Science
HANDBOOK
2000
Courses, programs and any arrangements for programs including staff allocated as stated in this Handbook are an expression of intent only. The University reserves the right to discontinue or vary arrangements at any time without notice. Information has been brought up to date as at 14 December 1999, but may be amended without notice by the University Council.

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3980 Aviation Degree Course Full Time
2001 Flying Stream
2003 Operations Management Stream

Biotechnology
3052 Biotechnology Full-time Course
3055 Bioprocess Engineering Full-time Course

Chemical Engineering and Industrial Chemistry
3100 Industrial Chemistry Full-time

Computer Science and Information Systems
3978 Computer Science
3979 Information Systems
3971 Business Information Technology Full-time

Environmental Science
3988 Environmental Science Degree

Food Science and Technology
3060 Food Science and Technology Full-time Program
3065 Honours in Food Science Full-time Program
3070 Food Science and Technology Part-time Program

Geography
3010 Geography Full-time Program

Geology
3000 Applied Geology Full-time

Materials Science and Engineering
Ceramic Engineering and Ceramics
Metallurgical Engineering
Materials Engineering
Components Common to all Materials Programs
3025 Ceramic Engineering Full-time Program
3030 Ceramic Engineering Part-time Course
3125 Metallurgical Engineering Full-time Course
3125 Metallurgical Engineering Full-time Program
3130 Metallurgy – Part-time Course
3615 Materials Engineering Full-time Program
Department of Textile Technology
3170 Textile Technology Full-time Course
3175 Textile Management Full-time Course
3177 Textile Design and Technology Full-time Course

Media and Communications
3932 Bachelor of Science (Communications)
3933 Bachelor of Science (Media and Communications)

Medical Science
3991 Medical Science Degree

Optometry
3950 Optometry Degree Program Full-time
3951 Combined Science / Optometry Program

Psychology
3432 Psychology Degree Full-time

Safety Science
3877 Safety Science Full/Part-time

Professional and Combined degrees with Science
Board of Studies in Science and Mathematics and another Faculty
3930 Combined Science/Arts
3935 Combined Science/Social Science
4075 Combined Science / Education Course
Board of Studies in Science and Mathematics and the Faculty of Engineering
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Welcome to Science at UNSW

Whether you are beginning studies as an undergraduate student, or are continuing on to postgraduate courses or research, we hope that your experience at UNSW will exceed your expectations, and that your studies in Science will provide you with an education which is second to none and the basis for a rewarding career.

Students study science for many different reasons. Some are looking to establish themselves in particular science-based industries or professions, some are looking to science to enhance or complement their studies in other areas such as law or medicine or commerce, while others study science because they have a passion for it or are fascinated by it as a tool to understand the world.

Whatever your reasons for studying science, we have subjects or programs which will meet your needs. Your program of study can have a strong vocational orientation or be quite general. It can lead to research in a particular discipline, or incorporate non-science areas in a multidisciplinary combination. Most programs are very flexible, providing a degree of specialisation and also the option to include subjects of your own choice.

The UNSW science courses have a reputation which is unsurpassed in Australia. The Science Faculties are renowned for their research, and all of our staff are committed to providing the best possible science education and to sharing their enthusiasm for their areas of interest with you.

This Handbook provides the basic information on the science courses and Faculties. However, it can only indicate the full range of possibilities which are open to you. All of the science staff are ready, willing and able to provide advice on administrative matters, and on subject, course and career options. Students are thus encouraged to approach staff to discuss any concerns they have.

We wish you every success in your studies in Science at UNSW, and hope that the time you spend with us as valued members of the UNSW community will be happy, stimulating, productive and rewarding.

C E Sutherland
Dean
Faculty of Science and Technology, and BSSM

MJ Sleigh
Dean
Faculty of Life Science
This Handbook is designed as a detailed source of information in all matters related to the Faculties of Life Science and of Science and Technology, and more generally to science at UNSW. Other information sources include the Student Guide, which is distributed at no charge to all students, and which provides information on the University as a whole, on many of the services available to students, and on some important rules and guidelines. For other details on some aspects of the University, students may need to consult the University Calendar.

Science at UNSW

The education and academic activities at UNSW are organised around the Faculties. Two of these, the Faculties of Life Science, and of Science and Technology, are focussed towards providing teaching and research in the sciences. Others, including Engineering, Medicine, Arts and Social Sciences, and Commerce and Economics, also make a major contribution to activities in the sciences.

The basic educational building blocks in the sciences are the courses which students take. These subjects are drawn together into majors, minors, and study plans providing coherent development of specific disciplines, and these programs are in turn drawn together to form degrees. These majors, minors, and study plans are listed in the contents pages, and are described in detail in the body of this Handbook, as are the courses which make up these components.

Each course is assigned a unit of credit or UOC value, typically 3 or 6. This is intended to indicate the workload required of students to satisfactorily complete the course. A good rule of thumb is that one unit of credit corresponds to 25-30 hours of student effort, both in and out of class.

Because science draws on so many Faculties, UNSW has created an inter-Faculty body called the Board of Studies in Science and Mathematics or BSSM to administer the majority of the undergraduate science programs. Some of the more specialised science programs, and all postgraduate programs, are administered by the Faculties themselves.

Some People Who Can Help You

Enquiries related to administrative aspects of most of the science programs should be made at the BSSM or Science Office, located in the lower ground floor of the Electrical Engineering Building (reference G18 in the map at the back of this handbook). Academic enquiries relating to these programs should be made in the relevant School.

[All types of enquiries concerning the other undergraduate science programs, and all postgraduate enquiries, should also be directed to the relevant School.]
From the start of 2000, the University will move to a new academic structure that will be common to all undergraduate and postgraduate programs. The new structure will lead to greater flexibility and improved educational opportunities for students.

While many programs are already structured in a way consistent with the new direction, others have been revised for 2000 to take advantage of the benefits of the new structure.

What is the New Academic Structure?

The new academic structure is based on units of credit, which replace credit points. A full-time enrolment for one year is defined as 48 units of credit. A normal full-time enrolment for one semester is 24 units of credit. (You will be regarded as full-time if you enrol in at least 18 units per semester.)

Courses (subjects) will also change to reflect the new structure. Most courses will be worth 6 units of credit. Some courses will have a higher or lower value: for example, undergraduate General Education courses will be worth 3 units of credit.

A full-time student in an undergraduate or graduate coursework program will typically enrol in four x 6 unit courses per semester.

How Are the Changes Being Implemented?

The changes take effect from the start of 2000. Handbooks, forms, program specific enrolment materials, and timetables will all reflect the new structure.

You will notice the changes when you enrol for 2000. Your program office will give you information specific to your program as part of the enrolment process.

How Will These Changes Affect Me?

If you do not complete requirements for your program in 1999, and need to re-enrol in 2000 your remaining program requirements will be measured in units of credit. Similarly, courses you have previously taken will be reported in terms of a conversion to the new units of credit.

Units of Credit

From January, 2000 the University will move to a new academic structure based on units of credit. A full-time enrolment for one year is defined as 48 units of credit (24 per semester). A course will have the same unit of credit value and generate the same load for HECS and fees irrespective of the program or stage in which it is taken. All courses will be measured in whole units of credit. The normal workload expectations are 25 - 30 hours per semester for each unit of credit, including class contact hours, preparation and time spent on all assessable work.

Terminology

Along with the change from credit points to units of credit there will be other changes in terminology from 1 January 2000. What you know as your course (Example: 3502 Bachelor of Commerce) will become your program and what you know as a subject (Example: ACCT2522) will become a course.

Further Information

For information specific to your program, including advice about enrolment, your standing and study options contact your program office.

For general information about these changes and updates to arrangements:
- NewSouth Q (Kensington) - 9385 3093
- Student Centre, College of Fine Arts - 9385 0684
- UNSW Website - www.unsw.edu.au
- NewSouth Solutions - nss.admin.unsw.edu.au/student/student_info.html
The academic year is divided into two sessions, each containing 14 weeks for teaching. Between the two sessions there is a break of approximately six weeks, which includes a one-week study period, two weeks for examinations, and three weeks recess. There is also a short recess of one week within each session. Session 1 commences on the Monday nearest 1 March.

Faculty others than Medicine, AGSM and University College, ADFA

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<td>26 February to 12 April</td>
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<td>21 April to 30 April</td>
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<td>Session 2</td>
<td>17 July to 10 September</td>
<td>23 July to 21 Sept</td>
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<td>14 weeks</td>
<td>7 October to 17 November</td>
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<td>Mid-session recess</td>
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<td>9 November to 27 November</td>
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Important dates for 2000

**January 2000**
- S 1 New Year's Day - Public Holiday
- M 3 Public Holiday
- T 6 Medicine V - Term 1 begins
- M 10 Medicine IV - Term 1 begins
- W 26 Australia Day - Public Holiday

**February 2000**
- M 7 Medicine VI - Term 2 begins
- AGSM Executive MBA Program - Session 1 begins
- M 14 AGSM MBA Program - Year 1 classes - Term 1 begins
- M 21 AGSM MBA Program - Year 2 classes - Term 1 begins
- M 28 Session 1 begins - for Faculties other than Medicine, AGSM and University College, ADFA

**March 2000**
- M 6 University College, ADFA - Session 1 begins
- F 10 Last day applications are accepted from students to enrol in Session 1 courses
- Su 12 Medicine IV - Term 1 begins
- Medicine V - Term 1 ends
- M 13 Medicine IV - Term 2 begins
- M 20 Medicine V - Term 2 begins
- F 24 Medicine VI - Term 2 ends
- S 25 Medicine VI - Recess begins
- F 31 Last day for students to discontinue without failure Session 1 courses
- HECS census date for Session 1

**April 2000**
- Su 2 Medicine VI - Recess ends
- M 3 Medicine VI - Term 3 begins
- F 21 Mid-session recess begins - for Faculties other than Medicine, AGSM and University College, ADFA
- Good Friday - Public Holiday
- S 22 Easter Saturday
- Su 23 Easter Sunday
- Medicine IV - Term 2 ends
- M 24 Easter Monday - Public Holiday
- Medicine IV - Recess begins
- T 25 Anzac Day - Public Holiday
- Su 30 Mid-session recess ends - for Faculties other than Medicine, AGSM and University College, ADFA
- Medicine IV - Recess ends
- AGSM MBA Program - Year 1 classes - Term 1 ends
- AGSM MBA Program - Year 2 classes - Term 1 ends

**May 2000**
- M 1 Medicine IV - Term 3 begins
- AGSM MBA Program - all classes - Examinations begin
- AGSM MBA Program - all classes - Examinations end
- S 6 University College, ADFA - Mid-session recess begins
- T 9 Publication of provisional timetable for June examinations
- Su 14 Medicine VI - Term 3 ends
- M 15 Medicine VI - Term 4 begins
- AGSM MBA Program - all classes - Term 2 begins
- W 17 Last day for students to advise of examination clashes
- F 19 AGSM Executive MBA Program - Session 1 ends
- Su 21 Medicine V - Term 2 ends
- University College, ADFA - Mid-session recess ends
June 2000

F 9  Session 1 ends - for Faculties other than Medicine, AGSM and University College, ADFA

S 10 Study period begins - for Faculties other than Medicine, AGSM and University College, ADFA

Su 11 Medicine IV - Term 3 ends

M 12 Queen's Birthday - Public Holiday

W 14 Study period ends - for Faculties other than Medicine, AGSM and University College, ADFA

Th 15 Examinations begin - for Faculties other than Medicine, AGSM and University College, ADFA

F 23 University College, ADFA - Session 1 ends

T 29 Examinations end - for Faculties other than Medicine, AGSM and University College, ADFA

F 30 Mid-year recess begins - for Faculties other than Medicine, AGSM and University College, ADFA

July 2000

F 7 Medicine VI - Term 4 ends

University College, ADFA - Examinations end

University College, ADFA - Mid-year recess begins

S 8 Medicine VI - Recess begins

M 10 AGSM - Executive MBA Program - Session 2 begins

Su 16 Mid-year recess ends - for Faculties other than Medicine, AGSM and University College, ADFA

M 17 Session 2 begins - for Faculties other than Medicine, AGSM and University College, ADFA

University College, ADFA - Session 2 begins

Su 23 AGSM MBA Program - all classes - Term 2 ends

M 24 AGSM MBA Program - all classes - Examinations begin

F 28 AGSM MBA Program - all classes - Examinations end

Last day applications are accepted from students wishing to enrol in Session 2 courses

Su 30 Medicine V - Term 3 ends

August 2000

Su 6 Medicine IV - Term 4 ends

M 7 Medicine IV - Term 5 begins

Medicine V - Term 4 begins

AGSM MBA Program - all classes - Term 3 ends

Th 17 Medicine VI - Term 5 begins

Su 27 Medicine VI - Term 5 ends

M 28 Medicine VI - Term 6 begins

Th 31 Last day for students to discontinue without failure Session 2 courses

HECS Census date for Session 2

September 2000

S 2 Open Day

S 9 Medicine V - Recess begins (Olympic Break)

