. Quantum Physics of Atoms, Molecules, Solids, Nuclei and Particles. 2nd edn (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
Qualifying: 16 credit points of Intermediate Physics. **Prerequisite:** 8 credit points of Intermediate Mathematics. **Prohibition/other:** May not be counted with Physics 3906. **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. Not all 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
Qualifying: 16 credit points of Intermediate Physics. **Prerequisite:** 8 credit points of Intermediate Mathematics. **Prohibition/other:** May not be counted with Physics 3907. **Offered:** March. **Classes:** 3 lec/wk. **Assessment:** 1 hr exam, project, assignments.
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
Qualifying: 16 credit points of Intermediate Physics. **Prerequisite:** 8 credit points of Intermediate Mathematics. **Prohibition/other:** May not be counted with Physics 3908 or 3009 or 3909. **Offered:** March. **Classes:** 4hr prac/wk. **Assessment:** Prac assessment.
Six experiments drawn from a range of experiments in the area of waves and optics, nuclear physics and the properties of matter.

PHYS 3009   Experimental Physics B
8 credit points
Qualifying: 16 credit points of Intermediate Physics. **Prerequisite:** 8 credit points of Intermediate Mathematics. **Prohibition/other:** May not be counted with Physics 3008 or 3908 or 3909. **Offered:** March. **Classes:** 8hr prac/wk. **Assessment:** Prac assessment.
Twelve 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
Qualifying: 16 credit points of Intermediate Physics. **Prerequisite:** 8 credit points of Intermediate Mathematics. **Prohibition/other:** May not be counted with Physics 3102 or 3801 or 3802. **Offered:** July. **Classes:** 4hr prac/wk. **Assessment:** Prac assessment.
Six 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
Qualifying: 16 credit points of Intermediate Physics. **Prerequisite:** 8 credit points of Intermediate Mathematics. **Prohibition/other:** May not be counted with Physics 3101 or 3801 or 3802. **Offered:** July. **Classes:** 8hr prac/wk. **Assessment:** Prac assessment.
Twelve 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
Qualifying: 16 credit points of Intermediate Physics. **Prerequisite:** 8 credit points of Intermediate Mathematics. **Prohibition/other:** May not be counted with Physics 3104 or 3803 or 3804. Approval for this unit must be obtained from the Lecturer in charge of Senior Physics. **Offered:** March. **Classes:** 4hr prac/wk. **Assessment:** Written report and oral presentation.

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
Qualifying: 16 credit points of Intermediate Physics. **Prerequisite:** 8 credit points of Intermediate Mathematics. **Prohibition/other:** May not be counted with Physics 3103 or 3803 or 3804. **Offered: July. Classes:** 4hr prac/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. **Offered:** March. **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 3303   Scientific Visualisation
4 credit points
Prerequisite: Physics 3301. **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 valumes, 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
Qualifying: Physics 2901 and 2902, or Credit or better in Physics 2001 or 2101 and Credit or better in Physics 2002 or 2102. **Prerequisite:** 16 credit points of Intermediate Mathematics. **Prohibition/other:** May not be counted with Physics 3101 or 3102 or 3802. **Offered:** July. **Classes:** 4hr prac/wk. **Assessment:** Prac assessment.
As for Physics 3101 with extension material.

PHYS 3802   Experimental Physics D (Advanced)
8 credit points
Qualifying: Physics 2901 and 2902, or Credit or better in Physics 2001 or 2101 and Credit or better in Physics 2002 or 2102. **Prerequisite:** 16 credit points of Intermediate Mathematics. **Prohibition/other:** May not be counted with Physics 3101 or 3102 or 3801. **Offered:** July. **Classes:** 8hr prac/wk. **Assessment:** Prac assessment.
As for Physics 3102 with extension material.

PHYS 3803   Special Project A (Advanced)
4 credit points
Qualifying: Physics 2901 and 2902, or Credit or better in Physics 2001 or 2101 and Credit or better in Physics 2002 or 2102. **Prerequisite:** 16 credit points of Intermediate Mathematics. **Prohibition/other:** May not be counted with Physics 3103 or 3104 or 3804. Approval for this unit must be obtained from the Lecturer in charge of Senior Physics. **Offered:** March. Classes: 4hr prac/wk. **Assessment:** Written report and oral presentation.
As for Physics 3103, but at a more challenging level.

PHYS 3804   Special Project B (Advanced)
4 credit points
Qualifying: Physics 2901 and 2902, or Credit or better in Physics 2001 or 2101 and Credit or better in Physics 2002 or 2102. **Prerequisite:** 16 credit points of Intermediate Mathematics. **Prohibition/other:** May not be counted with Physics 3103 or 3104 or 3803. **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
Qualifying: Physics 2901 and 2902 or Credit or better in Physics 2001 or 2101 and Credit or better in Physics 2002 or 2102. **Prerequisite:** 16 credit points of Intermediate Mathematics. **Prohibition/other:** May not be counted with Physics 3003 or 3200, **Offered:** March. **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 BH, & Joachain CJ. Introduction to Quantum Mechanics.
Reference book
Griffiths DJ. Introduction to Electrodynamics. 2nd edn

PHYS 3904   Condensed Matter Physics and Photonics (Advanced)
4 credit points
Qualifying: Physics 2901 and 2902 or Credit or better in Physics 2001 or 2101 and Credit or better in Physics 2002 or 2102. **Prerequisite:** 16 credit points of Intermediate Mathematics. **Prohibition/other:** May not be counted with Physics 3004. **Offered:** March. **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
Qualifying: Physics 2901 and 2902 or Credit or better in Physics 2001 or 2101 and Credit or better in Physics 2002 or 2102. **Prerequisite:** 16 credit points of Intermediate Mathematics. **Prohibition/other:** May not be counted with Physics 3005. **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 may be replaced by Statistical Mechanics, which provides the molecular basis of thermodynamics. Extension material is also provided.
Textbooks
Eisberg R, & Resnick R. Quantum Physics of Atoms, Molecules, Solids, Nuclei and Particles. 2nd edn (for Nuclear and Particle Physics)
Reference book
Zemansky and Dittman. Heat and Thermodynamics.
Chen. Introduction to Plasma Physics and Controlled Fusion. (Vol I) (for Plasma Physics)

PHYS 3906   Topics in Modern Physics B (Advanced)
4 credit points
Qualifying: Physics 2901 and 2902, or Credit or better in Physics 2001 or 2101 and Credit or better in Physics 2002 or 2102. **Prerequisite:** 16 credit points of Intermediate Mathematics. **Prohibition/other:** May not be counted with Physics 3006. **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
Qualifying: Physics 2901 and 2902, or Credit or better in Physics 2001 or 2101 and Credit or better in Physics 2002 or 2102. **Prerequisite:** 16 credit points of Intermediate Mathematics. **Prohibition/other:** May not be counted with Physics 3007. **Offered:** March. **Classes:** 3 lec/wk. Assessment: 1 hr exam, project, assignments.

This unit of study is as described for Physics 3007 Computational Physics, with extension material.

PHYS 3908   Experimental Physics A (Advanced)
4 credit points
Qualifying: Physics 2901 and 2902, or Credit or better in Physics 2001 or 2101 and Credit or better in Physics 2002 or 2102. **Prerequisite:** 16 credit points of Intermediate Mathematics. **Prohibition/other:** May not be counted with Physics 3008 or 3009 or 3909. **Offered:** March. **Classes:** 4hr prac/wk. **Assessment:** Prac assessment.

As for Physics 3008 with extension material.

PHYS 3909   Experimental Physics B (Advanced)
8 credit points
Qualifying: Physics 2901 and 2902, or Credit or better in Physics 2001 or 2101 and Credit or better in Physics 2002 or 2102. **Prerequisite:** 16 credit points of Intermediate Mathematics. **Prohibition/other:** May not be counted with Physics 3008 or 3009 or 3908. **Offered:** March. **Classes:** 8hr prac/wk. **Assessment:** Prac assessment.

As for Physics 3009 with extension material.

Physics Senior 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
Qualifying: 16 credit points of Intermediate Physics. **Prerequisite:** 8 credit points of Intermediate Mathematics. **Offered:** July (check with coord.). **Classes:** 2 lec & 2hr prac/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 astrophysics component of Physics 3005. Several experiments illustrating the principles of astrophysics are also undertaken in the physics laboratory.

(May not be available every year - check with the Senior Physics coordinator)

PHYS 3106   Plasma Physics
4 credit points
Qualifying: 16 credit points of Intermediate Physics. **Prerequisite:** 8 credit points of Intermediate Mathematics. **Offered:** July (check with coord.). **Classes:** 2 lec & 2hr prac/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 plasma physics component of Physics 3005. Several experiments illustrating the principles of plasma physics are also undertaken in the physics laboratory.

(May not be available every year - check with the Senior Physics coordinator)

PHYS 3107   Modern Optics
4 credit points
Qualifying: 16 credit points of Intermediate Physics. **Prerequisite:** 8 credit points of Intermediate Mathematics. **Offered:** July (check with coord.). **Classes:** 2 lec & 2hr prac/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 modern optics component of Physics 3005. Several experiments illustrating the principles of modern optics are also undertaken in the physics laboratory.

(May not be available every year - check with the Senior Physics coordinator)

PHYS 3108   Nuclear and Particle Physics
4 credit points
Qualifying: 16 credit points of Intermediate Physics. **Prerequisite:** 8 credit points of Intermediate Mathematics. **Offered:** July (check with coord.). **Classes:** 2 lec & 2hr prac/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.

(May not be available every year - check with the Senior Physics coordinator)

PHYS 3109   Acoustics and Ultrasonics
4 credit points
Qualifying: 16 credit points of Intermediate Physics. **Prerequisite:** 8 credit points of Intermediate Mathematics. **Offered:** July (check with coord.). **Classes:** 2 lec & 2hr prac/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 acoustics and ultrasonics component of Physics 3005. Several experiments illustrating the principles of acoustics and ultrasonics are also undertaken in the physics laboratory.

(May not be available every year - check with the Senior Physics coordinator)

PHYS 3200   Quantum Physics
4 credit points
Qualifying: 16 credit points of Intermediate Physics. **Prerequisite:** 8 credit points of Intermediate Mathematics. **Prohibition/other:** May not be counted with Physics 3003 or 3903. **Offered:** March. **Classes:** 2 lec & 2hr prac/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 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
Dr Robinson
Qualifying: 24 units of Senior Physics. **Offered:** March. **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, modem 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 a part of the research activity of that group. Students are required to submit a formal report on their research work. Only students with a strong mathematical background are permitted to undertake a wholly theoretical research project.

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 form (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.

PHSI2001 **Introductory Physiology A**
4 credit points
Dr M. Frommer, assisted by Mrs I. Schneider
Prerequisite: 6 credit points of Junior Mathematics plus 12 credit points of Junior Chemistry, plus 18 credit points from Junior Biology and Physics (preferred), Mathematics, Computer Science or Psychology. Other combinations subject to unit of study coordinators approval, especially for combined award courses. **Offered:** March. **Classes:** 3 lec & 1 tut or 1 prac/wk. **Assessment:** One 3hr exam, data analysis, essay.

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: The practical component involves simple experiments using human subjects and animal tissue, with an emphasis on data analysis.
Textbooks
Rhoades R, & Pflanzer RR. Human Physiology. Saunders, 1996

PHSI2002   **Introductory Physiology B**
4 credit points
Dr Frommer assisted by Mrs 1. Schneider
Prerequisite: Physiology 2001. **Prohibition/other:** This is a qualifying unit of study for Senior Physiology units of study. **Offered:** July. **Classes:** 3 lec & 1 tut or 1 prac/wk. **Assessment:** One 3hr exam, data analysis, essay.

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: The practical component involves simple experiments using human subjects, with an emphasis on data analysis.
Textbooks
Rhoades R, & Pflanzer RR. Human Physiology. Saunders, 1996

PHSI 3001   **Neuroscience**
12 credit points
Dr P. Martin
Qualifying: Human Life Sciences 2101 and 2102 or Physiology 2002 or Anatomy and Histology 2002. Students in the Faculty of Engineering who have completed Physiology 2001 and 2002 plus at least one other Intermediate unit of study similar to the prerequisites may also be permitted to enrol. **Offered:** March. **Classes:** 4 lec & 8 prac/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: The practical component of this unit of study consists of small group tutorials in neuroanatomy, experimental and computer based sessions on physiological methods, and small group sessions in which you will discuss current research papers related to the lecture topics. You will have the opportunity to examine human brain specimens during the tutorials, and in the Wilson Museum in the Department of Anatomy and Histology. Computer based facilities which allow you to learn the brain structures by simulated dissection are also available.
Textbooks
Kandel E, Schwartz J, & Jessell T. Principles of Neural Science
    (3rd ed), Elsevier
or
Bear M F, Connois, Paradiso MA. Neuroscience: Exploring the
    Brain. Baltimore: Williams and Williams, 1996
(Kendel 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
Dr K Keay, Professor M Bennett
Prerequisite: 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.
Prohibition/other: Students in the Faculty of Engineering who have completed Physiology 2001 and 2002 plus at least one other Intermediate unit of study similar to the prerequisites may also be permitted to enrol. **Offered:** July. **Classes:** 3 lec, 3 tut & 6hr prac/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: 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
Dr J Hoh
Qualifying: BMED 2101 and 2102 or Physiology 2002. Students in the Faculty of Engineering who have completed Physiology 2001 and 2002 plus at least one other Intermediate unit of study similar to the prerequisites may also be permitted to enrol. **Offered:** July.
Classes: 4 lec, 2 tut & 6hr prac/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: Lectures are combined with practical laboratory experiments on animals and human subjects.

PHSI 4001   **Physiology Honours**
48 credit points
Dr J. Hoh
Offered: March.
During fourth year, no formal series of lectures is provided but students are given a relevant problem to investigate. This prob-

lem 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, 2111, 2112, 2113, 2114, and six Senior units of study selected from Psychology 3201, 3202, 3203, 3204, 3205, 3206, 3207, 3208, 3209, 3210, 3211 and 3212. Mid year entry is possible and involves modification of this sequence.

The units of study available are:
Psychology 1001, 6 credit points
Psychology 1002, 6 credit points
Psychology 2111, 4 credit points
Psychology 2112, 4 credit points
Psychology 2113, 4 credit points
Psychology 2114, 4 credit points
Psychology 3201, 4 credit points
Psychology 3202, 4 credit points
Psychology 3203, 4 credit points
Psychology 3204, 4 credit points
Psychology 3205, 4 credit points
Psychology 3206, 4 credit points
Psychology 3207, 4 credit points
Psychology 3208, 4 credit points
Psychology 3209, 4 credit points
Psychology 3210, 4 credit points
Psychology 3211, 4 credit points
Psychology 3212, 4 credit points
In addition, Bachelor of Psychology students may be permitted to study:
Psychology 3213, 4 credit points (This unit of study may not be available every year.)

Students who have completed PSYC 3001 and/or 3002 must obtain the permission of the Head of Department of Psychology before enrolling in any of PSYC 3201 to 3212.

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 Intermediate and Senior Psychology 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 enter Psychology 4 Honours, it is necessary (except as provided in the by-laws or resolutions) to gain a year average of Pass with at least Credit average in Intermediate and in Senior Psychology units of study. These Psychology units include Psychology 2111, 2112, 2113, 2114, 3201, 3202, and at least four other Senior Psychology unit from Psychology 3203, 3204, 3205, 3206, 3207, 3208, 3209, 3210, 3211 and 3212. Students wishing to graduate with Honours in Psychology are urged to discuss their choice of other subjects with a Faculty adviser as soon as practicable. There is currently a quota on entry to Psychology 4.

Examinations
Undergraduate units of study are examined at the end of each semester and include classwork by way of essays, reports or practical/laboratory work. At the beginning of each unit of study students are advised of its the contributions of exam and classwork for assessment purposes.
Textbooks
Check Departmental syllabi before buying prescribed texts.

PSYC 1001   Psychology 1001
6 credit points
Offered: March. **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
Psychology 1001 Handbook (1999) and others as advised.

PSYC 1002   Psychology 1002
6 credit points
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; human mental abilities; learning, motivation and abnormal psychology; visual perception; cognitive processes.
Textbooks
Psychology 1002 Handbook (1999) and others as advised.

PSYC 2111   Perception, Learning and Neuroscience
4 credit points
Qualifying: Psychology 1001 and 1002 (Note: 16 credit points of Intermediate Psychology is required tor Honours entry). **Offered:** March. **Classes:** 2 lec & 1 prac/wk. **Assessment:** Multiple choice exam, lab report.

This unit of study examines a range of phenomena and principles in perception and learning and their relations to neural substrates. The emphasis in perception is on the visual system and the relationship between structure and function, especially with respect to receptive fields and various visual effects. Also covered are depth, form, object and movement perception, the problem of perceptual stability and constancy and perceived orientation, including the relationship between the visual and vestibular systems. The emphasis in learning is on instrumental conditioning and the principle of reinforcement, ranging from applications of this principle to its neural substrates. Also covered are analyses of aversive-based learning, such as punishment and avoidance, and anxiety, together with related neurochemical mechanisms and the effects of various psychopharmacological agents on these processes. A series of practical classes and demonstrations allow students to gain hands-on experience of how some of these principles and phenomena may be studied experimentally.
Textbooks
See Departmental handout

PSYC 2112   Psychological Statistics
4 credit points
Qualifying: Psychology 1001 and 1002 (Note: 16 credit points of Intermediate Psychology is required for Honours entry). Offered: March. Classes: 2 lec & 1 prac/wk, 1 computer tut/fortnight. Assessment: Class tests, Group project, Multiple choice exam.
The aim of this unit of study is to introduce students to some of the fundamental concepts in statistics as used in Psychology. These include summary descriptive statistics and an introduction to the principles and practice of experimental design and inferential statistics. Building upon this ground work, the unit of study aims to develop student's expertise in understanding the rationale for, and application of a variety of statistical tests to the sorts of data typically obtained in psychological research.

Textbooks
See Departmental handout

PSYC 2113   Cognitive Processes and Social Psychology
4 credit points
Qualifying: Psychology 1001 and 1002 (Note: 16 credit points of Intermediate Psychology is required for Honours entry). **Offered:** July. **Classes:** 2 lec & 1 prac/wk. **Assessment:** Class quiz and multiple choice exam.

The aim of the Cognitive Processes component is to acquaint students with current theoretical work in cognitive psychology. The aim of the Social Psychology component is to extend some of the Social Psychology topics introduced in Psychology 1001 and to introduce some new topics. Students are expected to gain an understanding of two main areas of Social Psychology: (1) Group and intergroup relationships and (2) Interpersonal processes, with a focus on altruism and helping behaviour and affiliation and attraction.

Textbooks

Cognitive Processes - see Departmental handout

Social Psychology - Baron RA & Byrne D. Social Psychology. 8th Edition, Allyn& Bacon: Boston, 1997

PSYC 2114   Personality and Individual Differences
4 credit points
Qualifying: Psychology 1001 and 1002 (Note: 16 credit points of Intermediate Psychology is required for Honours entry). **Offered:** July. **Classes:** 2 lec & 1 prac & 1 hr self-paced computer/library research/wk. **Assessment:** Personality: 1 hr exam & essay; Individual Differences: 1 hr exam.

PSYC 2114 is made up of two components: Personality and Individual Difference. The aim of the Personality component is to introduce the student to a wide range of theories of personality, ranging from the psychoanalytic approach through its dissensiona, extensions and revisions to the behavioural model, including the social learning approach, and culminating in the Third Force, ie. the humanistic perspective. The focus is on controversial issues, allowing the student to see how different philosophical assumptions lead to the same behavioural manifestations being interpreted in different ways. The aim of the Individual Differences component is to introduce the major issues in individual differences and group differences in human abilities. It is divided inot tow parts: 5 lectures on individual differences and 8 lectures on group differences. Students are expected to gain an understanding about the major theories of intelligence and of the facts related to the traditional areas of group differences.

Textbooks
See Departmental handout

PSYC 3201   Statistics and Psychometrics
4 credit points
Qualifying: 12 credit points of Intermediate Psychology including Psychology 2112 (or Psychology 2001 and 2002). **Offered:** July. **Classes:** 2 lec & 1 prac & 1 hr unsupervised computer practice/wk. **Assessment:** Class test, assignment, examination.

PSYC 3201 consists of two components, Statistics and Psychometrics. The aim of the Statistics component is to teach students the structure of experiments for which analysis of variance would be an appropriate means of analysis. The unit of study aims to develop students' ability to ask more focused questions than can be answered by omnibus F tests, specifically by the testing of contrasts. The problems of multiple inferences, and the control of the Type I error rate, are an integral aspect of the unit of study.

The objective of the Psychometrics component is to introduce students to measurement as understood in Psychology, to a range of quantitative theories and to the basic concepts of classical psychometrics, item analysis and test construction.

Textbooks
See Departmental handout

PSYC 3202   History and Philosophy of Psychology
4 credit points
Qualifying: 12 credit points of Intermediate Psychology. **Offered:** March. **Classes:** 2 lec & 1 prac & 1 hr self paced library research/wk. **Assessment:** 2 hr exam, 1 x 2500 word essay.

PSYC 3202 consists of two components: History of Psychology and Philosophy of Psychology. The History of Psychology introduces the historical foundations of Western psychology from Descartes through to the cognitive revolution in the 1960's. In covering important individuals, movements and themes, attention is drawn to debate about interpretation of the historical process, and to analysis of the form and structure of the various arguments presented in favour of certain psychological theories. The Philosophy of Psychology introduces traditional and contemporary themes in the philosophy of science, with focus on the relevance to psychology. Students are expected to become aware that metatheoretical analysis has a central place in psychology alongside empirical methods, that the basic concepts and theories of psychology involve philosophical assumptions which can be articulated and examined.

Textbooks
See Departmental handout

PSYC 3203   Abnormal Psychology
4 credit points
Qualifying: 12 credit points of Intermediate Psychology. **Offered:** July. **Classes:** 2 lec & 1 tut/wk. **Assessment:** 2 hr exam, essay.

This unit of study examines core issues in Abnormal Psychology. The unit of study will cover aspects of adult abnormality and child abnormality and will include topics such as:

(a) Adult abnormal psychology: Anxiety disorders (specific phobias, panic disorder, agoraphobia, OCD; Addictive disorders (drug, alcohol, gambling); Eating disorders (anorexia nervosa, bulimia nervous); Mood disorders (dysthymia, major depressive disorder, cyclothymia, bipolar disorder); Schizophrenia, Personality disorders.

(b) Child abnormal psychology: Learning disabilities, Mental retardation, Intellectual and educational assessment of children; Pervasive developmental disorders; Attention deficit disorder, conduct disorder,; Anxiety disorders in children and adolescents; Depression; Feeding and elimination disorders; CBT interventions; Traditional and family therapy approaches.

Textbooks

Davidson GC & Neale JM. Abnormal Psychology. 6th edition, Wiley: New York, 1996

PSYC 3204   Behavioural Neuroscience
4 credit points
Qualifying: 12 credit points of Intermediate Psychology including Psychology 2111 and 2112 (or Psychology 2001 and 2002). **Offered:** July. **Classes:** 2 lec & 1 prac/wk. **Assessment:** 2 hr exam, class quiz, report.

This unit of study carries on from the Neuroscience component in PSYC 2111, providing more specialised coverage in the areas of psychopharmacolgy, molecular neuroscience, human brain imaging, cognitive neuroscience and energy balance regulation. Topics to be covered include: Psychopharmacology (neural actions of cannabinoids, effects of cannabis on memory and cognition, neural actions and neurotoxicity of MDMA, neural actions of antidepressants); Molecular Neuroscience (drug effects on gene expression, knockout mice and antisense technologies); Overview of brain imaging technologies (findings in psychiatry and neurology, what we can learn about the fundamentals of brain functions from brain imaging); Obesity, definitions, epidemiology and implications (the components of mammalian energy balance, the psychobiology of weight loss).

Top 25% if students (as determined by quiz performance in week 6) are given the opportunity to participate in a laboratory project. Other students do a library project.

Textbooks
See Departmental Handout

PSYC 3205   Cognition and Language
4 credit points
Qualifying: 12 credit points of Intermediate Psychology including Psychology 2112 and 2113 (or Psychology 2001 and 2002).
Offered: July. **Classes:** 2 lec & 1 tut/wk. **Assessment:** Class quiz, laboratory report, multiple choice exam.

Cognitive Processes and Language & Communication. Cognitive Processes deals with current research in memory, attention and pattern recognition and is approached in a practical way. Students participate in experiments as subjects and experimenters and are encouraged to think and act as experimenters in order to prepare them for their empirical projects in fourth year honours. Additionally, in tutorials, students are given experience at running simple neural network simulation programs and encouraged to think about the experimental implications of these simulations. In other tutorial sessions students are set problems in the derivation of hypotheses from theory and the design of experiments to test these hypotheses. Language & Communication focuses on face-to-face communication. Language is considered in terms of its expressive content, and spoken language is discussed as part of a multi-channel communication system.
Textbooks
See Departmental Handout

PSYC 3206   Developmental Psychology
4 credit points
Qualifying: 12 credit points of Intermediate Psychology. **Offered: March. Classes: 2** lec **& 1** tut/wk. **Assessment:** 2 hr exam, child study report.

This unit of study examines the theoretical bases of human development and selected issues within Developmental Psychology. The major issues/controversies in Developmental theory are examined in relation to a number of the more influential theoretical approaches. Students are expected to gain an understanding of the main theoretical influences upon current developmental research and to be able to compare and contrast theories of development. The unit of study examines theories of cognitive development in somewhat more depth and students are expected to apply this knowledge in their practical exercise (child study). In addition the unit introduces students to a range of issues in selected areas of contemporary Developmental Psychology. Students are expected to gain knowledge of these areas, and to develop a critical approach to the analysis of current research and theoretical issues. They are also expected to apply their knowledge and skills to the observation and assessment of a child across a range of developmental domains in their practical exercise (child study).
Textbooks
See Departmental handout.

PSYC 3207   Human Performance & Organisational Psychology
4 credit points
Qualifying: 12 credit points of Intermediate Psychology including Psychology 2113 (or Psychology 2001 and 2002). **Offered:** July.
Classes: 2 lec & 1 tut/wk. **Assessment:** 2 hr exam, prac report.
PSYC 3207 is comprised of two parts; Human Performance and Organisational Psychology. The former is designed to provide a basic understanding of the factors affecting variation in human performance and ways of optimising performance and to provide a demonstration of the application of psychology to work and sport. The unit of study focuses on some environmental, and subjective factors which affect performance as well as introducing students to the relationship between chronobiology and performance. The Organisational Psychology component focuses on performance in the work place and the influence of social factors on such performance.
Textbooks
See Departmental handout.

PSYC 3208   Intelligence
4 credit points
Qualifying: 12 credit points of Intermediate Psychology including Psychology 2112 and 2114 (or Psychology 2001 and 2002).
Offered: July. **Classes:** 2 lec & 1 tut/wk. **Assessment:** 2 hr exam, tutorial quizzes.

The aim is to provide an overview and critical platform to evaluate recent studies of individual differences in human cognitive abilities. The unit introduces major contemporary issues in individual differences in human abilities and intelligence. The emphasis of the latter part is on recent work on the topics related to (a) Psychometric research on intelligence; (b) Experimental cognitive correlates approach to intelligence; (c) Biological aspects of intelligence; and (d) the role of metacognitive abilities in intelligence. Some of the work carried out at this University is also discussed.
Textbooks
See Departmental handout.

PSYC 3209   Learning & Motivation
4 credit points
Qualifying: 12 credit points of Intermediate Psychology including Psychology 2111 and 2112 (or Psychology 2001 and 2002).
Offered: March. **Classes: 2** lec **& 1 tut/wk. Assessment:** Report, exam.

PSYC 3209 introduces the fundamental concepts and more important research findings of contemporary learning theory and selected approaches to motivation. It examines the application of such fundamental research to issues such as drug tolerance, food choice, stress, health promotion and risk taking. It is designed to develop skills in reading primary sources in this area; and to provide the opportunity for hands-on experience of planning and carrying out a research project.
Textbooks
See Departmental handout.

PSYC 3210   Perceptual Systems
4 credit points
Qualifying: 12 credit points of Intermediate Psychology including Psychology 2111 and 2112 (or Psychology 2001 and 2002).
Offered: March. **Classes:** 2 hrs lec & 1 hr lab/wk. **Assessment:** 2 hr exam, quiz/report.

This unit covers at an advanced level selected topics in Perception from both the psychophysical and neuroscientific perspectives. Students are expected to gain an understanding of the main theoretical perspectives in current research, to appreciate the significance and relevance of basic perceptual research for understanding normal perceptual functioning, and to be able to evaluate the conceptual and empirical worth of research contributions.

PSYC 3211   Psychological Assessment
4 credit points
Qualifying: 12 credit points of Intermediate Psychology including Psychology 2112 and 2114(or Psychology 2001 and 2002).
Offered: March. **Classes:** 2 lec & 1 tut/wk. **Assessment:** 2 hr exam, tutorial evaluation.

This unit will cover fundamental issues in the construction, evaluation and administration of psychological tests with particular emphasis on tests of personality. Students will be given 'hands-on' experience with a variety of psychological instruments including those used for personality, aptitude and clinical assessment. A variety of psychometric 'skills' (eg: calculating reliability, rudiments of scale construction) will also be taught. This unit of study will conclude with an introduction of state of the art issues in psychological assessment including demonstrations of adaptive and computerised testing and discussion of item response theory (IRT) and confirmatory factor analysis (CFA).
Textbooks
See Departmental handout

PSYC 3212   Social Psychology
4 credit points
Qualifying: 12 credit points of Intermediate Psychology including Psychology 2113 (or Psychology 2001 and 2002). **Offered:** March.
Classes: 2 lec & 1 tut/wk. **Assessment:** 2 hr exam, prac report.
PSYC 3212 examines aspects of Social Psychology with an emphasis in the latter parts of the course on Environmental Psychology. The former aims to extend the Social Psychology component of PSYC 2113 and to acquaint students with research in the basic areas covered. Tutorials provide first hand experience of research by involving students in the carrying out of up to five research projects. Tutorials also provide the opportunity for discussion of the areas.

Environmental Psychology examines the effect of several aspects of the physical environment on social behaviour. The emphasis is upon practical applications of the theories and research in these areas.

PSYC4001　Psychology Honours
48 credit points
Prerequisite: Average of Credit or better in 16 credit points of Intermediate Psychology, and also in Senior Psychology units which must include 3201, 3202 and at least four other units of study (or equivalent from Psychology 3001 and 3002). BPsych students should consult resolutions in Chapter 8. Department permission required. **Offered:** March (year-long). **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:

(a) devise, conduct and report upon an empirical research project,

(b) write a theoretical thesis or attend three Special Fields modules and write three essays;

(c) 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 appropraite Bachelor of Science unit of study descriptions.
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 University of Sydney into the Bachelor of Science (Environmental) degree program with the approval of the Chair of the Program Committee for Environmental Science.

Bachelor of Science (Environmental) Junior Units of Study

Students should refer to the 'Summary of Requirements' in Chapter Three of this Handbook for regulations and unit of study requirements for the Bachelor of Science (Environmental) award course.

ENVI1001　Global Geology
6 credit points
Professor Davies
Prohibition/other: 'Changes to prerequisites and corequisites subject to Faculty approval. **Offered:** March. 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
Assoc. Prof. D. Dragovich
Prohibition/other: 'Changes to prerequisites and corequisites subject to Faculty approval. **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

In each semester, you must enrol in both of the Environmental Science Intermediate units of study offered.

ENVI2003　Environmental Processes*
6 credit points
Prerequisite: ENV11001 and ENV11002. **Corequisite:** ENVI 2004. **Prohibition/other:** This unit of study can only be taken by students enrolled in the BSc(Environmental). Note: enrolment is limited to 50 students. 'New unit of study subject to Faculty approval. **Offered:** March. **Classes:** 2 lec, 1 prac & 1 tut/wk, field excursions in prac time. **Assessment:** Examination (50%), practical assessment (50%).

ENVI 2004　Physical and Human Environmental Impacts*
4 credit points
Prerequisite: ENV11001 and ENV11002. **Corequisite:** ENVI 2003. **Prohibition/other:** This unit of study can only be taken by students enrolled in the BSc(Environmental). Note: enrolment is limited to 50 students. 'New unit of study subject to Faculty approval. **Offered:** March. **Classes:** 2 lec & 2 tut/prac/wk, field excursions in prac time. **Assessment:** Examination (70%), practical assessment (30%).
The two Environmental Science units of study (ENVI 2003 and 2004) must be taken together, and 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.

ENVI 2103　Environmental Sampling and Biology*
6 credit points
Prerequisite: ENV11001 and ENV11002 and Biology (1001 or 1901) and Biology (1002 or 1902). **Corequisite:** ENVI 2104. **Prohibition/other:** This unit of study can only be taken by students enrolled in the BSc(Environmental), and cannot be counted towards BIOL 3202. 'New unit of study subject to Faculty approval. **Offered:** July. **Classes:** 3 lec & 3 prac/wk, field excursions in prac time. **Assessment:** Examination (50%), practical assessment (50%).
This unit of study consists of two parts. The first is a modification of a successful module in the Senior Biology (Ecology) course and will run in conjunction with it. It introduces the logical structure of environmental sampling, including the nature of variables, univariate and multivariate measures, correlation of environmental variables and interpretation of data. This course also 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. The second part looks at anthropogenic impacts from the point of view

of an analyst. Topics examined include indicator species, eco-toxicology and conservation biology.

ENVI2104   Environmental Pollution*

4 credit points

Prerequisite: ENV11001 and ENV11002. **Corequisite:** ENVI 2103. **Prohibition/other:** This unit of study can only be taken by students enrolled in the BSc(Environmental). *New unit of study subject to Faculty approval. **Offered:** July. **Classes:** 2 lec & 2 prac/wk, field excursions in prac time. **Assessment:** Examination (50%), practical assessment (50%).

This unit of study covers the anthropogenic impacts of pollution on the environment, from air and water pollution, to that caused by various mining and agricultural activities.