Medicine VI - Recess begins (Olympic Break)

M 11 Mid-session recess begins - for Faculties other than Medicine, AGSM and University College, ADFA

Th 14 Closing date for 'on-time' applications to the Universities Admissions Centre

S 16 University College, ADFA - Mid-session recess begins

Su 17 Medicine IV - Term 5 ends

M 18 Medicine IV - Recess begins (Olympic Break)

October 2000

Su 1 Medicine IV - Recess ends (Olympic Break)

Medicine V - Recess ends (Olympic Break)

Medicine VI - Recess ends (Olympic Break)

M 2 Labour Day - Public Holiday

University IV - Term 6 begins

University College, ADFA - Mid-session recess ends

F 6 Mid-session recess ends - for Faculties other than Medicine, AGSM and University College, ADFA

T 17 Publication of provisional timetable for November examinations

W 25 Last day for students to advise of examination clashes

F 27 University College, ADFA - Session 2 ends

S 28 University College, ADFA, study period begins

Su 29 Medicine V - Term 4 ends

Medicine VI - Term 6 ends

November 2000

F 3 University College, ADFA, Study period ends

S 4 University College, ADFA - Examinations begin

T 7 Publication of timetable for November examinations

F 10 AGSM MBA Program - all classes - Term 3 ends

Su 12 Medicine IV - Term 6 ends

M 13 AGSM MBA Program - all classes - Examinations begin

F 17 Session 2 ends - for Faculties other than Medicine, AGSM and University College, ADFA

University College, ADFA - Examinations end

AGSM MBA Program - all classes - Examinations end

S 18 Study period begins - for Faculties other than Medicine, AGSM and University College, ADFA

AGSM - Executive MBA Program - Session 2 begins

W 22 Study period ends - for Faculties other than Medicine, AGSM and University College, ADFA

Th 23 Examinations begin - for Faculties other than Medicine, AGSM and University College, ADFA

December 2000

Th 7 Examinations ends - for Faculties other than Medicine, AGSM and University College, ADFA

M 25 Christmas Day - Public Holiday

T 26 Boxing Day - Public Holiday
The Board of Studies in Science and Mathematics is a coordinating body for undergraduate science degrees, and its staff includes all members of the Faculty of Life Sciences and the Faculty of Science and Technology, and some members of specific schools in other faculties contributing to the Science programs: Philosophy, Science and Technology Studies (Arts and Social Sciences); Accounting, Economics, Information Systems (Commerce and Economics); Electrical Engineering, Computer Science and Engineering, Chemical Engineering and Industrial Chemistry, Mechanical and Manufacturing Engineering, Geomatic Engineering (Engineering); Anatomy, Community Medicine, Physiology and Pharmacology (Medicine).

Dean
Professor CE Sutherland

Presiding Member
Vacant

Associate Dean
Dr K Moon

Administrative Officer
Paul Buist, BA MEd UNSW
Faculty of Life Sciences

Comprises Schools of Applied Bioscience (encompassing the Departments of Biotechnology and Food Science and Technology), Biochemistry and Molecular Genetics, Biological Science, Microbiology and Immunology, Psychology, the Centre for Marine and Coastal Studies, the Centre for Biotechnology and Bio-Innovation, the Centre for Entomological Research and Insecticide Technology, and the Co-operative Research Centre for Food Industry Innovation.

Dean
Professor Merilyn Joy Sleigh, BSc Syd, PhD Macq, DipCorpMan, FTSE

Associate Dean (Research)
Professor Ian William Dawes, BSc UNSW, DPhil Oxf

Presiding Member
Associate Professor Kevin David Barrow, BSc PhD Adel

Executive Officer
Michael Dwyer, BSc UNSW

Communications Manager
Deborah Lum, BSc DipEd UNSW, GradDipSciComm ANU

Executive Assistant
Carlene Annette Kirvan, BA Flinders

School of Applied Bioscience

Professor of Food Science and Technology, Head of School and Head of Department of Food Science and Technology
Kenneth Alan Buckle, BSc PhD UNSW, FTSE, FAIFST, FCIAM, FIAFoST, MIFT

Professor of Biotechnology and Head of Department of Biotechnology
Peter Philip Gray, BSc Syd, PhD UNSW, FTSE, FIEAust, MABA, MAICHE

Department of Biotechnology

Head of Department of Biotechnology
Professor PP Gray

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Dr Matthew Wood

Industry Research Liaison Program Manager
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CFD Consultant
Dr Amir Eghtimi
Dr Reza Roomina

FEA Consultant
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Deputy Manager
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The information in this handbook is set out as follows:

1. General Information

2. Undergraduate Study
   This contains:
   • Courses: Science and Advanced Science
   • Information on how to structure your course
   • Program outlines
   • Specific, Professional and Combined courses: followed by program outlines of these courses
   • Course Descriptions: this section includes HSC requirements, prerequisites, corequisites, exclusions and other notes

3. Postgraduate Study
   This contains:
   • Courses and Programs: followed by course outlines
   • Course Descriptions: this section includes prerequisites, corequisites, exclusions and other notes
   • Conditions for the Award of Degrees

4. Scholarships and Prizes

Information Key

The following key provides a guide to abbreviations used in this book:

<table>
<thead>
<tr>
<th>Prefix</th>
<th>Organization Unit</th>
<th>Faculty/Board</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>full year (Session 1 plus Session 2)</td>
<td></td>
</tr>
<tr>
<td>HPW</td>
<td>hours per week</td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>lecture</td>
<td></td>
</tr>
<tr>
<td>P/T</td>
<td>part-time</td>
<td></td>
</tr>
<tr>
<td>S1</td>
<td>Session 1</td>
<td></td>
</tr>
<tr>
<td>S2</td>
<td>Session 2</td>
<td></td>
</tr>
<tr>
<td>SS</td>
<td>single Session, but which Session taught is not known at time of publication</td>
<td></td>
</tr>
<tr>
<td>T</td>
<td>tutorial/laboratory</td>
<td></td>
</tr>
<tr>
<td>UOC</td>
<td>Unit(s) of Credit</td>
<td></td>
</tr>
<tr>
<td>WKS</td>
<td>weeks of duration</td>
<td></td>
</tr>
<tr>
<td>X</td>
<td>external</td>
<td></td>
</tr>
</tbody>
</table>

Prefixes

The identifying alphabetical prefixes for each organisational unit offering subjects to students in the Board of Studies in Science and Mathematics follow.
<table>
<thead>
<tr>
<th>Prefix</th>
<th>Organisational Unit</th>
<th>Faculty/Board</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEIC</td>
<td>School of Chemical Engineering and Industrial Chemistry</td>
<td>Engineering</td>
</tr>
<tr>
<td>CHEM</td>
<td>School of Chemistry</td>
<td>Science and Technology</td>
</tr>
<tr>
<td>CVEN</td>
<td>School of Civil and Environmental Engineering</td>
<td>Engineering</td>
</tr>
<tr>
<td>CMED</td>
<td>School of Community Medicine</td>
<td>Medicine</td>
</tr>
<tr>
<td>COMP</td>
<td>School of Computer Science and Engineering</td>
<td>Engineering</td>
</tr>
<tr>
<td>ECOH</td>
<td>Department of Economic History</td>
<td>Commerce and Economics</td>
</tr>
<tr>
<td>ECON</td>
<td>School of Economics, Departments of Economics and Econometrics</td>
<td>Commerce and Economics</td>
</tr>
<tr>
<td>ELEC</td>
<td>School of Electrical Engineering</td>
<td>Engineering</td>
</tr>
<tr>
<td>ENVS</td>
<td>Environmental Studies</td>
<td>Life Sciences</td>
</tr>
<tr>
<td>FINS</td>
<td>School of Banking and Finance</td>
<td>Commerce and Economics</td>
</tr>
<tr>
<td>GENS</td>
<td>Centre for Liberal and General Studies</td>
<td></td>
</tr>
<tr>
<td>GEOG</td>
<td>School of Geography</td>
<td>Science and Technology</td>
</tr>
<tr>
<td>GEOL</td>
<td>School of Geology</td>
<td>Science and Technology</td>
</tr>
<tr>
<td>INFS</td>
<td>School of Information Systems</td>
<td>Commerce and Economics</td>
</tr>
<tr>
<td>JAPN</td>
<td>Asian Studies Unit</td>
<td></td>
</tr>
<tr>
<td>LAWS</td>
<td>School of Law</td>
<td>Law</td>
</tr>
<tr>
<td>LEGT</td>
<td>Department of Legal Studies and Taxation</td>
<td>Commerce and Economics</td>
</tr>
<tr>
<td>MANF</td>
<td>School of Mechanical and Manufacturing Engineering</td>
<td>Engineering</td>
</tr>
<tr>
<td>MATH</td>
<td>School of Mathematics</td>
<td>Science and Technology</td>
</tr>
<tr>
<td>MATS</td>
<td>School of Materials Science and Engineering</td>
<td>Science and Technology</td>
</tr>
<tr>
<td>MDCN</td>
<td>School of Medicine</td>
<td>Medicine</td>
</tr>
<tr>
<td>MECH</td>
<td>School of Mechanical and Manufacturing Engineering</td>
<td></td>
</tr>
<tr>
<td>MICR</td>
<td>School of Microbiology and Immunology</td>
<td>Engineering</td>
</tr>
<tr>
<td>MSCI</td>
<td>Centre for Marine and Coastal Studies</td>
<td>Life Sciences</td>
</tr>
<tr>
<td>OCEA</td>
<td>Oceanography (Mathematics)</td>
<td>Science and Technology</td>
</tr>
<tr>
<td>OPTM</td>
<td>School of Optometry</td>
<td>Science and Technology</td>
</tr>
<tr>
<td>PATH</td>
<td>School of Pathology</td>
<td>Medicine</td>
</tr>
<tr>
<td>PHIL</td>
<td>School of Philosophy</td>
<td>Arts and Social Sciences</td>
</tr>
<tr>
<td>PHPH</td>
<td>School of Physiology and Pharmacology</td>
<td>Medicine</td>
</tr>
<tr>
<td>PHYS</td>
<td>School of Physics</td>
<td>Science and Technology</td>
</tr>
<tr>
<td>POLY</td>
<td>Department of Polymer Science</td>
<td>Science and Technology</td>
</tr>
<tr>
<td>PSCY</td>
<td>School of Psychiatry</td>
<td>Medicine</td>
</tr>
<tr>
<td>PSYC</td>
<td>School of Psychology</td>
<td>Life Sciences</td>
</tr>
<tr>
<td>REMO</td>
<td>Centre for Remote Sensing</td>
<td>Engineering</td>
</tr>
<tr>
<td>SAFE</td>
<td>School of Safety Science</td>
<td>Science and Technology</td>
</tr>
<tr>
<td>SCTSI</td>
<td>School of Science and Technology</td>
<td>Arts and Social Sciences</td>
</tr>
<tr>
<td>HPST</td>
<td>Technology Studies</td>
<td>Science and Technology</td>
</tr>
</tbody>
</table>
Science programs are built from the wide range of science and technology-based courses available across the University.

These programs are divided into two types – the general "Science" and "Advanced Science" programs, and a range of "Vocational Science Programs" oriented more toward professional or industry based careers. These programs, and the courses which they are composed of, are described in later sections of the handbook.

However, the information which follows in this section applies equally to both types of program.

Enrolment Procedures

New students will receive enrolment information with their offer of a place in their chosen program. All students re-enrolling in 2000 should obtain a copy of the leaflet Re-Enrolling 2000: Procedures and Fees for Science Programs. This is available from the Science Office and the Admissions Office. Students enrolling in graduate programs should contact the Postgraduate Section.

The Course timetable for the Science and the Advanced Science programs is available in late October/early November from the Science Office, The Undercroft, Electrical Engineering Building. All re-enrolling students should collect one of these timetables along with a preliminary enrolment form (SM2000). The preliminary enrolment form is to be completed and returned to the Science Office by late December.

Students not lodging a completed enrolment form before the first day of Session 1 have no guarantee that a place is available in the courses offered in that year. This is particularly important for courses where laboratory space is limited. Students should be aware that some courses may require a field trip which may involve personal costs to the student. Consult individual course authorities for details.

* It should be noted that quotas apply to certain courses and programs, as indicated in the relevant program or course descriptions. All quotas are assessed on the basis of applications made at the time of preliminary enrolment.