Bachelor of Science (Environmental) Senior Units of Study

You must enrol in both Environmental Science Senior units of study (ENVI 3001 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 First and Second Semester subjects at the beginning of First Semester. Furthermore, no option may be counted towards a Senior Environmental Science course 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: ENVI 2003,2004, 2103 and 2104*. **Prohibition/other:** 'Changes to prerequisites and corequisites subject to Faculty approval. **Offered:** March.

Environmental Science 3001 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 3A Core module include introductions to environmental ethics, law, and issues of planning, regulation and management for the built and natural environments.

Environmental Science 3001 Option Modules

The following list of Options modules are available for inclusion within the ENVI 3001. The modules are of varying durations and credit weightings, 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 subjects at the beginning of First Semester. Please see the Chair of the Program Committee for Environmental Science for an up-to-date listing.

Biology
- 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) (CHEM 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 (PHYS 3600, 4 credit points)

Geography
- Ancient Environments (6 credit points) {Taken as part of GEOG3101}
- Environmental Fluvial Geomorphology (6 credit points) {Taken as part of GEOG 3101}

Agricultural Chemistry & Soil Science
- Environmental Soil Physics (6-credit points). {Taken as part of SOIL3001}
- Pedology (6-credit points). {Taken as part of SOIL 3001}
- Introductory Environmental Plant & Soil Chemistry (AGCH 3012, 4-credit points)

Geology and Geophysics
- Physical Sedimentology (MARS 3001/MS3, 6 credit points)
- ■ Geodynamics (GEOP 3002, 4 credit points)

Microbiology
- Microbiology (2 x 4 credit points - one each semester) {Taken as part of MICR 2001 and 3002 }

  These 2 modules must be taken together. They cannot be taken individually.

  The 1st Semester module covers: 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 second semester, the module consists 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: ENVI 2003, 2004, 2103 and 2104*. **Prohibition/other:** 'Changes to prerequisites and corequisites subject to Faculty approval. **Offered:** July.

Environmental Science 3002 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 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 3002 Option Modules

The following list of Options modules are available for inclusion within the 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 ENVI 3001 and 3002 subjects at the beginning of First Semester. Please see the Chair of the Program Committee for Environmental Science for an up-to-date listing.

Biology
- Ecology (8 credit points) (Taken as part of BIOL 3202)

  Divided into field course (4 credit points) and lectures (4 credit points), running in 2nd semester. The field course (week before semester starts) is compulsory for the lecture series.
- Terrestrial Ecology (4 credit points) (Taken as part of BIOL 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 BIOL 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) (CHEM 3602, 4 credit points)
  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 GEOG3102)
- Geographical Information Systems (6 credit points) (Taken as part of GEOG 3102)
- Rock Weathering (6 credit points) (Taken as part of GEOG 3002)
- Agricultural Chemistry & Soil Science
- Advanced Soil Chemistry (6-credit points). (Taken as part of SOIL 3002)

Geology and Geophysics
- Environmental Geophysics (GEOP 3005, 4 credit points)
- Chemical Processes in the Oceans (MARS 3O01/MS8, 6 credit points)
- Marine Geology and Palaeoclimates (MARS 3001/MS9, 6 credit points)
- Paleobiology (GEOL 3004, 4 Credit points)

Microbiology
- Microbiology (2 x 4 credit points, one each semester) (Taken as part of MICR 2001 and 3002)

These 2 modules must be taken together. They cannot be taken individually.

The 1st 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 second 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.

AGCH 3012 Introductory Environmental Plant and Soil Chemistry
4 credit points
Qualifying: Environmental Science 2001 and 2002. Corequisite: Environmental Science 3003. Prohibition/other: May not be counted with Agricultural Chemistry 3002. This unit of study is offered only to students enrolled in the BSc(Environmental). A maximum quota of 25 may exist. Contact the Environmental Science advisor. Offered: March. Classes: 1 two hour tutorial and laboratory session per week. A 6-day field trip held in Orientation week. Assessment: Practical Assessment (report) (100%).
This unit of study is based on a field excursion to areas such as the Namoi Valley near Narrabri, and the Macquarie Marshes in the Macquarie Valley, where agriculture based on irrigation has been developed. The elementary aspects of soil formation and profiling will be examined and the extent of environmental impacts of these agricultural enterprises and human settlement assessed. Observations will be made in the Field and samples of water, sediment and soil brought back for analysis at the University, covering tests such as pH, oxygen content, redox potential, salt content, nutrient content, water and solute transport and pesticide content. An interactive computer exercise will be used to foster knowledge gained from this excursion and its associated sample analyses.

CHEM 3601 Chemistry 3A (Environmental)
4 credit points
Prerequisite: Chemistry 1102 or 1902 and Anthropogenic Impacts on Environments 2002. **Prohibition/other:** May not be counted with Chemistry 3101 or 3201 or 3901 or 3102 or 3202, or 3902 or 3903. **Offered:** March. **Classes:** 2 lec and 2hr prac/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. Prohibition/other: May not be counted with Chemistry 3101 or 3201 or 3901 or 3102 or 3202 or 3902 or 3903. Offered: July. Classes: 2 lec and 2hr prac/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.

PHYS3600 Energy and the Environment
4 credit points
Prerequisite: Environmental Science 2102 or 12 credit points of Junior Physics. **Offered:** March. **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.

ENVI3003 Environmental Law and Planning
4 credit points
Prerequisite: ENVI 2001 and ENVI 2002. **Corequisite:** Senior Environmental Science Elective units of study to a minimum value of 4 credit. **Offered:** March (may not be offered in 1999). **Classes:** 2 two hour lecture sessions per week. **Assessment:** Examination (100%).

This Senior Environmental Science unit of study is the same as the core module for ENVI 3001. It builds on foundations laid by the Intermediate Environmental Science units of study to provide the integration of scientific and other aspects of environmental problem-solving and professional responsibilities. Topics covered include introductions to environmental ethics, law, and issues of planning, regulation and management for the built and natural environments.

(This unit of study may not be available in 1999.)

ENVI 3004   Environmental Assessment
4 credit points
Prerequisite: ENVI 2001 and ENVI 2002. **Corequisite:** Senior Environmental Science Elective units of study to a minimum value of 4 credit. **Assumed knowledge:** ENVI 2001, ENVI 2002, ENVI 2103. **Offered:** March (may not be offered in 1999). **Classes:** 2 two hour lecture sessions per week. **Assessment:** Examination (100%). This Senior Environmental Science unit of study is the same as the core module for ENVI 3002. It builds on foundations laid by the Intermediate Environmental Science units of study to provide the integration of scientific and other aspects of environmental problem-solving and professional responsibilities. Topics covered 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.

(This unit of study may not be available in 1999.)

ENVI 4001   Environmental Science Honours
48 credit points
Offered: March.

Students of sufficient merit may be admitted to an Honours course in Environmental Science. In the Honours year, a student will undertake an interdisciplinary research exercise in association with one or more supervising members of the academic staff at the University of Sydney, writes a thesis based upon the research, and attends advanced lecture units of study and seminars as required by their supervisor(s). The Honours year is not only rewarding but enjoyable as well, and marks the transition period where a student becomes a research collaborator.

Postgraduate Units of study in Environmental Science

The Environmental Science program offers a variety of postgraduate study opportunities, including an interdisciplinary Graduate Diploma of Science (Environmental) and a Masters of Science (Environmental). Entry into the latter course requires the previous completion of either the Graduate Diploma or an Honours year. Further information on the postgraduate units of study can be obtained from either the Environmental Science Office or from the Chair of the Program Committee for Environmental Science.

Bachelor of Science (Molecular Biology and Genetics)

BIOL 1904   Living Systems Molecular (Advanced)
6 credit points
Dr G M Wardle, Dr K Raphael
Assumed knowledge: Biology section of HSC 4-unit or Biology 1901 or eqiuvalent. **Prohibition/other:** 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. **Offered:** July. **Classes:** 3 lec & 3hr prac/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 Biology section of HSC 4-unt Science or Biology 1901 or equivalent. **Prohibition/other:** 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. **Offered:** July. **Classes:** 3 lec & 3hr prac/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: UAI of at least 92.5 and at least 75% in HSC 2-unit Chemistry or equivalent. **Prohibition/other:** May not be counted with Chemistry 1001 or 1101 or 1901 or 1903 or 1906. **Offered:** March. **Classes:** 3 lec/tut & 3hr prac/wk for 10 weeks& 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 Chemistry 1901 except for the addition of 7 special molecular biology and genetics discussion sessions, which consist of topical seminars and discussions in this discipline. An essay based on these discussions is included as part of the assessment of the unit of study.

CHEM 1906   Chemistry 1A Molecular (Special Studies Program)
6 credit points
Prerequisite: UAI of at least 98 and at least 85% in HSC 2-unit Chemistry or equivalent. **Prohibition/other:** May not be counted with Chemistry 1001 or 1101 or 1901 or 1903 or 1905. **Offered:** March. **Classes:** 3 lec/tut & 3hr prac/wk & 7 discussion sessions. **Assessment:** One 3hr closed book exam (70%), prac reports (15%), assignments (5%), essay based on discussion sessions (10%).

This unit of study is the same as Chemistry 1903 except for the addition of 7 special molecular biology and genetics discussion sessions, which consist of topical seminars and discussions in this discipline. An essay based on these discussions is included as part of the assessment of the unit of study.

CHEM 1907   Chemistry 1 Life Sciences A Molecular (Advanced)
6 credit points
Prerequisite: UAI of at least 92.5 and at least 75% in HSC 2-unit Chemistry or equivalent. **Offered:** March. **Classes:** Total of 6hrs per week consisting on average of 3 lectures, 1 tutorial/discussion session and 2hrs of practical work. **Assessment:** Exam 75%, practicals 15%, essay based on discussion sessions 10%.
Lectures (41 hr): A strong background in junior chemistry is essential for understanding molecular structures and processes. This unit of study provides the basis for understanding fundamental chemical processes and structures at an advanced level, with particular emphasis on how this applies to the life sciences. Topics to be covered include: atomic structure, chemical bonding and organic chemistry of functional groups with applications in life sciences.

Tutorials/Discussions (13 hr): These will provide aspects of problem solving and will include special lectures on aspects of molecular biology and genetics from external experts.
Practical: (30hr): These will be designed to develop practical skills based on the theory presented in the lectures.
Textbooks
As for Chemistry 1101

CHEM 1909   Chemistry 1 Life Sciences B Molecular (Advanced)
6 credit points
Prerequisite: Chemistry 1907 or 1908 or equivalent. **Offered:** July. **Classes:** Total of 6hrs per week consisting on average of 2 lectures, 1 tutorial/discussion session and 3hrs of practical work. **Assessment:** As for Chemistry 1101.

Lectures (27 hr): A strong background in junior chemistry is essential for understanding molecular structures and processes. This unit of study provides the basis for understanding fundamental chemical processes and structures at an advanced level, with particular emphasis on how these apply to the life sciences. Topics to be covered include: chemical equilibria, solutions, acids and bases, ions in solution, redox reactions, colloids and surface chemistry, the biological periodic table, chemical kinetics and radiochemistry with applications to life sciences.

Tutorials/Discussions (13 hr): These will provide aspects of problem solving relevant to the unit of study.

Practical: (30 hr) These will be designed to develop practical skills based on the theory presented in the lectures.
Textbooks
As for Chemistry 1101

CHEM 2903   Chemistry 2 (Life Sciences Advanced)
8 credit points
Qualifying: Chemistry 1902,1904 or 1909. **Prerequisite:** 12 credit points of Junior Mathematics. **Prohibition/other:** May not be counted with Chemistry 2001 or 2101 or 2301 or 2901 or 2502.
Offered: March. **Classes:** 4 lec & 4hr prac/wk. **Assessment:** Three 2hr closed book exams (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
CDr Carter
Qualifying: Biology 1901 and Biology 1904 or 1905 and Chemistry 1902 or 1904 or 1909. **Offered:** March. **Classes:** 3 lec/wk & 4hr prac/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
Dr Carter
Qualifying: Microbiology 2005 and Biology 1901 and (1904 or 1905) and Chemistry 1902 or 1904 or 1909. **Offered:** July. **Classes:** 3 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

MICR 2909   Fundamental and Applied Microbiology (Advanced)
8 credit points
Dr Carter
Prerequisite: Biology 1901 and 1904/1905 and Chemistry 1902 or 1904 or 1905 or 1906 or 1907 or 1909. **Prohibition/other:** May not be counted with MICR 2005, 2006, 2906 or 2009. **Offered:** July.
Classes: 3 lec, 1 tut & 4hr prac/wk & 9 advanced seminars.
Assessment: One 3 hr exam (40%), one 2 hr exam based on advanced seminars (20%) continuous prac assessment (25%), assignment (15%).

This unit of study is designed to provide students with the knowledge and technical skills needed to understand and manipulate microorganisms as part of the field of molecular biology and genetics. In the first part of the unit of study, students are introduced to the nature and scope of microbiology, and to practical methods for handling and analysing microorganisms. The latter part of the unit focuses on the role of microorganisms in health and disease, and on industrial processes involving microorganisms, including recombinant DNA products, biocontrol agents and bioremediation. An advanced seminar series accompanies the latter part of the unit, and focuses on recent research topics in molecular microbiology. This is assessed in a 2 hr theory exam.
Textbooks
As for Microbiology 2001

BCHM 3904   Metabolic and Medical Biochemistry Molecular (Advanced)
12 credit points
Qualifying: Biochemistry 2002 or 2902. **Prohibition/other:** May not be counted with Biochemistry 3002 or 3902. **Offered:** July.
Classes: 4 lec & 8hr/wk & 4 seminars. **Assessment:** Two 3hr exams, one 1 hr exam, prac work.

This unit of study is the same as that in the normal degree program except for the addition of seminars and discussions in this discipline.
Textbooks
Cooper GM. The Cell: A Molecular Approach. OUP, 1997

BIOL 3905   Eukaryotic Genetics and Development Molecular (Advanced)
12 credit points
Biology 3203 Executive Officer
Qualifying: 16 credit points of Biology including Biology 2905.
Prohibition/other: May not be counted with Biology 3203 or 3904.
Offered: July. **Classes:** 4 lec & 8 prac/wk, one 2 day excursion & 4 discussion sessions. **Assessment:** One 3hr theory 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 topical seminars and discussions in this discipline.

CHEM 3903   Chemistry 3 Life Sciences (Advanced)
12 credit points
Qualifying: Chemistry 2903. **Prohibition/other:** May not be counted with Chemistry 3102 or 3902. **Offered:** July. **Classes:** 4 lec & 8 prae/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
   3I15d 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
Some of these modules may not be offered in the July semester.

MICR 3004   Molecular Biology of Pathogens
Molecular

12 credit points
Dr Carter
Qualifying: Microbiology 2005 or 2906. **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. As essay based on these discussions is included as part of the assessment of the unit of study.

MICR 3904   Molecular Biology of Pathogens
Molecular (Advanced)

12 credit points
Dr Carter
Qualifying: Microbiology 2005 or 2906. **Offered:** July. **Classes:** 4 lec & 8hrs prac/wk and 4 discussion sessions. **Assessment:** Two 2hr exams, practicals, and an essay based on discussion sessions. Same details as Microbiology 3004, with advanced components.

Bachelor of Science (Nutrition)

NUTR 2901   Introductory Food Science (Advanced)
8 credit points
Associate Professor J Brand Miller
Prerequisite: Biology 1901 and (1902 or 1903) and Chemistry (1101 or 1901 or 1903) and (1102 or 1902 or 1904). **Prohibition/other:** Subject to Faculty approval. **Offered:** March. **Classes:** 3 lec & 5 hr prac/wk. **Assessment:** One 3 hr exam (50%), practical (50%).
Lectures 1-16: Foods as commodities (16 lectures): food use around the world, including the origin, history, cultural and nutritional importance of each of the following major human foods: Wheat, sugar, fats and oils, rice, milk and dairy products, fish, legumes and nuts, roots and tubers, maize, green leafy vegetables, herbs and spices, alcohol, meat, fruit, novel proteins
Lectures 17-21: Geography of foods (5 lectures): understanding of the global food distribution, food abundance and food scarcity, the problems of nutrition in very poor countries and the potential of food aid to minimise food problems.
Lectures 22-34: Food Technology (13 lectures): Principles of food preservation, cereal technology, Milk and dairy technology, Fat and oil technology, Sugar technology, Meat technology, Processing and nutrient changes, Food analysis, Food legislation, Food inspection, Food additives, Naturally-occurring toxicants, Food pollutants, Food safety,
Lectures 35-39: Food Hygiene (5 lectures) Food microbiology, Food hygiene, Critical Hazards Analysis.
Practical: The practical work aims to give student skills and experience in food analysis and an understanding of commercial scale food processing operations. The classes will complement the lectures by providing practical experience of different foods in different forms from around the world. They will be exposed to spectroscopic, enzymic and chromatographic (including GC and HPLC) methods for analysis of starches, sugars, fat, protein (nitrogen), fibre and vitamin C in foods. Several of the practical classes will involve field trips to show methods of food processing, including canning, freezing, spray drying and oil refining. Students will be responsible for maintaining a laboratory workbook which will be assessed at the end of the semester.
Textbooks
Garrow JS, James WPT. Human Nutrition and Dietetics. Churchill

Livington: London, 1993
Proudlove RK. The Science & Technology of Foods. Forbes: London, 1985.

Hobbs BC. Food poisoning and food hygiene. 5th ed, E. Arnold: Baltimore, Md, 1987.

NUTR 2902   Introductory Nutritional Science
(Advanced)

8 credit points
Associate Professor J Brand Miller
Prerequisite: Nutritional Science 2901. **Prohibition/other:** Subject to Faculty approval. **Offered:** July. **Classes:** 3 lec & 5 hr prac/wk.
Assessment: One 3 hr exam (50%), practical (50%).
Lectures 1-13: Macronutrients (13 lectures) Consumption patterns, requirements for health, absorption, metabolism and health/disease significance of food energy, protein, fat, carbohydrate, fibre, water, alcohol
Lectures 14-26: Vitamins (12 lectures): Consumption patterns, requirements for health, absorption, metabolism, nutritional/disease significance, deficiency state in regard to Vitamins A, B1, B2, B6, B12, niacin, folate, biotin, pantothenic acid, Vitamin C, Vitamin D, Vitamin E, Vitamin K
Lectures 26-39: Other micronutrients (13 lectures): Consumption patterns, requirements for health, absorption, metabolism, nutritional/disease significance, deficiency state in regard to calcium, iron, sodium, potassium, carnitine, choline, zinc, selenium, copper and other trace elements.
Practical: Formats will include laboratory classes, supermarket tours, small group field assignments.
Textbooks
Mann J & Truswell AS. Essentials of human nutrition. Oxford University Press: Oxford, 1998.

NUTR 3901   Nutrition in Individuals (Advanced)
12 credit points
Dr P Lyons-Wall
Prerequisite: Nutritional Science 2902. **Prohibition/other:** Subject to Faculty approval. **Offered:** March. **Classes:** 4 lec & 8 hr prac/wk.
Assessment: One 3 hr exam (50%), practical project (50%).
Lectures 1-12: Dietary intake assessment (12): basic concepts in nutritional status; four methods of dietary assessment in individuals, advantages and limitations; validation of dietary methods; nutritional guidelines, targets and recommended dietary intakes; computerised nutrient analysis; Atwater conversion factors; limitations of food composition analysis; critical interpretation of nutrient analysis
Lectures 13-14: Behavioural influences on food intake (2)
Lectures 15-16: Clinical assessment and biochemical evaluation (2): nutritional assessment of individuals through clinical examination and commonly used laboratory biochemical tests for nutritional status; methods used to diagnose nutritional deficiencies; specificity, reliability of biochemical tests
Lectures 17-20: Anthropometry and body composition (4): techniques for measuring body composition; soft tissue measurements; percent body fat; reference standards; growth standards and percentiles
Lectures 21-30: Nutritional metabolism (10): biochemical interrelationships between nutrients and the supply of energy to the body; effects of nutritional state on energy metabolism (exercise, starvation, obesity, diabetes)
Lectures 31-40: Nutritional epidemiology (10): basic concepts (causality, randomised control trials, cohort studies, case-control studies, cross sectional and ecological studies); advantages and limitations of epidemiological methods; biological markers of chronic diseases; use of biostatistical tools in epidemiology; critical interpretation of published data.
Lectures 41-42: Research design (2): qualitative research methods; questionnaire design
Lectures 43-52: Statistics for nutrition (10): basic concepts (mean, median, standard deviation; association and regression in the relationship between two continuous variables; parametric and non parametric tests for group comparisons); statistical methods used to analyse dietary intake and epidemiological studies; data management and analysis.
Practical: Formats will include practical classes, problem-based learning with case histories and small group tutorials.

Textbooks

Cameron ME, Van Staveren WA eds. Manual on Methodology for Food Consumption studies. Oxford: Oxford University Press, 1988.

Willett W. Nutritional Epidemiology. Oxford: Oxford University Press, 1990.

Gibson RS. Nutritional Assessment: A Laboratory Manual. Oxford: Oxford University Press, 1993.

NUTR 3902 Nutrition in Populations (Advanced)

12 credit points
Ms Sue Amanatidis
Prerequisite: Nutritional Science 2902. **Prohibition/other:** Subject to Faculty approval. **Offered:** July. **Classes:** 4 lec & 8 hr prac/wk.
Assessment: One 3 hr exam (50%), practical project (50%).
Lectures 1-5: Nutrition through the lifecycle (5): nutritional needs of infants, children, adolescents, pregnant and lactating women and older people.

Lectures 6-10: Food Habits (5): theories of food habits; factors affecting food habits of individuals and societies; food habits of major ethnic and cultural groups in Australia.

Lectures 11-13: Nutritional problems in contemporary communities and selected target groups (3): nutritional problems in Aboriginal communities, low income groups and non-English speaking communities.

Lectures 14-26: Nutritional health and chronic disease (13): chronic diseases related to nutrition including, obesity, cancer, coronary heart disease, hypertension, non-insulin dependant diabetes, dental caries, osteoporosis, iron deficiency, iodine deficiency, vitamin A deficiency and folate deficiency; nutritional problems in developing countries.

Lectures 27-31: Food and nutrition policies and guidelines (5: dietary guidelines; dietary goals and targets; Recommended Dietary Intakes; food selection guides; national and food and nutrition policies; local government food policies.

Lectures 32-34: Food and Nutrition Systems (3): the food and nutrition system in Australia; food regulation in Australia

Lectures 35-40: Principles of Public Health nutrition (6): history and philosophy of public health nutrition; the Ottawa Charter for health Promotion; needs assessment and program planning for populations; evaluation.

Lectures 41-45: Public Health Nutrition Strategies and programs (5): theories of behaviour change; types of public health nutrition program in Australia; successful strategies for public health nutrition programs.

Lectures 46-51: Principles of Nutrition Education (6): small group dynamic theories; Adult learning principles; learning styles; small group education strategies; program planning and evaluation; resource development.

Lecture 52: Nutrition controversies (1): fad diets and alternative practitioners.
Practical: The aim of the practicals is to allow students to put into practice what is covered in the lectures. The practical sessions will include problem based learning (PBL) learning with cases studies and small group tutorials. Practical project Students will work in groups on a major project over the entire semester. Students will be asked to plan a community intervention for a specific target group. The project will require the students to conduct a needs assessment with the target group and to seek information from various community sources including government and non-government organisations and food industries. The students will write a report and present their project to the class.

NUTR 4001 Clinical Nutritional Science A

24 credit points
Dr M Allman-Farinelli
Prerequisite: Nutritional Science 3901 and 3902. **Prohibition/other:** Subject to Faculty approval. **Offered:** March. **Assessment:** One 3 hr exam (50%), practical project (50%).
The contact hours per week are a minimum of 15 and during intensive practicals will be 35. With problem based learning it is expected that a student will need to spend minimum of 20 h in self-directed learning.

At the completion of this course students will be able:

• to describe the pathophysiology and biochemistry of disease processes where nutrition is an important part of prevention and/or treatment
• to construct appropriate treatment regimes and prevention strategies for these diseases using their nutritional science knowledge

NUTR 4002 Clinical Nutritional Science B

24 credit points
Dr M Allman-Farinelli
Prerequisite: Nutritional Science 3901 and 3902. **Prohibition/other:** Subject to Faculty approval. **Offered:** July.
See details under Clinical Nutritional Science A, NUTR 4001.

NUTR 4003 Nutrition Research

48 credit points
Dr S. Samman
Prerequisite: Nutritional Science 3901 and 3902. **Prohibition/other:** Subject to Faculty approval. **Offered:** March.
Students will be involved in full-time research under the supervision of a staff member within the Human Nutrition Unit, the Department of Biochemistry or a cognate department. During the year, students will be required to:

(i) carry out a supervised research project;

(ii) present a written project proposal and present orally a brief literature survey and aims of the project;

(iii) write an essay based on the project; and

(iv) deliver a seminar on the project.

Students will prepare a project proposal, which should outline the aims, significance and background of the project, including an indication of the relationship of the project to the work of others, citing key references (not to be included in the 1000 word limit) where appropriate. A brief outline of methods and techniques to be used.

Bachelor of Science/Bachelor of Law

LAWS 1006 Legal Institutions

6 credit points
Ms Millbank
Offered: March. **Classes:** 1 x 1 hr lecture & 2 x 2 hr seminars per week. **Assessment:** Will include classwork and participation, a court report, a case assignment and one 2000-3000 word essay.
This unit of study provides a foundation core for the study of law. We aim to provide a practical overview of the Australian legal system, an introduction to the skills of legal reasoning and analysis which are necessary to complete your law degree, and an opportunity for critical engagement in debate about the role of law in our lives.

The course will introduce students to issues such as:
• the development of judge made and statute law
• the relationship between courts and parliament
• the role and function of courts, tribunals and other forms of dispute resolution
• understanding and interrogating principles of judicial reasoning and statutory interpretation
• key aspects of legislative process
• the relationship between law, government and politics
• the law reform process in action
• what are rights in Australian law, where do they come from and where are they going

We will have a particular focus on indigenous Australia in exploring many of these issues, for example through the landmark Mabo decision.

LAWS 1007 Law, Lawyers and Justice in Australian Society

6 credit points
Associate Professor Ziegert
Prerequisite: Legal Institutions. **Offered:** July. **Classes:** 1 x 2 hr lecture & 2 x 2 hr seminars per week. **Assessment:** Classwork, one 1500 word assignment, one 3500 word essay and a take-home exam.
The aim of this unit of study is to present students with a range of perspectives from which to analyse the role of law and law-

yers in Australian society. The unit has a jurisprudential (especially sociological jurisprudence) and comparativist orientation, and addresses broad issues of ethics and professional responsibility. The unit consists of five components: Law and Social Theory; Law, Liberalism and the Welfare State; Law, Civil Society and the Struggle for Social Justice; The Sociology of Law, Lawyers and Professions; and Legal Ethics and Professional Responsibility.

The first component, Law and Social Theory, consists of an introduction to law and social theory, including analysis of the legal formalist claim that law is objective and neutral. It examines legal decision-making as a constructed, interpretative process, with specific reference to lawyer/client relations, the trial process and judicial reasoning.

The second component, Law, Liberalism and the Welfare State, involves an historical and sociological analysis of the emergence of the welfare state and the concomitant changes in the form and function of law. Examples are drawn from social security law, anti-discrimination law, environmental law, family law and consumer law.

The third component, Law, Civil Society and the Struggle for Social Justice, examines the role of law in promoting the ideals of movements for social justice, e.g. in relations to issues of race, gender, class, disability and sexual orientation. This includes consideration of potential for law to promote social change; having regard to the prevalent practises of lawyers and judges; the effectiveness of particular regulatory programs in dealing with issues of social concern; and access to justice.

The fourth component, the Sociology of Law, Lawyers and Professions, is an introduction to the major issues in the sociology of law, lawyers and professions (especially the legal profession). This includes issues such as the concept of professionalism, the sociography and demography of lawyers; and the organisation and regulation of legal work.

The fifth component, Legal Ethics and Professional Responsibility, provides an introduction to the major issues and controversies involving legal ethics and professional responsibility, such as: lawyer-client relations, confidentiality and privilege; conflict of interest; the special obligations of advocates to the court; the disciplinary system and complaints against lawyers; and over-riding social, ethical and systematic duties.

LAWS 1002 Contracts
8 credit points
Professor Harland
Offered: March. **Classes:** 2 x 2 hr seminars per week.
Assessment: Combination of assignment/s, essay/s and open book exam.

Contract law provides the legal background for transactions involving the supply of goods and services and one means, arguably the most significant means, by which the ownership of property is transferred from one person to another. It vitally affects all members of the community and a thorough knowledge of contract law is essential to all practising lawyers. In the context of the law curriculum as a whole, Contracts provides background which is assumed knowledge in many other units.

It necessarily follows from the above that the aim of this unit are composite in nature. Perhaps the central aim is to provide an understanding of the basic principles of the common law and statutes applicable to contracts and to provide a grounding in one of the most important areas of law in practice. A second aim is for students to be given the means to evaluate, to make normative judgements, about the operation of the law. This leads to a further aim, admittedly fairly modest in scope, to make some examination of contract law in other countries. As Contracts is basically a case law subject, the final aim of the unit of study is to provide experience in problem solving by application of the principles provided by the decided cases. Successful completion of this unit of study is a prerequisite to the option Advanced Contracts.

LAWS 1003 Criminal Law
8 credit points
Ms Tolmie
Offered: July. **Classes:** 2 x 2 hr seminars per week. **Assessment:** A court report, a research paper and an exam.

This unit of study is designed to assist students in developing the following understandings:

(1) A critical understanding of certain key concepts which recur throughout the substantive criminal law.

(2) A knowledge of the legal rules in certain specified areas of criminal law.

(3) A preliminary understanding of the working criminal justice system as a process, and the interaction of that process with the substantive criminal law.

(4) A preliminary understanding of how criminal law operates in its broader societal context.

The understandings referred to in the foregoing paragraphs will have a critical focus and will draw on procedural, substantive, theoretical and empirical sources. Race, gender, class and the interaction of these factors will be key themes.

LAWS 3000 Federal Constitutional Law
10 credit points
Associate Professor Allars
Prerequisite: Legal Institutions; Law, Lawyers and Justice in Australian Society. **Offered:** March. **Classes:** 2 x 2 hr seminars per week. **Assessment:** Combination drawn from class participation, a 2000 word assignment, a 3000 word essay and an open book exam.

The central aim of the unit of study is to provide an understanding of constitutional arrangements at state and federal levels. At the state level the unit includes study of the Constitution Act 1902 (NSW); parliamentary sovereignty and legislative power; manner and form provisions; territoriality; separation of powers; and the Australia Acts 1986. At the federal level topics covered are federation; characterisation of laws; severance; judicial review and interpretation; selected federal heads of legislative power (eg trade and commerce power, corporations power, external affairs power, taxation and Financial arrangements); federal/state relations (inconsistency of laws; legislating with respect to the Crown, intergovernmental immunities); prohibitions upon legislative power (implied freedoms, freedom of inter-state trade, excise power); separation of powers and judicial power of the Commonwealth.

Students are required to evaluate the legal principles critically, with reference to underlying political theory.

LAWS 3001 Torts
10 credit points
Dr Ball
Prerequisite: Legal Institutions; Law, Lawyers and Justice in Australian Society. **Offered:** July. **Classes:** 2 x 2 hr seminars per week. **Assessment:** Combination drawn from class participation, assignment/s and open book exam.

This is a general introductory unit of study concerned with liability for civil wrongs. The unit seeks to examine and evaluate, through a critical and analytical study of primary and secondary materials, the function and scope of modern tort law and rationale and utility of its governing principles.

Particular topics on which the unit will focus will be drawn from amongst the following:

(a) The relationship between torts and other branches of the common law including contract and criminal law;

(b) The role of fault as the principal basis of liability in the modern law;

(c) Historical development of trespass and the action on the case and the contemporary relevance of this development;

(d) Trespass to the person (battery, assault, and false imprisonment);

(e) Interference with goods (trespass, detinue card conversion);

(f) Trespass to land;

(g) The action on the case for intentional injury;

(h) Defences to trespass, including consent, intellectual disability, minority, necessity and contributory negligence;

(i) Development and scope of the modern tort of negligence, including detailed consideration of duty of care, breach of duty, causation and remoteness of damage and assessment of damages;

(j) Injuries to relational interests, including compensation to relatives of victims of fatal accidents;

(k) Alternative systems for compensation;

(l) Concurrent and vicarious liability;

(m) Defences to torts of negligence;

(n) Breach of statutory duty;

(o) Public nuisance;

(p) Private nuisance; and

(q) Liability for animals.

Bachelor of Computer Science and Technology

ELEC1101   Science, Technology and Engineering
6 credit points
Corequisite: Mathematics 1001 and 1002 or 1901 and 1902 and 1003 and 1004 or 1903 and 1904 and Computer Science 1001 or 1901 and 1002 or 1902. **Assumed knowledge:** HSC Mathematics 3-unit course and the Physics section of the Science 3-unit or 4-unit course or 2-unit Physics. **Offered:** March. **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.

ELEC 1102   Introductory Electronic Circuits
6 credit points
Prerequisite: Mathematics 1001 and 1002 and Electrical Engineering 1101. **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. **Offered:** March. **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 net-

works. Introduction to energy conversion; balanced three phase circuits. Modelling and simulation using Matlab.

ELEC 2401   Electronic Devices and Circuits
4 credit points
Prerequisite: Electrical Engineering 1102. **Offered:** July. **Classes:** 2 lec & average 2hr prac/tutfwk. **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.

ELEC 2501   Signals and Communications
4 credit points
Prerequisite: Mathematics 1001,1002,1003 and 1004 and Electrical Engineering 1102. **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. **Offered:** March. **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 VII (i) Units of Study

All qualifying, pre- and corequisite units of study, details of staff, examinations, unit 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
COMP 3809 Software Project (Advanced) 4 credit points

Bachelor of Computer Science and Technology-Table VII (ii) Units of Study

With the exception of ECMT 3510 Operations Research A and ECMT 3520 Operations Research B, and all ELEC units of study, all qualifying, pre- and co-requisite units of study, details of staff, examinations, unit delivery and descriptions are as described in the appropriate Department or School entry for the BSc.

Consult 1999 Faculty of Economics Handbook for details of ECMT units of study:
ECMT 3510 Operations Research A, 8 credit points
ECMT 3520 Operations Research B, 8 credit points
Consult 1999 Faculty of Engineering Handbook for details of ELEC units of study:
ELEC 3501 Communications 4 credit points
ELEC 3601 Digital Systems Design, 4 credit points
ELEC 4302 Image Processing and Computer Vision 4 credit points
ELEC 4303 Digital Signal Processing, 4 credit points
ELEC 4501 Data Communication Networks, 4 credit points
ELEC 4601 Computer Design, 4 credit points
ELEC 4602 Real-Time Computing, 4 credit points

ELEC 5501 Advanced Communication Networks, 4 credit points

ELEC 5601 Advanced Real-Time Computing, 4 credit points

ELEC 5602 Advanced Computer Architecture, 4 credit points

ELEC 5603 Biologically Inspired Signal processing, 4 credit points

ELEC 5604 Adaptive Pattern Recognition, 4 credit points

ELEC 5605 Advanced Digital Engineering, 4 credit points

ELEC 5606 Multimedia Systems, 4 credit points

ELEC 5607 Hardware/Software Co-design, 4 credit points

GEOG 3102 Coastal Environmental Management and GIS, 12 credit points

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 3020 Nonlinear Systems and Biomathematics, 4 credit points

MATH 3905 Categories and Computer Science (Advanced), 4 credit points

MATH 3912 Combinatorics (Advanced), 4 credit points

MATH 3913 Computational Algebra (Advanced), 4 credit points

MATH 3916 Mathematical Computing I (Advanced), 4 credit points

PHYS 3301 Scientific Computing, 4 credit points

PHYS 3303 Scientific Visualisation, 4 credit points

STAT 3004 Design of Experiments, 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

CHEM 1908 Chemistry 1 Life Sciences A (Advanced), 6 credit points (preferred option)

CHEM 1909 Chemistry 1 Life Sciences B Molecular (Advanced), 6 credit points (preferred option)

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 1001 Differential Calculus, 3 credit points

MATH 1002 Linear Algebra, 3 credit points

MATH 1003 Integral Calculus and Modelling, 3 credit points

MATH 1004 Discrete Mathematics, 3 credit points

MATH 1005 Statistics, 3 credit points

MATH 1011 Life Sciences Calculus, 3 credit points

MATH 1012 Life Sciences Algebra, 3 credit points

MATH 1013 Life Sciences Difference and Differential Equations, 3 credit points

MATH 1015 Life Sciences Statistics, 3 credit points

MATH 1901 Differential Calculus (Advanced), 3 credit points

MATH 1902 Linear Algebra (Advanced), 3 credit points

MATH 1903 Integral Calculus and Modelling (Advanced), 3 credit points

MATH 1904 Discrete Mathematics (Advanced), 3 credit points

MATH 1905 Statistics (Advanced), 3 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

CHEM 1908 Chemistry 1 Life Sciences A (Advanced)
6 credit points

Prerequisite: UAI of at least 92.5 and at least 75% in HSC 2-unit Chemistry or equivalent; by invitation. **Corequisite:** (Recommended concurrent unit of study) Preferred - Mathematics 1001 and 1002 or 1901 and 1902; otherwise Mathematics 1011 and 1012.
Prohibition/other: May not be counted with Chemistry 1001 or 1101 or 1903. **Offered:** March. **Classes:** Total of 6hrs per week consisting on average of 3 lectures, 1 tutorial/discussion session and 2hrs of practical work. **Assessment:** As for Chemistry 1101.
Lectures (41 hr): A strong background in junior chemistry is essential for understanding molecular structures and processes. This unit of study provides the basis for understanding fundamental chemical processes and structures at an advanced level, with particular emphasis on how these apply to the life sciences. Topics to be covered include: atomic structure, chemical bonding and organic chemistry of functional groups with applications in life sciences.

Tutorials/Discussions (13 hr): These will provide aspects of problem solving relevant to the theory.
Practical: Practicals (30hr) These will be designed to develop practical skills based on the theory presentaed in the lectures.
Textbooks
As for Chemistry 1101

CHEM 1909 Chemistry 1 Life Sciences B Molecular (Advanced)
6 credit points
Prerequisite: Chemistry 1907 or 1908 or equivalent. **Offered:** July.
Classes: Total of 6hrs per week consisting on average of 2 lectures, 1 tutorial/discussion session and 3hrs of practical work.
Assessment: As for Chemistry 1101.

Lectures (27 hr): A strong background in junior chemistry is essential for understanding molecular structures and processes. This unit of study provides the basis for understanding fundamental chemical processes and structures at an advanced level, with particular emphasis on how these apply to the life sciences. Topics to be covered include: chemical equilibria, solutions, acids and bases, ions in solution, redox reactions, colloids and surface chemistry, the biological periodic table, chemical kinetics and radiochemistry with applications to life sciences.

Tutorials/Discussions (13 hr): These will provide aspects of problem solving relevant to the unit of study.
Practical: (30 hr) These will be designed to develop practical skills based on the theory presented in the lectures.
Textbooks
As for Chemistry 1101

Bachelor of Medical Science Intermediate Core Units of Study

Except for BMED 2101 and 2102, 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.

BMED 2101 Human Life Sciences A, 12 credit points

BMED 2102 Human Life Sciences B, 12 credit points

(For descriptions of the following see Department/School entry for BSc)

PCOL 2001 Fundamentals, 4 credit points

PCOL 2002 Drug Actions, 4 credit points

BCHM 2101 Genes and Proteins Theory, 4 credit points

BCHM 2102 Molecules, Metabolism and Cells Theory, 4 credit points

BMED 2101 Human Life Sciences A
12 credit points
Mrs F Janod-Groves
Qualifying: 12 credit points of Junior Mathematics, 12 credit points of Junior Chemistry, 12 credit points of Junior Physics, and 12 credit points of Junior Biology or 12 credit points of Junior Computer Science or 12 credit points of Junior Psychology. **Offered:** March. **Classes:** 5 lec, 2 tut & 5 prac/wk. **Assessment:** Written & prac exams, essays, group discussions and reporting.

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.

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: Structure and function of the endocrine system. Cell injury and adaptation. Inflammation, wound healing and repair.

BMED 2102 Human Life Sciences B
12 credit points
Mrs Janod-Groves
Prerequisite: BMED 2101. **Offered:** July. **Classes:** 5 lec, 2 tut & 5 prac/wk. **Assessment:** Written & prac exams, essays, group discussions and reporting.

Maintaining Life: Principles of homeostasis at systemic and cellular levels. Structure and function of blood. Structure and function of: heart and circulation, including haemodynamic derangements; respiratory, urinary, and digestive. 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.

Bachelor of Medical Science Intermediate Elective Units of Study

All qualifying, prerequisite and corequisite 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 units of study listed below (total units 16) in place of the core Biochemistry units of study.

BCHM 2001 Genes and Proteins, 8 credit points

BCHM 2901 Genes and Proteins (Advanced), 8 credit points

BCHM 2002 Molecules, Metabolism and Cells, 8 credit points

BCHM 2902 Molecules, Metabolism and Cells (Advanced), 8 credit points

BIOL 2005 Molecular and General Genetics, 8 credit points

BIOL 2905 Molecular and General Genetics (Advanced), 8 credit points

HPSC 2001 Introductory Philosophy of Science, 4 credit points

HPSC 2002 Introductory History of Science, 4 credit points

Bachelor of Medical Science Senior Core Units of Study (March)

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
Dr Phillips
Qualifying: BMED 2101 and 2102. **Prerequisite:** Pharmacology 2001 and 2002, and Biochemistry 2101 and 2102 or Biochemistry 2001 and 2002 or Biochemistry 2901 and 2902. **Offered:** March. **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
Dr Humphery-Smith (Coordinator), Dr Britton, Prof. Reeves, Dr New, Mrs Dalins, Dr Carter, Dr Briscoe
Qualifying: BMED 2101 and 2102. **Prerequisite:** Pharmacology 2001 and 2002, and Biochemistry 2101 and 2102 or Biochemistry 2001 and 2002 or Biochemistry 2901 and 2902. **Offered:** March. **Classes:** 4 lec & 6 prac/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.

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 of Medical Science Senior Elective Units of Study (March)

Except for History and Philosophy of Science 3102, all qualifying, pre- and corequisite 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

BCHM 3001 Molecular Biology and Structural Biochemistry, 12 credit points

BCHM 3901 Molecular B iology and Structural Biochemistry (Advanced), 12 credit points

BIOL 3103 Molecular Genetics and Recombinant DNA Technology 12 credit points

BIOL 3903 Molecular Genetics and Recombinant DNA Technology (Advanced), 12 credit points

CPAT 3001 Cell Pathology A, 12 credit points

HPSC 3102 History of the Biomedical Sciences, 12 credit points

PCOL3001 Molecular Pharmacology and Toxicology, 12 credit points

PHSI3001 Neuroscience, 12 credit points

HPSC 3102 History of the Biomedical Sciences
12 credit points
Dr Griffiths
Qualifying: History and Philosophy of Science 2001 and 2002.
Offered: March. **Classes:** 4 lec, 4 tut & 4 prac/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 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 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 Elective Units of Study (July)

Except for Anatomy and Histology 3003, Microbiology 3003, Immunology (BMED 3003) and Infectious Diseases (BMED 3004), all qualifying, pre- and corequisite 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

ANAT 3005 Topographical Anatomy, 12 credit points

BCHM 3002 Metabolic and Medical Biochemistry, 12 credit points

BCHM 3902 Metabolic and Medical Biochemistry (Advanced) 12 credit points

BIOL 3203 Eukaryotic Genetics and Development, 12 credit points

BIOL 3904 Eukaryotic Genetics and Development (Advanced), 12 credit points

CPAT 3002 Cell Pathology B, 12 credit points

MICR 3003 Molecular Biology of Pathogens, 12 credit points

BMED 3003 Immunology, 12 credit points

BMED 3004 Infectious Diseases, 12 credit points

PCOL3002 Neuro- and Cardiovascular Pharmacology, 12 credit points

PHSI 3002 Neuroscience - Cellular and Integrative, 12 credit points

PHSI 3003 Heart and Circulation, 12 credit points

ANAT 3005 Topographical Anatomy
12 credit points
Dr Provis
Qualifying: BMED 2101 and 2102. **Offered:** July. **Classes:** 3 lec & 9 tut or prac/wk. **Assessment:** One 3hr exam, one prac exam, one 2500w essay.

This unit of study comprises two strands of topographical anatomy - head and neck anatomy and musculoskeletal anatomy. The anatomy of the head and neck region will be studied in one lecture, one tutorial and one dissection class per week. The 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
Assoc. Prof. Britton
Qualifying: BMED 2101 and 2102. **Prerequisite:** Pharmacology 2001 and 2002, and Biochemistry 2101 and 2102 or Biochemistry 2001 and 2002 or Biochemistry 2901 and 2902. **Offered:** July. **Classes:** 3 lec, 1 tut & 8 prac/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
Assoc. Prof. Harbour, Prof. Reeves
Qualifying: BMED 2101 and 2102. **Prerequisite:** Pharmacology 2001 and 2002, and Biochemistry 2101 and 2102 or Biochemistry 2001 and 2002 or Biochemistry 2901 and 2902. **Corequisite:** Coreq Microbiology 3003. **Offered:** July. **Classes:** 4 lec & 8 prac/wk. **Assessment:** One 3hr exam, one 1 hr prac, 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.

MICR3003   Molecular Biology of Pathogens
12 credit points
Dr Ferenci, Prof. Reeves, Dr Carter, Dr Humphery-Smith (Coordinator)
Prohibition/other: Students are advised not to attempt this unit of study if they have not performed well in BMED 3002 Microbiology and Immunology. **Offered:** July. **Classes:** 4 lec & 8 prac/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
Offered: March.

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 courses. Entry to Honours courses is regulated by individual Departments and the exact detail of Honours programs also varies from Department to Department. Students interested in undertaking Honours should consult the relevant Department for further details.

Bachelor of Pharmacy
Pharmacy 1 st 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.

PHAR 1603   Introductory Pharmacy
6 credit points
Miss Sainsbury
Assumed knowledge: HSC 2-unit Chemistry or equivalent and see below. **Offered:** July. **Classes:** See below.
This unit of study is made up of two sections:
• Pharmaceutical Science
Classes: July Semester - 3 lec & 2hr tut/workshops/wk for 9 weeks
Assessment: two 2hr exams; reports from workshop sessions
Introduction to dosage forms, plant drugs and galencials, intermolecular forces in liquids and solids, acidic and basic drugs, partitioning of drugs, pharmaceutical calculations.
• Pharmacy Practice
Classes: July Semester - 1 lec/wk & 2hr tut/wk for 3 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 AN. Physical Pharmacy. Lea & Febiger, 1993

MATH 1604   Mathematics/Statistics (Pharmacy)
6 credit points
Assumed knowledge: HSC 2-unit Mathematics or equivalent (Students without this assumed knowledge are advised to attend a bridging course in February). **Offered:** March.

Mathematics
Classes: Sem 1 - 2 lec & 4 tut/wk
Assessment: assignments (10%), one 2hrexam (90%)
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 JC. & Lardner RW. Mathematics for the Biological Sciences. Prentice-Hall
Gentry RD. 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, & Gauvreau K. Principles of Biostatistics. Duxbury Press, 1993

CHEM 1611   Chemistry A (Pharmacy)
6 credit points
See School of Chemistry for list of staff
Assumed knowledge: HSC Chemistry 2-unit or the chemistry component of the 3/4-unit Science course and the 2-unit Mathematics course. **Offered:** March. **Classes:** 3 lec & 1 tut/wk & 3hrs prac/wk for 10 wks. **Assessment:** As for Chemistry 1101.
Chemistry provides the basis for understanding molecular structures and processes, essential knowledge for many later year Pharmacy units of study. Lecture topics include some fundamental concepts, atomic theory, states and properties of matter, equations and stoichiometry, chemical energetics, equilibrium theory, solution theory, general acid-base theory, atomic structure, chemical bonding. Practical work is designed to enhance confidence and develop skills in the handling and manipulation of chemicals and in the observation and processing of experimental results.
Special preparative studies: Students wishing to enrol in CHEM 1611 who do not have the assumed chemical knowledge are advised to consult the School of Chemistry for information about a bridging course.
Textbooks
Students should obtain a booklist from the School of Chemistry during the orientation period.

CHEM 1612   Chemistry B (Pharmacy)
6 credit points
See School of Chemistry for list of staff
Prerequisite: Chemistry 1.611 Chemistry A (Pharmacy). **Assumed knowledge:** HSC Chemistry 2-unit or the chemistry component of the 3/4-unit Science course and the 2-unit Mathematics course. **Offered:** July. **Classes:** 3 lec & 1 tut/wk & 3hrs prac/wk for 10 wks. **Assessment:** As for Chemistry 1101.

Chemistry provides the basis for understanding molecular structures and processes, essential knowledge for many later year Pharmacy units of study. Lecture topics include redox reactions, electrochemistry, introduction to colloids and surface chemistry, the biological periodic table, radiochemistry, introduction to organic chemistry, nomenclature, aliphatic chemistry, aromatic chemistry, heterocyclic compounds, isomerism, stereoisomerism, reaction mechanism, biomolecules, amino acids and peptides, carbohydrates. Practical work is designed to enhance confidence and develop skills in the handling and manipulation of chemicals and in the observation and processing of experimental results.
Textbooks

Students should obtain a booklist from the School of Chemistry during the orientation period.

BIOL 1001   Concepts in Biology
See description under Bachelor of Science entries.

BIOL 1003   Human Biology

See description under Bachelor of Science entries.

PSYC 1001   Psychology 1001

See description under Bachelor of Science entries.

PSYC 1002   Psychology 1002

See description under Bachelor of Science entries.

Pharmacy 2nd 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.

PCOL2603   **Pharmacology 2A (Pharmacy)***

2 credit points
Assoc. Prof. Starmer, Assoc. Prof. Mylecharane
Prerequisite: CHEM 1611 Chemistry A (Pharmacy) and CHEM 1612 Chemistry B (Pharmacy). **Corequisite:** BCHM 2611 Proteins, Enzymes and Metabolism 1 and PHAR 2611 Pharmacy Practice 2A. **Prohibition/other:** 'Unit of study subject to Faculty approval. **Offered:** March. **Classes:** 2 lec/wk & 2 x 2hr tut. **Assessment:** One 1.5hr exam.

The aim of this unit of study is for students to gain a basic understanding of drug actions which are related to physiological and patholofical functions. It covers drug-receptor interactions, the pharmacodynamics of peripheral and central neurotransmission, and the pharmacodynamics of autacoids.

Textbooks

Rang HP et al. Pharmacology. 3rd edn, Churchill Livingstone, 1995

Study Aids

Dale M M & Dickenson A H. Companion to Pharmacology. Churchill Livingstone, 1993

Neal M J. Medical Pharmacology at a Glance. 3rd edn, Blackwell Scientific Publications, 1992

Reference Books

Cooper J R et al. The Biochemical Basis of Neuropharmacology. 6th edn, Oxford, 1991

Hardman JG et al (eds). Goodman and Gilman's The Pharmacological Basis of Therapeutics. 9th edn, Pergamon, 1996

PCOL 2604   **Pharmacology 2B (Pharmacy)***

2 credit points
Assoc. Prof. Starmer, Assoc. Prof. Mylecharane
Qualifying: PCOL 2603 Pharmacology 2A (Pharmacy). **Corequisite:** BCHM 2612 Metabolism 2 and Genes and PHAR 2612 Pharmacy Practice 2B. **Prohibition/other:** 'Unit of study subject to Faculty approval. **Offered:** July. **Classes:** 2 lec/wk & 3 x 1 hr tut. **Assessment:** One 1.5hr exam.

The aims of this unit of study are first for students to continue to gain a basic understanding of drug actions which are related to physiological and pathological functions, and second, to develop an understanding of the therapeutic applications of drugs based on their underlying pharmacodynamic and pharmacokinetic properties. The first part of this unit of study covers the pharmacodynamics of the endorine system; the second part covers cardiovascular and renal drugs, and the principles of chemotherapy.

Textbooks

Study aids and reference books as recommended for PCOL 2603 Pharmacologt 2A (Pharmacy)

PHSI2604   **Physiology 2A (Pharmacy)***

3 credit points
Dr L Cottee
Prerequisite: Biology 1001 and 1003. **Prohibition/other:** 'Unit of study subject to Faculty approval. **Offered:** March. **Classes:** 3 lec/wk. **Assessment:** One 2hr exam.

This unit of study provides a broad basic knowledge of human functions and includes studies of nerve and muscle physiology, blood, heart and circulation and respiration.

Textbooks

Marieb EN. Human Anatomy & Physiology. 4th ed, Benjamin/Cummings, 1998

MICR2605   **Microbiology (Pharmacy)**

3 credit points
Mrs Dalins
Prerequisite: Biology 1001 and 1003. **Offered:** March. **Classes:** 2 lec & 2 or 2.5hr prac/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). **Practical:** 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.

Reference

Tortora GT et al. Microbiology: An Introduction. 5th ed, Benjamin/Cummings, 1995

PHSI 2605   **Physiology 2B (Pharmacy)***

3 credit points
Dr L Cottee
Prerequisite: PHSI 2604. **Prohibition/other:** 'Unit of study subject to Faculty approval. **Offered:** July. **Classes:** 3 lec/wk. **Assessment:** One 2hr exam.

This unit of study provides a broad basic knowledge of endocrinology, reproduction, gastrointestinal function, body fluid regulation, sensory perception, movement and consciousness.

Textbooks

Marieb EN. Human Anatomy & Physiology. 4th ed, Benjamin/Cummings, 1998

PHAR 2607   **Pharmaceutical Microbiology**

4 credit points
DrEMGipps
Prerequisite: PHAR 1603 Introductory Pharmacy. **Corequisite:** MICR 2605 Microbiology (Pharmacy). **Offered: July. Classes:** 2 lec/wk for 3 wks then: 1 lec, 1 tut & 4hr of prac/wk for 8 wks. **Assessment:** 1.5hr exam (85%), laboratory work, presentation & assignment (15%).

A pharmacist should be able to make clean products and create clean situations. The definition of clean and the methods for achieving it depend on the product or situation. It may include sterilisation, asepsis, disinfection, antisepsis, preservation and contamination control. This 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.

Reference books

Aulton ME (ed). Pharmaceutics: The Science of Dosage Form

Design. Churchill Livingstone, 1988

Hugo WB & Russell AD. Pharmaceutical Microbiology. Blackwell, 1992

PHAR 2609   **Medicinal Chemistry** 2A*

6 credit points
Dr M B Morris
Prerequisite: MATH 1604 Mathematics/ Statistics (Pharmacy), CHEM 1612 Chemistry A (Pharmacy), CHEM 1612 Chemistry B (Pharmacy) and PHAR 1603 Introductory Pharmacy. **Corequisite:** BCHM 2611 Proteins, Enzymes and Metabolism 1, PCOL 2603

Pharmacology 2A (Pharmacy). **Prohibition/other:** 'Unit of study subject to Faculty approval. **Offered:** March. **Classes:** 2hr lec & 1.5hr tut/wk & 3hr lab/workshop for 2 wk. **Assessment:** One 2hr exam (56%); laboratories, workshops, quizzes (42%).

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.

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 AB. Medicinal Chemistry. 4th edn, Interscience, 1980
Pratt W & Taylor P. Principles of Drug Action: the Basis of Pharmacology. Churchill/Livingstone, 1990
Alberts A. Selective Toxicity. Methuen, 1985
Solomons TWG. Organic Chemistry. 5th edn, Wiley, 1992

PHAR2610   Medicinal Chemistry 2B*
4 credit points
Dr M B Morris
Prerequisite: PHAR 2609 Medicinal Chemistry 2A. **Prohibition/other:** 'Unit of study subject to Faculty approval. **Offered:** July. **Classes:** 3hr lec, 0.5hr tut & 0.5 workshop/wk. **Assessment:** One 2hr exam (70%), classwork (30%).

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
As for PHAR 2609 Medicinal Chemistry 2A

BCHM 2611   Proteins, Enzymes and Metabolism 1
3 credit points
Prerequisite: Chemistry 1611 Chemistry A (Pharmacy) and Chemistry 1612 Chemistry B (Pharmacy). **Offered:** March. **Classes:** 3 lec/wk. **Assessment:** One 3hr exam & assignments.

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?

Specifically, the unit of study will cover the following topics: structures of biological macromolecules (proteins, nucleic acids, and sugars); molecular morphology of cells; digestion, storage, and utilisation of dietary carbohydrate; biological catalysts (enzymes); generation of metabolic energy; metabolic adaptation during starvation, exercise, and diabetes.

Textbooks
Campbell. Biochemistry (3rd edn). Saunders

PHAR 2611   Pharmacy Practice 2A*
2 credit points
Dr I Krass
Prerequisite: Psychology 1001 and 1002, Introductory Pharmacy 1603. **Corequisite:** PCOL 2603Pharmacology 2A (Pharmacy). **Prohibition/other:** 'Unit of study subject to Faculty approval. **Offered:** March. **Classes:** 1 lec/wk & 7 x 2hr tut. **Assessment:** One 1hr exam (80%), tutotial assessment (20%).

Subject material covered in lectures will include a theoretical examination of the communication process and a discussion of various communication skills particularly in the health care setting. The lecture series is given by members of both the Psychology and Pharmacy Departments. Tutorial sessions will enable students to practice various communication skills in a group setting. Specifically, the tutorials will focus on the recognition of nonverbal communication, the use of compliance aids and questioning and listing techniques. The utilization of video equipment will allow self- and group assessment of communication exercises such as scripted role plays.

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
USP DI Drug Information for the Health Care Professional 1996 (16th edn), United States Pharmacopoeial Convention Inc.
Facts and Comparison, Drug Interactions, Lippincott U.S.A. 1995

Reference books
Prescription Products Guide 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

BCHM 2612   Metabolism 2 and Genes
3 credit points
Prerequisite: BCHM 2611 Proteins, Enzymes & Metabolism I. **Offered:** July. **Classes:** 3 lec/wk. **Assessment:** One 3hr exam & assignments.

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: genetic engineering and the genetic code - storage, utilisation, and control of genetic information (DNA); digestion, storage, and utilisation of dietary lipid and protein; generation of metabolic energy; metabolic adaptation during starvation, exercise, and diabetes; inherited disorders of metabolism; pharmaceutical intervention in metabolic pathways.

PHAR 2612   Pharmacy Practice 2B*
3 credit points
Dr I Krass
Prerequisite: PHAR 2611 Pharmacy Practice 2A. **Prohibition/other:** 'Unit of study subject to Faculty approval. **Offered:** July. **Classes:** 2 lec/wk & 7 x 2hr tut. **Assessment:** One 1.5hr exam (80%), tutotial assessment (20%).
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. Tutorials will examine drug management of relevant disease states and the communication of relevant drug information to patients using acquired communication skills in a counselling context.

Textbooks
Ass for PHAR 2611 Pharmacy Practice 2A

PHAR 2613   Physical Pharmaceutics A*
5 credit points
Dr H K Chan
Prerequisite: MATH 1604 Mathematics/ Statistics (Pharmacy), CHEM 1611 Chemistry A (Pharmacy), CHEM 1612 Chemistry B (Pharmacy), PHAR 1603 Introductory Pharmacy. **Prohibition/other:** 'Unit of study subject to Faculty approval. **Offered:** March. **Classes:** 3 lec/wk & 36hr prac & tuts. **Assessment:** One 3hr exam (90%) and practical assessment (10%).

Solid pharmaceuticals and particle science; liquid formulations; diffusion and dissolution of drugs; drug-packaging intereactions; surface and interfacial tension; surface active materials.

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 & Rhodes C T (eds). Modern Pharmaceutics. Marcel
   Dekker, 1990
Connors K A et al. Chemical Stability of Pharmaceuticals. Wiley-
   Interscience, 1979
Florence A T & 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

PHAR 2614   Physical Pharmaceutics B*

5 credit points
Dr H K Chan
Prerequisite: PHAR 2613 Physical Pharmaceutics A. **Prohibition/
other:** "Unit of study subject to Faculty approval. **Offered:** July.
Classes: 3 lec & 0.5hr tut/wk & 32hr prac. **Assessment:** One 3hr
exam (90%) and practical assessment (10%).
Theory and models; colloidal dispersions; rheology; micelle for-
mation; drug solubilisation; suspensions; emulsions; semisol-
ids; pharmaceutical complexes; biophysical properties of pro-
tein and peptide drugs.
Textbooks
As for PHAR 2613 Physical Pharmaceutics A

Pharmacy 3rd Year Units of Study

PHAR 3601   Dispensing

4 credit points
Miss Sainsbury
Prerequisite: PHAR 2613 Physical Pharmaceutics A, PHAR 2614
Physical Pharmaceutics B, and PHAR 2607 Pharmaceutical
Microbiology. **Corequisite:** PHAR 3608 Formulation B. **Offered:**
July. **Classes:** 1 lec/tut & 3hr prac/wk. **Assessment:** Two 3hr
practical exams, one 90 min theory exam, continuous assessment.
Introduction to dispensing practice, the prescription, approach-
es to dispensing prescriptions, labelling of dispensed medicines,
containers, documentation of dispensing procedures, dispens-
ing of particular formulations, effect of changing formulation
variables on the physical properties and efficacy of pharmaceu-
tical products.
   Twelve 3-hour practical classes complement the lecture/tuto-
rial series and allow the students to prepare a variety of pharma-
ceutical products and critically assess them.
Textbooks
Australian Pharmaceutical Formulary. 16th edn, 1997

PCOL3603   Pharmacology 3A (Pharmacy)

6 credit points
Associate Professor Mylecharane & Associate Professor Starmer
Prerequisite: PCOL 2603 Pharmacology 2A, PCOL 2604
Pharmacology 2B (Pharmacy), PHSI2604 Physiology 2A
(Pharmacy) and PHSI 2605 Physiology 2B (Pharmacy).
Corequisite: PHAR 3609 Medicinal Chemistry 3A and PHAR 3613
Pharmacy Practice 3A. **Offered:** March. **Classes:** 2 lec & 4hr prac/
wk. **Assessment:** One 1.5hr exam, prac exam, classwork.
The aim of this unit of study is for students to continue the de-
velopment of an understanding of the therapeutic applications
of drugs based on their underlying pharmacodynamic and phar-
macokinetic properties. It covers chemotherapy (antibacterial,
antiviral, antifungal, antiprotozoal, anthelmintic and anticancer
drugs), analgesics and anti-inflammatory agents, respiratory
drugs, drugs affecting nutritional and metabolic function, drugs
affecting blood, and immunosuppressants.
Practical: The practical classes provide an opportunity to ob-
serve 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.
Textbooks

Textbook, study aids and reference books as recommended for
   PCOL 2603 Pharmacology 2A (Pharmacy)

PCOL 3604   Pharmacology 3B (Pharmacy)

2 credit points
Assoc. Prof. Mylecharane
Qualifying: PCOL 3603 Pharmacology 3A (Pharmacy).
Corequisite: PHAR 3610 Medicinal Chemistry 3B and PHAR 3614
Pharmacy Practice 3B. **Offered:** July. **Classes:** 2 lec/wk.
Assessment: One 1.5hr exam.
The aims of this unit of study are first, for students to continue
the development of an understanding of the therapeutic applica-
tions 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 gastro-intestinal drugs, anaes-
thetics, hypnotics, sedatives, anticonvulsants, anxiolytics, anti-
depressants, neuroleptics, and drugs used to treat motor distur-
bances and dementias. The second part of the unit of study cov-
ers principles of clinical toxicology, drug reactions and interac-
tions, reportage of drug reactions and the introduction of new
drugs, treatment of poisoning with drugs and other agents, and
drug abuse.
Textbooks

Textbook, study aids and reference books as recommended for
   PCOL 2603 Pharmacology 2A (Pharmacy)

PHAR 3607   Formulation A*

3 credit points
Professor K Brown
Prerequisite: PHAR 2607 Pharmaceutical Microbiology, PHAR
2613 Physical Pharmaceutics A and PHAR 2614 Pharmaceutics B.
Corequisite: PHAR 3601 Dispensing. **Prohibition/other:** 'Unit of
study subject to Faculty approval. **Offered:** March. **Classes:** 2 lec/
wk & 12hrs prac session & 2hr tuts. **Assessment:** One 2hr exam
(90%); prac (10%).
This unit of study aims to facilitate an understanding of the de-
sign, formulation, manufacture and evaluation of pharmaceuti-
cal dose forms. The unit starts with an introduction to different
dose forms and the importance of route of administration. Solid
dose forms are examined in detail. The formulation and evalua-
tion of aerosols is examined. The application and preparation of
radiopharmaceuticals is presented. Nasal delivery systems for
local and systmeic use are considered. Novel drug delivery tech-
nologies are also presented in this unit.
Practical: Two practical sessions will investigate the formula-
tion, manufacture and evaluation of solid dose forms.
Textbooks
Martin AN. Physical Pharamcy. Lea & Febiger, 1993
Reference books
Ansel et al. Pharmaceutical dose forms and Drug Delivery
   Systems. 6th edn, lea & febiger
Aulton. Pharmaceutics: the Science of Dosage Form Design.
   Churchill Livingston, 1988
Florence & Attwood. Physiochemical Principles of Pharmacy.
   MacMillan, 1988

PHAR 3608   Formulation B*

2 credit points
Professor K Brown
Prerequisite: PHAR 3607 Formulation A. **Prohibition/other:** *Unit
of study subject to Faculty approval. **Offered:** July. **Classes:** 2 lec/
wk. **Assessment:** One 2hr exam.
This unit of study builds on the matreial presented in Formula-
tion A (PHAR 3607). The topics covered in this unit include:
parenteral and ophthalmic formulations; rectal dose forms; top-
ical formulations; photobiology and sunscreens; and stability
aspects of pharmaceutical dose forms. Case studies in product
and process development will also be studied.
Textbooks
As fo PHAR 3607 Formulation A

PHAR 3609   Medicinal Chemistry 3A*

6 credit points
Associate Professor G Holder
Prerequisite: BCHM 2611 Proteins, Enzymes and Metabolism and
BCHM 2612 Metabolism 2 and Genes. **Corequisite:** PCOL 3603

Pharmacology 3A (Pharmacy) and PHAR 3613 Pharmacy Practice 3A. **Prohibition/other:** *Unit of study subject to Faculty approval. **Offered:** March. **Classes:** 3 lec & 1 hr tut/wk & 4hr of prac for 6 weeks. **Assessment:** One 3hr exam (70%), classwork (30%).

This unit of study deals with the application of the principles of medicinal chemistry learned in Year 2 to groups of drugs categorised by their pharmacological mode of action. For each, drug and development, the chemistry pertinent to drug use and the mode of drug action will be covered.

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 anticholinseterases, MAO, ACE; inhibitors as antiviral compounds, antibacterials, and anticancer drugs; cardiac glycosides; antilipidemic drugs.

Laboratory work will consist of the preparation of an analytical profile of a drug and is to be undertaken as a team activity over 6 weeks.

PHAR 3610   Medicinal Chemistry 3B*
6 credit points
Prerequisite: PHAR 3609 Medicinal Chemistry 3A. **Corequisite:** PCOL 3604 Pharmacology 3A(Pharmacy)and PHAR 3614 Pharmacy Practice3B. **Prohibition/other:** *Unit of study subject to Faculty approval. **Offered:** July. **Classes:** 3 lec & 1 hr tut/wk & 4hr of prac for 6 weeks. **Assessment:** One 3hr exam (70%), classwork (30%).   .