General Education Program

UNSW requires that all undergraduate students undertake a structured program in General Education as an integral part of studies for their degree. The University believes that a general education complements the more specialised learning undertaken in a student's chosen field of study and contributes to the flexibility which graduates are increasingly required to demonstrate. Employers repeatedly point to the complex nature of the modern work environment and advise that they highly value graduates with the skills provided by a broad general education, as well as the specialised knowledge provided in more narrowly defined degree programs. As well, over many years graduates of this University have reported that they greatly valued their General Education studies, which are found to be relevant to both career and personal development.

The General Education Program at UNSW intends to broaden students' understanding of the environment in which they live and work and to enhance their skills of critical analysis.

Objectives of the General Education Program

The following objectives were approved by the Council of the University in December 1994.

1. To provide a learning environment in which students acquire, develop, and deploy skills of rational thought and critical analysis.

2. To enable students to evaluate arguments and information.

3. To empower students to systematically challenge received traditions of knowledge, beliefs and values.

4. To enable students to acquire skills and competencies, including written and spoken communication skills.

5. To ensure that students examine the purposes and consequences of their education and experience at University, and to foster acceptance of professional and ethical action and the social responsibility of graduates.

6. To foster among students the competence and the confidence to contribute creatively and responsibly to the development of their society.

7. To provide structured opportunities for students from disparate disciplines to co-operatively interact within a learning situation.

8. To provide opportunities for students to explore discipline and paradigm bases other than those of their professional or major disciplinary specialisation through non-specialist subjects offered in those other areas.

9. To provide an environment in which students are able to experience the benefits of moving beyond the knowledge boundaries of a single discipline and explore cross- and interdisciplinary connections.

10. To provide a learning environment and teaching methodology in which students can bring the approaches of a number of disciplines to bear on a complex problem or issue.

General Education requirements

The basic General Education requirements are the same for students in all courses:

- Four (4) session length courses carrying 3 units of credit each or their equivalent in combinations of session length and year long courses.

- An additional fifty-six (56) hours of study which fosters acceptance of professional and ethical action and social responsibility. This fifty-six hours of study may be distributed throughout the program, or exist as a separate course, depending on the program.

Because the objectives of General Education require students to explore discipline and paradigm bases other than those of their professional or major disciplinary specialisation, all students are excluded from counting courses toward the fulfilment of the General Education requirement, which are similar in content or approach to courses required in their program.
Each Faculty has responsibility for deciding what courses are not able to be counted towards the General Education requirement for their students. In most cases, this means that courses offered by the Faculty in which a student is enrolled, or courses which are a required part of a program even though offered by another Faculty, are not able to be counted toward the General Education requirement. Students may also only count a maximum of 6 units of Credit (56 hours) of General Education courses from a single Faculty.

Students should consult the General Education Handbook for detailed information about what courses may and may not be taken to fulfill the General Education requirements for each program offered by the Faculty. The General Education Handbook is freely available from all Faculty Offices.

Additional information for undergraduate students who first enrolled before 1996

Transitional arrangements

It is intended that no student will be disadvantaged by the change to the new General Education Program. The old Program had specific requirements to complete four session length courses (or their equivalent) in designated categories A and B. The new General Education Program does not categorise courses in the same way.

As a result, students who enrolled prior to 1996 will be given full credit for any General Education courses completed up to the end of Session two 1995.

From the summer session of 1995-96, students will be required to satisfy the unified portion of their General Education requirement under the terms of the new Program.

The exemption of General Education requirements for some double or combined degree programs will continue to apply for students who enrolled in these exempt programs prior to 1996.

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Computing at UNSW

The Department of Information Services has general responsibility for information technology at UNSW, and for the University Library. Information on both areas may be accessed through the UNSW home page http://www.unsw.edu.au and its “navigation” link, or through the pages http://www.ascu.unsw.edu.au or http://www.misu.unsw.edu.au, using Mosaic or Netscape. In particular, the campus is served by an optical fibre network which supports TCP/IP, IPX and Appletalk protocols.

Within the Faculties of Life Sciences and of Science and Technology, each of the Schools manages or has access to undergraduate computing laboratories equipped with a combination of X-terminals, PCs and MacIntoshes. These are connected through the campus-wide network, and are used extensively in undergraduate teaching and in providing e-mail access to all students.

Many of the Schools also use computing extensively in research and postgraduate education. This is provided through local and often specialised facilities, and through access to regional and national centres. The systems accessible range from PCs to supercomputers together with the associated peripherals and support personnel.

Further information on computing is available through each of the Schools’ web pages.

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Library Information

Faculty of Life Sciences Library Facilities

Although any of the university libraries may meet specific needs, the staff and students of the Faculty of Life Sciences are served mainly by the Biomedical Library.

The Biomedical Library

The Biomedical Library provides library services for staff and students from the Faculties of Medicine and Life Sciences, and the Schools of Health Services Management and of Safety Science.

The Biomedical Library is located on Levels 2, 3 and 4 of the Mathews Building Annex and is connected to the other Special Libraries via a link through Level 3 of the Library Building. Professional staff are available at the Information Desk on Level 2 to provide reference services and to assist in the use of the catalogues. Instructional classes in the use of the library and specific subject material can be arranged through the Information Desk. Serials in the Biomedical Library are shelved in alphabetical order by title and carry the prefix MB or MBQ. Details about Biomedical Library books, serials and audiovisual material can be found in the Library Catalogue.

In addition, the Biomedical Library offers the following services: literature searches; on-site and remote access to a wide range of bibliographic databases; and a document supply service for external and remote students.

Biomedical Librarian: Jill Denholm

Faculty of Science and Technology Library Facilities

Although any of the university libraries may meet specific needs, the staff and students of the Faculty of Science and Technology are served mainly by the Physical Sciences Library.

The Physical Sciences Library

The Physical Sciences Library, located on levels 5, 6 and 7 of the Library Building, provides information for students and staff from the Faculties of Science and Technology, Engineering, and the Built Environment.

During the academic year, the Library is open from 8.00 to 10.00 Monday to Thursday, 8.00 to 6.00 on Friday and 12.00 to 5.00 Saturday and Sunday. During vacations, Library hours of opening will vary.

Staff assisted service is available after 10.00am including help with catalogue, CD-Roms, interlibrary loans, maps and online searching. An information skills program is in place with emphasis on developing basic information access and management skills for first years and advanced skills for final year and postgraduate students.

The Library’s catalogue and selected CD-Rom databases are available over the Campus Wide Network.

Physical Sciences Librarian: Rhonda Langford
Equal Opportunity in Education Policy

Statement

Under the Federal Racial Discrimination Act (1975), Sex Discrimination Act (1984), and Disability Discrimination Act (1992) and the New South Wales Anti-Discrimination Act (1977), the University is required not to discriminate against students or prospective students on the grounds of age, disability, homosexuality (male or female), marital status, pregnancy, race (including colour, nationality, descent, ethnic, ethno-religious or national origin, and immigration), religious or political affiliation, views or beliefs, sex, and transgender or transsexuality. Under the University of New South Wales Act (1989), the University declares that it will not discriminate on the grounds of religious or political affiliations, views or beliefs.

University Commitment to Equal Opportunity in Education

As well as recognising its statutory obligations as listed, the University will eliminate discrimination on any other grounds which it deems to constitute disadvantage. The University is committed to providing a place to study free from harassment and discrimination, and one in which every student is encouraged to work towards her/his maximum potential. The University further commits itself to course design, curriculum content, classroom environment, assessment procedures and other aspects of campus life which will provide equality of educational opportunity to all students.

Special Admissions Schemes

The University will encourage the enrolment of students who belong to disadvantaged groups through programs such as the University Preparation Program and the ACCESS Scheme. Where members of disadvantaged groups are particularly under-represented in certain disciplines, the responsible faculties will actively encourage their enrolment.

Support of Disadvantaged Students

The University will provide support to assist the successful completion of studies by disadvantaged group members through such means as the Aboriginal Education Program and the Learning Centre. It will work towards the provision of other resources, such as access for students with impaired mobility, assistance to students with other disabilities, the provision of a parents' room on the upper campus, and increased assistance with English language and communication.

Course Content, Curriculum Design, Teaching and Assessment, and Printed Material

Schools and faculties will monitor course content (including titles), teaching methods, assessment procedures, written material (including study guides and handbook and Calendar entries) and audiovisual material to ensure that they are not discriminatory or offensive and that they encourage and facilitate full participation in education by disadvantaged people.

Equal Opportunity Adviser Scheme

The University will continue its Equal Opportunity Adviser Scheme for students who feel that they have been harassed or who consider they have been disadvantaged in their education by practices and procedures within the University.

Harassment Policy

The University is committed to ensuring freedom from harassment for all people working or studying within the institution. It will continue to take action, including disciplinary action, to ensure that freedom from harassment is achieved.

Special Government Policies

The NSW Health Department and the NSW Department of Education and Training have special requirements and policies of which students of health-related and education programs should be aware. The requirements relate to:

- clinical/internship placements which must be undertaken as part of your program
- procedures for employment after you have completed the program

Health-related programs

Criminal record checks

The NSW Health Department has a policy that all students undertaking clinical placements, undergo a criminal record check prior to employment or placement in any capacity in the NSW Health System. This check will be conducted by the NSW Police Service and will be co-ordinated by the Department of Health.

Infectious diseases

Students required to complete clinical training in the NSW hospital system will be subject to various guidelines and procedures laid down for healthcare workers by the NSW Department of Health relating to vaccination and infection control.

An information sheet is available from your program officer and further details can be obtained from your Program Authority.

Education programs

Criminal record checks

It is a requirement that a check of police records be conducted for all teacher education students applying for an unsupervised internship placement in a New South Wales Government school.

Contact your program co-ordinator for further details.
Overview of Programs

The main aims of the Science programs may be summarised as providing opportunities for students to prepare themselves for careers in research, technology, science, mathematics and education, or areas of management or public policy which involve the use of science or mathematics.

The Science Programs (3970; 3978; 3979) lead to the award of the degree of Bachelor of Science (BSc) at pass level on the completion of a three stage program, taking three years of full-time study. A student who completes the program with a high standard of achievement may be permitted to continue to a fourth year in order to take an Honours degree.

The Advanced Science Programs (3973; 3976; 3985; 3990) lead to the award of Bachelor of Science (BSc (Hons)) on the completion of a four stage program, at honours or pass level (level of award and honours is based on academic performance), taking four years of full-time study. Depending on their program of study, students in their fourth year undertake either a research honours program or a program of coursework and research.

The time specified (three or four years) is the minimum time required for completion of each program. Students may complete program requirements over a longer period of time or as part-time candidates. Students contemplating part-time study should note that with few exceptions classes are offered in the day only. This applies even at first year level and means that it is not possible to complete studies by evening classes alone.

Both the Science and the Advanced Science programs are controlled by the Board of Studies in Science (BSSM).

Admission

For admission requirements for Science programs see the appropriate entry in the current UAC Handbook.

Applicants for admission to Science programs should note that a number of new UAC entry codes have been introduced which correspond to specific programs and programs of study. UAC entry codes for Science programs are:

429000 Science
This is applicable to study in a wide range of Science areas in program 3970 as indicated in the programs outlined on pages 35-36.

429019 Computer Science
This is applicable specifically to a major in Computer Science in program 3978 as outlined on pages 58.

429024 Information Systems
This is applicable specifically to a major in Information Systems in program 3979 as outlined on page 58-59.

429010 Advanced Science (Chemical, Mathematical, and Physical Sciences)
This is applicable to study in areas of mathematics, chemistry and physics in program 3985 as outlined in the program descriptions commencing on page 43, and in program 3973 as outlined in the Medical Physics program on page 50.

429009 Advanced Science (Life Sciences)
This is applicable to study in areas of biological, biomedical and behavioural sciences in program 3990 as outlined in the program descriptions commencing on page 43.
Program Design

The Science program (3970)
The three year Science degree has been designed for students who seek a 'generalist' degree in which there is a large element of choice. A student can combine courses from 2 or more Science disciplines, or take courses from outside the Science disciplines. The basic rules for the degree are printed on page X. The main thing that students in the Science program need to ensure is that they complete at least one Major and either a second Major or a Minor sequence. At least 84 units of credit (out of a total of 144) must be taken from Science. The remainder may be in another Faculty. Subject to certain conditions a student may be permitted to continue into a fourth year to complete an honours degree.

Advanced Science program (3973, 3985, 3986, 3990)
A feature of the design of both the Advanced Science program is the requirement that all students enrol in and complete requirements for a specified study plan. Each study plan is designed to link courses in such a way that a coherent pattern of study is achieved in a specific discipline or specialisation. A wide choice of study plans, designed to meet specific aims and objectives, is available. Most study plans are identified with a particular School or discipline (eg Anatomy, Chemistry) but some are multidisciplinary (eg Mathematics and Computer Science). Some courses are only available in the Advanced Science programs. See the relevant study plan for details.
Students are required to fulfill all of the requirements of their particular study plan as specified in the handbook in the year in which they first enrolled.