This unit of study continues on the principles of medicinal chemistry established and developed in Medicinal Chemistry 3A (PHAR 3609).

Lectures will be on the following: 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 photbbiology; 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 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.

Textbooks
As for PHAR 2609 Medicinal Chemistry 2A

PHAR 3611   Pharmacokinetics A*
3 credit points
Dr D Cutler
Prerequisite: PHAR 2613 Physical Pharmaceutics A and PHAR 2614 Physical Pharmaceutics B. **Prohibition/other:** *Unit of study subject to Faculty approval. **Offered:** March. **Classes:** 2.5 lec &0.5 tut/wk. **Assessment:** One 3hr exam.

Fundamental concepts of pharmacokinetics; mass balance principle; elimination, extraction ratio, clearance, bioavailability, constant rate infusion, first pass effect; volume of distribution; intervenous bolus kinetics; kinetics following extravascular doses; renal excretion; hepatic elimination mechanisms; tissue distribution mechanisms; calculation of multiple dose regimens.

PHAR 3612   Pharmacokinetics B*
3 credit points
Dr D Cutler
Prerequisite: PHAR 3611 Pharmacokinetics A. **Prohibition/other:** *Lnit of study subject to Faculty approval. **Offered:** July. **Classes:** 2.5 lec &0.5 tut/wk. **Assessment:** One 3hr exam.

Pharmacodynamics, metabolite pharmacokinetics, variability in pharmacokinetics and pharmacodynamics, pharmacokinetics and biopharmaceutics of selected drug classes including antibiotics, cardiovascular agents, analgesics, bronchodilators, anticonvulsants and anticoagulants; biotechnology products;

bioequivalence; pharmacokinetics and pharmacodynamics in drug development; Tutorial/Revision session.

PHAR 3613   Pharmacy Practice 3A*
6 credit points
Professor SI Benrimoj
Corequisite: PHAR 3603 Pharmacology 3A (Pharmacy), PHAR 3611 Pharmacokinetics 3A. **Prohibition/other:** "Unit of study subject to Faculty approval. **Offered:** March. **Classes:** 2 lec/wk & 10 x 2hr tuts & 9 x 4hr field work sessions. **Assessment:** 1 hr clinical exam (38%), 0;5hr oral exam (38%), tut (12%), externship assessment (12%).

Therapeutics: This section is a continuation of the therapeutics section of Pharmacy Practice 2B (PHAR 2612). Topics covered include epidemiology, pathophysiology, symptoms, signs, management of drug and non-drug treatment of diseases associated with gastrointestinal, and rheumatology. 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.

PHAR 3614   Pharmacy Practice 3B
7 credit points
Professor SI Benrimoj
Prerequisite: PHAR 3613 Pharmacy Practice 3A. **Offered:** July. **Classes:** 3 lec/wk & 10 x 2hr Tuts & 9 x 4hr field work sessions. **Assessment:** One 2hr exam (42%), 0.5hr oral exam (25%), tut (8%), externship (25%).

Therapeutics: This section is a continuation of the therapeutics section of Pharmacy Practice 3 A (PHAR 3613). Topics covered include epidemiology, pathophysiology, symptoms, signs, management of drug and non-drug treatment of diseases associated with obstetrics and gynaecology, dermatology, oncology, genito-urinary tract, hepatic, 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.

Textbooks
As for PHAR 3613 Pharmacy Practice 3A

Pharmacy Honours (1999)
Pharmaceutical Chemistry: Dr C Duke; Pharmacy Practice: Dr I Krass; Pharmaceutics: Dr A McLachlan
Offered: March.

Honours program available in 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 forBPharm 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.

PHAR4601   Integrated Dispensing
4 credit points
Dr I Krass Dr A McLachlan
Prerequisite: PHAR3601 Dispensing, PHAR 3613 Pharmacy Practice 3A and PHAR 3614 Pharmacy Practice 3B. **Offered:** March. **Classes:** 4hr prac class/wk. **Assessment:** Prao work exam (50%), assessment (50%).

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 pf 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
Professor B Roufogalis
Prerequisite: PHAR 3609 Medicinal Chemistry 3A and PHAR 3610 Medicinal Chemistry 3B. **Offered:** March. **Classes:** 3 lec & 1 tut/wk. **Assessment:** Two 2hr exam (86%) and 1 quiz/class assessment (14%).

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, rheymatoid 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; texatogenicity, 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 WO, Lemke TL & Williams DA. Principles of Medicinal Chemistry. (4th edn), Williams & Wilkins, 1995

Klaassen CD, Amdur MO & Doull J. Casarett and Doull's Toxicology: The Basic Sciences of Poisons. (3rd edn), Macmillan, 1986 (or 4th edn, 1991)

Abbas AK, Lichtman AH & Pober JS. Cellular and Molecular Immunology. WB Saunders Company, 1991

PHAR 4603   Pharmaceutics Workshop
4 credit points
Dr I Ramzan
Prerequisite: PHAR 3611 Pharmacokinetics A, PHAR 3612 Pharmacokinetics B, PHAR 3607 Formulation A and PHAR 3608 Formulation B. Offered: March. Classes: 4hr tut/workshop/wk. Assessment: Assignments (70%) and oral presentation (30%).

Small group workshops will consider problems of formulation and delivery of drugs with a range of physiochemical, biopharmaceutic, pharmacokinetc and therapeutic properties. The selected examples will include drugs with high and low aqueous solubility, with long and short elimination half-lives with low and high clearances 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 4606   Clinical Information/Technology
2 credit points
Professor SI Benrimoj
Prerequisite: PHAR 3613 Pharmacy Practice 3A, PHAR 3614 Pharmacy Practice 3B, PCOL 3603 Pharmacology 3A (Pharmacy), PCOL3604 Pharmacology 3B (Pharmacy), PHAR 3611 Pharmacokinetics A, and PHAR 3612 Pharmacokinetics B. **Offered:** July. **Classes:** 4 lec; twelve 2hr tut (2hr/wk). **Assessment:** Written assignments (100%).

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.

PHAR4607   Clinical Pathology
4 credit points
Sr HTA Cheung&DrP Atkin
Prerequisite: PHAR 3613 Pharmacy Practice 3A, PHAR 3614 Pharmacy Practice 3B, PHAR 3609 Medicinal Chemistry 3A and PHAR 3610 Medicinal Chemistry 3B. **Offered:** July. **Classes:** 3 lec/wk & 7 x 2hrs tut. **Assessment:** One 2hr exam (50%), assignments (50%).

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, anil pathophysiology and methods of analysis are covered.
Textbooks
Kaplan A & Szabo L L. Clinical Chemistry: Interpretation and Techniques. William and Wilkins, 1994

PHAR 4608   Ethics and History of Pharmacy
2 credit points
Professor SI Benrimoj
Offered: July. **Classes:** 1 lec/wk & 7 x 2hr tuts. **Assessment:** Written exam (50%), tutorial assessment (50%).
Topics to be covered are the beginnings and antiquity of Pharmacy, main periods of Pharmacy history, traditions of Asian, European and American Pharmacy, the beginnnings 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
Professor SI Benrimoj
Offered: July. **Classes:** 4 lec/wk. **Assessment:** Written exam (100%).
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.

PHAR 4612   Pharmacotherapeutics A
6 credit points
Professor SI Benrimoj
Prerequisite: PHAR 3613 Pharmacy Practice 3A, PHAR 3614 Pharmacy Practice 3B, PCOL 3603 Pharmacology 3A (Pharmacy), PCOL 3604 Pharmacology 3B (Pharmacy), PHAR 3611 Pharmacokinetics 3A and PHAR 3612 Pharmacokinetics 3B.
Offered: March. Classes: 4 lec & 2hr tut/wk. Assessment: Oral exam (40%), written exam (40%) & tutorial participation (20%).
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 dosage regimen which is appropriate for that disease. In addition, the ability to communicate such information in an appropriate manner will be discussed. The Therapeutics topics to be covered in this unit include: endocrinology, cardiology, respiratory, oncology. The unit of study will expand the role of the pharrhacist in monitoring therapeutic outcomes, and in participating in therapeutic decision-making.
Textbooks
Edwards & Walker. Clinical Pharmacy and Therapeutics.
Herfindal. Clinical Pharmacy and Therapeutics.

PHAR 4610   Pharmacotherapeutics B
6 credit points
Professor SI Benrimoj
Prerequisite: PHAR 4612 Pharmacotherapeutics A. **Offered:** July.
Classes: 4 lec & 2 hr tut/wk. **Assessment:** Oral exam (40%), written exam (40%) & tutorial participation (20%).
This unit of study continues on from Pharmacotherapeutics A. 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. The unit will expand the role of the pharmacist in monitoring therapeutic outcomes and participation in therapeutic decision-making.
Textbooks
As for PHAR 4612 Pharmacotherapeutics A

PHAR 4613 Clinical Practice A
6 credit points
Professor SI Benrimoj
Prerequisite: PHAR 3613 Pharmacy Practice 3A, PHAR 3614 Pharmacy Practice 3B, PCOL 3603 Pharmacology 3A (Pharmacy), PCOL 3604 Pharmacology 3B (Pharmacy), PHAR 3611 Pharmacokinetics 3A and PHAR 3612 Pharmacokinetics 3B.
Offered: March. **Classes:** 3hrs tut & 3hrs clinical rounds/wk.
Assessment: Case assessment by peers and clinical specialists (100%).

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 & Walker. Clinical Pharmacy and Therapeutics.
Herfindal. Clinical Pharmacy and Therapeutics.
USP-DI. Drug Information for the Health Care Professional.

PHAR 4611   Clinical Practice B
6 credit points
Professor SI Benrimoj
Prerequisite: PHAR 4613 Clinical Practice A. **Offered:** July.
Classes: 3 hrs tut & 3 hrs Clinical Rounds/week. **Assessment**
Case assessment by peers and clinical specialists (100%).
This unit of study is a continuation of Clinical Practice A. 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 course. 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
As for PHAR 4613 Clinical Practice A

Pharmacy Honours (from 2000)
Offered: March.

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.

PFJAR 4921 Pharmaceutics A (Advanced), 10 credit points

PHAR 4924 Pharmaceutics B (Advanced), 10 credit points

PHAR 4923 Pharmacy Practice A (Advanced), 10 credit
points

PHAR 4926 Pharmacy Practice A (Advanced), 10 credit
points

PHAR 4922 Pharmaceutical Chemistry A (Advanced), 10
credit points

PHAR 4925 Pharmaceutical Chemistry B Advanced), 10
credit points

PCOL 4907 Pharmacology A (Advanced), 10 credit points

PCOL 4907 Pharmacology A (Advanced), 10 credit points

Students will enrol in one subject in these advanced units by
invitation only.

PCOL 4907 **Pharmacology A Advanced (Pharmacy)**
10 credit points
Assoc. Prof. Mylecharane, Assoc. Prof. Starmer
Prerequisite: PCOL 3604 Pharmacology 3B (Pharmacy). **Offered:**
March (2000). Glasses: Two 2hr seminar & 5hr prac/wk.
Assessment: One 3hr exam (seminar), one 1.5hr exam (prac), oral
and written presentations, classwork.

(This unit of study is not available in 1999. Available from 2000)

The aim of this unit of study is to develop students' aware-
ness and understanding of the pivotal role of experimental phar-
macology in the development of drugs, and to develop their abil-
ity to conduct experimental investigations in accordance with
established standards of scientific methodology and critical anal-
ysis. The experimental pharmacological aspects of the develop-
ment of selected drug classes is studied by means of enquiry-
based and problem-based learning approaches utilizing semi-
nar/workshops, library research and written assignments. Expe-
rience in a range of pharmacological experimental techniques is
gained in supervised laboratory practical classes by completing
a series of experimental pharmacological investigations into the
actions of selected classes of drugs whose activity is well estab-
lished; experience in the practical aspects of experiment design,
analysis, interpretation and reporting of pharmacological inves-
tigations is also gained. Students will also select and prepare for
an experimental pharmacology research project, which will be
undertaken in PCOL 4908 Pharmacology B Advanced (Phar-
macy), by preparing a literature survey and research proposal
for both oral and written presentation.
Textbooks
Textbook, study aids and reference books as recommended for
PCOL 2603 Pharmacology 2A (Pharmacy)

PCOL 4908 **Pharmacology B Advanced (Pharmacy)**
10 credit points
Assoc. Prof. Mylecharane, Assoc. Prof. Starmer
Prerequisite: PCOL 4907 Pharmacology A Advanced (Pharmacy).
Offered: July (2000). **Classes:** 10hr research laboratory placement/
wk. **Assessment:** Oral presentation, written dissertation, laboratory
placement work.

(This unit of study is not available in 1999. Available from 2000)

The aim of this unit of study is to develop students' aware-
ness and understanding of the pivotal role of experimental phar-
macology in the development of drugs, and to develop their abil-
ity to conduct experimental investigations in accordance with
established standards of scientific methodology and critical anal-
ysis. In this unit of study, each student will gain experience in
some advanced experimental pharmacological research tech-
niques, through the undertaking of an individual research project
under the direct supervision of academic and research staff in
the Department, and the preparation of an oral presentation and
a written dissertation on the experimental project work. The ex-
perimental project work is undertaken in the July semester, dur-
ing placement for 15 contiguous days per week in Department
research laboratories. Students are selected for participation in
their individual research projects following initial preparation
in the February semester unit of study, PCOL 4907 Pharmacol-
ogy A Advanced (Pharmacy), in which literature reviews and
research proposals are completed.

Textbooks
Textbook, study aids and reference books as recommended for
PCOL 2603 Pharmacology 2A (Pharmacy)

PHAR 4921 **Pharmaceutics A (Advanced)**
10 credit points
DrAMcLachlan
Prerequisite: all third year pharmacy units of study. Enrolment by
invitation to those with a high WAM. **Offered:** March. **Classes:** 1hr
lec/tut, 1 hr Seminar & 8hr Project/wk. **Assessment:** Examination/
assignment (10%), Oral presentation (10%) & Report on project
(80%).

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.) A maximum of
10 students will be enrolled by invitation only.

PHAR 4922 **Pharmaceutical Chemistry A (Advanced)**
10 credit points
Dr C Duke
Prerequisite: all third year pharmacy units of study. Enrolment by
invitation to those with a high WAM. **Offered:** March. **Classes:** 1 hr
lec/tut/seminar & 9hr Project/wk. **Assessment:** Examination/
assignment (10%), Oral presentation (10%), Report on project
(80%).

The Pharmaceutical Chemistry A (Advanced) unit 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.)

PHAR 4923 **Pharmacy Practice A (Advanced)**
10 credit points
Dr I Krass & Professor SI Benrimoj
Prerequisite: all third year pharmacy units of study. Enrolment by
invitation to those with a high WAM. Offered: March. Classes: 5 lec
& 5 tut/wk. Assessment: Examination/assignment-20%, Oral
presentation - 20% & Report on Protocol - 60%.

Weekly discussion between students, their supervisors and oth-
er pharmacy practice personnel will take place in order to eval-
uate arid formulate possible methodologies for research projects.
Students will provide short oral presentations for open discus-
sion with other staff and postgraduate students at the weekly
scheduled pharmacy practice research meetings, research
projects in areas of Pharmacy Practice such as Pharmacoeco-
nomics, Pharmacoepidemiology, professional Practice, Geriat-
ric 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.) A maximum of 10 students will be enrolled by
invitation only.

PHAR 4924 **Pharmaceutics B (Advanced)**
10 credit points
DrAMcLachlan
Prerequisite:PHAR 4921 Pharmaceutics A (Advanced) at a credit
level or better. Offered: July. Classes: 1 hr lec/tut, 1hr seminar & 8
hr prac/wk. Assessment: Oral presentation -10%, Examination -
10% & Project/report - 80%.

(This unit of study will not be available in 1999.)

The PHAR 4924 Pharmaceutics B (Advanced) unit 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 acquired in the February se-
mester unit of study PHAR 4921 Pharmaceutics A (Advanced).

The course provides an important basis for those who may wish to branch into specialised areas and will be particularly useful for those seeking employment in industrial, government, hospital laboratories, research institutions and also for those considering continuation to postgraduate studies.

The lecture/tutorial and seminar components of the unit of study (2 credit points) will assist in the development of advanced laboratory based research skills and will complement the research project. The individual research project prepared in the February semester will be pursued (8 credit points). A final research presentation and report describing research results and conclusions is to be presented at the end of the July Semester.

PHAR 4925   Pharmaceutical Chemistry B (Advanced)
10 credit points
Dr C Duke
Prerequisite: PHAR 4922 Pharmaceutical Chemistry A (Advanced) at a credit level or better. **Offered:** July. **Classes:** 1 hr lec/tut/ seminar & 9 hr practical work/wk. **Assessment:** Oral presentation - 10%, Examination - 10% & Project/report- 80%.
(This unit of study will not be available in 1999.)

The PHAR 4925 Pharmaceutical Chemistry B (Advanced) course is designed to extend the Pharmacy undergraduate's knowledge and skills in research practice and problem solving, and written and oral scientific communication acquired in the February semester unit of study PHAR 4922 Pharmaceutical Chemistry A (Advanced). The course provides an important basis for those who may wish to branch into specialised areas and will be particularly useful for those seeking employment in industrial, government, hospital laboratories, research institutions and also for those considering continuation to postgraduate studies.

The lecture/tutorial/seminar component of the course (1 Unit) will assist in the development of advanced laboratory based research skills and will complement the research project. The individual research project prepared in the February semester will be pursued (9 Units). A final research presentation and report describing research results and conclusions is to be presented at the end of the July Semester.

PHAR 4926   Pharmacy Practice B (Advanced)
10 credit points
Dr I Krass & Professor SI Benrimoj
Prerequisite: PHAR 4923 Pharmacy Practice A (Advanced) at a credit level or better. **Offered:** July. **Classes:** 1 hr lec/tut/seminar & 9 hr Research Project/ wk. **Assessment:** Protocol presentation 10%, Report 90%.
(This unit of study will not be available in 1999.)

The unit 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 acquired in the February semester unit of study PHAR 4923 Pharmacy Practice A (Advanced). The unit of study provides an important basis for those who may wish to branch into specialised areas and will be particularly useful for those seeking employment in industrial, government, hospital laboratories, research institutions and also for those considering continuation to postgraduate studies.

The lecture/tutorial/seminar component of the course (1 credit point) will assist in the development of advanced research skills and will complement the research project. A final research presentation and report describing research results and conclusions is to be presented at the end of the July semester.

Bachelor of Psychology

Students should refer to the 'Summary of Requirements' in Chapter Three of this handbook for further information regarding the Bachelor of Psychology award course. The following unit of study (PSYC 3213) is only available to students in the Bachelor of Psychology. It may not be offered every year and can only be taken with the permission of the Head of Department.

PSYC 3213   Special Topics in Psychology
4 credit points
Qualifying: 16 credit points of Intermediate Psychology (or Psychology 2001 and 2002). **Prohibition/other:** Available only to BPsych or Talented Student Program students with permission of the Head of Department. **Offered:** March & July (check with coord.). **Classes:** 1 hr seminar & supervision meeting/wk. **Assessment:** 5000 word report.
PSYC 3213 is a reading and/or research unit where students will be expected to research independently (under supervision from senior academic staff) topics on current issues in Psychology and to produce a major report on the topic.
Textbooks
See Departmental handout

Bachelor of Liberal Studies

ENGL 1050   Language in Context: Image, Speech, Writing
6 credit points
Dr Williams
Offered: July. **Assessment:** Two short class exercises, one essay, end of semester exam.

The unit provides an introduction to the systematic study of English language for a variety of practical, interpretive purposes. Major topics include relations between different varieties of English, the study of grammatical structures from a meaning perspective, speech and writing variation, relationships between visual images and language, and the relevance of historical changes to the English language to contemporary practice. The major concepts introduced in this unit will enable students to analyse texts systematically, and to critique the significance of linguistic variation.
Textbooks
A resource book will be available from the Department

Graduate units of study

Master of Information Technology (MlnfTech)

The Resolutions for this course are outlined in Chapter 9.

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. All units of study are listed for each semester, but not all will be offered at any time. Availablility will depend on staff interests and resources; contact the Director for information.

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. (Not all units of study in this table will be offered in any given semester.)

    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 2 (each unit of study 6 credit points)

Units of study are group projects designed to put into practice the work covered in Table 1. Only one unit of study may be taken from this table. (Not all units of study in this table will be offered in any given semester.)

    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 3 (each unit of study 6 credit points)

A minimum of 24 credit points must be chosen from this Table and Table 4. 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 0-0 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 4 (each unit of study 6 credit points)

A minimum of 24 credit points must be chosen from this Table and Table 3. 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.

TableS (24 credit points)

COMP 5701 Information Technology Project

    This project is compulsory for all students in the Master of Information Technology.

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.

COMP5001 Algorithms

6 credit points
Offered: March & July. **Classes: 2** lec **& 1** tut/wk. **Assessment:** Assignments, written exam.
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.

COMP 5002 Artificial intelligence

6 credit points
Offered: March & July. **Classes:** 2 lec, 1 tut/wk. **Assessment:** Assignments, written exam.
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.

COMP 5003 Computer Architecture

6 credit points
Offered: March & July. **Classes:** 2 lec, 1 tut & 2 prac/wk.
Assessment: Assignments, written exam.
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
Offered: March & July. **Classes:** 2 lec, 1 tut/wk. **Assessment:** Assignments, written exam.
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
Offered: March & July. **Classes:** 2 lec, 1 tut/wk. **Assessment:** Assignments, written exam.
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 Declarative Programming Languages

6 credit points
Offered: March & July. **Classes: 2** lec, **1** tut/wk. **Assessment:** Assignments, written exam.
Table 1

What distinguishes Declarative Programming Languages is the way in which programmers specify the logic of a problem (what is to be done) rather than the mechanics of solving the problem (how to do it). It is this aspect that has led to these sorts of languages being extensively used for Artificial Intelligence software systems. In addition, they are also often used for rapid prototyping of novel software systems, and many of the ideas and techniques employed in declarative programming language systems have found broader application.

The unit of study focuses on two languages: Prolog and Lisp. Through a combination of workshops, lectures and assignment students will gain practical skills and come away with significant new tools with which to tackle future software development projects.

COMP 5007 Networked Systems

6 credit points
Offered: March & July. **Classes:** 2 lec, 2 prac/wk. **Assessment:** Assignments, written exam.
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: 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
Offered: March & July. **Classes: 2** lec, **1** tut/wk. **Assessment:** Assignments, written exam.
Table 1

Provides further study of the object-oriented paradigm in all stages of the software lifecycle.

COMP 5009 Operating Systems

6 credit points
Offered: March & July. **Classes:** 2 lec, 1 tut/wk. **Assessment:** Assignments, written exam.
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 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.

COMP5100 Software Engineering
6 credit points
Offered: March & July. **Classes:** 2 lec, 1 tut/wk. **Assessment:** Assignments, written exam.
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.

COMP5102 User Interfaces
6 credit points
Offered: March & July. **Classes:** 2 lec, 1 tut/wk. **Assessment:** Assignments, written exam.
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.

COMP5201 Algorithmic Systems Project
6 credit points
Offered: March & July. **Classes:** Supervised project. **Assessment:** Quality of software product, written report, product presentation.
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
Offered: March & July. **Classes:** Supervised project. **Assessment:** Quality of software product, written report, product presentation.
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.

COM P 5203 Intelligent Systems Project
6 credit points
Offered: March & July. **Classes:** Supervised project. **Assessment:** Quality of software product, written report, product presentation.
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 (e.g., advice-giving, troubleshooting), in a carefully selected domain; and to evaluate the utility and performance of the techniques used.

COMP5204 Large-Scale Software Project
6 credit points
Offered: March & July. **Classes:** Supervised project. **Assessment:** Quality of software product, written report, product presentation.
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.

COMP5205 Product Development Project
6 credit points
Offered: March & July. **Classes:** Supervised project. **Assessment:** Quality of software product, written report, product presentation.
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.

COMP5301 Algorithms (Adv Topic)
6 credit points
Offered: March & July.
Table 3

COMP 5302 Artificial Inteil (Adv Topic)
6 credit points
Offered: March & July.
Table 3

COMP 5303 Comp Architecture (Adv Topic)
6 credit points
Offered: March & July.
Table 3

COMP 5304 Computer Graphics (Adv Topic)
6 credit points
Offered: March & July.
Table 3

COMP 5305 Computer Networks (Adv Topic)
6 credit points
Offered: March & July.
Table 3

COMP 5306 Database Systems (Adv Topic)
6 credit points
Offered: March & July.
Table 3

COMP 5307 Distributed Systems (Adv Topic)
6 credit points
Offered: March & July.
Table 3

COMP 5308 Machine Learning (Adv Topic)
6 credit points
Offered: March & July.
Table 3

COMP 5309 Object-Oriented Systems (Adv Topic)
6 credit points
Offered: March & July.
Table 3

COMP 5400 Operating Systems (Adv Topic)
6 credit points
Offered: March & July.
Table 3

COMP 5401 Software Eng (Adv Topic)
6 credit points
Offered: March & July.
Table 3

COMP5402 **User Interfaces (Adv Topic)**
6 credit points
Offered: March & July.
Table 3

COMP 5403 **Computation Theory (Adv Topic)**
6 credit points
Offered: March & July.
Table 3

COMP 5404 **Science Visualisation (Adv Topic)**
6 credit points
Offered: March & July.
Table 3

COMP 5601 **Advances in Computer Science 1**
6 credit points
Offered: March & July.
Table 4

COMP 5602 **Advances in Computer Science 2**
6 credit points
Offered: March & July.
Table 4

COMP 5603 **Advances in Computer Science 3**
6 credit points
Offered: March & July.
Table 4

COMP 5604 **Advances in Computer Science 4**
6 credit points
Offered: March & July.
Table 4

COMP 5701 **Information Technology Project**
24 credit points
Offered: March & July.
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. International students, may, if permission is given, complete the project in their home country.

Environmental Science
Graduate Diploma in Science (Environmental Science)

The Resolutions for this award course are outlined in Chapter 9.

Course overview
The Graduate Diploma in 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 in 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 analytical chemistry or ecology) 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 in 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 in 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 33 credit points, chosen from the subjects below, plus an interdisciplinary research project worth 15 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.

Please note: Although some units of study are listed as available in both the February and July semesters they may not be offered in both semesters every year. Please check with the Administrative Coordinator before enrolling.

AGEC 4026 **Introductory Natural Resource Economics**
2 credit points
Offered: March.
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.

ENVI4501 **Interdisciplinary Research Project A**
3 credit points
Offered: March & July.

ENVI 4502 **Interdisciplinary Research Project B**
12 credit points
Offered: March & July.

ENVI 4703 **Human Ecology**
2 credit points
Offered: July.
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. This unit of study involves 21 contact hours, including talks by guest speakers.

ENVI 4705 **Introductory Environmental Biology**
3 credit points
Offered: March.
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
Offered: March.
This unit of study examines the problems of environmental sampling and introduces the statistical bases behind correct sampling regimes. This unit of study involves 4 contact hours per week for one half semester.

ENVI 4707   Environmental Physics
3 credit points
Offered: March.

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
Offered: March & July.   •*

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
Offered: March & July.

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
Offered: July.

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-basic 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
Offered: March.

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
Offered: March & July.

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 4805   The Built Environment and Planning Aspects of the Environment
2 credit points
Offered: March.

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 4807   Environmental Geology II
3 credit points
Offered: July.

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 is worth 3 credit points over the semesters, and largely involves the practical analysis of Fieldwork samples and the application of acquired environmental knowledge.

ENVI 4808   Advanced Environmental Biology
3 credit points
Offered: July.

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.

ENVI 4809   Environmental Modelling
4 credit points
Offered: March.

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. Importantly, the course is designed for non-programmers, and involves a minimum of 4 contact hours per week.

ENVI 4901   Rock Weathering
6 credit points
Offered: March & July.

Predominantly physical, chemical and biological weathering processes will be considered in terms of their effectiveness in different rocks and weathering environments. Particular emphasis will be given to solution weathering and its acceleration following environmental acidification; to the weathering of building and monumental stone, and the evidence this provides for establishing weathering rates and understanding processes; and to the use of weathering products like desert varnish as environmental indicators.

ENVI 4902   Environmental Fluvial Geomorphology
6 credit points
Offered: March & July.

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.

ENVI 4903   Ancient Environmental Change
6 credit points
Offered: March & July.

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.

Master of Science (Environmental Science)

Course overview

The Master of Science (Environmental Science) requires the completion of an interdisciplinary research project over 18 to 24 months of full-time study (18 to 48 part-time). This project must have a strong environmental emphasis. Reflecting the philosophy of Environmental Science at the Unversity of Sydney, students are encouraged to extend their knowledge base through further training by the requirement that students also satisfactorily complete 24 credit points from the units of study listed in the Graduate Diploma in Science (Environmental Science).

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) is a research degree, requiring the submission of a research thesis in a subject of significant environmental emphasis. In addition to this thesis, students are also required to satisfactorily complete 24 credit points from units of study listed for the Graduate Diploma in Science (Environmental Science)

Course descriptions
As for the Graduate Diploma in Science (Environmental Science), with the addition of the project which is described below.

Research Project
The research project represents one year's full-time work with the work load spread over 2 to 3 semesters for full-time students; 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 student's who do not wish to select their own topic.

Mathematics for the Master of Science Coursework

MATH 5001   Mathematics Option 1
6 credit points
Offered: March.

MATH 5002   Mathematics Option 2
6 credit points
Offered: March.

MATH 5003   Mathematics Option 3
6 credit points
Offered: July.

MATH 5004   Mathematics Option 4
6 credit points
Offered: July.

MATH 5005   Research Project A
12 credit points
Offered: March.

MATH 5006   Research Project B
12 credit points
Offered: July.

MATH 5007   Research Project C
6 credit points
Offered: March.

MATH 5008   Research Project D
6 credit points
Offered: March.

MATH 5010   Research Project E
6 credit points
Offered: July.

MATH 5011   Research Project F
6 credit points
Offered: July.

Microscopy and Microanalysis
Graduate Diploma in Science (Microscopy and Microanalysis)

The Resolutions for this course are outlined in Chapter 9.

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.

MCAN 4001   Principles of Microscopy and
                          Microanalysis
2 credit points
Professor Colin Sheppard
Offered: March & July.
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 4007   Instrumentation - Monitoring and
                          Maintaining Electron Microscopes
2 credit points
Professor Cockayne
Prerequisite: MCAN 4302 or MCAN 4303. Offered: July.
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
DrAnsselin
Offered: March & July.

Develops knowledge and skills in the fundamentals of specimen preparation for light microscopy. (This is a core unit of study.)

MCAN 4009   Advanced Biological Specimen Preparation for Optical Microscopy

2 credit points
Dr Dibbayawan
Prerequisite: MCAN 4008. Offered: March & July.

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
DrAnsselin
Prohibition/other: May not be counted with MCAN 4102. **Offered:** March & July.

Presents theory and practical skills of routine specimen preparation techniques used in the biological sciences including fixing, embedding, sectioning, drying, coating and staining techniques. (This is a core unit of study.)

MCAN 4102   Materials Specimen Preparation - TEM & SEM

4 credit points
Professor David Cockayne
Prohibition/other: May not be counted with MCAN 4101. **Offered:** March & July.

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.)

MCAN 4103   Surface Microscopy

2 credit points
Dr Lukins
Offered: March & July.

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 an option.)

MCAN 4104   Signal and Image Processing

4 credit points
Dr Jones
Offered: March & July.

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 an option.)

MCAN 4105   Advanced Instrumentation - Spectroscopy

4 credit points
Professor Cockayne
Offered: March & July.

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 (EELS), cathodoluminescence spectra and Auger spectroscopy, and in the interpretation of the data. (This is a core unit of study.)

MCAN 4108   Independent Project and Report

4 credit points
DrAnsselin
Prerequisite: MCAN 4301 and 4302 and 4303 and 4008 and 4102 or 4101. **Offered:** March & July.

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
Professor McKenzie
Offered: March & July.

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
Professor McKenzie
Prerequisite: MCAN **4109. Assumed knowledge:** Assumes mathematic ability including elementary complex numbers and integration. **Offered:** July.

Provides training in advanced structural analysis using X-ray, electron and neutron techniques. (This is an option.)

MCAN 4202   Microanalysis - Electron Techniques

4 credit points
Dr Nockolds
Offered: March & July.

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. (This is an option.)

MCAN 4203   Microanalysis for Materials - Non-electron Techniques

4 credit points
Dr McCulloch
Offered: March & July.

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
Dr Nockolds
Prerequisite: MCAN 4303, 4101 and 4205. Offered: March & July.

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 EM**
4 credit points
Dr Vesk
Prerequisite: MCAN 4302 and 4303 and 4101. **Offered:** March & July.

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 4207 **Image Capture and Recording**
2 credit points
Dr Jones
Offered: March & July.

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 B/W 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 4209 **Stereology**
2 credit points
Dr Ansselin
Prerequisite: MCAN 4207 and 4308. **Offered:** March & July.

Provides a general overview of stereology, including global, specific, manual and computerised measurements, geometric probability, density estimation and sampling. (This is an option.)

MCAN 4301 **Instrumentation - Light Microscopy**
4 credit points
Dr Guy Cox
Offered: Marchand July.

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 4302 **Instrumentation -Transmission Electron Microscopy**
4 credit points
Professor David Cockayne
Offered: March & July.

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 4303 **Instrumentation -Scanning Electron Microscopy**
4 credit points
Dr Clive Nockolds
Offered: March & July.

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 how to obtain the optimum performance from it in routine operation. (This is a core unit of study.)

MCAN 4304 **Instrumentation -Confocal Microscopy**
4 credit points
Dr Cox
Offered: March & July.

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 4305 **Advanced Instrumentation - Transmission Electron Microscopy**
2 credit points
Professor Cockayne
Prerequisite: MCAN 4302. **Offered:** March & July.

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 4306 **Advanced Instrumentation -Scanning Electron Microscopy**
2 credit points
Dr Clive Nockolds
Prerequisite: MCAN 4303. **Offered:** March & July.

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 4307 **Advanced Instrumentation - Confocal Microscopy**
4 credit points
Professor Sheppard
Prerequisite: MCAN 4301 and MCAN 4304. **Offered:** March & July.

Provides advanced training in confocal microscopes, and introduction to specialised techniques. (This is an option.)

MCAN 4308 **Image Analysis**
4 credit points
Dr Jones
Prerequisite: MCAN 4104 and MCAN 4207. **Offered:** March & July.

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.)

Master of Science (Microscopy and Microanalysis)

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.

MCAN5001 Project 1
8 credit points
Offered: March & July.

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. (This is a core unit of study.)

MCAN5002 Project 2
8 credit points
Offered: March & July.

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.)

MCAN5003 Essay
8 credit points
Offered: March & July.

A wide range of essay topics will be offered. (This is a core unit of study.)

Nutrition and Dietetics
Master of Nutrition and Dietetics

The Resolutions for this award course are outlined in Chapter 9.

Course overview

The MNutrDiet is a course designed to survey all aspects of human nutrition, with special emphasis on the needs of dietitians who will be working in Australia. It provides the basic training for hospital and community dietitians and nutritionists and is one of the recognised professional courses for dietitians in Australia.

The course requires two years of full-time work and study. The first year consists of coursework, lectures, tutorials and practicals. In the second year, one semester is devoted to clinical training and the other semester is spent on a small research project. The dates for this course do not follow the undergraduate academic year. First year starts at the same time as undergraduate teaching but there is some work during vacations. Second year commences in late January.

Course outcomes

Upon completion of the course, the graduate will have a sound knowledge base in nutrition and dietetics, possess the skills to improve nutritional status of individuals, families and the community at large and to modulate the course of illness with dietetics. The graduate will be skilled in basic research and have a lifelong commitment to the pursuit of excellence in professional conduct.

Admission Requirements

Applicants must have a degree from a recognised institution and have completed two full semesters in Biochemistry and Human Physiology. For example, a student who completed a BSc at Sydney should have studied Biochemistry 2001 and 2002 and Physiology 2001 and 2002. A student who has completed a BMedSc should have studied Biochemistry 2101 and 2102 and BMED 2101 and 2102. 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 do a clinical and community dietetics training placement while the other half do a research project. Then in the fourth semester (July to Nov) students cross over to the alternate course.

During the second year all students are required to attend formal lectures at the University on several days. Lectures on management, advanced clinical nutrition and advanced community nutrition are compulsory.

The units of study are supervised by a Board of Studies in Nutrition and Dietetics, chaired by the Dean of the Faculty of Science.

NTDT 5001 Nutritional Biochemistry
2 credit points
Offered: March.

The study of biochemical interrelationships between nutrients, energy supply and modification of metabolism by disease.

NTDT 5002 Nutritional Science
6 credit points
Offered: March.

The study of the macrpnutrients ie, protein, fat, carbohydrate, energy and the micronutrients ie vitamins and minerals.

NTDT 5003 Foods
2 credit points
Offered: March.

The study of nutritional content, production and consumption of major foods.

NTDT 5004 Food Science
2 credit points
Offered: March.

The study of principles of food preservation, processing, safety and microbiology.

NTDT 5005 Dietary Intake and Nutritional Assessment
4 credit points
Offered: March.

The study of methodology for assessing dietary intake and nutritional status.

NTDT 5006 Principles of Dietetic Practice
2 credit points
Offered: March.

The study of knowledge and skills of professional dietetic conduct.

NTDT 5007 Clinical Nutrition and Dietetics
12 credit points
Offered: March.

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
Offered: July.

The study of nutrition in the prevention of disease and the methods involved in promotion of nutritious food for all.

NTDT 5009 Community and Public Health Nutrition
8 credit points
Offered: July.

The study of nutrition assessment, planning, intervention and outcomes in the community.

NTDT 5101   Food Service Management
4 credit points
Offered: March.

The study of food service systems for use in institutions.

NTDT **5102**   Effective Communications for Dietitians
2 credit points
Offered: July.

The study of counselling and education methods to communicate nutrition to individuals, groups and nations.

NTDT 5103   Nutrition Research Project
24 credit points
Offered: March & July.

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. Students also attend nutrition seminars.

NTDT 5104   Clinical and Dietetics Training Placement
24 credit points
Offered: March & July.

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.

NTDT 5105   Upgrade Research Semester (full-time)
24 credit points
Offered: March & July.

NTDT 5106   Upgrade Research (Initial) (part-time)
12 credit points
Offered: March & July.

NTDT 5107   Upgrade Research (Secondary) (part-time)
12 credit points
Offered: March & July.

Master of Nutritional Science
The Resolutions for this award course are outlined in Chapter 9.
Course overview
The MNutrSc provides the same survey of all aspects of human nutrition in the first year, as the MNutrDiet but is designed for those persons who wish to pursue a career in nutrition research 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.
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: Applicants must have a degree from a recognised institution and have completed two full semesters in Biochemistry and Human Physiology. However, the requirement for 2nd year university physiology can be replaced by such alternatives as a third year course in Biochemistry or in Food Science.

Application forms are available from the Faculty of Science. Applications close on November 7 and should be lodged with the Faculty of Science together with your academic record.

NTDT 5201   Nutritional Science Research
24 credit points
Offered: March.

Pharmacy
Diploma in Hospital Pharmacy
Dr Philip Atkin

Classes and Assessment: details from Department. Admission: consult the coordinator

The Resolutions for this award course are outlined in Chapter 9.

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

PHAR4901   Therapeutics
16 credit points
Offered: Year.

Advanced study of the therapeutic use of drugs in the context of the clinical setting.

PHAR4902   Case Histories
2 credit points
Offered: Year.

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.

PHAR4903   Computing
2 credit points
Offered: Year.

Aids in the development of skills in word processing, database, spreadsheet management, statistical and graphics presentations.

PHAR4904 Literature Review

2 credit points
Offered: Year.

Develop the ability to critically evaluate the medical and scientific literature.

PHAR 4905 Research Methods

6 credit points
Offered: Year.

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

4 credit points
Offered: Year.

Biostatistical analysis of clinical research data.

PHAR 4907 Experiential learning in the hospital environment

2 credit points
Offered: Year.

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

2 credit points
Offered: Year.

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

2 credit points
Offered: Year.

A general unit of study on the biochemical basis of disease and common lab tests which help in diagnosis.

PHAR 4910 Clinical Tutorials

2 credit points
Offered: Year.

To complement lectures by providing a practical pharmacist-oriented approach to therapeutic topics

PHAR 4911 Medical Liaison

4 credit points
Offered: Year.

Attending discussion in therapeutics with final year medical students.

PHAR 4912 Therapeutics Review

4 credit points
Offered: Year.

Tutorial review of therapeutics topics.

Master of Clinical Pharmacy

Associate Professor Carol Armour

The Resolutions for this award course are outlined in Chapter 9.

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 credit points) 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:
- Pharmacy degree and an honours or diploma course
  OR
- Pharmacy degree and a minimum of three years experience as a pharmacist, subject to approval by the head of department.
  OR
- equivalent, subject to approval by the head of department.

Course structure

The program requires 48 units of study. 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
Offered: March. **Classes:** 2hrs lec/wk. **Assessment:** Oral examination (100%).

Therapeutics and the interactions between medicines is becoming increasingly complex. This unit of study 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, renal diseases, cardiology, gastroenterology and antimicrobials.

PHAR 5002 Medication Review 1

4 credit points
Offered: March. **Classes:** 1 hr lec & 3hrs tut/week. **Assessment:** Cases presented during semester - peer assessment (30%), lecturer assessment (70%).

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 unit of study 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
Offered: March. **Classes:** 2hrs lec/wk for 3 wks & 2hrs tut/wk for 6 wks & assignments 2hrs/wk for 5 wks. **Assessment:** Assignment 50%, oral presentation 50%.

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
Offered: July. **Classes:** 2hrs lec & 2hrs tut/wk. **Assessment:** Oral examination 100%.

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
Offered: July. **Classes:** 1 hr lec/wk for 14 wks & 1 hr tut/wk for 14 wks. **Assessment:** Tutorial assessment - 50%, assignment - 50%.
The amount of epidemiological literature a pharmacist is required to assess 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 epidemiological methods, clinical pharmacy, drug surveillance, studies of drug utilisation, post marketing surveillance, bias, and confounding.

PHAR 5006 Statistics
2 credit points
Offered: March. **Classes:** 1 hr lec/wk & 1 hr tut/wk for 14 weeks. **Assessment:** Assignment 50%, exam 50%.
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
Offered: March. **Classes:** 1hr lec & 3hrs tut/wk. **Assessment:** By case presentation and participation (100%).
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
Offered: March. **Classes:** 2hrs lec/wk for 6 wks & 2hrs tut/wk for 8 wks. **Assessment:** Protocol case presentation (80%), participation (20%).
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
Offered: July. **Classes:** 2hrs lec/wk for 6 wks & 2hrs tut/wk for 8 wks. **Assessment:** Continuous assessment (100%).
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
Offered: July. **Classes:** 2hrs tut/wk for 14 wks & 2hrs pracs/wk for 14 wks, then 8hrs/wk research for semester 5,6. **Assessment:** Protocol presentation (25%), research thesis (75%).
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).

Psychology
Graduate Diploma in Science (Psychology)
The Resolutions for this award course are outlined in Chapter 9.
Description
In addition to the Resolutions of the Faculty governing the Graduate Diploma in Science and other graduate diplomas which may be found in the University of Sydney Calendar, 1996 Vol. 1, Statutes and Regulations, the following applies, from 1999, to the Graduate Diploma in Science (Psychology):
Eligibility for admission
1.(1) The Faculty of Science, on the recommendation of the appropriate Interdepartmental Committee, may admit to candidature the following:

(d) Graduate Diploma in Science (Psychology) an applicant who is a holder of a Bachelors degree with a major in Psychology within the past 10 years from a recognised tertiary institution and has achieved a minimum of Credit* average in senior (third) year courses which include units in statistics/research methods which meet the requirements of the Department.

♦Students with a near Credit average may be considered (at the discretion of the Head of Department).
Award Course overview
The Graduate Diploma in Science (Psychology) is an Honours equivalent (in the terms used by the Australian Psychological Society) fourth year of study in Psychology. It is designed to meet the needs of students wishing to continue with Psychology but who have not completed a four year Honours program. The diploma requires one year of full-time or two years of part-time study.
Course outcomes
Upon completion of this course the graduate will have a sound background in significant issues in general and applied psychology, an understanding of research methodology in both experimental and field studies contexts, be capable of finding and assessing relevant research literature, be eligible to apply for further programs of study in psychology and be prepared to undertake supervised training in certain professional areas of psychology.
Course requirements
The program involves attending lectures and seminars in six units and completing a research project. The compulsory (core) units in addition to the Research Project are Psychological Research Methods and Ethics & Current Issues in Psychology. The optional units offered in 1999 are Abnormal Psychology, Counselling Psychology (I), Counselling Psychology (II), Health Psychology, Psychology of Addiction and Special Fields Seminar. All lectures are in the late afternoon/evening; day and evening seminars are available. Part-time candidates will take the compulsory units and two elective units in first year; they will take the research project and two elective units in second year.
Entry to other postgraduate programs
Students who have completed the Graduate Diploma are eligible to apply for fifth and sixth year university programs in Psychology.
Current Departmental rules on progress
In the event of a candidate failing one core unit, permission may be granted for the candidate to repeat that unit in the following year. In the event of a candidate failing an elective unit, permission may be granted to repeat that unit or to do another elective unit in its stead. Candidature normally will be terminated if any two units are failed or if a unit is failed twice.

PSYC 4711 Psychological Research Methods
5 credit points
Offered: March.

A series of lectures and tutorials on topics which include research ethics, experimental design, statistical analysis and field research methods. Contribution: 10% of total mark.

PSYC 4712 Ethics and Current Issues in Psychology
5 credit points
Offered: July.

A series of lectures covering ethical and professional issues in psychology, as well as more general issues such as the relationship between academic research and applied psychology. Contribution: 10% Of total mark.

PSYC 4713 Abnormal Psychology
5 credit points
Offered: March.

This unit of study addresses classification, epidemiology and aetiology of major diagnostic psychopathologies. Both assessment and treatment issues are considered from a behavioural and cognitive-behavioural orientation. Contribution: 10% of total mark.

PSYC 4714 Counselling Psychology I
5 credit points
Offered: March.

Lectures, seminar papers and discussions centred on selected audio and visual aids, role plays and demonstrations. The main aim of the course is to examine critically the theoretical foundations of counselling processes and to consider relevant empirical research. Contribution: 10% of total mark.

PSYC 4715 Special Fields Topic
5 credit points
Offered: March.

This consists of 8 research seminar areas: Cognitive Processes, Developmental, Individual Differences, Learning, Neuroscience, Perception, Social Psychology and Theory & Systems, which are offered as part of the Psychology Honours program. Students may participate in one of these seminar courses as a Graduate Diploma elective. Contribution: 10% of total mark.

PSYC 4716 Health Psychology
5 credit points
Offered: July.

This addresses theoretical and empirical issues associated with a number of health and medical conditions. Discussion includes 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. Contribution: 10% of total mark.

PSYC 4717 Counselling Psychology II
5 credit points
Prerequisite: Counselling Psychology I. **Offered:** July.

The weekly meetings consist of lectures, seminar papers, and discussions centred on selected audio and visual aids, role plays and demonstrations. The main aim of the course is to extend the coverage of the Semester 1 course into specific areas of counselling. Contribution: 10% Of total mark.

PSYC 4718 Psychology of Addiction
5 credit points
Offered: July.

This deals with addiction from two perspectives. The first is primarily biological, focusing on biological, pharmacological, genetic, sociopolitical and clinical aspects of addiction to psychoactive drugs. The second is primarily social, focusing on conceptual issues in defining addiction and the extent to which the notion of addiction can be extended validly to include excessive behaviours that do not involve drugs. Contribution: 10% of total mark.

PSYC 4710 Research Project A
9 credit points
Offered: March & July.

In this year long component students complete an individual research project under supervision of a member of the academic staff. An 8000 word report is assessed by at least two independent examiners. Contribution: 40% of total mark.

PSYC 4720 Research Project B
9 credit points
Offered: March & July.

See description under Research Project A (PSYC 4710) above.

Master of Psychology (MPsych)
The Resolutions for this award course are outlined in Chapter 9.

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 College 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
- therapy skills
- applied psychometrics
- psychosis
- abnormal psychology
- adult therapy
- behavioural assessment
- disabilities and behavioural medicine
- child problems
- neuropsychology
- psychophysiology
- psychopharmacology
- professional practice
- addictive behaviours
- 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 5003   Applied Psychometrics
2 credit points
Offered: March.

PSYC 5004   Psychosis
3 credit points
Offered: March.

PSYC 5007   Neuropsychology 1A
3 credit points
Offered: March.

PSYC 5008   Disabilities, Psychogeriatrics and Rehabilitation
4 credit points
Offered: July.

PSYC 5009   Child Therapy
3 credit points
Offered: March.

PSYC 5101   Neuropsychology 1B
3 credit points
Offered: July.

PSYC 5102   Psychophysiology and Behavioural Medicine
3 credit points
Offered: July.

PSYC 5103   Psychopharmacology
3 credit points
Offered: March.

PSYC 5104   Professional Practice
2 credit points
Offered: July.

PSYC 5105   Addictive Behaviours
2 credit points
Offered: March.

PSYC 5106   Research Thesis A
6 credit points
Offered: March.

PSYC 5107   Assessment Placement
6 credit points
Offered: July.

PSYC 5108   Therapy Placement
6 credit points
Offered: July.

PSYC 5109   Family, Couple and Sex Therapy
4 credit points
Offered: July.

PSYC 5201   Option 1
4 credit points
Offered: March.
Choice between Child Neuropsychology 2 and Child Health Psychology.

PSYC 5202   Option 2
4 credit points
Offered: July.
Choice between Behavioural Medicine 2 and Neuropsychology 2.

PSYC 5203   Clinical Placements A
6 credit points
Offered: March.

PSYC 5204   Case Discussions A
6 credit points
Offered: March.

PSYC 5205   Case Discussions B
6 credit points
Offered: July.

PSYC 5206   Clinical Placements B
6 credit points
Offered: July.

PSYC 5207   Research Thesis B
6 credit points
Offered: July.

PSYC 5208   Adult Therapy
3 credit points
Offered: March.
(Includes Abnormal psychology & cognitive behavioural assessment & cognitive behavioural therapy)

PSYC 5209   Assessment Methods in Psychology
5 credit points
Offered: March.

Other Faculty information

This chapter 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, counseling, 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 & prizes

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	5000 p.a. up to 4 yrs, 5 yrs forBSc/LLB	UAI of 95 or above. Awarded on the basis of academic merit and personal attributes.
Australian Coal Association (closes mid January)	600-1200	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	2000	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	2500	Full-time first year BSc student who has not undertaken previous tertiary study. Awarded on the basis of academic merit. 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 (closes mid-January)	700-1200	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.
Medical Science Scholarships (2)	2000	On the basis of academic merit to students entering the BMedSc.
Molecular Biology and Genetics Scholarship	2000	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	100	Proficiency in Senior Marine Sciences units of study.
Procter and Gamble	2500	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	2000	Awarded to highly ranked Alumni Scholarship applicants.
Science Scholarship for Academic Excellence	2000	Awarded to students with a UAI of 100.
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.
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 an award course 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.

, Prize or Scholarship	Value $	Qualifications
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.
Slade Prizes (6)	80	Proficiency in practical classes in Intermediate Chemistry, Geology, Biochemistry, or Junior Geography or Biology.

Biological Sciences

Biology Entry Scholarships (2)	2000 each	On the basis of UAI 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 or 2901 and 2902
Eva Saunders Memorial Prize	60	To a female student for merit in Intermediate or Senior Plant Sciences.
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)	2000 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)	800	Merit in Senior Chemistry to students proceeding to Chemistry Honours.
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 Scholarship (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 Prize Analytical Chemistry	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)	2000	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.
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.
Professor John Rosenberg Prize for Excellence in Computer Science	550	

Geography

Geography Entry Scholarship	2000	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.

Prize or Scholarship	Value $	Qualifications
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 Charle Marshall Thesis Prize	1000	Best Honours thesis in a Geoscience, Mining or Extractive Metallurgical Engineering Department in NSW and ACT
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	6500	Proficiency in Geology Honours to a student proceeding to postgraduate Geology.
Deas-Thomson Scholarship in Mineralogy	1000	Merit in Senior Geology to a student proceeding to Honours.
Earth Resources Foundation Honours Year Scholarships (2)	1000	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	1000	Best overall Senior student in Geophysics.
Geological Society of Australia Prize		Merit in Senior Geology to a student proceeding to Honours.
Jack Mahoney Memorial Prize	90	Junior Geology practical.
Ken Richard's Memorial Scholarship	1250	For Geological Science Honours.
L. A. Richardson Memorial Prize	3000	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 (NSW) Prize in Mathematics	100	Merit in Mathematics or Statistics 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 Mathematics by a student proceeding to full-time Honours in Applied Mathematics.
K.E. Bullen Scholarship No. Ill	1000	Merit in Senior Mathematics by a female student proceeding to full-time Honours in Applied Mathematics.
K.E. Bullen Memorial Prize	650	Merit in Applied Mathematics Honours.
Mathematics Entry Scholarships (2)	2000 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 (NSW Branch) Prize in Mathematical Statistics	200	Merit in Statistics Honours.
The M.J. and M. Ashby Prize for Mathematics in Science	250	Best Honours essay in the School.
Tim Brown Prize No. 1	130	Merit in Intermediate Statistics.
Tim Brown Prize No. 2	210	Merit in Senior Statistics.
Veronica Thomas Prize	100	Proficiency in General Statistical Methods.
Wadsworth Publishers Prize (book vouchers)	125	Merit in Junior Mathematics.
Medical Oncology		
Medical Oncology Scholarship	1000	Honours research in Cancer Biology.
Medical Sciences		
Korner Prize	100	Proficiency in the core units of study within the second year of the BMedSc.
YE. Knight Neuroscience Essay Prize (Prize subject to approval)	100	For the best short essay (2000 word limit) with diagrams and references, on a current topic of Neuroscience research

Prize or Scholarship	Value $	Qualifications
Microbiology		
Sydney Chinese Association Prize	100	Proficiency in Senior Microbiology or Agricultural Microbiology.
Pharmacology		
Roland H. Thorpe Prize	200	Proficiency in Senior Pharmacology.
Dorothy Thorpe Prize		
Pharmacy		
David Hutcheson Prize for Pharmacy Practice	150	Merit in Pharmacy Practice 3.
Guild Insurance Company Limited Prize	100	Merit in Senior Pharmacy.
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)	2000 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 (NSW Branch) Prize in Physics	100	Merit in Physics Honours.
Deas-Thomson Scholarship in Physics	6500	Merit in Senior Physics.
Geoffrey Builder - AWA Prize	250	Merit in Intermediate experimental Physics
Levey Scholarships No 1	825	Merit in Junior Physics.
Science Foundation for Physics Scholarships No 1 (5)	700	Merit in Junior Physics.
No 2 (5)	800	Merit in Intermediate Physics.
No 3 (5)	900	Merit in Senior Physics.
Physics Entry Scholarships (2)	2000 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 experimental Physics.
Walter Burfitt Scholarship No. II	750	Merit in Senior Physics.
Malcolm Turki Memorial Scholarship	1500	Merit in Senior Physics and financial need, to a student entering Honours 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)	2000 each	On the basis of academic merit to students entering the BPsych.
Both Undergraduates and Postgraduates		
K.E. Bullen (Greig Fester Pty Ltd) Scholarship	1500	Merit in Senior or Honours Applied Mathematics.
K.E. Bullen (Kinhill Engineers Pty Ltd) Scholarship	1 500	Merit in Senior or Honours Applied Mathematics.
Henry Chamberlain Russell Prize	250-1400	Essay, thesis or research report on Astronomy.
Lewy Miall Pattinson Scholarships	300-2000	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.
John Coutts Scholarship	1000p.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 Lecturesi	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	2500	Postgraduate research in science.
Martin and Elizabeth Jane Simmat Prize No. 2	250	Merit in MPsych.
The Margaret Stewart Fund Scholarship	15 364 p.a.	Postgraduate research in Psychology.
Jo Rogers Memorial Prize	varies	Top student in final year Nutrition & Dietetics course.
Yakult Award	300	Top student in Clinicial Dietetics in last year of Nutrition & Dietetics course.

Prize or Scholarship	Value $	Qualifications
Elizabeth Wunsch Postgraduate Research Scholarship in Pharmacy	14 260p.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	2500	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.
Bursaries		
AusIMM Mining and Metallurgical Bursaries	600	Best Intermediate, Senior and Honours students in a Geoscience, Mining or Extractive Metallurgical Department in NSW or ACT
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).

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 Madsen 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

Director: Associate Professor Andy Short
The Marine Studies Centre integrates and coordinates undergraduate 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 or (02) 9351 6291.

Mathematics Learning Centre

Lecturer-in-charge: Ms 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 and 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 lecturers, and we also arrange small supplementary tutorials for students who are having difficulties. Introductory and bridging courses in mathematics and statistics are organised during the summer.

The centre is located on the 4th floor of the Carslaw Building (Room 455). Any student seeking assistance should call at the centre, or phone (02) 9351 4061.

The Australian Key Centre for Microscopy and Microanalysis

Director: Professor David Cockayne
The Australian Key Centre for Microscopy and Microanalysis is established and supported under the Australian Research Council's Research Centre Programme and focuses on industry interaction, educational development and innovative research. It has access to unparalleled infrastructure and expertise in optical and electron microscopies and microanalysis.

The teaching and research programmes are undertaken by staff of the Electron Microscope Unit, School of Physics and local and overseas visiting academics.

The Key Centre offers Graduate Diploma, Masters and PhD programs which provide students with the knowledge and skills required to become practical microscopists and microanalysis. For further information call Professor Cockayne (02) 9351 2351, see www.kcmm.usyd.edu.au, or visit LG24 Madsen Building.

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, Medical Science 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 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.

Figures for 1997 establish that over 85% of University of Sydney Science graduates are employed or in full-time study within months of graduation.

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: Carslaw, Chemistry, Geology and Geophysics, and Biochemistry, to name a few.

In 1954 a donation from Adolph Basser enabled the University to buy its first computer; in 1956 an electron microscope was purchased. These items of major equipment opened up many new fields of research and teaching.

Undergraduates have come to play an increasing part in the activities and operation of the Faculty. In 1904 the Science Society was established, which eventually became the Sydney University Science Association, and in 1971 the first students were elected to the Faculty of Science.

In 1985 the Faculty celebrated the centenary of its first graduates. A series of lectures, exhibitions, films and social events was held. A history book *Ever Reaping Something New* was published. A film about the Faculty, entitled *A Century of Science,* was also produced and broadcast nationally by the ABC.

Undergraduate degree regulations

This chapter contains the regulations governing the undergraduate degrees offered by the Faculty of Science. These are:

Bachelor of Science	BSc
Bachelor of Computer Science and Technology	BCST
Bachelor of Computer Science and Technology (Advanced)	BCST(Advanced)
Bachelor of Medical Science	BMedSc
Bachelor of Pharmacy	BPharm
Bachelor of Psychology	BPsych

The Bachelor of Science includes the specially designated degree programs:

Bachelor of Science (Advanced)	BSc(Advanced)
Bachelor of Science (Advanced Mathematics)	BSc(Advanced Mathematics)
Bachelor of Science (Bioinformatics)	BSc(Bioinformatics)
Bachelor of Science (Environmental)	BSc(Environmental)
Bachelor of Science (Molecular Biology and Genetics)	BSc(Molecular Biology and Genetics)
Bachelor of Science (Nutrition)	BSc(Nutrition)

The Faculties of Arts and of Science jointly offer the:

Bachelor of Liberal Studies	BLibStud

The Faculty also jointly offers several combined degree programs:

Bachelor of Arts/Bachelor of Science	BA/BSc
Bachelor of Engineering/Bachelor of Science	BE/BSc
Bachelor of Science/Bachelor of Arts	BSc/BA
Bachelor of Science/Bachelor of Commerce	BSc/BCom
Bachelor of Science/Bachelor of Engineering	BSc/BE
Bachelor of Science/Bachelor of Laws;	BSc/LLB

The regulations governing postgraduate award courses are to be found in Chapter 9.

Degree of Bachelor of Science

Regulations

Resolutions of the Senate

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(l)(xi), 4(l)(xii), 6(2), 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
Nutritional Science
Pharmacology
Physics
Physiology
Psychology
Soil Science
Statistics

(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 3, 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.

{A} 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(l)(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 (or its predecessor prior to Second Semester 1997, Terminating Pass) was awarded;
>
> (xi) except as provided in sections 11 (4) and 13, no more than 28 credit points are from units of study not in Science Discipline Areas, taken from not more than two subject areas 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 award course;

(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 enrols 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.

(4) Where a candidate enrols 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 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 enrols 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 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 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;

(v) 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:

(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 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 an average of at least 24 credit points in each semester of enrolment over the duration of the degree;

(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) (a) 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); or (b) qualify for admission to Intermediate units of study designated as Advanced (and/or 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)) to a value of at least 16 credit points.

(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);

(4) Candidates wishing to graduate in the BSc (Advanced Mathematics) degree program shall:

(i) (a) 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). Of these 24 credit points, at least 12 credit points are from Junior units of study designated as Advanced in the Science Discipline Areas of Mathematics and Statistics; or (b) qualify for admission to Intermediate units of study designated as Advanced in the Science Discipline Areas of Mathematics and Statistics (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)) to a value of at least 16 credit points

(ii) include, in the Intermediate units of study taken, at least 24 credit points in the Science Discipline Areas of Mathematics and Statistics. Of these 24 credit points, at least 16 credit points are 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);

(iv) complete no more than 44 credit points from units of study not in Science Discipline Areas.

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
(4) Nutritional Science	Table V

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 VI associated with this section for the Bachelor of Science degree', prov ided 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 VI, 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 VI, 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 VI until they have completed the units of study Legal Institutions 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.'

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 Surgery[2],

(ii) Bachelor of Arts and Bachelor of Science;

(iii) Bachelor of Science and Bachelor of Commerce;

(iv) Bachelor of Engineering and Bachelor of Science

(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 Faculties.[1]

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 be enrolled in more than one Honours unit of study at any one time.

(4) Candidates who have qualified for the Honours degree may take, in the next semester or at such later times as the Faculty permits, an additional Honours unit of study for which they are qualified.

Honours units of study

17.(1) Candidates for the Honours degree shall complete an Honours unit of study, full-time over two consecutive semesters.

(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 four consecutive semesters. 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, Nutritional Science, 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.

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1. See the sections 'Combined Science/Law degree', 'Combined Science/Engineering degrees', 'Combined Science/Medicine degrees', 'Combined Science/Commerce degree' and 'Combined Arts/Science degrees'elsewhere in the Handbook.

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

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 [see Arts handbook] 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 six semesters) 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 unit of study. In cases where the Honours unit of study 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 unit of study.
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 six semesters 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 ten semesters 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 unit of study. In cases where the Honours unit of study 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 unit of study.
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 six semesters 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. Except as provided in Section (4) 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 who fail to complete the required 48 credit points specified in Section 3 of the Resolutions but who have completed a minimum of 40 credit points may in the following year of their BE enrolment complete the remaining units of study necessary to satisfy the 48 credit point requirement of the BSc. Otherwise such candidates may only be readmitted to the Faculty of Science if a successful application is made at the appropriate time through the Universities Admission 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 Bachelor of Science degree.

5. Candidates admitted under Section 14 shall comply with Section 5 of the Resolutions of the Senate governing the degree of Bachelor of Science.

6. 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.

BE/BSc Joint Resolutions of the Faculties of Engineering and Science

1. Candidature for this combined degree program is a minimum of 5 years of full-time study.

2. Candidates qualify for the two degrees of the combined program (a separate testamur being awarded for both the BE and the BSc) by completing at least 240 credit points which must include the following:
(a) At least 160 credit points from the units of study prescribed for the BE specialisation undertaken. These units of study are set out in the tables appended to the Senate Resolutions relating to the BE degree.
(b) At least 80 credit points from units of study listed in Table 1 for the BSc degree other than those in the Science Discipline Area of Engineering Science, 32 of which must be from Intermediate units of study and 24 of which must be from Senior units of study in one Science Discipline Area.
(c) The same unit of study cannot be used to satisfy the requirements of (a) and (b).

3. (a) 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 currently enrolled).
(b) The choice of units of study made by a candidate shall be limited by the exigencies of the timetable except that where two units of study are given wholly or partly at the same time the Heads of the Departments concerned may give permission for the candidate to attend equivalent units or parts of units at another time.

4. Candidates will be under the general supervision of the Faculty of Engineering. General supervision covers all areas of policy and procedures affecting candidates, such as combined degree program rules and enrolment procedures. Candidates will be under the supervision of the Faculty of Science regarding enrolment and progression within the BSc component of the combined degree program, as defined in subsection 2(b).

5. Candidates may qualify for the award of BE degree with Honours.

6. Candidates who complete the combined degree program may qualify for admission to an honours year in the Faculty of Science.

7. Candidates who abandon the combined degree program may elect to complete the BE degree in accordance with the appropriate Senate Resolutions.

8. Candidates in the combined degree program may apply for admission to the BSc degree and enrol in such units of study as are required to complete the requirements for the degree. Such candidates shall be deemed to have abandoned the BE/BSc combined degree program.

9. The Deans of the Faculties of Engineering and Science shall jointly exercise authority in any matter concerning this combined degree program not otherwise dealt with in the Senate Resolutions or these joint resolutions.

Combined Science/ Commerce degree

BSc/BCom 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 six semesters 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 enrolled[3].

4. Candidates will be under the general supervision of the Faculty of Science until the end of the semester 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 six semesters of
■ *Q* enrolment, enrol in at least ^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 unit of study.

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

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.
(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;

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.

(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, Fxonomics 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:

$$\sum W_c$$

where W_c 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 M_c 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

Award of the degree with Honours

8. (a) **On** completion of the requirements for the award of the degree with the grade of Distinction or High Distinction, candidates may apply for admission to Honours candidature in a subject area in which an Honours Year is available for the Bachelor of Arts or the Bachelor of Science, provided that the entry requirements have previously been satisfied.

(b) The Honours Year consists of 48 credit points in units of study at 4000 level in a single subject area, or with the permission of the Faculties as Joint Honours in two subject areas.

(c) The 48 credit points in units of study at 4000 level must be completed full-time in two consecutive semesters, except that on the recommendation of the Head of Department concerned, the Faculties may permit completion part-time over three or four consecutive semesters.

(d) Honours candidates, including part-time candidates, may not be enrolled in any other unit of study, program or course at any institution except with the permission of the Deans of Arts and Science.

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

(i) Honours Class I, Class II and Class III
(ii) Within Honours Class II, in two Divisions, (I) and (II).

(f) A candidate who qualifies for the award of Honours Class I and whose work is in the opinion of the Deans of Arts and Science of outstanding merit qualifies for a University Medal.

Degree of Bachelor of Computer Science and Technology (BCST)
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, BEc, as well as all core or recommended elective units of study for the degree of BE(Computer Engineering). 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. For a unit of study available in the BA or BEc degree, the Discipline Area is called the "subject area" in the corresponding Resolutions of that degree, while for a unit of study available in the BSc degree the Discipline Area is called the "Science Discipline Area" in the corresponding Resolutions. Units of study available as "Senior Advanced" units in the BE(Computer Engineering) are regarded as Senior units of study for the Bachelor of Computer Science and Technology.

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(i) 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{l)(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(ii) 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 (or its predecessor prior to Second Semester 1997, Terminating 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 enrols 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.
(4) Where a candidate enrols 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(l)(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 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 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 enrols 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(l)(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.

BCST Advanced Program

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

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

(i) complete an average of at least 24 credit points in each semester of enrolment over the duration of the degree;

(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 12.