Computer Science program (3978)

Information Systems program (3979)

Medical Science Program (3991)
These are 3 year degrees based on structured study plans leading to a Bachelor of Science. Subject to certain conditions a student may be permitted to continue into a fourth year to complete an honours degree.

Environmental Science Program (3988)
This is a 4 year degree leading to a Bachelor of Environmental Science. A student must complete a specialisation in Environmental Science plus another specialisation in one of the approved disciplines.

Bachelor of Science (Communications) Program (3932)

Bachelor of Science (Media and Communications) Program (3933)
These are 3 year Science degrees in which students must do a major in Communications or Media Studies and either a major or two minors in Science. Subject to certain conditions a student may be permitted to continue into a fourth year to complete an honours degree.

Combined degrees
In these degrees Science is combined with studies in another Faculty (eg Engineering, Law, Arts and Social Sciences etc.). The basic requirement from science is that a student should complete at least 84 units of credit in Science including a major. It may be possible with permission to combine Advanced Science with another Degree.
Courses

Typically, each program requires study of a number of prescribed courses and elective courses at specified stages or levels to ensure a sound basis in the discipline. Each course is assigned a "Level", which corresponds to the defined stages for each program. There are limits on the number of Level I courses that can be studied in a program (see Program Requirements and Rules below). Students are not normally allowed to enrol in courses at a given level before reaching the corresponding stage of the program. Levels are:

- Level I Stage 1
- Level II Stage 2
- Level II/III Stage 2 or 3
- Level III Stage 3 (also Stage 4 in some Advanced Science programs)
- Level IV Stage 4 (or Honours year) – Advanced Science only

Program Objectives

Programs in the Science and the Advanced Science degrees have been designed to:

1. develop and sustain an interest in and knowledge of Science.
2. develop a working knowledge of scientific methods of investigation.
3. encourage curiosity and creative imagination and an appreciation of the role of speculation in the selection and solution of problems, the construction of hypotheses, and the design of experiments.
4. develop an appreciation of scientific criteria and a concern for objectivity and precision.
5. develop confidence and skill in formulating problems and in treating both qualitative and quantitative data.
6. develop the ability and disposition to think logically, to communicate clearly by written and oral means, and to read critically and with understanding.
7. develop the habit of seeking and recognizing relationships between phenomena, principles, theories, conceptual frameworks and problems.
8. promote understanding of the significance of science, technology, economics and social factors in modern society, and of the contributions they can make in improving material conditions.
9. provide opportunities for the development of students' motivations and social maturity, and an awareness of their capabilities in relation to a choice of career which will be fruitful to themselves and to society.

Assessment of students

Students' assessment results are reviewed by the Board of Studies in Science and Mathematics Assessment Committee at the end of each semester.

Students are awarded a mark in the range 0-100 in each course they take; letter grades are also used, with marks in the range 50-64 classified as a pass (P), those in the range 65-74 a credit (CR), those in the range 75-84 a distinction (D), and those in the range 85-100 a high distinction (HD).

Students in the Advanced Science programs should note that they normally need to maintain a Credit average in order to progress to the Honours year.

If a student's overall performance in the science courses or their equivalent is rated as: good, i.e. if the average in those courses is 55.0 or higher; reasonable, i.e. if the average in those courses is 50.0 or higher and less than 55.0; poor, i.e. if the average in those courses is less than 50.0, then

- for a mark of 49 a PC (pass conceded) can be awarded for a reasonable or good performance;
- for a mark of 48 a PC can be awarded for a good performance and a PT (pass terminating) can be awarded for a reasonable performance;
- for a mark of 47 a PT can be awarded for a good performance. A PT means that the student will not be permitted to progress to another course for which this is a prerequisite.

Students with a poor performance may be awarded concessional passes only on the basis of one concession for each course passed with the equivalent or greater Credit Point value. These can only be 49PC or 48PT. Where results are available for one course only in a particular session a PC may be awarded if the mark in that course is 49, or a PT may be awarded for a mark of 48.
Program Requirements and Rules

Science Programs (3970)
pass program (3 years)

Conditions for the Award of the Degree

1. A student must complete 144 units of credit including 12 units of General Education.
2. The degree must contain a Major sequence of study and either a second Major or a Minor sequence.
3. A student must complete at least 36 units and no more than 60 units in Level I courses from at least three Schools.
4. A student must complete at least 24 units at Level I from Science Schools.
5. No student may commence Level II courses until 24 Level I units have been successfully completed.
6. A student must complete a minimum of 84 units of credit from Science Schools.
7. For entry to Honours a student must complete at least 24 units at Level III in the relevant Major sequence and have the permission of the Head of School.
8. A Major sequence is defined as: at least 42 units at Level II and III in a single discipline or area of study, including at least 18 units at Level III. Major sequences are defined in Table A.
9. A Minor sequence is defined as: 24 units of credit at Level II or III. The Minor may either consist of courses available within but not taken as part of a Major or may be a sequence as defined in Table B.
10. Where a student does Majors in two cognate areas that have courses in common the Board of Studies in Science and Mathematics may permit up to 12 units at Level II and 6 units at Level III to be counted towards each Major sequence.

Transition Rule for 2000

Students are enrolled at all stages in the current Program 3970. New students entering in 2000 will enrol under the new Rules and Requirements. Re-enrolling students will normally be treated as follows:

- Students entering Year 2 will be transferred into the new Conditions and will be required to complete a Major and Minor (or a second Major);
- Students entering Year 3 will be encouraged to convert to the new Conditions, in which case they will only be required to complete a Major sequence. However if they elect to complete the Program of Study in which they are enrolled they will be permitted to do so.
- Students who are suspended or have deferred in 2000 will be required to enter under the new Conditions when they recommence.

Advanced Science Programs (3973; 3985; 3986; 3990)
Honours/Advanced Program (4 years)

Conditions for the Advanced Science Program

1. A student must complete 144 units of credit including 12 units of General Education in Stages 1-3 and a 48 unit Honours sequence at Stage 4. A minimum of 132 units of credit (including Stage 4) must be in Science courses.
2. The degree must contain a study plan as specified in the Handbook.
3. A student must complete at least 36 units and no more than 48 units in Level I courses except where specified in a particular plan.
4. A student must complete before the end of Stage III at least two 3 unit courses taken from Table ‘X’.
5. No student may normally commence Level II courses until 24 Level I units have been successfully completed unless approved by the Head of School.
6. Progression to Stages III and IV is subject to academic performance. A student will be required to have attained an average of 65 or higher in courses relevant to the major area and cognate courses in each prior stage.
7. Students whose performance is unsatisfactory may be asked to show cause at the end of the academic year why they should remain in their program of study.
Transition Rule for 2000

Students are enrolled at all stages in the current Advanced Science Courses. New students entering in 2000 will enrol under the new Rules and Requirements. Re-enrolling students will be treated as follows:

- Students entering Stage 2 or Stage 3 will be transferred into the new Conditions and will be required to complete 48 units of credit per year. They will not be required to comply with points 3 and 4 of the Conditions unless this can be accommodated within their current program.
- Students who are suspended or have deferred in 2000 will be required to enter under the new Conditions when they recommence.

Rules and requirements for other programs in science are printed with the programs descriptions later in this handbook.

Elective Courses

Students enrolled in any Science degree may take as electives any courses (subject to satisfying prerequisites) which are:

- Specified as electives for their degree, or
- Available within a Major or Minor in Program 3970.

General Rules and Requirements

General Education Requirement

1. The University requires all students to complete a selection of General Education courses. The General Education Program is an integral part of all UNSW undergraduate programs and gives students the opportunity to address some of the key questions they will face as individuals, citizens and professionals. Students in the Science program must complete General Education courses totalling 12 units of credit plus an additional 56 hours of study which fosters acceptance of professional and ethical action and social responsibility. See the General Education Handbook for a description of General Education course categories.

Prerequisites, Corequisites and Excluded Courses

2. Where a choice of courses is available in a program students must take care to satisfy prerequisites and corequisites. A prerequisite is a course which must be completed prior to enrolment in the course for which it is prescribed. A corequisite course is one which must either be completed successfully before, or studied concurrently with, the course for which it is prescribed. An excluded course is one which cannot be counted towards the degree qualification together with the course which excludes it.

Credit Transfer

3. In addition to University rules governing admission with credit for previous studies or attainments, the following provisions apply for the BSSM.

Students admitted to the Science or Advanced Science programs may be granted credit by the BSSM for previous studies and attainments provided that:

31. where students transfer from another tertiary institution, they shall not in general be granted credit superior to that attained at the other institution.

3.2 Students admitted to the Science program who hold a completed or partly completed degree or another award, may be given credit for previous studies and attainments, but in order to qualify for the award of the BSc will be required as a minimum to complete courses equivalent to the requirements for Stage 3 of the program.

3.3 Students admitted to the Advanced Science program who hold a completed or part completed degree or another award (including the BSc at pass level at UNSW), may be given credit for previous studies and attainments, but in order to qualify for the award of the BSc in an Advanced Science program, will be required as a minimum to complete a sequence of courses or other requirements equivalent to the requirements for Stage 4 of the program.

Study Load

4. Students may not undertake a study load of more than 24 Units of credit in any session (including General Education). This can be exceeded only in exceptional circumstances by students with an excellent academic record and requires the permission of the Associate Dean. Students with external commitments — such as part-time employment — in excess of ten hours per week, should take fewer courses each session. External commitments will not be taken into consideration in relation to such matters as extensions of time for submission of written work or failure to attend examinations (which may, for some courses, be scheduled on Saturday mornings). Students who do not make satisfactory progress may be required to show cause.
why they should be allowed to continue in the program or may be given a restricted program (see 7. Progression and Exclusion below).

Students wishing to take courses additional to those required for the award should be aware that the relevant courses will attract an additional fee, payable up-front, as voluntary courses.

Progression and Exclusion

5. Students whose performance is unsatisfactory in the program will be asked to show cause at the end of the academic year why they should remain in their program of study. Any student who fails a course twice, or is deemed to be making unsatisfactory progress, will be required to show cause.

Unsatisfactory progress may include:

- in the case of an Advanced Science program, failure to achieve an average of 65 or higher in courses attempted in an academic year;
- failure in 50% or more of courses attempted in an academic year;
- failing to pass courses totalling at 24 Units of credit in one year;
- failing to complete the stage 1 requirement of a particular study plan in the first two years of study.

Students required to show cause will be informed by the Registrar in writing. Students who apply to show cause will be assessed in accordance with the University's procedures. Failure to show cause can result in exclusion from a course or the program. Also see the section on progression and exclusion (see Restrictions on Students Re-enrolling) in the Student Guide.

Program and Course Quotas

6. Quotas are imposed on some programs and courses (usually because of class size constraints related to space). Where quotas are imposed, students' eligibility to enrol will be assessed on academic merit or on the basis of the requirements of the program of study in which the student is enrolled.

Accelerated Progression in Advanced Science Programs

7. There is provision for exceptionally talented students to take higher level courses in Stage 1. Contact the Science office for details.

Graduation and majors

Science Program (3970)

8. In order to graduate, students must satisfy requirements for the award by passing all the courses and requirements specified for their program. Students who complete requirements will be awarded the degree of Bachelor of Science at pass or honours level with a major in the area of specialisation (usually indicated by the program name). The award will appear on the testamur as:

Bachelor of Science in (name of program)  
or  
Bachelor of Science (with Honours) in (name of program or specialisation)

Advanced Science Programs (3973, 3985, 3986, 3990)

9. In order to graduate, students must satisfy requirements for the award by passing all courses and the requirements specified for their program. Students who complete requirements will be awarded the degree of Bachelor of Science at honours or pass level with a major in the area of specialisation (usually indicated by the program name, except that for some honours candidates the name of the honours specialisation will appear). Students who successfully complete Stage 4 of their program will be considered for the award of Honours. The following scale generally applies to Honours gradings and, depending on the structure of the program, is based either on performance in the Stage 4 program or on performance over the whole 4 stages of the program:

- Honours Class 1 mark or weighted average of 85 or greater
- Honours Class 2 Division 1 mark or weighted average from 75 to 84
- Honours Class 2 Division 2 mark or weighted average from 65 to 74
- Honours Class 3 or Pass mark or weighted average below 65

The award will appear on the testamur as:

Bachelor of Science (with Honours) in (name of program or specialisation)
Rules on Progression and Transfer in The Advanced Science Programs

Transferring Study Plans

10. Students must apply in writing to transfer between study plans within each of the Advanced Science programs. Applications are assessed on academic performance and approval is subject to places being available in the nominated program. Applications must be lodged with the Science office by the end of December in the preceding academic year.

Transferring between the Advanced Science Programs

11. Applications for transfer from one Advanced Science Program to another are only accepted at the end of each year of study. Applicants must lodge the Internal Program Transfer form with the Student Centre by 30 November in the preceding academic year.