(3) Candidates wishing to graduate in the BCST (Advanced) Degree Program shall:

(i) (a) 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 Area of Computer Science; or

(b) qualify for admission to Intermediate units of study designated as Advanced in the Science Discipline area of Computer Science (and/or 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)) to a value of at least 16 credit points.

(ii) include, in the Intermediate units of study taken, at least 16 credit points from units of study designated as Advanced in the Science Discipline Area of Computer Science and/or from studies at Intermediate level in the Science Discipline Area of Computer Science 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 which are either in the Science Disicpline area of Computer Science or are listed in Table V(ii) of these Resolutions, and/or from studies at Senior level in the Science Discipline Area of Computer Science taken under the Faculty's Talented Student Program, as approved from time to time by the Dean under Resolution 6(2);

(iv) in satisfying section 1 l(3)(iii) complete the unit of study COMP 3809.

Admission to Honours units of study

12.(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 be enrolled in more than one Honours unit of study at any one time.

(4) Candidates who have qualified for the Honours degree may take, in the next semester or at such later times as the Faculty permits, an additional Honours unit of study for which they are qualified.

Honours units of study

13.(1) Candidates for the Honours degree shall complete an Honours unit of study, full-time over two consecutive semesters or half-time over four consecutive semesters.

(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

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 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

15.(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.

Degree of Bachelor of Medical Science

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. (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;
(ii) to complete satisfactorily the essays, exercises and the practical and field work, if any; and
(iii) 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 totaling at least 144 credit points, not more than 16 credit points of which shall be credited from units of study in which the grade of Concessional Pass (or its predecessor prior to Second Semester 1997, Terminating Pass) has 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 enrols 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.

(5) Where a candidate enrols 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 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 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 enrols 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 be enrolled in more than one Honours unit of study at any one time.

(4) Candidates who have qualified for the Honours degree may take, in the next semester or at such later times as the Faculty permits, an additional Honours unit of study for which they are qualified.

Honours units of study

12.(1) Candidates for the Honours degree shall complete an Honours unit of study, full-time over two consecutive semesters.

(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 four consecutive semesters. 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.

Degree of Bachelor of Pharmacy

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 four 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.

Units of study for Pass degree

2. 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

3. 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

4. (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

5. (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 24 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 18 credit points derived from Second Year units of study, and

(ii) until they have completed all the First Year units of study, and all the 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 18 credit points derived from Third Year units of study, and
(ii) until they have completed all the Second Year units of study and all the Third Year units of study, if any, prescribed as prerequisites for the Fourth 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

6. (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 enrols in another course of tertiary study after having been granted a suspension of candidature.

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 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 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.

(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

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 Table 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 8(1), shall be regarded as having completed such units of study for the purposes of these Resolutions.

Grades of award

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

(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 points, with all attempts at units of study being included in the calculation, except where units of study are discontinued with permission; the formula is as follows:

where W_L is the weighted credit point value - i.e., the product of the credit point value and the level of weighting of 1, 2, 3 or 4 for a First Year unit of study, Second Year unit of study, Third Year unit of study or a Fourth Year unit of study, respectively; and where M_c 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 Faculty Board of Examiners
(i) with Class 1 Honours
(ii) with Class 2 Honours, Division 1 or 2
(iii) Pass

(c) Except with the permission of the Faculty, candidates of more than four years standing in the degree shall not be awarded the degree with Honours.

(d) A candidate who has an outstanding performance in the degree and who has completed two Advanced units of study shall, if deemed to be of sufficient merit by the Faculty, receive a bronze medal.

Candidates enrolled before 1997

10. (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.

Degree of Bachelor of Psychology

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:
(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 '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 two semesters 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 third semester.

(3) In their third and fourth semesters, 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 fifth semester.

(5) In their fifth and sixth semesters, 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 seventh semester, 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.[4]

(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 unit of study.

(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 (or its predecessor prior to Second Semester 1997, Terminating 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.

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4. 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.

(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.

(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 unit of study.

(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 unit of study.

Time limits, Suspension, Part-time study
8. (1) A candidate must re-enrol each 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.

(2) 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 enrols in another course of tertiary study after having been granted a suspension of candidature.

Credit for other 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 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
10. 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
11.(1) There shall be three Classes of Honours, namely Class I, Class II and Class III, and within Class II there shall be two Divisions, namely Division 1 and Division 2.

(2) A candidate with an outstanding performance in the Honours 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
12.(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.

Postgraduate award regulations

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)

Prospective candidates for these awards should consult with the Head of the Department most closely concerned as early as possible.

Degrees of Doctor

Doctor of Science (DSc)

Resolutions of the Senate

The Resolutions of the Senate relating to the degree of Doctor of Science are printed in *University of Sydney Calendar, 1996. Vol 1, Statutes and Regulations.* The following Resolutions of the Faculty also apply:

Resolutions of the Faculty

(i) Published work which a candidate for the degree of Doctor of Science submits for examination must, in addition to satisfying the requirements of the resolutions of the Senate relating to the degree, be in a field with which the Faculty is concerned.

(ii) A candidate for the degree is required, by way of an introduction, to describe the theme of the published work submitted and, where there is a large number of publications whose dates range over a period of time and which contain some range of subject matter, to state how these are related to one another and to the theme.

(iii) If a prospective candidate, as a first step tenders the introduction called for in (ii) above, together with a list of the published work which it is proposed to submit for examination, the Faculty will endeavour to make an assessment as to whether the published work is in a field with which the Faculty is concerned and, if so, an assessment also of the prima facie worthiness for examination of the published work.

(iv) A prospective candidate who tenders the introduction together with the list of published work shall not be debarred from subsequently submitting the published work for examination.

Doctor of Philosophy (PhD)

The degree of Doctor of Philosophy is a research degree awarded for a thesis considered to be a substantially original contribution to the subject concerned. Some coursework may be required (mainly in the form of seminars) but in no case is it a major component. The Resolutions of the Senate relating to the degree of Doctor of Philosophy are printed in *University of Sydney Calendar, 1996. Vol 1, Statutes and Regulations.* 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.

Degrees of Master

Master of Science (MSc) and Master of Pharmacy (MPharm)

Postgraduate candidates in Pharmacy are now managed by the Faculty of Medicine.

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 (requiring 48 credit points per year for full-time candidature).

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

Resolutions of the Senate
Master of Science

1. (1) The Faculty of Science may, on the recommendation of the Head of the Department concerned, admit to candidature for the degree of Master of Science an applicant who

(a) is a graduate of the University of Sydney; and

(b) has, in the opinion of the Faculty, reached a first or second class Honours standard

(i) in the final year of an Honours unit of study for either the degree of Bachelor of Science or the degree of Bachelor of Pharmacy, or

(ii) in a unit of study considered by the Faculty to be equivalent to a unit of study referred to in subsection (i), or has, in some other manner, acquired a standard of knowledge considered by the Faculty to be equivalent to a first or second class Honours standard in a unit of study referred to in subsection (i).

(2) Notwithstanding subsection (1), the Academic Board may admit a person to candidature for the degree in accordance with the provisions of Chapter 10 of the by-laws.

1a. Subject to the approval of the Head of the Department, a candidate for the degree shall elect to proceed

(a) either as a full-time or as a part-time candidate;

(b) either by research and thesis in accordance with section 6 or by coursework and essay in accordance with section 7; and

(c) except in the case of a candidate proceeding in accordance with Chapter 10, either within the University of Sydney or elsewhere.

2. (1) A candidate to be full-time shall not keep the normal semesters but shall pursue candidature continuously throughout the year, except for a period of recreation leave and shall not have any substantial employment during the day.[1]

(2) A candidate who does not comply with subsection (1) shall be regarded as a part-time candidate.

3. (1) A candidate shall not present for examination for the degree earlier than one year after commencement of candidature.

(2) Except with the permission of the Faculty, a full-time candidate proceeding by research and thesis or any candidate proceeding by coursework and essay shall complete the requirements for the degree not later than two years after the commencement of candidature.

(3) Except with the permission of the Faculty, a part-time candidate proceeding by research and thesis shall complete the requirements for the degree not later than four years after the commencement of candidature.

4. Time spent by a candidate in advanced study in the University of Sydney before admission to candidature may be deemed by the Faculty to be time spent after such admission.

5. (1) The Dean of the Faculty, on the recommendation of the Head of the Department concerned, shall appoint a full-time member of the academic staff or research staff of the University to act as supervisor of each candidate.

(2) Where the supervisor is a member of the research staff, the Dean of the Faculty, on the recommendation of the Head of the Department concerned, shall also appoint a member of the full-time academic staff as associate supervisor. Any person so appointed as associate supervisor must be capable of acting as supervisor in the event that the supervisor is no longer able to act.

(3) The Dean of the Faculty, on the recommendation of the Head of the Department concerned, may appoint a full-time member of the academic staff of the University or

other appropriately qualified person to act as associate supervisor.

(4) The supervisor shall report annually to the Faculty, through the Head of Department, on the progress towards completion of the requirements for the degree of each candidate under his or her supervision.

(5) The Faculty, on the recommendation of the Head of the Department concerned, may terminate the candidature of any candidate who has not shown evidence of sufficient progress, in the opinion of the Faculty.

6. (1) A candidate proceeding by research and thesis shall

(a) carry out an original investigation on a topic approved by the Head of the Department concerned,

(b) write a thesis embodying the results of this investigation and state in the thesis generally in a preface and specifically in notes, the sources from which the information was taken, the extent to which the work of others has been used, and the proportion of the thesis claimed as original,

(c) lodge with the Registrar three copies of the thesis, typewritten and bound,

(d) if required by the examiners, sit for an examination in the branch or branches of science to which the thesis relates.

(2) The thesis shall be accompanied by a certificate from the supervisor stating whether in the supervisor's opinion the form of presentation of the thesis is satisfactory.

(3) The Dean of the Faculty on the recommendation of the Head of the Department concerned, shall appoint two, or where the Dean considers it appropriate, more than two examiners of whom one may be the person appointed to act as supervisor of the candidate.

(4) The examiners shall report to the Faculty which shall determine the result of the examination.

(5) A candidate may not present as the thesis any work which has been presented for a degree or diploma at this or another tertiary institution, but the candidate shall not be precluded from incorporating such work in the thesis, provided that in presenting the thesis the candidate indicates the part of the work which has been so incorporated.

(6) The Registrar shall lodge one copy of the thesis with the Librarian if the degree is awarded.

7. (1) A candidate proceeding by course work and essay shall

(a) attend such course of study and pass such examinations in each unit of study as the Faculty, on the recommendation of the Department concerned, shall by resolution prescribe,

(b) write a substantial essay on a topic approved by the Head of the Department concerned and state in the essay, generally in a preface and specifically in notes, the sources from which the information was taken and the extent to which the work of others has been used,

(c) lodge with the Registrar two typewritten copies of the essay.

(2) The Dean of the Faculty, on the recommendation of the Head of the Department concerned, shall appoint two examiners to examine the essay. One may be the person appointed to act as supervisor of the candidate.

(3) The examiners shall report to the Faculty which shall determine the result of the examination.

(4) The candidate may not present as the essay any work which has been presented for an award course at this or another tertiary institution, but the candidate will not be precluded from incorporating such in the essay, provided that in presenting the essay the candidate indicates the part of work which has been so incorporated.

Resolutions of the Senate
Master of Pharmacy

1. (1) An applicant for admission as a candidate for the degree of Master of Pharmacy shall

(a) except as provided in Chapter 10 of the by-laws, be a Bachelor of Pharmacy of the University of Sydney

with first or second class Honours in that branch of Pharmaceutical Science in which the candidate seeks to pursue candidature;

(b) pass a preliminary examination, unless the candidate is a Bachelor of Pharmacy with first or second class Honours or exempted by the Faculty;

(c) apply during March semester for the approval of the Head of the Department and of the Faculty of the topic of a thesis.

(2) A candidate admitted in accordance with Chapter 10 of the by-laws shall

(a) be a graduate in Pharmacy of another university at the time of admission or hold such other qualifications in Pharmacy as may be considered equivalent by the Faculty and the Academic Board; and

(b) engage for a period of not less than two years in advanced study and research in the University of Sydney.

(3) Time spent by a candidate referred to in subsection (2) in advanced study and research in the University of Sydney before admission as a candidate may, for the purpose of subsection (2), be deemed by the Faculty to be time spent after such admission.

2. After admission by the Faculty a candidate shall
(a) not less than one year after passing the preliminary examination nor less than six months after approval of the topic of the thesis, lodge a thesis embodying the results of an original investigation by the candidate;

(b) if required by the examiners, pass an examination in the branch or branches of Pharmaceutical Science to which the topic of the thesis relates.

3. The investigation shall be carried out in the University of Sydney, except that the Faculty may permit a candidate who is a graduate of the University of Sydney to carry out the investigation or part of it elsewhere.

4. The Faculty shall appoint a member of the staff of the University to act as adviser to the candidate.

5. (1) A candidate shall lodge with the Registrar three copies (printed or typewritten) of the thesis not later than the first day of February of the year in which the examination for the degree is to occur.

(2) The candidate shall state in the thesis, generally in a preface and specifically in notes, the sources from which the information was derived, the extent to which the work of others has been used, and the portion of the thesis claimed as original.

6. The Faculty shall appoint two examiners of whom one should normally be the person appointed to act as adviser in accordance with section 4.

7. The degree shall not be conferred in the case of a Bachelor of Pharmacy with first or second class Honours, until the candidate is a graduate of one year's standing and in the case of any other candidate until the candidate is a graduate of two years' standing.

Master of Information Technology (MInfTech)

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)

Resolutions of the Senate
Master of Nutrition and Dietetics (MNutrDiet)

Award of the Degree

1. The degree of Master of Nutrition and Dietetics shall be awarded in two grades, namely Pass and, in the case of an outstanding candidate, Pass with Merit.

Eligibility for Admission

2. (1) The Faculty of Science, on the recommendation of the Board of Studies, may admit to candidature for the degree

(i) graduates of the University of Sydney who have, unless exempted by the Board of Studies, completed acceptable units of study in Biochemistry and Physiology;

(ii) persons who have satisfied the requirements for the award of the Diploma of Nutrition and Dietetics.

Method of Progression and Degree Requirements

3. (1) (a) A candidate for the degree shall proceed full - time and, except with the permission of the Faculty of Science, shall complete the requirements for the degree no later than two years from the date of first enrolment.

(b) Entry to the second year of candidature shall be subject to satisfactory progress in the first year. If progress is not considered satisfactory, a candidate may be asked by the Faculty to show cause why he or she should be permitted to re-enrol.

(c) A candidate for the degree who has been admitted on the basis of having satisfied the requirements for the award of the Diploma in Nutrition and Dietetics, may elect to proceed as a full - time or part - time candidate and shall complete the requirements for the degree not later than six months from the date of first enrolment, in the case of a full - time candidate and not more than twelve months from the date of enrolment, in the case of a part - time candidate.

(d) A unit of study shall consist of lectures together with such tutorial instruction, essays, exercises or practical work as may be prescribed.

(2) A candidate shall complete in the first year of candidature such courses as may be prescribed by the Board of Studies in: Nutritional Biochemistry, Nutritional Science, Foods and Food Science, Nutrition in Individuals, Nutrition in Populations, Principles of Dietetic Practice, Clinical Nutrition, Nutrition Management, Communications.

(3) In the second year of candidature a candidate will:

(a) undertake training in the dietetics departments of primary health care settings;

(b) complete further units of study as prescribed by the Board of Studies; and

(c) undertake a project approved by the Head of the Human Nutrition Unit. The result of this project shall be presented for examination in the form of a long essay.

4. A candidate admitted under section 2(1)(ii):

(a) may be granted credit for up to three semesters towards the degree; and

(b) will undertake a project approved by the Head of the Human Nutrition Unit. The result of this project shall be presented for examination in the form of a long essay.

Examination

5. On completion of the requirements for the degree, the Faculty shall determine the result of the candidature, on the recommendation of the Board of Studies, acting on a report from the Head of the Human Nutrition Unit.

Master of Nutritional Science (MNutrSc)

Resolutions of the Senate
Master of Nutritional Science (MNutrSc)

Award of the degree

1. The degree of Master of Nutritional Science shall be awarded in two grades, namely Pass and, in the case of an outstanding candidate, Pass with Merit.

Eligibility for admission

2. (1) The Faculty of Science, on the recommendation of the Board of Studies, may admit to candidature for the degree graduates of the University of Sydney, who have, unless exempted by the Board of Studies, completed acceptable units of study in Biochemistry and Physiology.

(2) The Academic Board, on the recommendation of the Board of Studies and of the Faculty, may admit to candidature for the degree graduates of other universities who have qualifications equivalent, in the opinion of the Academic Board, to those specified in subsection (1), and on such conditions as the Board of Studies may prescribe.

Method of progression and degree requirements

3. (1)(a) A candidate for the degree shall proceed full-time and, except with the permission of the Faculty of Science, shall complete the requirements for the degree no later than two years from the date of first enrolment.

(b) Entry to the second year of candidature shall be subject to satisfactory progress in the first year. If progress is not considered satisfactory, a candidate may be asked by the Faculty to show cause why he or she should be permitted to re-enrol.

(c) A unit of study shall consist of lectures together with such tutorial instruction, essays, exercises or practical work as may be prescribed.

(2) A candidate shall complete in the first year of candidature such courses as may be prescribed by the Board of Studies in: Nutritional Biochemistry, Nutritional Science, Foods and Food Science, Nutrition in Individuals, Nutrition in Populations, Principles of Dietetic Practice, Clinical Nutrition, Nutrition Management, Communications

(3) A candidate in the second year of candidature shall proceed by research and thesis. A candidate shall:

(a) carry out an original investigation on a topic approved by the Head of the Human Nutrition Unit;

(b) write a short thesis embodying the results of the investigation and state in the thesis, generally in a preface and specifically in notes, the sources from which the information was taken, the extent to which the work of others has been made use of, and the proportion of the thesis which the student claims as original;

(c) lodge with the Registrar three copies of the thesis, typewritten and bound.

4. (1) The thesis shall be accompanied by a certificate from the supervisor stating whether in his or her opinion the form of the presentation of the thesis is satisfactory.

(2) A candidate may not present as the thesis any work which has been presented for a degree at this or another tertiary institution, but shall not be precluded from incorporating such work in the thesis, provided that in presenting the thesis indications are given to the part of the work which has been so incorporated.

(3) The Registrar shall lodge one copy of the thesis with the Librarian if the degree is awarded.

Supervision

5. The Faculty of Science shall appoint, on the recommendation of the Head of the Human Nutrition Unit, a full-time member of the teaching staff of the University to act as the supervisor for each candidate.

Examination

6. The Dean of the Faculty, on the recommendation of the Head of the Human Nutrition Unit, shall appoint two or, where the Dean considers it appropriate, more than two

examiners of whom one may be the person appointed to act as supervisor of the candidate.

7. On completion of the requirements for the degree, the Faculty shall determine the results of the candidature, on the recommendation of the Board of Studies, acting on a report from the Head of the Human Nutrition Unit.

Master of Pharmacy (Clinical) (MPharm(Clin))

Resolutions of the Senate
Master of Pharmacy (Clinical) (MPharm(Clin))

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 o/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)

Resolutions of the Senate
Master of Psychology (MPsych)

Award of the Degree

1. The degree of Master of Psychology shall be awarded in two grades, namely Pass and, in the case of an outstanding candidate, Pass with Merit.

Eligibility for admission

2. An applicant for admission to candidature for the degree shall, except as provided in Chapter 10 of the by-laws
(a) have completed units of study in Abnormal Psychology acceptable to the Faculty; and
(b) be a Bachelor of Arts or Bachelor of Science of the University of Sydney; and
(c) have obtained fourth year Honours in Psychology; or
(d) be a graduate of the University other than as specified in (b) and hold qualifications considered by the Faculty to be equivalent to fourth year Honours in Psychology at the University of Sydney; or
(e) have completed the requirements for the degree of Master of Science in Psychology or Master of Arts (Honours) or Master of Philosophy in Psychology of the University of Sydney; and
(f) have satisfied the Faculty of their personal suitability for the practice of clinical psychology. When evaluating personal suitability the Faculty may take into account previous relevant experience, reports of the referees and the outcome of selection interviews.

Method of progression

3. (1) A candidate for the degree shall proceed by completing units of study as prescribed by the Faculty.
(2) A unit of study shall consist of lectures, together with such seminars, tutorial instruction, essays, exercises or practical work as may be prescribed.
(3) In these resolutions the expression 'to complete a unit of study' means
(a) to attend the lectures, and the meetings, if any, for seminars or tutorial instruction;
(b) to complete satisfactorily the essays, exercises and practical work if any; and
(c) to pass the examinations of the unit of study.

Time limits

4. A candidate may proceed on either a full-time or a part-time basis.

5. (1) A full-time candidate shall complete the requirements for the degree not later than the end of the second year of candidature, unless otherwise determined by the Faculty.
(2) A part-time candidate shall complete the requirements for the degree not later than the end of the fourth year of candidature, unless otherwise determined by the Faculty.

Requirements for the Degree

6. The following are the requirements for the degree of Master of Psychology:
(1) Candidates for the degree are required to complete satisfactorily
(a) a coursework component according to the syllabus approved by the Faculty;
(b) a practicum component involving both training in therapeutic and assessment techniques and field placements; and
(c) a research project and submit a dissertation on that project.
(2) The requirements for the degree shall be completed in two Parts, namely Part I and Part II.
(3) A candidate must complete Part I to the satisfaction of the Faculty before proceeding to Part II.
(4) Full-time candidates are required, except with permission of the Faculty, to complete the requirements of

Part I of the course within one year of first enrolment and to complete Part II of the course within two years of first enrolment.

(5) Part-time candidates are required, except with the permission of the Faculty, to complete the requirements of Part I within two years of first enrolment and to complete Part II within four years of first enrolment.

Master of Psychology/Doctor of Philosophy[2]

7. A person may proceed concurrently as a candidate for the degrees of Master of Psychology and Doctor of Philosophy. For further details refer to the resolutions of the Senate for the combined award course for the degrees of Master of Psychology and Doctor of Philosophy.

Examination

8. On completion of requirements for the degree, the Faculty shall determine the results of the candidature, on the recommendation of the Head of the Department of Psychology.

Progress

9. The Faculty may

(a) call upon any candidate to show cause why that candidature should not be terminated by reason of unsatisfactory progress towards completion of the degree; and

(b) where the candidate does not show good cause, terminate the candidature.

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.[3]

Note: This combined degree is no longer available to new students. It is available only to students accepted into it prior to 1999.

Resolutions of the Senate
Master of Psychology/Doctor of Philosophy

The Resolutions of the Senate relating to candidature for the degrees of Master of Psychology and Doctor of Philosophy shall apply to the combined award course for the degrees of Master of Psychology and Doctor of Philosophy except for sections 1, 5, 6 and 7 of the resolutions of the Senate relating to the degrees of Master of Psychology and sections 7 and 8 of the resolutions of the Senate relating to the degrees of Doctor of Philosophy, which are replaced by the following:

Award of the degrees

1. (1) The degrees of Master of Psychology shall be awarded in two grades, namely Pass and, in the case of an outstanding candidate, Pass with Merit.

(2) The degrees of Master of Psychology shall only be awarded on satisfactory completion of the requirements for the degrees of Doctor of Philosophy, except as provided by section 15 of the resolutions of the Academic Board relating to the degrees of Doctor of Philosophy.

Time limits

2. (1) A full-time candidate shall complete the requirements for both degrees not earlier than the end of the fourth year of candidature and, unless otherwise determined by the Faculty, not later than the end of the sixth year of candidature.

(2) A part-time candidate shall complete the requirements for both degrees not earlier than the end of the fourth year of candidature and, unless otherwise determined by the Faculty, not later than the end of the seventh year of candidature.

(3) Notwithstanding sub-sections (1) and (2), a candidate who meets the requirements of sections 7(2) and (3) of the Resolutions of the Senate relating to the degrees of Doctor of Philosophy may be permitted to complete the requirements at an earlier date.

2. See also Master of Psychology / PhD Resolutions on this page.

3. See also Master of Psychology, Resolution 7, above.

Requirements for the Degrees

3. The following are the requirements for the combined award course for the degrees of Master of Psychology and Doctor of Philosophy:

(1) Candidates for the degrees are required

(a) to complete satisfactorily a coursework component according to the syllabus approved by the Faculty;

(b) to complete satisfactorily a practicum component involving both training in therapeutic and assessment techniques and field placements; and

(c) to pursue a course of advanced study and research leading to the submission of a thesis in an area of clinical research as approved by the Head of the Department of Psychology.

(2) The requirements for both degrees shall be completed in three parts, namely Part I, Part IIA and Part III.

(3) A candidate must complete Part I to the satisfaction of the Faculty before proceeding to Part IIA.

(4) Full-time candidates are required, except with permission of the Faculty, to complete the requirements of Part I within one year of first enrolment, to complete Part IIA within two years of First enrolment and to complete Part III within six years of first enrolment.

(5) Part-time candidates are required, except with the permission of the Faculty, to complete the requirements of Part I within two years of first enrolment, to complete Part IIA within four years of first enrolment and to complete Part III within seven years of first enrolment.

(6) Part III of the requirements for the degrees of Master of Psychology is satisfied under sub-section (1)(c) above.

Transfer to Master of Psychology candidature

4. The Head of the Department of Psychology may recommend that a candidate withdraw from candidature for the combined degrees and complete the requirements for the degrees of Master of Psychology under such conditions as the Faculty may determine.

Examination

5. The procedures for the examination and award of the degrees of Doctor of Philosophy (including the provision for transfer to Master's candidature if the degrees is not awarded) shall be as prescribed in the resolutions of the Senate and of the Academic Board relating to that degrees.

6. On completion of Parts I, IIA and HI of the requirements for the degrees, and following the award of the degrees of Doctor of Philosophy, the Faculty shall determine the results of the candidature for the degrees of Master of Psychology, on the recommendation of the Head of the Department of Psychology.

Master of Science (Environmental Science) (MSc(EnvironSc))

Resolutions of the Senate
Master of Science (Environmental Science) (MSc(EnvironSc))

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 an Honours degree majoring in a Science discipline that has a significant environmental emphasis, or in Environmental Science, or equivalent; or

(ii) have completed the requirements for the Graduate Diploma of Science (Environmental Science).

Availability

2. (1) Admission to candidature may be limited by a quota. In determining the quota, the University will take into account:

(i) availability of resources including space, laboratory and computing facilities; and

(ii) availability of adequate and appropriate supervision.

(2) In considering an application for admission to candidature the Program Committee for Environmental Science and the Faculty shall take account of the quota and

will select, in preference, applicants who are most meritorious in terms of section 1 above.

Method of progression

3. (1) A candidate for the degree shall proceed by completing units of study and a research thesis 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 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 research project resulting in the submission of a research thesis.

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)

Resolutions of the Senate

Master of Science (Microscopy and Microanalysis) MSc(Micr&An)

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.

Resolutions of the Senate

Graduate Diploma in Science

Eligibility for admission

1. (1) The Faculty may, on the recommendation of the head of the department concerned, admit to candidature for the Graduate Diploma in Science an applicant who is a holder of the award course of Bachelor of Science, Bachelor of Pharmacy or Bachelor of Medical Science from the University of Sydney.

    (2) The Academic Board, in accordance with the provisions of Chapter 10 of the by-laws, on the recommendation of the relevant Head of Department and of the Faculty, may admit to candidature for the graduate diploma graduates of other universities or other appropriate institutions who have qualifications equivalent, in the opinion of the Academic Board, to those specified in subsection (i).

Availability

2. (1) Admission to the graduate diploma may be limited by quota.

    (2) In determining the quota the University will take into account:

    (a) availability of resources including space, library, equipment, laboratory and computing facilities; and

    (b) availability of adequate and appropriate supervision.

    (3) In considering an application for admission to candidature the Head of Department and the Faculty shall take account of the quota and will select in preference applicants who are most meritorious in terms of section 1 above.

Method of progression and time limits

3. (1) A candidate shall engage in a program of work equivalent to that required for completion of the relevant fourth year Bachelor of Science, Bachelor of Pharmacy or Bachelor of Medical Science Honours unit of study offered by the department concerned either as a full-time student for a period of one year or, with the approval of the head of the department concerned, as a part-time student for a period of two years.

    (2) There shall be units of study in the following subjects: Agricultural Chemistry, Anatomy, Applied Mathematics, Biochemistry, Biochemistry (Molecular Biology), Biology, Cell Pathology, Computer Science, Geography, Geology, Geomorphology with Geography, Geophysics, Histology, History and Philosophy of Science, Immunology, Inorganic Chemistry, Marine Sciences, Mathematical Statistics, Microbiology, Organic Chemistry, Pharmacology, Pharmacy Practice, Physical Chemistry, Physics, Physiology, Psychology, Pure Mathematics, Soil Science, Theoretical Chemistry.

Examination

4. The award of the graduate diploma shall be subject to the completion of the program of work and examinations to the satisfaction of the Honours Board of Examiners appointed by the Faculty.

Progress

5. The Faculty may call upon any candidate to show cause why that candidature should not be terminated by reason of unsatisfactory progress towards completion of the graduate diploma and where, in the opinion of the Faculty, the candidate does not show good cause, terminate the candidature.

Graduate Diploma in Science (Environmental Science)

Graduate Diploma in Science (Microscopy and Microanalysis)

Graduate Diploma in Science (Psychology)

Resolutions of the Senate

Graduate Diploma in Science (Environmental Science)
Graduate Diploma in Science (Microscopy and Microanalysis)
Graduate Diploma in Science (Psychology)

Eligibility for admission

1. (1) The Faculty of Science, on the recommendation of the appropriate Interdepartmental Committee, may admit to candidature the following:

    (a) *Graduate Diploma in Science (Environmental Science)* An applicant who is a holder of the award course of Bachelor of Agricultural Science, Bachelor of Engineering, Bachelor of Science, Bachelor of Veterinary Science or any other award course at the University of Sydney which includes science-based units of study acceptable to the Interdepartmental Committee;

    (b) *Graduate Diploma in Science (Microscopy and Microanalysis)* An applicant who is a holder of the award course of Bachelor of Science or Bachelor of Engineering, or any other award course of the University of Sydney which includes science or engineering based subjects acceptable to the Faculty.

    (c) *Graduate Diploma in Science (Psychology)* An applicant who is a holder of a Bachelors degree with a major in Psychology from a recognised tertiary institution within the past ten years and who has achieved a minimum of credit average[4] in Senior (third year) units of study which include units of study in statistics/research methods which meet the requirements of the Department.

    (2) The Academic Board, on the recommendation of the appropriate Interdepartmental Committee and of the Faculty, may admit to candidature for the graduate diploma graduates of other universities or other appropriate institutions who have qualifications equivalent, in the opinion of the Academic Board, to those specified in subsection (1).

Availability

2. (1) Admission to the graduate diploma may be limited by quota.

    (2) In determining the quota the University will take into account:

    (a) availability of resources including space, library, equipment, laboratory and computing facilities; and

    (b) availability of adequate and appropriate supervision.

    (3) In considering an application for admission to candidature the Interdepartmental Committee and the Faculty shall take account of the quota and will select in preference applicants who are most meritorious in terms of section 1 above.

Time limits

3. A candidate shall proceed as a full-time student for a period of one year or, with the approval of the Interdepartmental Committee, as a part-time student for two years.

Method of progression

4. A candidate shall complete coursework for the graduate diploma as prescribed from time to time by resolution of the Faculty.

Examination

5. A candidate may be tested by written and oral examinations, assignments, exercises and practical work or any combination of these.

6. On completion of the requirements for the graduate diploma the results of the examination of the coursework and participation in the seminar series shall be reported by the Interdepartmental Committee to the Faculty which shall determine the result of the candidature.

Progress

7. The Faculty may call upon any candidate to show cause why that candidature should not be terminated by reason of unsatisfactory progress towards completion of the graduate diploma and where, in the opinion of the Faculty, the candidate does not show good cause, terminate the candidature.

Graduate Diploma in Science (Environmental Science) (GradDipSc(EnvironSc))

Resolutions of the Senate

See above.

Resolutions of the Faculty

1. A unit of study shall consist of lectures together with such tutorial instructions, essays, exercises or practical work as may be prescribed. In these resolutions, to *'complete a unit of study'* and derivative expressions 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 33 credit points from a list of core units of study as approved from time to time or a list of units of study approved by the Faculty, subject to the availability of these units of study at the time of enrolment, and in addition satisfactorily completing an interdisciplinary research project worth 15 credit points.

Graduate Diploma in Science (Microscopy and Microanalysis) (GradDipSc(Micr&An))

Resolutions of the Senate

See above.

Resolutions of the Faculty

1. A unit of study shall consist of lectures together with such tutorial instruction, essays, exercises or practical work in the laboratory as may be prescribed. In these resolutions, to 'complete a unit of study' and derivative expressions shall mean
(i) to attend the lectures, laboratories, tutorials and meetings as recommended;
(ii) to complete satisfactorily any practical and theoretical assignments; and
(iii) to pass the examination on the unit of study.