Transfer should not be considered automatic. Applications are assessed on academic performance and approval is subject to places being available in the nominated program. Students must satisfy all prerequisites for the courses specified in the study plan of the particular Advanced Science program, and have completed the relevant sequence of courses for the proposed study plan.

Progression to Stage 4 Honours in Advanced Science

12. Progression to Stage 4 is subject to academic performance. Students seeking to enrol in a Stage 4 honours program are required to have the approval of the Head of School and normally will be required:

- to have completed the requirements for Stages 1, 2 and 3 of the specific study plan and to have satisfied prerequisite requirements as specified in that study plan. All General Education also must be completed;
- to have attained an average of 65 or higher in each stage of the program.

Students should also seek the guidance of the appropriate Head of School at an early stage of study to ensure that the study plan being followed is best suited to lead to the Year 4 honours program;

In addition, admission to a particular Stage 4 program is subject to appropriate research and supervision resources being available. Quotas may be imposed for entry in any year, in which case admission will be determined on academic merit.

Students who do not attain an average of 65 or higher in Stage 3 of their program are normally required to transfer to the Science program (3970) and take out the BSc award at pass level.

Transfers from Advanced Science to the Science Program

13. Students enrolled in the Advanced Science programs (program code 3973; 3976; 3985; 3986; 3990) who wish to take out the BSc award at pass level and without proceeding to Stage 4 are required to transfer to the Science program (3970). Applications to transfer should be lodged with the BSSM Office no later than the HECS census date in the session in which the student expects to satisfy requirements. Students applying after that date may not be able to graduate in the next round of graduation ceremonies. The application should state the 3970 Major in which the student wishes to be enrolled. Students must satisfy all requirements for the designated Science (3970) major in order to qualify for the award of the BSc. Further information regarding the transfer from the Advanced Science program to majors that are available in the Science program is available through the Science Office.

Table 1

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<th>Subject Area</th>
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<td>STATISTICS</td>
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Note:
Certain of the majors listed above are also appropriate for programs 3930 (Science/Arts), 3931 (Advanced Science/Arts), 3529 (Science/Commerce), 3611 (Science/Aeronautical Engineering), 3661 (Science/Industrial Engineering), 3681 (Science/Mechanical Engineering), 3701 (Science/Naval Architecture), 3725 (Science/Electrical Engineering), 3730 (Science/Civil Engineering), 3820 (Science/Medicine), 3951 (Science/Optometry), 4075 (Science/Education), 4770 (Science/Law). Students in these courses should consult their program advisor for details.

Students interested in Life Sciences topics but unsure of which program to choose are advised to enrol in the Biological Sciences Holding Program for the First Year. Information sessions will be held to assist students in their choice of major or study plan for Year 2.
Program Descriptions

Science (3970)

Conditions for the Award of the Degree

1. A student must complete 144 units of credit including 12 units of General Education.
2. The degree must contain a Major sequence of study and either a second Major or a Minor sequence.
3. A student must complete at least 36 units and no more than 60 units in Level I courses from at least three Schools.
4. A student must complete at least 36 units at Level I from Science Schools*.
5. No student may commence Level II courses until 24 Level I units have been successfully completed.
6. A student must complete a minimum of 84 units of credit from Science Schools*.
7. For entry to Honours a student must complete at least 24 units at Level III in the relevant Major sequence and have the permission of the Head of School.
8. A Major sequence is defined as: at least 42 units at Level II and III in a single discipline or area of study, including at least 18 units at Level III. Major sequences are defined in Table A
9. A Minor sequence is defined as: 24 units of credit at Level II or III. The Minor may either consist of programs available within but not taken as part of a Major or may be a sequence as defined in Table B.
10. Where a student does Majors in two cognate areas that have courses in common the Board of Studies in Science and Mathematics may permit up to 12 units at Level II and 6 units at Level III to be counted towards each Major sequence.

* Defined as Schools in the Science Faculties plus those in other Faculties that currently provide programs under the authority of the BSSM.

Transition Rule for 2000

Students are enrolled at all stages in the current Program 3970. New students entering in 2000 will enrol under the new Rules and Requirements. Re-enrolling students will normally be treated as follows:

- Students entering Year 2 will be transferred into the new Conditions and will be required to complete a Major and Minor (or a second Major);
- Students entering Year 3 will be encouraged to convert to the new Conditions, in which case they will only be required to complete a Major sequence. However if they elect to complete the Program of Study in which they are enrolled they will be permitted to do so.
- Students who are suspended or have deferred in 2000 will be required to enter under the new Conditions when they recommence.

Elective Courses

Students enrolled in any Science degree may take as electives any courses (subject to satisfying prerequisites) which are Specified as electives for their degree, or Available within a Major or Minor in Program 3970.
<table>
<thead>
<tr>
<th>Major / Staff Contact</th>
<th>Stage 1</th>
<th>Stage 2</th>
<th>Stage 3</th>
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<td><strong>Anatomy</strong></td>
<td>BIOS1101, BIOS1201</td>
<td>ANAT2111, ANAT2200, ANAT2210, ANAT2300, ANAT2310 (ANAT3121 may be taken in Stage 2)</td>
<td>Choose 18 units of credit from: ANAT3121, ANAT3211, ANAT3231, ANAT3411, ANAT3421. Choose 6 units of credit from: level III Anatomy not already taken or 6 units of credit at level III from the schools of Biochemistry, Biological Science, Microbiology, Pathology or Physiology.</td>
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<td>Dr B Freeman</td>
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<tr>
<td><strong>Biochemistry</strong></td>
<td>BIOS1101, BIOS1201, CHEM1011, CHEM1021</td>
<td>BIOS2101, BIOS2201, Choose at least 6 units of credit from: BIOS2021, CHEM2021, CHEM2041, MIRC2011</td>
<td>A Total of 24 units of credit. Choose 12 or 18 units of credit from: BIOCS111, BIOCS261, BIOCS271. Choose 0-12 units of credit from: BIOCS121, BIOCS201, BIOCS311. Choose 0 or 6 units of credit from: ANAT3231, BIOCS141, BIOT3061, CHEM3021, CHEM3041, MIRC3041, PHPH3211, PHPH3221.</td>
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<tr>
<td>Dr A Bagnara</td>
<td>BIOS1101, BIOS1201</td>
<td>BIOS2011, BIOS2021 (or BIOCS2621), BIOS2041, Choose 6 units of credit from: BIOS2031, BIOS2051, BIOS2061</td>
<td>Choose 24 units of credit from Level III Biological Science Courses.</td>
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<td><strong>Biological Science</strong></td>
<td>BIOS1101, BIOS1201, CHEM1011, MATH1041</td>
<td>BIOS2101, BIOS2201, MIRC2021, Recommended MIRC2011</td>
<td>Choose 24 units of credit from Level III Biological Science Courses.</td>
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<tr>
<td><strong>Biotechnology</strong></td>
<td>BIOS1101, BIOS1201, CHEM1011, CHEM1021, MATH1031, MATH1041</td>
<td>BIOS2101, BIOS2201, MIRC2201, Recommended MIRC2011</td>
<td>A Total of 24 units of credit. Choose 12 or 18 units of credit from: BIOCS111, BIOCS261, BIOCS271. Choose 0-12 units of credit from: BIOCS121, BIOCS201, BIOCS311. Choose 0 or 6 units of credit from: ANAT3231, BIOCS141, BIOT3061, CHEM3021, CHEM3041, MIRC3041, PHPH3211, PHPH3221.</td>
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<td>Ms R Lee</td>
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<tr>
<td><strong>Chemistry</strong></td>
<td>CHEM1011, CHEM1021 OR CHEM1031, CHEM1041</td>
<td>18 units of credit from: CHEM2011 or CHEM2617, CHEM2021, CHEM2031 or CHEM2839, CHEM2041 or CHEM2849</td>
<td>At least 12 units of credit from: CHEM3011, CHEM3021, CHEM3031, CHEM3041. Plus a further 12 units of credit from level II/III Chemistry.</td>
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<td>Dr N Duffy</td>
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<td><strong>Ecology</strong></td>
<td>BIOS1201, BIOS1101, CHEM1011, MATH1041</td>
<td>BIOS2011, BIOS2041, Choose 6 units of credit from: BIOS2031, BIOS2051, BIOS2061</td>
<td>Choose 24 units of credit from: BIOCS3061, BIOCS3071, BIOCS3081, BIOCS3091, BIOCS3011, BIOCS311 (or Advanced level equivalents).</td>
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<td><strong>Environmental Systems</strong></td>
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<td>Choose at least 6 units of credit from Mathematics, Biology, Geology and Geography</td>
<td>Choose 6 units of credit from Statistics. Choose at least 6 units of credit from 2 of the following: BIOS2011, OR GEOG2711, OR GEOE2120, GEOE2290</td>
<td>Choose at least 12 units of credit from 2 of the following: BIOCS3071, BIOCS3111 OR GEOG3711, GEOG3911 OR GEOE2240, GEOE3280, MSCI6300.</td>
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<td>Dr D Cohen</td>
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<tr>
<td>Dr S Mooney</td>
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<td>A/Prof P Adam</td>
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<td><strong>Food Science and Nutrition</strong></td>
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<td>BIOS1101, BIOS1201, CHEM1011, CHEM1021, FOOD1110, MATH1041</td>
<td>BIOS2181, FOOD3230, FOOD3220 Recommended BIOS2291, CHEM2801, CHEM2821, MIRC2011, MIRC2021, PHPH2101, PHPH2201</td>
<td>FOOD1310, FOOD3440, Choose 12 units of credit from: FOOD1390, FOOD2330, FOOD2340 Recommended CHEM3801.</td>
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<td>Prof. K. Buckle</td>
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<td><strong>Genetics</strong></td>
<td>BIOS1101, BIOS1201, CHEM1011, CHEM1021, MATH1031, MATH1041</td>
<td>BIOS2021, Choose 12 units of credit from: BIOS2101, BIOS2201, BIOS2041, MIRC2011 (MIRC2041 is usually required but may be replaced by MATH2841 or an approved COMP course).</td>
<td>A total of 24 units of credit: BIOSC3151, BIOSC3291. Choose 6 or 12 units of credit from: BIOCS141, BIOCS121, BIOCS3131, BIOCS301, MIRC3021. Choose 0 or 6 units of credit from: BIOS3071, BIOT3061.</td>
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<td>Prof L Dawes</td>
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<td>Major / Staff Contact</td>
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<tr>
<td>Geography</td>
<td>Choose 12 units of credit from: GEOG1601, GEOG1701, GEOG1801</td>
<td>GEOG2101 Choose 12 units of credit from level II Geography.</td>
<td>Choose 24 units of credit from level III Geography.</td>
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<tr>
<td>Geology</td>
<td>GEOL1111, GEOL1211</td>
<td>Choose at least 18 units of credit from level II Geology.</td>
<td>Choose additional Geology courses to make a total of at least 42 units of credit (54 for entry into honours) with at least 18 at level III.</td>
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<tr>
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<tr>
<td>Marine Science (Marine Biology)</td>
<td>BIOS1101, BIOS1201</td>
<td>MSCI2001, MSCI6200, BIOS2031, MICR2201</td>
<td>MSCI3001, BIOS3081, BIOS3091, MICR3071</td>
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<td>Dr D Cohen</td>
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<tr>
<td>Marine Science (Physical Oceanography)</td>
<td>MATH1131, MATH1231</td>
<td>MATH2111, MATH2120, MATH2240, MATH2301</td>
<td>MATH3241, MATH3261 OR MATH3270</td>
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<tr>
<td>Marine Science (Marine Geology)</td>
<td>GEOL1111, GEOL1211</td>
<td>MSCI2001, MSCI6200, GEOL2100, GEOL2110, GEOL2120, GEOL2220</td>
<td>MSCI3001, MSCI6300, choose 6 units of credit from: GEOL2290, GEOL3120, GEOL2231. Choose a further 6 units of credit from level III Geology subjects.</td>
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<td>Dr P March</td>
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<td>Major / Staff Contact</td>
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<tr>
<td>Philosophy</td>
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<tr>
<td>Dr P Cam</td>
<td>12 units of credit of level I Philosophy</td>
<td>Choose 18 units of credit from level II/III Philosophy</td>
<td>Choose 24 units of credit from level II/III Philosophy</td>
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<td>Physics</td>
<td>MATH1131, MATH1231, PHYS1121, PHYS1221</td>
<td>PHYS2050, PHYS2060, PHYS2040, PHYS2030, Choose 12 units of credit from level II or Level III Physics</td>
<td>Choose 18 units of credit from level III Physics.</td>
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<td>CHEM1011, CHEM1021, BIOS1101, BIOS1201,</td>
<td>PHPH2101, PHPH2201, BIOC2101, BIOC2201 OR BIOC2181, BIOC2291</td>
<td>Choose 18 units of credit from: PHPH3121, PHPH3131, PHPH3211, PHPH3221 Choose 6 units of credit from: Any level III Physiology course not included above PHPH3151, PHPH3251, BIOC3261, BIOC3271, BIOC3111, BIOC3121, MICR3041, MICR3051, PATH3203, PATH3204, Any level III Anatomy course.</td>
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<td>Physiology</td>
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<td>A/Prof J Morley</td>
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<td>Psychology</td>
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<td>PSYC2001</td>
<td>PSYC3001</td>
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<tr>
<td>A/Prof P Lovibond</td>
<td>Choose 18 units of credit from: PSYC2061, PSYC2071, PSYC2081, PSYC2101</td>
<td>Choose 18 units of credit from: Psychology advanced electives (from at least two elective groups)</td>
<td>Choose 18 units of credit from: Psychology advanced electives (from at least two elective groups)</td>
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<tr>
<td>Safety Science</td>
<td>ANAT2151, SESC2100, SESC2500, SESC3541 Any Level II Statistics course</td>
<td>PSYC3141 or PSYC3526, SESC3200, SESC2090, SESC4310 Further Level II or III SESC courses to total 42 units of credit.</td>
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<tr>
<td>Prof J Cross</td>
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<tr>
<td>Science and Technology Studies</td>
<td>Up to 12 units of credit from: HPST1107, HPST1108, SCTS1106, SCTS1107</td>
<td>Choose 18 units of credit from level II/III Science and Technology Studies</td>
<td>Choose 24 units of credit from level II/III Science and Technology Studies</td>
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<tr>
<td>Dr A Corones</td>
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<tr>
<td>Statistics</td>
<td>MATH1131, MATH1231 MATH1081</td>
<td>MATH2501, MATH2510 MATH2801, MATH2810, MATH2831</td>
<td>MATH3801, MATH3811, MATH3821 MATH3010</td>
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</tbody>
</table>

NOTES

- Students who are unsure of which study plan to choose are advised to enrol in the Science Holding Program for the First Year. Information sessions will be held to assist students in their choice of study plan for Year 2.
- Subjects listed for stage 1 are recommended subjects only. It is important to note that many of these subjects may be required as prerequisites for subjects required for later years.
- Where students have the necessary qualifications they are encouraged to enrol in the higher Mathematics courses.
- Where students have the necessary qualifications they are strongly encouraged to enrol in CHEM1031 and CHEM1041 instead of CHEM1011 and CHEM1021.
- Students are advised that Mathematics or Physics subjects totalling 6 units of credit is recommended for all programs.
- Students doing a physics major are also expected to take the courses MATH2011 and MATH2120.
- BIOC2181 and BIOC2291 may be substituted for BIOC2101 and BIOC2201 respectively (but only with the permission of the head of School). Minimum grades of credit in BIOC2181 and BIOC2291 will normally be required for entry into level III Biochemistry courses.
- Students wishing to do honours will need to consult with the appropriate school at the end of stage 2 of their program.
Table B

<table>
<thead>
<tr>
<th>Minor</th>
<th>Stage 1</th>
<th>Stage 2</th>
<th>Stage 3</th>
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<tbody>
<tr>
<td>Australian Studies</td>
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<td>Chinese Studies</td>
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<td>American Studies</td>
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<tr>
<td>Theatre, Film and Dance</td>
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<tr>
<td>Women's Studies</td>
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<tr>
<td>Accounting</td>
<td>ACCT1501, ACCT1511</td>
<td>24 level II or III units of credit in Accounting.</td>
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<tr>
<td>Aviation</td>
<td>AVIA1100, AVIA1900,</td>
<td>24 units of credit from AVIA2100, AVIA2400,</td>
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<td></td>
<td>AVIA1850</td>
<td>AVIA2500, AVIA2700, AVIA2800,</td>
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<td>AVIA301, AVIA3102, AVIA3400, AVIA3600,</td>
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<td>AVIA3701, AVIA3800, AVIA3810,</td>
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<td>AVIA3852</td>
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<tr>
<td>Business Economics</td>
<td>ECON1101, ECON1102</td>
<td>24 level II or III units of credit in Business Economics.</td>
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<tr>
<td>Business Law and Taxation</td>
<td>ECON1101, ECON1102</td>
<td>24 level II or III units of credit in Business Law and Taxation</td>
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</tr>
<tr>
<td>Business Statistics</td>
<td>ECON1101, ECON1102</td>
<td>24 level II or III units of credit in Business Statistics.</td>
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<tr>
<td>Computing</td>
<td>COMP2811, COMP2011</td>
<td>COMP2021, COMP2041</td>
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<td>Economic History</td>
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<td>Finance</td>
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<td>Human Resource Management</td>
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<td>Industrial Relations</td>
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<td>Information Systems</td>
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<td>International Business</td>
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<td>PATH3206, PATH3207</td>
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<td>Pathology</td>
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<td>GEOG3811, GEOG3921</td>
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<tr>
<td>Remote Sensing</td>
<td></td>
<td>GEOG2811, GEOG2921</td>
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</tr>
</tbody>
</table>

In addition to the minors listed below, 24 units of credit taken at level II or III in any major listed in Table A will also satisfy the requirements of a minor.
Advanced Science Degrees (3973; 3985; 3986; 3990) - Honours/Advanced Degree (4 years)

ADVANCED SCIENCE

Conditions for the Completion of the Advanced Science Program

- A student must complete 144 units of credit including 12 units of General Education in Stages 1-3 and a 48 unit Honours sequence at Stage 4.
- The degree must contain a study plan as specified for each Advanced Science program in the Handbook.
- A student must complete at least 36 units and no more than 48 units in Level I courses except where specified in a particular program.
- A student must complete before the end of Stage 3 at least two 3 unit courses taken from Table 'X'.
- No student may normally commence Level II courses until 24 Level I units have been successfully completed unless approved by the Head of School.
- Progression to Stages 3 and 4 is subject to academic performance. A student will be required to have attained an average of 65 or higher in courses relevant to the major area and cognate subjects in each prior stage.
- Students whose performance is unsatisfactory may be asked to show cause at the end of the academic year why they should remain in their program.

STUDY PLANS AVAILABLE IN ADVANCED SCIENCE

Anatomy
Applied Mathematics
Biochemistry
Biological Science
Biotechnology
Chemistry
Ecology
Engineering Physics
Food Science
Genetics
Geophysics
Marine and Coastal Studies
Materials Science
Mathematics with Computer Science
Mathematics and Finance
Medical Chemistry
Medical Microbiology and Immunology
Medical Physics
Microbiology
Molecular Biology
Neuroscience
Pharmacology
Physical Oceanography and Meteorology
Physics
Physics and Astronomy
Physics with Computing
Physiology
Psychology
Pure Mathematics
Statistics

Transition Rule for 2000

- Students are enrolled at all stages in the current Advanced Science Courses. New students entering in 2000 will enrol under the new Rules and Requirements. Re-enrolling students will be treated as follows:
- Students entering Stage 2 or Stage 3 will be transferred into the new Conditions and will be required to complete 48 units of credit per year. They will not be required to comply with points 3 and 4 of the Conditions unless this can be accommodated within their current program.
- Students who are suspended or have deferred in 2000 will be required to enter under the new Conditions when they recommence

Table X

<table>
<thead>
<tr>
<th>Level I</th>
<th>Level II</th>
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<tbody>
<tr>
<td>CHEM1000</td>
<td>FSCT2000</td>
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<tr>
<td>LIFE1001</td>
<td>LIFE2001</td>
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<tr>
<td>MATH1000</td>
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<td>PHYS1000</td>
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<tr>
<td>GEOS1000</td>
<td></td>
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</tbody>
</table>
Details of Study Plans

ANATOMY

Anatomy is the study of the structure of the human body. The word 'anatomy' is derived from the Greek, and means 'cutting up' or 'dissection'. However, anatomy today is much more than the descriptive study of the dissected body although dissected specimens are still used for research and instruction. The 'subject' Anatomy now embraces separate but strongly related disciplines. Gross Anatomy deals with the description of form, arrangement and function of the bones, joints, muscles and internal organs, together with their blood and nerve supply. Histology deals with the microscopic structure of tissues and cells. Embryology is concerned with the normal development of the embryo and fetus from conception to birth and with the mechanisms of development and malformations. Neuroanatomy deals with the internal organisation and functions of the brain and spinal cord. In all courses in Anatomy, strong emphasis is given to the functional significance of the structures in health and in disease. Advanced anatomy courses may include affiliation with a research project and a project evaluation report and, in some courses, an assessable dissection program.

A major in anatomy may be combined suitably with elective courses from Biochemistry, Physiology or Psychology.

Biochemistry*

Stage 1
BIOS1101, BIOS1201
CHEM1011, CHEM1021
MATH1131 or MATH1141 or MATH1011
MATH1231 or MATH1241 or MATH1021
LIFE1001
One General Education course totalling 3 units of credit

Stage 2
ANAT2111, ANAT2200, ANAT2210, ANAT2300, ANAT2310
(ANAT3121 may also be taken in Stage 2)
Elective courses totalling 24 units of credit
Recommended: Biological Science, Biochemistry, Physiology, Psychology
LIFE2001
One General Education course totalling 3 units of credit

Stage 3
Level III Anatomy courses totalling at least 18 units of credit from:
ANAT3121 or ANAT3531, ANAT3141 or ANAT3541, ANAT3121 or
ANAT3521, ANAT3231 or ANAT3631, ANAT3411, ANAT3421
General Education courses totalling 6 units of credit
Further level III courses from Biological Science, Biochemistry, Microbiology, Pathology, Physiology to give a total of 48 units of credit
Students proposing to proceed to Stage 4 (Honours) must complete Level III subjects totalling 36 units of credit

Biochemistry*

Stage 1
BIOS1101, BIOS1201
CHEM1011, CHEM1021
Choose at least 6 units of credit from:
MATH1031, MATH1041**
Elective courses totalling 12 units of credit
(Recommended: Physics)
LIFE1001
One General Education course totalling 3 units of credit

Stage 2
BIOC2101* and BIOC2201*
LIFE2001
Choose 6 units of credit from:
BIOS2021***, CHEM2021, CHEM2041, MICR2011
Elective subjects totalling 24 units of Credit
One General Education course totalling 3 units of credit

Stage 3
Choose 12 or 18 units of credit from:
BIOC3111***, BIOC3261, BIOC3271
Choose 0 - 12 units of credit from:
BIOC3121***, BIOC3281***, BIOC3131
Choose 0 - 6 units of credit from:
ANAT3231, BIOC3141, BIOC3301, BIOT3061, CHEM3021,
CHEM3041, MICR3041, PHPH3211, PHPH3221
Elective courses totalling 18 units of credit
General Education courses totalling 6 units of credit

Stage 4 (Honours)
BIOC4318/ BIOC4618
* At least two of the Stage 2 and two of the Stage 3 courses contributing to the major in Biochemistry must be taken at the advanced level.
** Other higher level study plan Mathematics courses may be substituted.
*** Advanced level options for these courses are proposed.

BIOLOGICAL SCIENCE

The Biochemistry Plan is closely allied to the Genetics Plan and the Molecular Biology Plan (see later) all of which are concerned with understanding life processes at the level of molecular structure, function and interaction. The Biochemistry Plan therefore provides a knowledge base and a broad range of specialised techniques which are relevant to all biology. The major impact of this discipline is largely at the molecular level and is ideal for those students whose interests are in understanding and appreciating biological processes at the molecular rather than the descriptive level. Integration of these molecular approaches at the cellular, tissue and whole organism level is an increasingly important part of Biochemistry. This discipline also is the foundation of medical science and is playing an increasingly important role in many aspects of modern medicine. The Biochemistry Plan (see below) provides opportunities to combine Biochemistry with other related discipline areas through careful choice of elective courses in Stages 2 and 3 of the Plan.

Biochemistry*

Stage 1
BIOS1101, BIOS1201
CHEM1011, CHEM1021
Choose at least 6 units of credit from:
MATH1031, MATH1041**
Elective courses totalling 12 units of credit
(Recommended: Physics)
LIFE1001
One General Education course totalling 3 units of credit

Stage 2
BIOC2101* and BIOC2201*
LIFE2001
Choose 6 units of credit from:
BIOS2021***, CHEM2021, CHEM2041, MICR2011
Elective subjects totalling 24 units of Credit
One General Education course totalling 3 units of credit

Stage 3
Choose 12 or 18 units of credit from:
BIOC3111***, BIOC3261, BIOC3271
Choose 0 - 12 units of credit from:
BIOC3121***, BIOC3281***, BIOC3131
Choose 0 - 6 units of credit from:
ANAT3231, BIOC3141, BIOC3301, BIOT3061, CHEM3021,
CHEM3041, MICR3041, PHPH3211, PHPH3221
Elective courses totalling 18 units of credit
General Education courses totalling 6 units of credit

Stage 4 (Honours)
BIOC4318/ BIOC4618
* At least two of the Stage 2 and two of the Stage 3 courses contributing to the major in Biochemistry must be taken at the advanced level.
** Other higher level study plan Mathematics courses may be substituted.
*** Advanced level options for these courses are proposed.