2. All units of study will be offered in February and July semesters.

3. A candidate shall complete coursework to the value of 48 credit points comprising ten core units of study, worth 32 credit points, and optional units of study worth 16 credit points selected from the following table:

Core Units of study

MCAN 4001	Principles of Microscopy and Microanalysis	2 *credit points*
MCAN 4301	Instrumentation - Introduction to Light Microscopy	4 *credit points*
MCAN 4302	Instrumentation - Introduction to Transmission Electron Microscopy	4 *credit points*
MCAN 4007	Instrumentation - Monitoring & Maintenance of Electron Microscopes	2 *credit points*
MCAN 4303	Instrumentation - Introduction to Scanning Electron Microscopy	4 *credit points*
MCAN 4008	Introductory Specimen Preparation for Optical Microscopy	2 *credit points*
MCAN 4102	Specimen Preparation (Materials) - TEM & SEM	4 *credit points*
MCAN 4101	Specimen Preparation (Biological) -TEM and SEM	4 *credit points*
MCAN 4105	Optical X-Ray & Electron Spectroscopy	4 *credit points*
MCAN 4304	Instrumentation - Introduction to Confocal Microscopy	4 *credit points*
MCAN 4108	Independent Project and Report	4 *credit points*

Optional Units of Study

MCAN 4009	Advanced Biological Specimen Preparation for Optical Microscopy	2 *credit points*
MCAN 4305	Instrumentation-Advanced Transmission Electron Microscopy	2 *credit points*
MCAN 4306	Instrumentation-Advanced Scanning Electron Microscopy	2 *credit points*
MCAN 4307	Instrumentation —Advanced Confocal Microscopy	4 *credit points*
MCAN 4109	Introduction to Diffraction	2 *credit points*
MCAN 4201	Advanced Diffraction Techniques	2 *credit points*
MCAN 4103	Surface Microscopy	2 *credit points*
MCAN 4104	Signal/Image Processing	4 *credit points*
MCAN 4202	Microanalysis for Materials - Electron	4 *credit points*
MCAN 4203	Microanalysis for Materials - Non-electron	4 *credit points*
MCAN 4204	Microanalysis in Life Sciences	2 *credit points*
MCAN 4205	Advanced Techniques in Biological Electron Microscopy	4 *credit points*
MCAN 4308	Image Analysis	4 *credit points*
MCAN 4209	Stereology	2 *credit points*
MCAN 4207	Image Capture/Recording	2 *credit points*

4. Satisfactory progress shall be as determined by the Faculty.

Graduate Diploma in Science (Psychology) (GradDipSc(Psych))

Resolutions of the Senate

See above.

Resolutions of the Faculty

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.

2. A candidate shall complete coursework to the value of 48 credit points comprising four core units of study and four elective units of study. The structure of the program is:

Full-time students, 24 credit points per semester

Semester 1

Unit of Study (core)	Weight	Credit points
Research Project (A)	20%	9
Research Methods	10%	5
Unit of Study (2 electives)		
Abnormal Psychology	10%	5
Counselling Psychology (I)	10%	5
Special Fields Topics	10%	5

Semester 2

Unit of Study (core)	Weight	Credit points
Research Project (B)	20%	9
Ethics/Issues	10%	5
Unit of Study (2 electives)		
Health Psychology	10%	5
Counselling Psychology (II)	10%	5
Psychology of Addiction	10%	5

Part-time students - Year 1, 25 credit points

Semester 1

Unit of Study (core)	Weight	Credit points
Research methods	10%	5
Unit of Study (1 elective)		
From table above	10%	5

Semester 2

Unit of Study (core)	Weight	Credit points
Ethics/Issues	10%	5
Unit of Study (1 elective)		
From table above	10%	5
Plus 1 further elective in Semester 1 or Semester 2		
From table above	10%	5

Part-time students - Year 2, 23 credit points

Semester 1

Unit of Study (core)	Weight	Credit points
Research Project (A)	20 %	9

Semester 2

Unit of Study (core)	Weight	Credit points
Research Project (B)	20%	9
Plus 1 further elective in semester 1 or semester 2		
From table above	10%	5

3. Satisfactory progress shall be as determined by the Faculty.

Current departmental rules on progress

In the event of a candidate failing one core unit of study, permission may be granted for the candidate to repeat that unit of study in the following year. In the event of a candidate failing an elective unit of study, permission may be granted to repeat that unit of study or to do another elective unit of study in its stead. Candidature normally will be terminated if any two units of study are failed or if a unit of study is failed twice.

Graduate Diploma in Hospital Pharmacy (DipHPHarm)

Resolutions of the Senate

1. (1) Except as provided in subsection (2) of this section, the Faculty may, on the recommendation of the Head of the Department of Pharmacy, admit to candidature for the Graduate Diploma in Hospital Pharmacy an applicant who is a Bachelor of Pharmacy of the University of Sydney.
    (2) The Academic Board, on the recommendation of the Faculty, may admit to candidature for the diploma a graduate of any other university or a candidate with qualifications from an appropriate institution whose qualifications are, in either case, equivalent in the opinion of the Faculty and the Academic Board to those specified in subsection (1), and on such conditions as the Faculty may prescribe.

2. (1) A candidate shall engage in coursework as a full-time student for a period of one year or, with the approval of the Head of the Department of Pharmacy, as a part-time student for a period of two years.
    (2) The coursework for the diploma shall be as prescribed from time to time by resolution of the Faculty.
    (3) Annual examinations for the diploma shall be held as the Faculty shall prescribe.
    (4) The award of the diploma shall be subject to completion of the coursework and the examinations to the satisfaction of the examiners, appointed by the Faculty on the recommendation of the Head of the Department of Pharmacy.

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.

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 that will make the examiners' tasks easier is obviously sensible.

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 S	Closing date for applications	Qualifications
1. Tenable at the University of Sydney			
Australian and University Postgraduate Research Awards	14961 (1997)	31 October	Graduates with Hons I. For research in any field.
Australian Postgraduate degrees course awards	11687	31 October	Graduates with honours or very good pass degrees. For Masters degrees undertaken by coursework
R. and M. Bentwich Scholarship			Graduate who holds a postgraduate research scholarship and who requires a supplementary grant.
Earth Resources Foundation Scholarship	10 500		Research in geology and geophysics
Henry Bertie and Florence Mabel Gritton Postgraduate Research Scholarships - Senior	27 139- 30 133	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 NSW
Richard Claude Mankin Scholarship - Postdoctoral	27 139- 30 133	as advertised	For research into water conservation
- Postgraduate	10 500		
Professor Harry Messel Research Fellowship in Physics		as advertised	Research in physics
- Postdoctoral	27 139- 30 133		
- Postgraduate	8882		
A.E. & F.A.Q. Stephens Research Scholarship	10 500	as advertised	Graduates with research experience. For research in any field
Elizabeth Wunsch Research Scholarship in Pharmacy	14 474		Research in pharmacy
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

Scholarship	Value $	Closing date for applications	Qualifications
James King of Irrawang Travelling Scholarship	1000	31 May	Travel grants for graduates in any faculty
G.H.S. & I.R. Lightoller Scholarship	1000	as advertised	Travel grants for graduates in Arts, Medicine, Science, Veterinary Science, Agriculture and Engineering
University of Sydney Postgraduate Research Travelling Scholarships (2)	9000*	31 October	Graduates from any faculty
J.B. Watt Travelling Scholarship	9000*	as advertised	Graduate with 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 in teaching or postgraduate research in the University of Sydney
Awarded by external bodies			
Caltex	24 000	30 September	Female graduates completing degree or diploma in year of application
Commonwealth Scholarship and Fellowship Plan Awards	living allowance*	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

Staff

Faculty of Science

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) N.S.W.I.T
Marketing Manager
Adrienne Jerram, BA Macq. GDipCommMan U.T.S
Professional Development Course Coordinator
Anne M. Powell, BBusCom Q.U.T.
Postgraduate Adviser
vacant
Undergraduate Adviser
Thea Papageorgiou
Faculty Administration Officer
Elisabeth Van de Wetering, BA
Finance Officer
Daniela Viola, RAG Scuola di Ragioneria (Milan)
Computer Systems Officer
John Twyman
Administrative Assistants
Renee Bartholomeusz
Jasmine Chambers, GDipComm U.T.S. BSc
Lisa N. Jones, BA
Shari Lee, BA Sing. MA
Eva Papas, DipEd U.N.S.W. BA
Sutira Teh

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
Alexander B. McBratney, BSc PhD Aberd. Appointed 1995
Associate Professors
Les Copeland, BSc PhD, MRACI CChem
Anthony J. Koppi, BSc PhD Aberd. (absent on secondment)
Senior Lecturers
Robert A. Caldwell, MSc PhD, MRACI CChem
Edith M. Lees, BSc PhD Lond.
Lecturer
Stephen R. Cattle, BScAdr PhD
Balwant Singh, MSc Haryana Agric Univ. HISAR India PhD
    W.Aust.
Professional Officer
John T. Corbett

Research Associates
Sundaram Baskaran, MSc Tamilnadu PhD Massey
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, BApplSc 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
Harold R. Geering, MSc Cornell
Rodney J. Roughley, PhD Lond. MScAgr
Norman K. Matheson, PhD Edin. MSc

Anatomy and Histology

Challis Professor of Anatomy
Jonathan Stone, BSc(Med) PhD DSc, FAA. Appointed 1987
Chair of Anatomy and Pain Management
Richard J. Bandler, BA Miami (Ohio) PhD Carnegie-Mellon
    DSc
Personal Chair in Visual Neuroscience
Bogdan Dreher, MS PhD Warsaw DSc
Reader
Johnston W. McAvoy, BSc Belf. PhD Flin.
Associate Professors
Cristobal G. dos Remedios, PhD DSc
Christopher R. Murphy, BSc Adel. PhD Flin. DSc
Cedric D. Shorey (Head of Department), MSc PhD U.N.S.W,
    CGIAFCGI
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.
Tailoi Chan-Ling, MOpton PhD U.N.S.W, FAAO
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
Robbert de Iongh, MSc PhD
Angela Hales, BSc PhD
Frank Lovicu, BSc PhD
Pierre Moens, MSc PhD UC Louvorin
Michael Slater, BSc Macq. PhD
Associate Lecturers
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Richard Ward, BMedSci MB BS Monash
Professional Officers
Peter R. Mills, DipMT A.I.M.L.S., AAIMLS
Timothy Shaw, BSc PhD
Vera Terry, BSc PhD
Senior Technical Officers
Darryl R. Cameron
Clive H. Jeffrey
Roland A. Smith

Technical Officers
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Henry Marell
Michael White
Administrative Officers
Lena Ting, DipPublAdmin H.K.
Debbi Douglass
Administrative Assistants
Mai Pham, BSc U.T.S.
Honorary Appointments
Honorary Associates
Arthur V. Everitt, BSc PhD
Anne Macintosh
Robert R. Munro, MD BS, FRACS
John K. Pollak, BSc PhD
Richard Wright, BA Camb. MA
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Peter O. Bishop, MB BS DSc MD, FRS FAA
William Burke, BSc PhD Lond
Estelle Lazer, BA PhD

Biochemistry

McCaughey Professor
(Vacant)
Professors
Richard I Christopherson, BSc PhD Melb. (Personal Chair).
   Appointed 1998
Philip William Kuchel, BMedSc MB BS Adel. PhD A.N.U.
   Appointed 1980
Robert Gerard Wake, MSc PhD, FAA (part-time).
   Appointed 1977
Associate Professors
Alan R. Jones, PhD Mane. MSc
Glenn F. King, BSc PhD
Emma Whitelaw, BSc A.N.U. DPhil Oxf.
Senior Lecturers
Charles A Collyer, BSc Flin. PhD
Arthur D Conigrave, BSc(Med) MB BS MSc PhD, FRACP
Merlin Crossley, BSc Melb. DPhil Oxf.
Ivan G Darvey, BSc PhD U.N.S.W.
Gareth S Denyer, BA DPhil Oxf.
Simon B Easterbrook-Smith, BSc Well. PhD Adel.
Michael A.W. Thomas, DPhil Oxf. BSc
Anthony S Weiss, BSc PhD
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
Dale P Hancock, BSc PhD (part-time)
Senior Research Fellow
J. Mitchell Guss, BSc PhD
Research Fellow
William A. Bubb, DIC Lond. BSc PhD
Computer Systems Manager
Sen Ho Tarn
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
vacant

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

Boden Professor of Human Nutrition
Ian Douglas Caterson, BSc MB BS PhD, FRACP
Appointment from 1 January 1997
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, DipIM CerfDiet 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
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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
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Maria Loveday, BSc Deakin CertDiet Vic
Rhonda Matthews, BSc DipDiet Deakin Vic
Jenny McDonnell, BSc DipNutrDiet
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Sandra Millet, BSc DipNutrDiet
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   U.N.S.W.
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Beth Rohrlach, BSc DipNutrDiet

Michele Ryan, BSc DipNutrDiet
Janice Sangster, BSc DipNutrDiet
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Fifi Spechler, BSc DipNutrDiet
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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, AUAPharm PhD DSc Adel., MASM
    FAIBiol. Appointed 1991
Professor in Experimental Ecology (Personal Chair)
Antony J. Underwood, PhD DSc Brist., FAA FLS FIBiol
    FAIBiol CBiol. Appointed 1992
Professor in Evolutionary Biology (Personal Chair)
Richard Shine, BSc A.N.U. PhD N.E. DSc. Appointed 1993
Professor in Plant Sciences (Personal Chair)
Anthony W.D. Larkum, BSc Lond. DPhil Oxf., ARCS
Readers
Christopher Dickman, BSc Leeds PhD A.N.U.
Alan W Meats, BSc Durh. PhD N'cle(U.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
Robyn L. Overall, BSc U.N.S.W. PhD A.N.U.
Director of First Year Biology
Mary Peat, BSc Birm. PhD Brist.
Senior Lecturers
Ove Hoegh-Guldberg, PhD Calif. BSc
Michael J. Kingsford, BSc Cant. MSc PhD Auck.
Peter McGee, BAgrSc PhD Adel. DipHEd U.N.S.W.
Stephen Morris, BSc Lond. PhD Glas.
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.
Dieter Hochuli, BSc Monash PhD La Trobe
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.
J\SSOCldt& 1 iP.C.tlA.Y'P.TS
Graham Harvey, BSc Griffith, MSc Qld, PhD U.N.S.W.
Osu Lilje, BSc
Jennifer Saleeba, BSc PhD Melb.
Charlotte Taylor, BSc Dund. PhD Aberd.
Associate Lecturers (half-time)
Laura Danckwerts, PhD NSW BSc
Rosanne Quinnell, BSc PhD A.N.U.
Fellowship Holders
QEII Fellow (ARC)
Gregory Rouse, MSc Qld PhD
ARC Postdoctoral Research Fellows
Michael Beck, MS Virginia PhD Florida State (Inst, of Marine
    Ecol.)
Bronwyn Gillanders, BSc Canterbury N.Z. MSc Otago PhD

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
    (EICC)
Grant Funded Postdoctoral Staff
Leila Blackman, BSc PhD
Gregory P Brown, BSc MSc Guelph
Melissa H. Brown, BSc PhD Adel.
Neville B.C. Firth, BSc PhD Monash
John Harper, BSc PhD Qu.
Ross Jones, BSc S'ton. PhD James Cook
William K. Loh, PhD
Karin Lyon, MSc PhD Aarhus
Thomas Madsen, PhD Lund
Ian Montgomery, BA Dublin PhD (Inst, of Marine Ecol.)
Nimalika Weerakoon, BSc Beloit PhD A.N.U.
Jing Ting Zhao, MedSc Shanghai PhD
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)
Naomi Jacobs, BBus U.T.S.
Finance Officer
Louie Briskoski, AssDip (Accounting) Granville T.A.F.E.
Computer Systems Officer
Sandra Lloyd, Adv Cert Urb Hort. Ryde School of Hort.
Senior Technical Officers
George Barrett, HNC(ApplBiol) U.K.
Virginia Klomp, BiolTechCert BiolTechHigherCert S.T.C.
Robert Mackay-Wood, BSc Cant.
Andrew Oulianoff
Basil Panayotakos
Malcolm Ricketts, BSc Macq. PhotogCert S.T.C.
Salvatore Ruggeri
Heather Sowden, BiolTechCert S.T.C.
Klaus-Peter Suckau, DipIlng Tech.Univ. Munich
Multimedia Courseware Developer
Aida Yalcin, BSc MSc Aegean Univ. Turkey
Technical Officers
Leslie Edwards, BiolTechCert S.T.C. AssDipBiolTech S.T.C.
    BSc U.T.S.
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 Muhlrad, BiolTechCert S.T.C.
Christine Newman, BAppSc U.T.S.
Helen Kranidiotis, BSc
Technical Officer (half-time)
Mark Dickson, BSc
Curator of Zoological Collections
Angela Low, BSc (part-time)
Laboratory Assistants
Hamlet Giragossyan (half-time)
Mihaly Ferenczi, BAgrSc Godallo
Juan Saldariagga, DipPharmChem Antioquia Columbia
Attendants

Hamlet Giragossyan (half-time)
Julio Pena
Administrative Assistants
Sabine Krause
Roslyn Malin (part-time)
Claudia Morales
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, BAgrSc Melb. DSc Adel. FAA FAAAS

Michael G. Pitman, OBE, MA PhD ScD Camb. FAA

Spencer Smith-White, DScAgr FAA

John Alexander Thomson, MSc MAgrSc PhD Melb.

Honorary Research Associates

Heather Adamson, PhD Macq. BSc

Ross A. Bradstock, BSc PhD

Judith Caton, BSc Adel. MA A.N.U. DipEd CCAE PhD A.N.U.

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) MScAgrPhD DAgrSc Melb.

Timothy Flannery, BALaT. MSc Monash PhD U.N.S.W.

Marianne Frommer, BSc PhD

Leslie Hall, BAppSc Canb. PhD Qld

George Humphrey, LLB U.N.S.W. BA PhD

Francis L. Lemckert, MSc

Garry Lynch, BSc Flinders, PhD Monash

Valerie B. Morris, BSc PhD Edin.

Peter Myerscough, MA PhD Oxon

Mats Olsson, BSc PhD Goteborg

John Palmer, MSc PhD Sheffield

Kerryn Parry-Jones, DipEd STC MAppSc PhD NSW Bsc

John D. Pollard, BSc MB BS PhD

Raymond Ritchie, BSc PhD

Deirdre Sharkey, BSc

John A Sved, BSc PhD Adel.

Athol Turner, BAppSc U.T.S. DipEd STC

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.

William Rudman, BSc 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

Louise Osborne

Elizabeth Raff, BS Penn. State PhD Duke

Roswitha Stenke, Dip PhD Munich

Jeffery Villinski, BA Minnesota MS Houston

Pathology (Cell Pathology)

Professor

Nicholas H. Hunt, BSc PhD Aston. Appointed 1989

Reader

John R. Gibbins, MDS PhD

Associate Professors

John Hilton, RFD MBChB St Andrews FRCPA

Nicholas J.C. King, MB ChB Cape T. PhD A.N.U.

Senior Lecturers

Kerry Crotty, BSc(Med) MBBS U.N.S.W. FRCPA MIAC

Brett D. Hambly, BSc(Med) MB BS PhD

Roger S. Pamphlett, BSc(Med) MD ChB Cape T. FRACP MRCPath

Chemistry

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 in Chemistry (Organic Chemistry)(Personal Chair)

Leslie D. Field, PhD DSc, FRACI CChem. Appointed 1994

Professor in Chemistry (Polymer Chemistry)(Personal Chair)

Robert G. Gilbert, PhD A.N.U. BSc, FAA FRACI CChem. Appointed 1992

Professor in Chemistry (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

Trevor W. Hambley, BSc W.Aust. PhD Adel., FRACI 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

Julia M. James, BSc PhD Lond., MRACI CChem

Senior Lecturers

George Bacskay, BSc Melb. PhD Camb.

James M. Eckert, BA MSc PhD, MRACI CChem

Margaret M. Harding, BSc PhD, MRACI CChem

Peter R. Harrowell, BSc PhD Chic.

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

Lecturer

Robert W. Baker, BSc PhD W.Aust.

Michael S. Sherburn, BSc PhD Nott.

Lecturer (fixed-term)

Mark W. Rutland, B Sc 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

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

Murray Davies, BSc PhD

Carolyn Dillon, BSc PhD

Luke Doepel, BSc

Paul Humphrey, PhD GradDipEd Adel., MRACI CChem

Aviva Levina, MSc Riga PhD Riga

Matthew P. Wilkinson, BSc PhD

Postdoctoral Fellows

Greg Metha, BSc PhD Monash

Pengwel Zhu, BSc Zhejiang PdH A.N.U.

Professional Officers

Bradley Collins, BSc PhD Qld (Optical Spectroscopy)

Tuan La, BE U.N.S.W. (Electronics)

Ian Luck, BSc

Kelvin Picker, BSc PhD, MRACI (GLC and HPLC)

Jaroslaw T. Popiolkiewicz (Electronics)

Michael P. Smyth, BSc(GenSc) (Mass Spectrometry)

Xiaomin Song, PhD lll. (Mass Spectrometry)

Peter Turner, BSc Flind. MSc PhD U.N.E.

Z. John Trafalski (Electronics)

Chuan-Liang Xie, PhD 111. (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. Swaine, 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
Richard W. O'Brien, BE U.N.S.W. PhD Camb.
Honorary lecturer
Alan J. Williams, MSc PhD, MRACI CChem

Basser Department of Computer Science

Professors
Jon D Patrick, BSc Deakin MSc Dublin, PhD Monash.
  Appointed 1998
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.
Antonios Symvonis, DipCompEng&InfoSc Patras MS PhD

Michael Wise, BA BE PhD U.N.S.W.
Lecturers
Nitin Indurkhya, PhD Rutgers
Wayne Wobcke, BSc MSc Qld PhD Essex
Raymond Wong, BSc ANU PhD HKUST
Associate Lecturers
Michael Hitchens, BMath PhD N'cle(N.S.W)
Nikki Lesley, BSc ANU MSc Colorado
Computer Systems Supervisor
Raymond Loyzaga, BSc U.N.S.W.
Computer Systems Officers
John Bignuocolo, 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
Sabine Kraus
Juhyun Pak
Josephine Spongberg
Honorary Appointments
Emeritus Professor
John Makepeace Bennett, AO, BE(Civ) BE(Mech&Elec) BSc
  Qld PhD Camb., FTS FACS FBCS FlEAust 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

Geosciences

McCaughey Professor
Eric Waddell, BA Oxf. MA McGill PhD A.N.U.
*Edgeworth David Professor of Geology and William Hilton
Hovell Lecturer*
Peter John Davies, BSc Leic. PhD Sheff. Appointed 1991
Professor of Geophysics
Iain M. Mason, BScEng Cape T. PhD Edin. Appointed 1995
Associate Professors
John Connell, BA PhD Lond.
Deirdre Dragovich, MA Adel. PhD
John B. Keene, B AgEc ME PhD Calif. BSc
Andrew D. Short, MA Hawaii PhD Louisiana State BA
Senior Lecturers
Gavin F. Birch, MSc PhD GradDipIndAdmin Cape T.
David E.M. Chapman, MEngSc U.N.S.W. BA PhD
Geoffrey L. Clarke, BSc PhD Melb.
PeterJ.Cowell,BAPhD
Colin Davey, BA U.N.E. PhD Macq.
Philip Hirsch, BA Oxf. MPhil Dundee PhD Lond.
Lecturers
Roger Buick, BSc PhD WAust.
Stephen J Gale, MA Oxf. PhD Keele
Thomas C.T. Hubble, MSc U.N.S.W. MSc DipEd
Michael Glen Hughes, BSc PhD
Alexandra R. Isern, BSc Flor. MSc Rhode Island PhD E.T.H.
  Zurich
Keith Klepeis, BA Colgate PhD Texas
Dietmar Miiller, BSc Kiel PhD Calif.
William Pritchard, BA PhD
Associate Lecturers
Gavin Doyle BSc N'cle(N.S.W)
Colin Wilkins, BSc Hull PhD James Cook
Research Fellow
Jonathan Hargreaves, BSc York SPhil Oxon.
Chief Cartographer
John E. Roberts
Honorary Appointments
Emeritus Professors
Maurice T. Daly, BA PhD
Trevor Langford-Smith, BA Melb. MSc Adel. PhD A.N.U.
  BSc

Honorary Research Associates
Jonathan Aitchison, BSc Msc Otago PhD N.E.
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
Chris Herbert, BSc
John P. Hudson, MA PhD A.N.U.
Huw Jenkins, PhD Wales
Robert A. Jones, BEng W.Aust. MEng Auck. MSc Lond.
Eric A K Middlemost, MSc PhD Cape T.
Gabriela Mora-Klepeis, BSc U.N.A.M. MA Texas
Philip Mulhearn, PhD
Gordon Packham, BSc PhD
Graeme Philip, BSc MSc Dsc Melb. PhD Cantab.
Charles Phipps, BSc PhD Toronto
Anne Reeckmann, BSc PhD Melb.
Peter Roy, BSc PhD Imp.Coll.
Erwin Schneiber, RNDR J. A. Comenius U.
Robin F. Warner, BA Birm. PhD N.E.
Edward Wheelwright, DFC MA St.And.
Kenneth Williams, MSc N.E. PhD A.N.U. BSc
Senior Technical Officers
Philip Manning
David Mitchell
Tom Savage
Administrative Officers
Rosanna Cheung
Erica Jobling

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 Ill. 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. Dun-ant, MA PhD Camb.
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 Junior 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 C. Luckock, BSc Auck. PhD N'cle(U.K.)
Charles C. 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.
M. Shelton Peiris, DipMath MSc Peradeniya PhD Monash
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
Humphrey M. Gastineau-Hills, MSc PhD
Jenny Henderson, DipEd Flin. MSc
David J. Ivers, BSc PhD
Alexander I. Molev, Diploma PhD Moscow
Adrian M. Nelson, PhD Lond. BSc
Mary C. Phipps, MSc
Rosemary S. Thompson, BSc A.N.U. PhD
Associate Lecturers
Andrew Pickering, BSc Durham, PhD Leeds
Michael Stewart, BSc MA
Vinsensia Suhana, BSc Auck. BSc U.N.S.W.
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
Mark Kisin, BSc Monash MA PhD Princeton
Postdoctoral Fellows
Stephen G. Lack, BSc PhD Camb.
Andrew P. Mathas, BSc MSc PhD Ill.
Research Associates
Jane Sexton, BSc PhD Qld.
William R. Unger, BSc PhD
Senior Research Assistants
Allan K. Steel, BA
Research Assistants
Jonathan M. Kress, BSc Adel. PhD N'cle (NSW)
Administrative Officer
Deirdre Lawrie, MA Dund.
Administrative Assistants
Flora Armaghanian
Viola Chao
Janet Doyle
Jan Love
Sonia Morr
Julie Small
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 Associates
David C. Edelman, MPhil PhD Col. SM M.I.T.
Stephen Glasby, BSc PhD
Michael S. Johnson, BSc PhD
Jacqueline R. Postle, BSc PhD U.N.S.W.
David E. Rees, MSc PhD
Ross H. Street, BSc PhD
Shu-Hao Sun, BSc MSc Shannxi Normal PhD Sichuan
George Tsoupros, BSc Aristotle, MSc Alberta PhD W.Ont.
Honorary Associate Professors
John M. Mack, MA Camb. BSc PhD
Denis E. Winch, MSc PhD, FRAS
Edward D. Fackerell, MSc PhD
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, B AgrSc 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
Honorary Appointments
Honorary Associates
K. Yip Cho, BSc U.N.S.W. PhD A.N.U.
William G. Murrell, PhD Oxf. DScAgr, FAIFST MASM

Pharmacology

Professor of Clinical Pharmacology
J. Paul Seale, MB BS PhD Lond. FRACP. Appointed 1992
Professors
Judith L. Black, MB BS PhD, FRACP. Appointed 1997
Graham A. R. Johnston, AM, MSc PhD Camb., CChem.,
    FRACI FTSE. Appointed 1980
Clinical Professor
Gillian M. Shenfield, MABCh DM Oxf., FRCP FRACP.
    Appointed 1993
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
Peter R.A. Johnson, BSc PhD
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
Lecturer
Robert J.Vandenberg, BSc PhD
Associate Lecturer
Izabela M. Brzuszczak, BSc PhD
Research Fellow
Mark A. Connor, BSc PhD Washington
Honorary Appointments
Adjunct Professor
Susan M. Pond, AM, MB BS MD U.N.S.W, FRACP FTSE
Honorary Associates
Sandra D. Anderson, PhD Lond. BSc
James Bell, BA MB BS, FRACP
Hugh R, Capper, BSc PhD
Noel J. Chambers, BSc PhD
Gregory B. Chesher, MSc PhD
L. Bruce Cobbin, BSc Melb. PhD
Richard Donnelly, MB ChB MD Birm. PhD Glasgow MRCP
    FRACP
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 I.B. Kerr, BSc PhD Adel.
Desmond J. Maddalena, DipTech N.S.W.I.T. BAppSc
    N.S.W.I.T. MAppSc N.S.W.I.T. PhD
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 MACPP
Michael B. Morris, BSc PhD
Associate Lecturers
Timothy F. Chen, BPharm DipHPharm, MPS
Shanlin Fu, BSc China MSc China PhD
Erica Sainsbury, BPharm MSc, MPS
Suzann Sime, BSc U.N.S.W.
Susan J. Taylor, MSc Lond. BPharm, MRPharmS
Frances Wilson, BPharm BA
Joint Appointments - Teacher Practitioners
Ben J. Basger, BPharm MSc DipHPharm, MPS
Barbara Bazarnik, BSc BPharm Lond.
Jason Campbell, BPharm
Cath Dwyer, BPharm
Ceridwyn Jones, BPharm
Rebecca Moles, BPharm DipHPharm
Academic (Research only)
Alaina J. Ammit, BAppSc U.T.S. MSc PhD
Vadim Dedov, BMMS PhD Yekaterinburg
Romina Nand, BSc PhD Melb.
Margaret Hughes, BSc PhD
Andrew Schrader, BSc PhD Monash
Van Hoan Tran, BPharm PhD
Kailing 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, BApSc 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 GDSc
Research Assistants
Damien Liu-Brennan, BMedSc
Linda Gelgar, MSc Sth Africa
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 Officer
Susan Putnam
Administrative Assistants
Catherine Eaton
Nicole Ginger
Maxine Mackellar, BA
Lynnette White
Computer Liaison
Nicole Haywood, BMath N'cle (N.S.W.)
Librarian
Julie Sorensen, BA GradDipLibSc
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 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 - Tradtional 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 (Astrophysics)
Lawrence Edward Cram, BSc BE PhD. Appointed 1987
Professor of Physics (Astronomy)
John Davis, BSc PhD Mane. Appointed 1987

Professor of Physics (Physical Optics)
Colin J.R. Sheppard, MA PhD Camb. DSc Oxf. Appointed 1989
Professor in Physics (Electromagnetic Physics)
Ross C. McPhedran, BSc PhD Tas.
Professor in Physics (Materials Physics)
David R. McKenzie, BSc PhD U.N.S.W.
Readers
Richard W Hunstead, BSc PhD
Peter A. Robinson, BSc PhD
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
Telescope Project Manager
Michael I. Large, BA PhD Camb.
Industry Liaison Officer
Maurice J Barton, BSc Brighton Coll Tech MSc Oxf. PhD Aston
Senior Lecturers
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
Anne Green, BSc Melb. PhD
James B.T. McCaughan, MSc PhD
John W. O'Byrne, BSc PhD
J. Gordon Robertson, BSc Adel. PhD
William J. Tango, BS Calif. PhD Colorado
Anthony J. Turtle, BA PhD Camb.
Juris Ulrichs, BSc PhD
Lecturers
Timothy R. Bedding, BSc PhD
Ian J. Cooper, BSc MPhysics DipEd U.N.S.W.
Joseph Khachan, BSc PhD U.N.S.W.
Rosemary M. Millar, BSc Qld MEd
Associate Lecturers
Manjula D. Sharma, MSc DAPh S.Pac.
Senior Research Fellow
David R. Mills, BSc PhD U.N.S.W.
ARC Senior Research Fellows
Iver H Caims,BSc PhD
Elaine M. Sadler, BSc Qld PhD A.N.U.
Kevin E. Varvell, BSc W.Aust. DPhil Oxf.
Kinwah Wu, MS PhD Louisiana
ARC Queen Elizabeth II Research Fellows
Qi-Chu Zhang, MSc PhD U.N.S.W.
Lewis T. Ball, BSc PhD
ARC Research Fellows

Sergei Vladimirov, MSc PhD Moscow Inst.Phys.&Eng.
U2000 Postdoctoral Fellows
Michael S Wheatland, BSc PhD
Andrew J Willes, BSc PhD
Postdoctoral Fellows
Pal Fekete, BSc PhD
Carol A. Jackson, BA PhD Camb.
Vincent J. Mclntyre, BSc MSc Cant.
David Miljak, BSc PhD
Nicolae Nicorovici-Porambaru, MSc Bucharest PhD Inst.At.Phys. Bucharest
Maitreyee Roy, BSc MSc MPhil Rani Dorgauati PhD
Peter G Tuthill, BSc Qld BSc (Hons) A.N.U PhD Camb.
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

Maxwell Howard Brennan, AO, HonDSc Flin. BSc PhD, FAA

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, BSc PhD Birm.

Honorary Senior Lecturers

Ian M. Bassett, MSc PhD Melb.

Ian S. Falconer, MSc N.Z. PhD A.N.U.

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.

Visiting Professors

Parameswaran Hariharan, BSc Travancore PhD Kerala

Colin A. Norman, BE Melb. DPhil Oxf.

Julius Sumner Miller Fellow

Karl Kruszelnicki, BSc MBioMedE U.N.S.W. MB BS

Special Research Centre for Theoretical Astrophysics

Director

Donald B. Melrose, BSc Tas. DPhil Oxf., FAA

Senior Research Fellows

Simon Johnston, BSc Edin. PhD Mane.

Jennifer A. Nicholls, BSc Flin. PhD Durh.

Research Fellows

Michelle C. Storey, BSc PhD

Mark A. Walker, BA Oxf. PhD Penn.

Mark J. Wardle, MSc Auck. PhD Prin.

Postdoctoral Fellows

Eric Rowe, BSc PhD

Jeanette I. Weise, BSc PhD Melb.

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

David I. Cook, BSc(Med) MB BS MSc (the University of Sydney Medical Foundation Fellow). 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 F. Davey, BSc PhD McG.

Rebecca S. Mason, MB BS PhD

Christopher O'Neill, BSc PhD N'cle(N.S.W) (Clinical Associate Professor at Royal North Shore Hospital)

Paul Pilowsky, BMedSc BMBS PhD Flinders (at Royal North Shore Hospital)

Senior Lecturers

Simon Carlile, BSc PhD (conjoint appointment in the Department of Education, Development & Evaluation)

Paul R. Martin, BSc PhD

Lecturers

Lynne J. Cottee, BSc PhD (half-time & Research Officer)

Miriam Frommer, PhD Lond. BSc

William D. Phillips, BSc PhD

Associate Lecturer

Francoise Janod-Groves, BSc N.S.WI.T. MApplSc U.T.S.