BIOLOGICAL SCIENCE

Biological Science encompasses all aspects of plants and animals including their relationship to each other and to the environment. The programs leading to the award of a science degree in Biological Science include cell biology, plant and animal physiology, ecology, genetics, taxonomy, marine biology, entomology and evolutionary studies. These studies are particularly relevant in the fields of agriculture, forestry, wildlife management, conservation and related environmental sciences. Within advanced science there are two plans available, Biological Science and Ecology.
Biological Science

Stage 1
BIOS1101, BIOS1201
CHEM1011
MATH1041
One General Education course totalling 3 units of credit
Choose 6 units of credit from: BIOS2031, BIOS2051, BIOS2061
One General Education course totalling 3 units of credit
E elective courses totalling 18 units of credit

Stage 2
BIOS2011, BIOS2621, BIOS2041, LIFE 2001
Choose 6 units of credit from: BIOS2031, BIOS2051, BIOS2061
One General Education course totalling 3 units of credit
Elective courses totalling 18 units of credit

Stage 3
Level III Biological Science courses totalling 36 units of credit, including advanced courses where available
One General Education course totalling 3 units of credit
Elective courses totalling 24 units of credit

Stage 4 (Honours)
Strand A or Strand B
(See course descriptions)

ECOLOGY

Ecology

Stage 1
BIOS1101, BIOS1201
CHEM1011
MATH1041
LIFE1001
One General Education course totalling 3 units of credit
Elective courses totalling 18 units of credit

Stage 2
BIOS2011, BIOS2041 LIFE 2001
Choose 6 units of credit from: BIOS2031, BIOS2051, BIOS2061
One General Education course totalling 3 units of credit
Elective courses totalling 24 units of credit

Stage 3
Choose 36 units of credit from: BIOS3001, BIOS3011, BIOS3061, BIOS3071, BIOS3081, BIOS3091, BIOS3111, BIOS3611, BIOS3671, BIOS3681
Elective courses totalling 24 units of credit

Stage 4 (Honours)
Strand A or Strand B
(See course descriptions)

BIOTECHNOLOGY

Biotechnology can be defined as the use of various biological processes to make products and perform services. The essential feature of biotechnology therefore is the use of biological processes based on living cells and biochemical macro-molecules such as proteins, DNA and RNA in a rapidly-expanding range of activities of benefit to mankind. As such, biotechnology makes practical use of the recent scientific advances in areas such as molecular genetics.

The development of recombinant-DNA (r-DNA) technology has resulted in the ability to produce large quantities of any potentially useful product. Based on this technology, a new generation of biopharmaceuticals, including hormones, vaccines, anti-hypertensive and anti-inflammatory agents, are being developed which have the potential to revolutionise medicine. Microorganisms and viruses are being modified for use in controlling plant and animal diseases and pests. Diagnostic kits are being developed for use in forensic science and in product identification and quality control. In addition, genetic improvements in agriculture, plants and animals are becoming a reality, as is the control of inborn genetic disorders in humans.

Some aspects of biotechnology are traditional, having been used for centuries. The first makers of bread, cheese and fermented beverages over six thousand years ago were applying biotechnological principles in processing these goods. Without understanding the processes they were operating, they were in fact making use of catalysis mediated by microbial cells. Such processes are still in use today and scientific advances now allow for much greater control of the processes with resultant improvements in quality and economics of production. The number of such biological processes has expanded also and enzymes and/or microorganisms are used in the production of a wide range of fermented foods (such as cheese, wine, beer, soy sauce, sauerkraut, yoghurt, tofu, kefir) and in the production of flavouring, colouring and sweetening agents. Bioprocesses are also used in the extraction of minerals from low grade ores, and modified and novel bioprocesses are being developed for the treatment of waste and degradation of recalcitrant molecules, an area of vital importance in our increasingly polluted planet.

The future for expansion in all the above areas is immense, and an ability to cope with the problems of the 21st century will be heavily dependent on these advances.

Biotechnology

Stage 1
BIOS1101, BIOS1201
CHEM1011, CHEM1021
LIFE1001
One General Education course totalling 3 units of credit
Choose at least 6 units of credit from:
MATH1031, MATH1041
One General Education course totalling 3 units of credit
Choose electives to make a total of 18 units of credit

Stage 2
BIOC2101**, BIOC2201**
MICR2201
LIFE2001
One General Education course totalling 3 units of credit
Choose electives totalling 24 units of credit
(Recommended: BIOS1201, MICR2011**)

Stage 3
Choose 12 units of credit from:
BIOT3011**, BIOT3061**, BIOT3071**, BIOT3021, BIOT3081
Choose elective courses totalling 30 units of credit
General Education courses totalling 6 units of credit
(Recommended: BIOT3021, BIOT3081)

Stage 4 (Honours)
BIOT4073 (F/T) BIOT4083 (P/T)

* At least two of the level II and two of the level III subjects contributing to the major must be taken at advanced level.
** Advanced level options for these subjects are proposed
CHEMISTRY

Within Advanced Science there are two plans available: Chemistry, and Medical Chemistry. Both plans provide a broad scientific education and a professional training in the chemical sciences. Fundamental, applied, environmental and industrial aspects of chemistry may be included by the appropriate choice of courses.

Chemistry

The Chemistry plan is designed for students who wish to specialise in the chemical sciences, and undertake the maximum number of chemistry courses. It is designed to provide education and training in all contemporary fields of chemistry, and should be selected by students who wish to devote the majority of their studies at Stage III to chemistry.

Within this plan there are sufficient electives available to complete the equivalent of a minor in another discipline. The School of Chemistry commands the following discipline areas: biochemistry, biotechnology, computing, geology, materials science, mathematics, physics. Other areas are available both within, and outside the science faculties. These possibilities should be discussed with an advisor from the School of Chemistry.

Inclusion of advanced level studies, from more than one field of specialisation, result in a broadly based degree in the chemical science. For example, a combination of chemistry and biochemistry leads to further work in areas such as toxicology and neurochemistry. Combining Level III chemistry with mathematics or computing provides a valuable basis for the many applications of computers in chemistry. Chemistry with physics or materials science allows entry into the rapidly developing field of advanced materials.

Stage 1
CHEM1031, CHEM1041*  
MATH1131 or MATH1141 or MATH1011  
MATH1231 or MATH1241 or MATH1021  
Choose 6 units of credit from level I Physics  
One Course from CHEM1000, PHYS1000, MATH1000, GEOS1000, LIFE1001  
One General Education course totalling 3 units of credit  
Elective courses totalling 12 units of credit

Stage 2**  
CHEM2011, CHEM2021, CHEM2031, CHEM2041  
BI0C2101 or BI0C2181  
Choose further specialisation in either physiology, pharmacology or molecular biology  
BI0C2201 or BI0C2291  
elective courses totalling 6 units of credit  
or  
PHPH2102 and PHPH2201  
FSCT2000 or LIFE2001  
General Education courses totalling 6 units of credit

Stage 3
CHEM3021, CHEM3041  
Further specialisation in either physiology, pharmacology or biochemistry/ molecular biology  
PHPH3151 and  
PHPH3251 or 6 units of credit from other level III physiology courses  
or  
Courses totalling 12 units of credit from Level III biochemistry and MICR3041  
Elective courses totalling 12 units of credit  
General Education courses totalling 6 units of credit

Stage 4  
CHEM4003  
Joint supervision of honours projects between the School of Chemistry and the Schools of either Physiology and Pharmacology or Biochemistry are strongly encouraged.

* Students without the assumed knowledge for these courses may substitute CHEM1011 and CHEM1021
**Alternative level II courses from CHEM2817, CHEM2821, CHEM2839 or CHEM2849 may be substituted by permission from the Head of School.

FOOD SCIENCE AND TECHNOLOGY

Food science and technology involves the understanding of basic sciences and the application of this knowledge to foods from the point of production, through handling, processing, preservation, distribution and marketing, up to consumption and utilisation by consumers. It is concerned with food processes, food commodities, food composition and food quality (including sensory properties, safety and nutritional value).

The study of food science and technology integrates many scientific disciplines. Its bases are in chemistry, physics, biochemistry and microbiology. Its borders merge with those of agriculture, engineering, human nutrition, public health, commerce, psychology and law. Biotechnology has a role of increasing importance in food science and technology.

The food scientist and food technologist are concerned with population food supplies and requirements, community wants and needs, and equitable distribution of foods to ensure human nutritional needs are met.

New knowledge is acquired in the laboratory, the pilot plant, and the community, and then applied to the development of safe, nutritious and palatable foods, beverages and food ingredients by optimisation of processes and equipment. Foods are studied in terms of their basic constituents and structures, and the changes they undergo when subjected to handling, processing and distribution.

Medical Chemistry

This program combines a strong knowledge of synthetic and analytical chemistry and aspects of Biochemistry and Pharmacology. The program is designed to produce graduates whose background in both chemical and biological areas are appropriate to the requirements of employers in Australia.
The food scientist and food technologist are equally concerned with the development and selection of raw materials from agricultural, horticultural, animal and marine sources.

A safe, adequate, palatable and nutritious food supply is essential to human health. The food and beverage industry is of major economic importance and in Australia is the largest sector of manufacturing industry. Internationally, food production, processing and service are among the largest and most stable industries. The challenges are to increase the availability, variety, quality and quantity of foods economically and in line with the needs of the world population. The Australian industry has a major role to play in supplying high quality foods to emerging overseas markets and there is a national and international demand for professionally trained people prepared to accept responsibility for the quality and safety of food.

The courses provide basic preparation for food science and technology careers in the food industry, the public sector, education, research, the food service industry, public health, management and marketing. Graduates may also find careers in health and environmental sciences, management of food resources and food wastes, and communication, and in areas such as dietetics after further training.

The Department of Food Science and Technology offers undergraduate training through the Board of Studies in Science and Mathematics (BSSM) and in the BSc programs in Food Science and Technology (four stages full-time 3060, six stages part-time 3070). The BSc program is three stages for a Pass degree during which students can study aspects of food science and technology in combination with other courses in a relevant discipline, preferably biochemistry, microbiology, biotechnology or chemistry. The fourth Honours Stage of the BSc Program includes further formal training in food science and technology as well as an extensive research project. The BSc degree in Food Science and Technology (3060) is four Stages full-time (pass or honour).

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**Food Science and Technology**

**Stage 1**
- BIOS1101, BIOS1201
- CHEM1031, CHEM1041*
- MATH1031, MATH1041
- or one of MATH1131, MATH1141
- and one of MATH1231, MATH1241

**LIFE1001**
One General Education course totalling 3 units of credit
- PHYS1111 or PHYS1201

**Stage 2**
- BIOC2101, BIOC2201
- CHEM2921
- LIFE2001
- MICR2201

General Education subjects totalling 9 units of credit
Elective subjects totalling 12 units of credit
*(recommended: CHEM2081, FOOD2320, FOOD3220)*

**Stage 3**
- FOOD1360, FOOD1370, FOOD1390
Elective subjects totalling 30 units of credit
*(recommended: FOOD1380, FOOD1490, FOOD2330, FOOD2340, FOOD2480, FOOD3490, FOOD3440, FOOD4450)*

**Stage 4 (Honours)**
- FOOD9420

* Students without the assumed knowledge for these courses may substitute CHEM1011 and CHEM1021.

**Alternative level II courses from CHEM2817, CHEM2821, CHEM2839 or CHEM2849 may be substituted by permission from the Head of School.

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**GENETICS**

The Genetics Plan is broadly based and offers a general introduction to the discipline during the first two years of study. The Plan allows students in Stage 3 to diversify into the more specialised areas of genetics, including molecular genetics, human genetics, plant and microbial molecular biology, conservation biology, etc. The flexibility of this Plan therefore allows students the scope to combine genetics with a number of other courses offered by the different Schools within the Faculty of Life Sciences so that Stage 4 (Honours) may be completed in any of these Schools provided that suitable genetics Honours projects are offered.