Irene Schneider, BSc U.N.S.W. MSc(Prelim)

Joint Appointees

Annick Ansselin, BA Macq. MSc PhD (Lecturer)

Visiting Fellows/Scholars

Jouji Horiuchi, BSc PhD Yamanashi

Zhao Bo Li, BSc PhD Beijing University

Meloni Muir, BSc Purdue PhD McGill

Tatsuya Tagawa, MD PhD Kyushu

Cuijiao Wu, MB BS Quingdao, MMed China Med Univ

Honorary Appointments

Emeritus Professor

William Burke, BSc PhD Lond.

Research Affiliate

Lyn R Griffiths, BSc NSW PhD (Senior Lecturer at Griffith Univ, Gold Coast)

Honorary Associate Professor

Barry S Gow, MDS PhD, FRACDS

Honorary Research Associate

Michael DL Slater, BSc NSW PhD FAIMS

Brett Wells, BSc PhD ANU

Postdoctoral Research Fellows

Margot Day, BSc PhD - NHMRC

Anuwat Dinudom, MSc PhD - Medical Foundation

Michael Emerson, BSc Leeds MSc PhD King's College - Medical Fund

Xiaohui Xiao, MD PhD Beijing Med Univ

Andre Van Schaik, MSc Twente, PhD EPFL

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 ANU - NHMRC

Akram Kabbara, BScMelb PhD Latrobe - NHMRC

Lucia H Kang, MD MSc Korea PhD - ARC

Jaimie Poison, BSc PhD - NHMRC

Angeles Sanchez-Perez, BSc PhD Salamanca

Christine Lucas, BSc PhD - NHHMRC

Research Assistants

Full-time

Anna Corderoy, BSc Wollongong - ARC

Jeremy Hogan, BMedSc - NHMRC

Lauren O'Mullane, BBiomedSc Wollongong

Shalini Jayram, BE NSW

Ana Lara, BSc Univ Republic

Research laboratory staff

Lorraine Kerr - Senior Technical Officer

Francis JW Lee, PTC STC - Technical Officer

Jiangbo (Lucia) Gan, BE ME Xidian Univ - Technical Officer

Judith O'Neill, RN BA(Health Sci-Nursing) Charles Sturt (part-time)

Laboratory assistant

Anandhi Anandan, BSc Bharathiyar Univ

Class laboratory staff

John F Cossey, BTC STC - Senior Technical Officer (in-charge)

Adel Mitry, BVSc Cairo ACC STC - Senior Technical Officer

Electronics workshop staff

Vincent HW Cheung, HND Hong Kong Polytechnic CEI Part 2 UK - Sen ior Technical Officer

Computing staff

John WA Dodson, HNC Lond MIEEIEI Eng - Computer Network Manager

Peter Lo, MSoc Paris, GradDipComp Deakin, GradDipB us Admin Monash, MCNE - Computer Systems Officer

Administrative Officers
Michele L Foord
Christine Hermely, BSc

Administrative Assistants
Jennifer E Cantrill
Louise Ciciriello, BSc

Psychology

Professors
Robert Alan Boakes, BA Cant. PhD Harv. Appointed 1989
Stephen W. Touyz, BSc PhD CapeT. BSc Witw. Appointed 1996
Ian S. Curthoys, BA PhD Monash . Appointed 1997

Readers
Dale M. Atrens, BA Windsor MA Hollins PhD Rutgers
Lazar Stankov, MA Belgrade PhD Denver

Associate Professor
Helen Beh, BA PhD NE

Senior Lecturers
Brian D. Crabbe, BA PhD
Alan E. Craddock, BA PhD
Deborah Erickson, BA Houghton Coll. NY. MA Alf Uni. D.Ed Uni Ark. USA
Rosalyn Griffiths, BA DipAppPsych (Clin) N'cle, PhD
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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
JoelB.Michell.BAPhD
John M. Predebon, BA PhD
Robyn Tate, MA MPsych UNSW PhD N'cle
Alison M. Turtle, MA
Michael B. Walker, BSc W.Aust. BA Adel. DPhil Oxf.

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Janet Wilson, BSc (Hons), MClinPsych PhD Uni Otago
Rick van der Zwan, BSc PhD

Associate Lecturers
Neeru Chadda, BA Delhi MA Kampur
Dianne Clark, BA UNSW
James Dalziel, BA
Fiona Hibberd, BA
Mariela Occelli, BA MPsych
Olivier Piguet, BPsych Gva MA (Clin.Neuropsych) Melb.
Gina Sartore, BSc GradDip ANU
Mark Yates, BA

Professional Officer
Kate Baggs, BA MPsych

Administrative Officers
Sandra Cheng, BBus UTS MCom CPA
Anne Kwan, BA DipEd CUHK

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Cindy Li
Louise Nelson
Margaret Smith, BA W'gong.
Tricia Berger, BEd SA MEd Qld
Maria Amilbangsa, BA Philip.

Head of Computer and Technical Services
John Holden

Manager of Computer Services
Yoichi Takayama, MSc Tohoku PhD Niigata

Computer Systems Officers
Siu Yau Kho, BSc(Hons) HK MBioMed.Eng UNSW
King Sing Shun, DipElectEng. BTech Macq.

Senior Technical Officers
Warren Davies
Raja Vijayenthiran

Technical Officers
Kerry Smith
Darek Figa

Animal House Attendants
Deborah Brookes
Lucy Maguire

Attendant
Matthew de Bois

Honorary Clinical Lecturers
Phyllis N. Butow, BA PhD
Nicholas Marlowe, BA PhD
Michael Nicholas, BA PhD
Michael Young, BA Macq. MPsych PhD UNSW
Philippa Hedges, BA MA Melb.
Lynne Sweeney, BA MA Clin.Psych Calif State, PhD LA
James Guinan, BSc DipEd MSc MPsych UNSW PhD
Stephanie Whitmont, BA USA MPsych PhD
Clive Allcock, BSc MB ChB NZ LTCL Lond. FRANZCP
Helen McCathie, BA MClinPsych PhD
Rocci Crino, BSc MPsych PhD UNSW
Michael Perdices, BA MA Clin.Psych Melb PhD UNSW

Honorary Clinical Supervisors
Mr Robert Armstrong, Clinical Psychology, North Ryde
Ms Vera Auerbach, Redbank House, Westmead
Dr Susan Ballinger, Stamdish Medical Centre, Nowra
Mr Gary Banks, Disability Resources Inc,, West Chatswood
Mr Christopher Basten, Department of Medical Psychology, Westmead
Ms Sharmilla Betts, Sydney Children's Hospital, Randwick
Mr Grant Betts, Department of Psychology, Randwick
Assoc. Prof. Alex Blaszynski, Liverpool Hospital, Liverpool
Ms Carol Boland, Paediatric Mental Health Team, Liverpool
Ms Philippa Bowden, Parramatta Sexual Health Clinic, Parramatta
Ms Naomi Brookes, Brian Injury Unit, Randwick
Dr Diana Caine, Neuropsychology Unit, Dept of Psychiatry, Camperdown
Ms Linda Chamberlain, Royal Blind Society, Burwood
Mr Nick Cocco, Broadway Adolescent and Family Health Services, Glebe
Mr Ulan Cohen,, Dover Heights
Ms Kathryn Craft, Psychological Health service, Campbelltown
Mr Rocco Crino, Anxiety Disorders Unit, Darlinghurst
Mr Jeroen Decates, Hillview Health Centre, Turramurra
Ms Gabrielle Duffy, Burwood Child & Family Health Team, Burwood
Mr Bob Duncan, Cremorne Community Health Centre, Cremorne
Ms Danielle Einstein, Anxiety Unit, Westmead
Ms Julie Erskine, University of New South Wales Counselling Services, Sydney
Ms Megan Forbes, Calvary Hospital, Kogarah
Ms Eleanor Gait, Department of Psychology, Concord
Mr Jonathan Gaston, University of New South Wales Counselling Service, Sydney
Ms Leah Giarratano, St John of God Hospital, North Richmond
Mr Fernando Gomez, Psychiatry Department, Taren Point
Ms Lia Gould, Arndell Children's Unit, North Ryde
Mr James Guinan, Royal Prince Alfred Hospital,. Camperdown
Mr Timothy Hannan, Department of Rehabilitation, Westmead
Mr George Haralambous, Arndell Children's Unit, North Ryde
Ms Raelene Hartman, Sutherland Division of Mental Health, Sutherland
Dr Evelyn Howe, Private Practice, Wahroonga
Ms Susan Johnson, Department of Psychological Medicine, Westmead
Ms Liz Kenway, Queenscliff-Dalwood Assessment Centre, Seaforth
Ms Christine Kipps, Child, Adolescent & Family, Hornsby

Ms Debbie Knight, Queenscliff-Dalwood Assessment Centre, Seaforth
Ms Elizabeth Kobylinska, Long Bay Hospital, Mattraville
Ms Sarah Lam, Psychological Health Services, Campbelltown
Mr Peter Mangioni, Clinic 8, OPD, Concord
Ms Nicola Marriott-Lloyd, Royal Rehabilitation Centre Sydney, Ryde
Ms Kaye Matthews, Psychology Department, Concord
Ms Antonia McKinnon, Department of Psychology, Rozelle
Mr Michael McMahon, Calvary Hospital, Kogarah
Mr Brian O'Grady, University of New South Wales Counselling Service, Sydney
Mr Salih Ozgul, Bankstown Community Health Centre, Bankstown
Mr Michael Parle, Liaison Clinical Psychologist, Darlinghurst
Ms Polly Pickles, Child Development Unit, Westmead
Mr Robert Pringle, Queenscliff Community Health Centre, North Manly
Dr Marija Radojevic, Child, Adolescent and Family Service, Hornsby
Mr Phil Renner, Child & Adolescent Mental Health, Campbelltown
Mr Kris Revson, Queenscliff Health Centre, North Manly
Ms Tanya Sackville, St Vincent's Mental Health Service, Darlinghurst
Mr Tom Schick, Broadway Adolescent and Family Health Services, Glebe
Mr Dieter Schlosser, Clinic 8 OPD, Concord
Mr Tim Sharp, Pain Management - 9C, St Leonards
Ms Julie Simmons, Queenscliff Health Centre, Brookvale
Mr Thiagarajan Sitharthan, Drug and Alcohol Unit, North Parramatta
Ms Katharine Smith, Gynaecological Oncology, Westmead
Ms Melissa Staples, Royal Rehabilitation Centre Sydney, Ryde
Dr Barbara Wardman,, Vaucluse
Ms Anne Wignall, Child And Family Psychiatry, Block 4, St Leonards
Dr Crista Wocadlo, King George V Hospital, Camperdown
Mr Michael Young, University of Sydney Counselling Service, Sydney
Dr Vito Zepinic, Hillview Health Centre, Turramurra
Dr Fazeela Zolfaghari, St John of God Hospital, North Richmond
Honorary Appointments
Pierre J. Beumont, MB ChB Pretoria DPM (RCP) Lond.MRCP Edin. M Phil Lond.MRCPsych UK MSc Oxf. FRC Psych UK FRACP FRANZCP FRCP Edin.
Olga Katchan, BA
David Kavanagh, BA Dip Psych PhD Stanf.
George Oliphant, BA PhD
Emeritus Professors
Richard Annells Champion, MA FASSA
Philip Ley, BA Mane. PhD Liv. DipPsych Lond.
John Philip Sutcliffe, MA PhD FASSA

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 Airoldi, MSc Milan PhD Genova
Marti J Anderson, BA L.A. PhD
Phillipe Archambault, BSc Montreal PhD Laval
Sean Connell, BSc Cant. MSc Auck PhD
Tim Glasby, BSc PhD
Miles Hoskin, BSc Hons Plymouth PhD W'gong

Mats Lindegarth, MSc PhD Gotebog
Ian Montegomery, BSc Dublin PhD
James Scandol, BSc(Hons) James Cook PhD James Cook
Research Support Staff
Peter Barnes, BSc U.N.S.W.
Jennifer Beckett
Emma Bradshaw, BSc(Hons) James Cook
Michelle Button, BSc U.N.S.W.
Jillian Grayson, BSc GradDipEnvSci.
Simon Heislers, BSc Monash, BSC(Hons) LaTrobe
Catherine Hemery, BA (Hons) Augustana College Illinois, GradDipSocEcol U.W.S
Graham Housefield, BSc C. Sturt
Shannon Long, BSc GradDipSc U.Qld
Vanessa Mathews, BSc
Samantha Neal, BSc(Hons) La Trobe
Danielle O'Connor, BSc GradDipEnvSci
Alison Phillips, BSc(Hons) U.Tas.
Matthew Sage, BSc GradDipEnvSci

Coastal Studies Unit

Director
Andrew D. Short, MA Hawaii PhD Louisana State BA

History and Philosophy of Science

Director and Senior Lecturer
Paul E. Griffiths, M.ACamb. PhD A.N.U.
Associate Professor
Alan F. Chalmers, BSc Brist. Msc Mane. PhD Lond.
Lecturer
Katherine M. Neal, BSc Houston M.A Toronto PhD Toronto
Administrative Assistant
Mamie Harmon-Ball, BA Oklahoma

Institute of Marine Ecology

Director
M Gee 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 Auck.
Anthony WD. Larkum, BSc Lond. DPhil Oxf., ARCS
Antony J. Underwood, PhD DSc Brist., FAAFLS FIBiol FAIBiol CBiol
Research Support Staff
Peter Barnes, BSc U.N.S.W.
Jennifer Beckett
Emma Bradshaw, BSc(Hons) James Cook
Michelle Button, BSc U.N.S.W
Jillian Grayson, BSc GradDipEnvSci
Simon Heislers, BSc Monash, BSC(Hons) LaTrobe
Catherine Hemery, BA (Hons) Augustana College Illinois, GradDipSocEcol U.W.S
Graham Housefield, BSc C. Sturt
Shannon Long, BSc GradDipSc Qld
Vanessa Mathews, BSc
Samantha Neal, BSc(Hons) La Trobe
Danielle O'Connor, BSc GradDipEnvSci
Alison Phillips, BSc(Hons) Tas
Matthew Sage, BSc GradDipEnvSci
Honorary Appointments
Honorary Associate
Professor J. Howard Choat, BSc Wellington PhD Qld
Research Affdiates
K L Astles, BSc MSc
Steven J. Kennelly, BSc PhD
Nicholas M. Otway, BSc PhD
G A Skilleter, BSc PhD

Marine Studies Centre

Director
Andrew D. Short, MA Hawaii PhD Louisana State BA
Administrative Assistant

Ocean Sciences Institute

Director
Peter John Davies, BSc Leic. PhD Sheff.
Research Scientists (part-time)
Gavin F. Birch, MSc PhD DTA Cape T.
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.
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.
Collin G. Phillips, BSc DipEd PhD
Administrative Assistant (part-time)
Cathy Kennedy

Australian Key Centre for Microscopy and Microanalysis

Director
David John Hugh 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.
Education Coordinator
Anil Singh Prakash

General university information

See also the Glossary for administrative information relating to particular terms.

Admissions Office
Student Centre
Ground Floor, F07 Carslaw
The University of Sydney
NSW 2006 Australia
Phone:+61 2 9351 4117 or+61 2 9351 4118. Special
   Admissions (including Mature Age) +61 2 9351 3615
Fax:+61 2 9351 4869
Email: admissions@records.usyd.edu.au
The Admissions Office is responsible for overseeing the distribution of offers of enrolment and can advise prospective local undergraduate students regarding admission requirements. Applicants without Australian citizenship or permanent residency should contact the International Office. Postgraduate students should contact the appropriate faculty.

Applying for a course
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.

Assessment
For matters regarding assessment, refer to the relevant Department.

Co-op Bookshop
Sydney University Sports and Aquatic Centre
G09, Cnr Codrington St and Darlington Rd
Phone: +61 2 9351 3705 or+61 2 9351 2807
Fax:+61 2 9660 5256
Email: sydu@mail.coop-bookshop.com.au
http://www.coop-bookshop.com.au
Sells textbooks, reference books, general books and software. 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 week of January. You must attend the University in person or else nominate, in writing, somebody to act on your behalf. On the enrolment day, you pay the compulsory fees for joining the Student Union, the Students' Representative Council and sporting bodies. You also choose your first-year units of study, so it's important to consult the Handbook before enrolling.
All other students
A pre-enrolment package is sent to all enrolled students in late September, and contains instructions on the procedure for pre-enrolment.

Examinations
Examinations and Exclusions Office
Student Centre
Level One, F07 Carslaw
The University of Sydney
NSW 2006 Australia
Phone: +61 2 9351 4005 or+61 2 9351 5054
Fax:+61 2 9351 7330
Email: exams.office@exams.usyd.edu.au
The Examinations and Exclusions Office looks after exam papers, timetables and exclusions.

Graduations
Ground Floor, Student Centre, F07 Carslaw
The University of Sydney
NSW 2006 Australia
Phone: +61 2 9351 3199 or +61 2 9351 4009.
   Protocol+61 2 9351 4612
Fax:+61 2 9351 5072
Email: k.fizzell@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 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.

A document outlining the current procedures for appeals against academic decisions is available at the Student Centre and on the University's web site at: http://www.usyd.edu.au/su/planning/policy/index.htm

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, SRC, Level 1, Wentworth Building. Phone +61 2 9660 5222 Legal Aid.

HECS & other fees
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   +61 2 9351 5659
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Fees Office
K07 Margaret Telfer
The University of Sydney
NSW 2006 Australia
Phone:+61 2 9351 5222
Fax:+61 2 9351 5861

Library (Fisher)

F03 Fisher Library
The University of Sydney
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Phone: +61 2 9351 2993 Enquiries/Information Desk
    +61 2 9351 3711 Library Hours
    +61 2 9351 7273 Borrowers' Cards
    +61 2 9351 6692 Holds Enquiries
    +61 2 9351 7277 Inter-library Loans
    +61 2 9351 2265 Loans, overdues enquiries
Fax: +61 2 9351 2890 Administration
    +61 2 9351 7278 Renewals
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    reqill@library.usyd.edu.au (inter-library loans)
http://www.library.usyd.edu.au

Student Centre

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    +61 2 9351 4109 Academic Records
    +61 2 9351 3023 Discontinuation of Enrolment
    +61 2 9351 5057 Handbooks
    +61 2 9351 5060 Prizes
Fax: +61 2 9351 5081; +61 2 9351 5350 Academic Records

Part-time, full-time

Students are normally considered as full-time if they have a HECS weighting of at least 0.375 each semester. Anything under this amount is considered a part-time study load. Note that some faculties have minimum study load requirements for satisfactory progress.

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 University, 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 Main Quadrangle
Phone:+61 2 9351 4263
Fax:+61 2 93517304
Email: trobinso@mail.usyd.edu.au
http://www.usyd.edu.au/su/foi

Student Services

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http://www.usyd.edu.au/su/stuserv/

Accommodation Service

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http://www.usyd.edu.au/su/accom

Casual Employment

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Counselling Service

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Disability and Welfare Services

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http://www.usyd.edu.au/su/disability/

Financial Assistance

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http://www.usyd.edu.au/su/fin_assist
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.

Learning Assistance Centre

Level 7
A35 Education Building (Manning Road)
The University of Sydney
NSW 2006 Australia
Phone:+612 9351 3853
Fax:+61 2 9351 4865
Email: lewalker@mail.usyd.edu.au
http://www.usyd.edu.au/su/lac/
Holds free workshops to assist undergraduate and postgraduate students wanting to improve their academic writing and communication skills at university.

Other student assistance

Careers information
Room 147, Ground Level
KOI Mackie Building (Arundel St, Forest Lodge)
The University of Sydney
NSW 2006 Australia
Phone:+61 2 9351 3481
Fax:+61 2 9351 5134
Email: info@careers.usyd.edu.au (general enquiries)
http://www.usyd.edu.au/homepage/exterel/careers/index.htm
The Courses & Careers Unit provides careers information, advice and help in finding course-related work both while you're studying and employment when you commence your career.

Centre for Continuing Education (bridging courses)
KOI Mackie
The University of Sydney
NSW 2006 Australia
Phone:+61 2 9351 2585
Fax:+61 2 9351 5022
Email: info@cce.usyd.edu.au
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, +61 2 9351 4095 Holme
Fax: +61 2 9351 4110 Wentworth, +61 2 9351 4338 Holme
Email: p.brown@unihealth.usyd.edu.au
Provides full general practitioner services and emergency
medical care to the University community

Koori Centre and Yooroang Garang
Ground Floor, 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
Email: adminoff@koori.usyd.edu.au
http://www.koori.usyd.edu.au/
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 and
Levels 1 and 2
A18 Christopher Brennan
The University of Sydney
NSW 2006 Australia
Phone:+61 2 9351 2371
Fax:+61 2 9351 4724
Email: Langcent.enquiries@language.usyd.edu.au
http://www.arts.su.edu.au/Arts/departs/langcent/home.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
Fourth floor, Room 455
F07 Carslaw
The University of Sydney
NSW 2006 Australia
Phone:+61 2 9351 4061
Fax:+61 2 9351 5797
Email: MLC@mail.usyd.edu.au
http://www.usyd.edu.au/su/mlc/

Scholarships
Research and Scholarships Office
Scholarships Administration Room N410.1,
A14 Main Quadrangle
The University of Sydney
NSW 2006 Australia
Phone: +61 2 9351 3250 Enquiries, Scholarships
Fax:+61 2 9351 3256
Email: scholars@reschols.usyd.edu.au
http://www.usyd.edu.au/su/reschols/scholarships

International students

International Office
Level 2, K07 Margaret Telfer
The University of Sydney
NSW 2006 Australia
Phone:+61 2 9351 4161, +612 93514079
Fax:+61 2 9351 4013
Email: info@io.usyd.edu.au
http://www.usyd.edu.au/homepage/exterel/internat/
   int_student_centre.html

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
Email: info@issu.usyd.edu.au
http://www.usyd.edu.au/su/issu/
Provides an advisory and counselling service to international
students at the University of Sydney.

Student organisations

Students' Representative Council
Level 1, Wentworth GO 1
The University of Sydney
NSW 2006 Australia
Phone: +61 2 9660 5222 Editors, Honi Soit
   +61 2 9660 4756 Secondhand Bookshop
   +61 2 9660 5222 Legal Aid
Fax:+61 2 9660 4260
Email: postmaster@src.usyd.edu.au

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 & Information Services Manager
Fax:+61 2 9563 6239
Email: email@usu.usyd.edu.au
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
Email: sports_union@susu.usyd.edu.au
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
Email: secretary@suwsa.usyd.edu.au
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.

Glossary

This glossary both defines terms in common use in the University and gives some useful administrative information.

Enrolment and general terms

Academic year
The period during which teaching takes place, from March 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 (Australian Graduate School of Management), 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.

Creditpoint
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
People 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 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 his or her behalf. Units of Study (for March 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 0.375 each semester.

Intermediate
Faculty of Science: Second-year level.

Junior
First-year level.

Glossary

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.

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.

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 March 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 0.375 each 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.

Prohibition
A Unit of Study that cannot be taken with 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 14 weeks during which teaching takes place. There are two semesters each year for most faculties. Semesters are named by the month in which they start, typically 'March' and 'July'

Senior
Second-year level or higher.
Faculty of Science: third-year level.

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.

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.

UAI
The University Admissions Index (UAI) 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.

UAI cut-off
The UAI of the last student admitted to a course. Some courses have a minimum UAI as an entry requirement.

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.

Universities Admissions Centre (UAC)
The organisation that processes applications for most NSW undergraduate university and TAFE courses.

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 $1000.

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 choses 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 $6250.

Scholarship

Matriculation and undergraduate funding by application awarded on UAI 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).

Appeal

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 substantial 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 his or her degree program, usually assigning more 'weight' to Senior or Honours years. Note that the WAM calculation may differ for purposes such as eligibility for various scholarships and will vary from faculty to faculty.

Index

This index provides a convenient way to find units of study, course requirements, regulations and other information listed in the Faculty of Science handbook. All units are listed twice: by name and unit code. (Please note that names of units of study in this index are truncated after 52 characters.)

Departments, Schools and Buildings Directory

Academic & Executive Services **16E**
Accounting **17P**
Accommodation Service **13G**
Administrative Policy & Strategic Planning Div'n **16E**
Administrative Support Services Division **16E**
Aeronautical Engineering **26M**
Agricultural Chemistry & Soil Science **10D**
Agricultural Economics **HD**
Agriculture Faculty Office **11C**
Australian Graduate School of Management **Burren St**
Alma Street Glasshouse **23N**
Alumni Relations **16E**
Anaesthesia **7K**
Anderson Stuart Bldg **17I**
Anatomy & Histology **17I**
Ancient History & Classics **16F**
Animal Health **Camden**
Animal Science **7F**
Anthropology **16F**
Archaeology **16F**
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Architecture, Planning & Allied Arts **22M**
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Arts Faculty Office **16F**
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Asian Studies **14F**
Attendant's Lodge **16O**
Badham Bldg & Library **14E**
Banks see Financial institutions
Baxter's Lodge **22E**
Behavioural & Social Sciences in Nursing **Mallett St**
Behavioural Science **Cumberland**
Behavioural Sciences in Medicine **7K**
Biochemistry **20P**
Biological Sciences **15D**
Biomedical Science **Cumberland**
Blackburn Bldg **7K**
Bookshops
  Medical **7K**
  SRC Secondhand **19N**
  University Co-operative **21R**
Bosch IA (lecture theatres) **8L**
Bosch IB Bldg **7M**
Brennan, C, Bldg **15F**
Budget Office **16E**
Business Liaison Office **12E**
Business Services *19V*
Campus Services **20T**
Careers Centre **13B**
Carslaw Bldg **19L**
Cashiers **13A**

Map legend:

- **P** Parking Station
- STA Bus Stop
- University Bus Stop
- **i** Information
- Toilets (a.h.)
- Food Outlet
- Public Telephone
- Emergency Button
- Security Office/Emergency 9351 3333

0 25 50 100 200 metres
all approximate scale
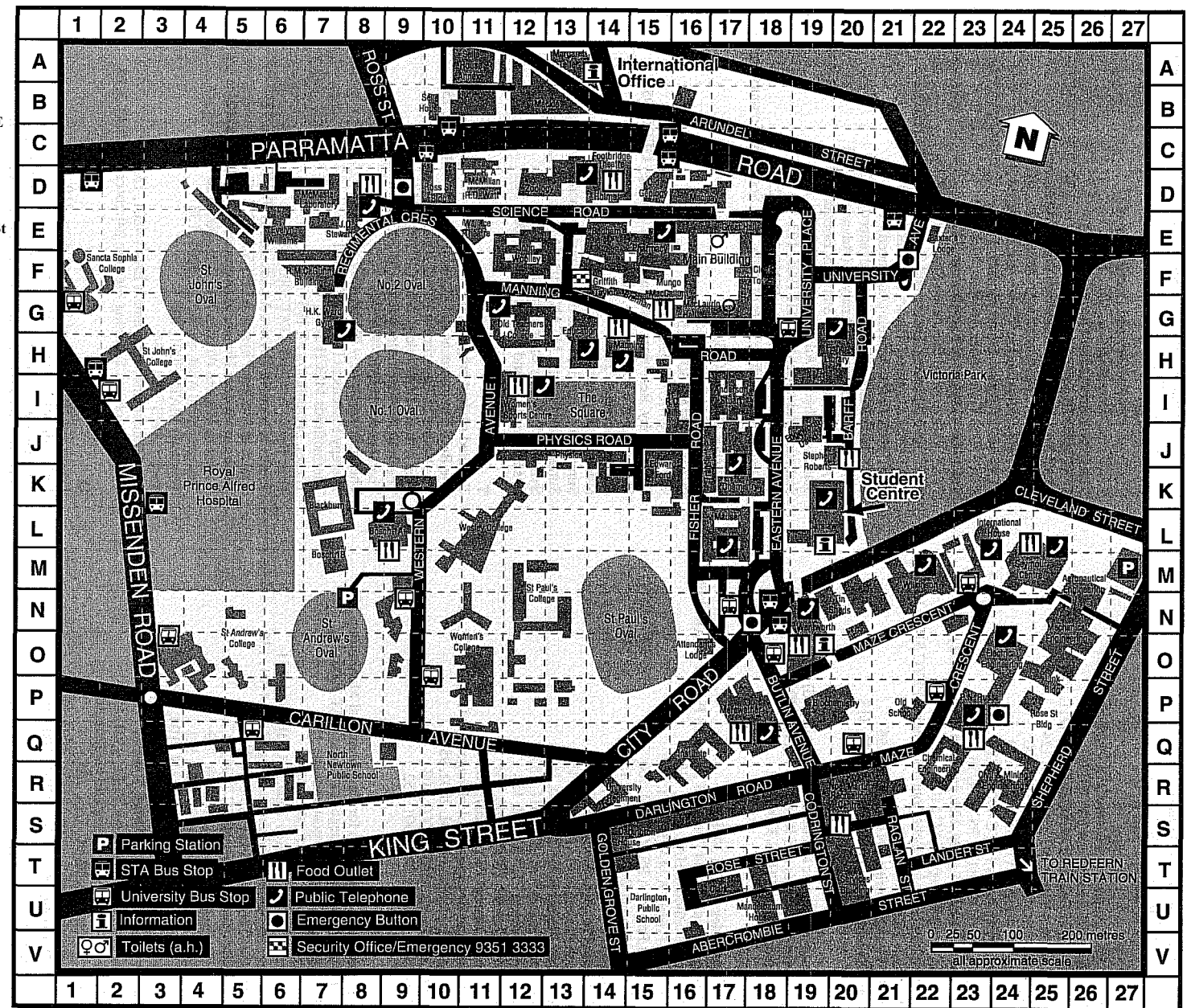
Central Services **20T**
Central Records Office **16E**
Centre for English Teaching **Mallett St**
Centre for Teaching & Learning **19L**
Chancellor's Committee Shop **17F**
Chaplains' Centre **10G**
Chemical Engineering **22Q**
Chemistry **17K**
Child Care
   Boundary Lane **16U**
   Carillon Avenue **9Q**
   Laurel Tree House (Glebe) **16B**
   Union (Darlington) **21S**
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Clark Bldg **17T**
Clinical Nursing **Mallett St**
Clinical Ophthalmology & Eye Health **Syd.** Eye
   Hospital
Clock Tower **17F**
Clinical Trials **Mallett St**
Communication Disorders **Cumberland**
Community & Mental Health Nursing **Cumberland**
Community Health **Cumberland**
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Development Office **16E**
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Financial Services Division **13A**
Financial Systems Development **13A**
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Gender Studies **16G**
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Geography **16Q**
Geology & Geophysics **19J**
Germanic Studies **15F**
Government & Public Administration **17P**
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Greek, Modern **14F**
Griffith Taylor Bldg **14F**
Gunn, R. M. C, Bldg **7F**
Health Information Management **Cumberland**
Health Sciences Faculty Office **Cumberland**
Health Service (Holme Bldg, Wentworth Bldg) **14C,**
   19N
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Industrial Relations, Dept of **16Q**
Infectious Diseases **7K**
Information Technology Services **19U**
Institute Bldg **16Q**
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   Services **13A**
International House **23L**
International Preparation Program **13B**
Italian **15I**
Jurisprudence **St James**
Koori Centre **12G**
Law Dept & Faculty Offce **St James**
Learning Assistance Centre **13G**
Life Sciences in Nursing **Mallett St**
Linguistics **16J**
Link Bldg **25O**
Lost Property **14F**
Mackie Bldg **13B**
MacLaurin Hall **16G**
Macleay Bldg & Museum **16D**
Madsen Bldg **17L**
Mail Room (Internal) **20T**
Main Bldg **17F**
Management Studies **Burren St**
Mandelbaum House **18U**
Manning House **14H**
Margaret Telfer Bldg **13A**
Marketing, Dept of **16Q**
Marketing & Publications **16E**
Mathematics & Statistics **19L**

McMasterBldg **7D**
McMillan, J. R. A., Bldg **11C**
Mechanical & Aeronautical Engineering Bldg **25N**
Mechanical Engineering **25N**
Media Office **16E**
Medical Radiation Technology **Cumberland**
Medicine, Dept of **7K**
Medicine, Faculty of **15K**
Merewether Bldg **17P**
Microbiology **20P**
Mills, R. C, Bldg **16I**
Mungo MacCallum Bldg **15G**
Music, Dept of **24M**
Nicholson Museum **16G**
Nursing Therapeutics **Cumberland**
Obstetrics & Gynaecology **9K**
Occupational Therapy **Cumberland**
Orange Agricultural College **Orange Agricultural**
   College Campus
Old Geology Bldg **15D**
Old School Bldg **21P**
Old Teachers' College Bldg **12G**
Operations Accounting **13A**
Orthoptics **Cumberland**
Paediatrics & Child Health **New Children's Hospital**
Pathology **7K**
Personnel Services **13A**
Pharmacology **7L**
Pharmacy **15E**
Philosophy **17G**
Photowise Imaging **20T**
Physics **13J**
Physiology **17I**
Physiotherapy **Cumberland**
Planning Support Office **16E**
Post Office **15E**
Printing Services, University **20T**
Professional Studies **13G**
Properties & Investments **13A**
Prospective Students Unit **12B**
Psychological Medicine **4K**
Psychology **14F**
Purchasing **13A**
Publications Unit **16E**
Public Health & Community Medicine **15K**
Quadrangle **17F**
Queen Elizabeth II Research Institute **9K**
Regiment, University **14R**
Religion, School of Studies in **12E**
Research & Scholarships **16E**
Revenue Services **13A**
Risk Management **13A**
Rose Street Bldg **24P**
Ross Street Bldg **10D**
Russell, Peter Nicol, Bldg **23P**
St Andrew's College **5O**
St John's College **3H**