**Genetics***

**Stage 1**
- BIOS1101, BIOS1201
- CHEM1011, CHEM1021

Choose at least 6 units of credit from:
- MATH1031**, MATH1041**

Elective courses totalling 12 units of credit
*(Recommended: Physics)*
- LIFE1001
One General Education course totalling 3 units of credit

**Stage 2**
- BIOC2021***
- LIFE2001
Choose 12 units of credit from:
- BIOC2101, BIOC2201, BIOS2041, MICR2201

Elective courses totalling 24 units of credit
One General Education course totalling 3 units of credit

**Stage 3**
- BIOC3201***, BIOC3151***
Choose 6 or 12 units of credit from:
- BIOC3121***, BIOC3141, MICR3021

Choose 0 or 6 units of credit from:
- BIOC3301, BIOS3071, BIOT3061

Elective courses totalling 18 units of credit
General Education courses totalling 6 units of credit

**Stage 4 (Honours)**
- BSSM4103 (F/T), BSSM4109 (P/T)

* At least two of the Stage 2 and two of the Stage 3 courses contributing to the Genetics Study Plan must be taken at the advanced level.
** Other higher Level I Mathematics courses may be substituted.
** Advanced level options for these courses are proposed.

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**GEOLOGY**

The School of Geology offers the following study plan within advanced science.

**2503**

**Geophysics (Advanced Science only)**

Professional geophysicists work closely with geologists and, appropriately, studies of both disciplines are undertaken in the one Department. This major is for students who intend to become professional geophysicists. Students should consult the School of Geology for program approval.
Stage 1
COMP1011
GEOL1111, GEOL1211
MATH131 or MATH1141
MATH1231 or MATH1241
PHYS1121 or PHYS1131
PHYS2121 or PHYS1231 or PHYS1601
One course from GEOS1000, MATH1000, PHYS1000, CHEM1000, LIFE1001
One General Education course totalling 3 units of credit

Stage 2
COMP2811, COMP2011
GEOL1700, GEOL2131, GEOL2231
MATH2111 or MATH2110 and MATH2610
FSCT2000 or LIFE2001
PHYS2050
One General Education course totalling 3 units of credit
Elective courses totalling 6 units of credit
(Recommended: GEOL2121, MATH2120, MATH2130, MATH2520, MATH2620, PHYS2601)

Stage 3
COMP3111 or COMP3421
GEOL3101, GEOL3241*, GEOL2260
MATH3101, MATH3150
General Education courses totalling 6 units of credit
Elective courses totalling 15 units of credit
(Recommended: GEOL3101, GEOL2290, GEOL3241*, GEOL3250, PHYS3230)

Stage 4
GEOL4303* or GEOL4343*
* Includes Geological fieldwork.

MARINE AND COASTAL STUDIES

Marine Science programs allow specialisations in selected areas of marine science, yet also include adequate exposure to other pertinent disciplines.

Marine and Coastal Studies

Stage 1
BIOS1101, BIOS1201
GEOL1111, GEOL1211
MATH1041
Elective courses totalling 12 units of credit
LIFE1001, GEOS1000

Stage 2
MSCI2001, MSCI6200
BIOS2031, GEOL2100
LIFE2001 or FSCT2000
General Education courses totalling 6 units of credit
Elective courses totalling 18 units of credit
(Recommended: BIOS2011, BIOS2041, GEOG2711, GEOG2810, GEOG2920, GEOG2910, GEOG3210, GEOG3220, MSCI2200, MSCI2501)

Stage 3
MSCI3001, MSCI6300
BIOS3681, BIOS3091
General Education courses totalling 6 units of credit
Elective courses totalling 18 units of credit
(Recommended: BIOS3071, BIOS3111, GEOG3025, GEOG3761, GEOG3911, GEOG3921, GEOL2290, MATH3120, GEOG3231, MSCI3071)

Stage 4 (Honours)
MSCI4003 F/T, MSCI4009 P/T

MATERIALS SCIENCE

From 2000 the School of Materials Science and Engineering are offering the following major within Advanced Science.

Materials Science

Stage 1
MATS1111, MATS1021
MECH0440
CHEM1011, CHEM1021
MATH131 or MATH1141
MATH1231 or MATH1241
PHYS1121, PHYS1221
One course from MATH1000, PHYS1000, CHEM1000, GEOS1000, LIFE1001

Stage 2
MATS1142, MATS1162, MATS1072, MATS1082, MATS1112
MATH2049, MATH2059
CHEM2011 and CHEM2021 or CHEM2031
PHYS3030
General Education courses totalling 6 units of credit

Stage 3
MATS1093, MATS1163, MATS2213, MATS1213, MATS1183, MATS1283
PHYS3020 and PHYS3080, PHYS3310
FSCT2000 or LIFE2001
Elective courses totalling 12 units of credit
General Education courses totalling 6 units of credit

Stage 4
MATS4444

MATHEMATICS

The School is divided into Departments of Pure Mathematics, Applied Mathematics and Statistics. It offers an Advanced Science study plan in each of these areas and also plans in Physical Oceanography/Meteorology, in Mathematics and Computer Science (in conjunction with the School of Computer Science) and in Mathematics and Finance (in conjunction with the Faculty of Commerce).

In all these plans, except Mathematics and Finance, Stage 4 is a special Honours year. For entry to the Honours year, students will normally be required to have a credit average in their Level III Mathematics courses. They will also need to have permission from the Head of the appropriate Department or from the Head of School. In order to receive this permission, students will normally be expected to have included a significant number of higher level courses among the courses they study in the earlier stages of the plan. To ensure that they will be eligible for entry to the Honours year, students should discuss their choice of Level III courses with the Head of the appropriate Department.

The Mathematics and Finance plan is a four year plan in which honours may be awarded on the basis of a weighted average of all courses studied in the plan.

Pure Mathematics is the study of the essential structures of mathematics. Work by pure mathematicians underpins most of the technological advances of this century. Pure Mathematics is concerned with problems and techniques which transcend specific applications. Research, focussing on the development of existing theories or the creation of new ones, may be driven by applications or by the internal demands of the discipline. Pure Mathematics courses provide the insights and understanding required by those using mathematics, leading to mastery of the fundamental processes of mathematical science and the capacity for innovative applications in any area.
Applied Mathematics concerns the development of mathematics and models for understanding scientific phenomena, for the solution of technical and industrial problems, and for use in the social, economic and management sciences. Courses are designed to provide basic mathematical and computational skills needed for a wide range of applications, to develop the capability to construct, analyse and interpret mathematical models, and to encourage enthusiasm for the role of the mathematician in a variety of contexts.

Statistics is the science and art of using factual material for modelling and inference. Its mathematical foundations are in the theory of probability and it deals with how to estimate and make decisions using knowledge which is uncertain or observational material which is subject to error. There is a rich interplay of ideas between the theory of statistics and fields such as engineering, medicine and biological and behavioural sciences where statistical problems constantly arise.

Choosing electives

The following information is provided to assist students in choosing their elective courses.

Pure Mathematics

Pure Mathematics courses relevant to the mathematical aspects of Computer Science are MATH2400 and MATH2410 in Stage 2, and MATH3400, MATH3411 and MATH3430 in Stage 3.

Pure Mathematics courses relevant to mathematics teaching are MATH3511, MATH3521, MATH3531, MATH3560 and MATH3570 in Stage 3, or their higher equivalents.

Pure Mathematics courses relevant to the applications of mathematics in physics or engineering are MATH3531, MATH3541 and MATH3570 in Stage 3, or their higher equivalents.

Applied Mathematics

It is recommended that students in the Applied Mathematics plan should include the following among their electives.

Level II: At least two of: MATH2160, MATH2180, MATH2200, MATH2220, MATH2240.

Level III: At least three of: MATH3101, MATH3121, MATH3161, MATH3181, MATH3201, MATH3241, MATH3281, MATH3301.

In addition, the following recommendations are made for Stage 1 of the Applied Mathematics plan.

For students interested in physical sciences or for theoretical oceanography, meteorology or fluid dynamics: PHYS1121 and PHYS1221.

For students interested in social or biological sciences, at least 12 units of credit from the following: BIOS1101 and BIOS1221; PSYC1001 and PSYC1011; PHYS1121 and PHYS1221; CHEM1011 and CHEM1021.

For students interested in computational methods or computer science: COMP1011 and COMP2811.

Statistics

Choosing electives

The following information is provided to assist students in choosing their elective courses.

Stage 1

MATH1131 or MATH1141
MATH1231 or MATH1241
MATH1081

Elective courses totalling 30 units of credit

One course from MATH1000, PHYS1000, CHEM1000, GEOS1000, LIFE1001

One General Education course totalling 3 units of credit

Stage 2

Stage 3

Further Mathematics courses totalling 9 units of credit

Elective courses totalling 6 units of credit

General Education courses totalling 6 units of credit

Stage 4 (Honours)

MATH4103 or MATH4104

Mathematics and Computer Science

Stage 1

COMP1011, COMP1021
MATH1131 or MATH1141
MATH1231 or MATH1241
MATH1081, MATH2400

Elective courses totalling 12 units of credit

One course from MATH1000, PHYS1000, CHEM1000, GEOS1000, LIFE1001

One General Education course totalling 3 units of credit

Stage 2

MATH2011 (or MATH2110 and MATH2610)
MATH2501 or MATH2601
MATH2301

ComP2011, COMP2021, COMP2041

Level III computer science courses totalling 6 units of credit

FSCT2000 or LIFE2001

One General Education course totalling 3 units of credit

Stage 3

Further Mathematics courses totalling 9 units of credit

Elective courses totalling 6 units of credit

General Education courses totalling 6 units of credit

Stage 4 (Honours)

MATH4003 or COMP4914

Further level III or IV Mathematics courses totalling 18 units of credit

Plus either

Further level III mathematics courses totalling 6 units of credit (if proceeding to MATH4003) or

Further level III or IV computer science courses totalling 6 units of credit (if proceeding to COMP4914)

General Education courses totalling 6 units of credit

Stage 4 (Honours)

MATH4003 or COMP4914

Statistics

Choosing electives

The following information is provided to assist students in choosing their elective courses.

Stage 1

MATH1131 or MATH1141
MATH1231 or MATH1241
MATH1081

Elective courses totalling 24 units of credit

One course from MATH1000, PHYS1000, CHEM1000, GEOS1000, LIFE1001

One General Education course totalling 3 units of credit

Stage 2

MATH2011 (or MATH2110 and MATH2610)
MATH2120 or MATH2130
MATH2501 or MATH2601
MATH2520 or MATH2620
MATH2801 or MATH2901
MATH2810
MATH2831 or MATH2931

Elective courses totalling 9 units of credit

FSCT2000 or LIFE2001

One General Education course totalling 3 units of credit

Stage 3

MATH3010
MATH3101 or MATH3101
MATH3301
MATH3400, MATH3411

A further Level III Mathematics course totalling 3 units of credit

Level III or IV Computer Science courses totalling 18 units of credit

Stage 4 (Honours)

MATH4103 or MATH4104

Further level III mathematics courses totalling 6 units of credit (if proceeding to MATH4003) or

Further level III or IV computer science courses totalling 6 units of credit (if proceeding to COMP4914)

General Education courses totalling 6 units of credit
Stage 3
MATH3010
MATH3801 or MATH2901
MATH3811
MATH3821
Statistics courses totalling 6 units of credit
Further Mathematics courses totalling 9 units of credit
Elective subjects totalling 6 units of credit
General Education courses totalling 6 units of credit

Stage 4 (Honours)
MATH4903 or MATH4904

Mathematics and Finance

Stage 1
ACCT1501
COMP1091
ECON1101, ECON1102
MATH1131 or MATH1141
MATH1231 or MATH1241
FINS2612
One course from MATH1000, PHYS1000, CHEM1000,
GEOS1000, LIFE1001
One General Education course totalling 3 units of credit

Stage 2
MATH2011 (or MATH2110 and MATH2610)
MATH2120 or MATH2130
MATH2501 or MATH2801
MATH2801 or MATH2901
MATH2810 or MATH2910
MATH2831 or MATH2931
ACCT1511
FINS2613
FSCT2000 or LIFE2001
One General Education course totalling 3 units of credit

Stage 3
MATH3010
Further level III mathematics courses totalling 12 units of credit*
A further level II or III mathematics course totalling 3 units of credit*
FINS2624, FINS3616
Further level III finance courses totalling 6 units of credit
Elective courses totalling 6 units of credit
General Education courses totalling 6 units of credit

Stage 4
MATH4012
Further level III mathematics courses totalling 12 units of credit*
FINS3635
Further level III finance courses totalling 6 units of credit
Elective courses totalling 12 units of credit

* The choice of Mathematics courses in stages 3 and 4 must include at least 6 units of credit from each of the following 4 groups:
1. (computing) MATH3101, MATH3301, MATH3821
2. (discrete modelling) MATH2160, MATH2180, MATH2200, MATH3941,
   MATH3980
3. (continuous modelling) MATH2220, MATH3161, MATH3181, MATH3201,
   MATH3641, MATH3901
4. (statistics) level III statistics

Stage 5
MATH3010
Physical Oceanography / Meteorology

Stage 1
MATH1131 or MATH1141
MATH1231 or MATH1241
MATH1081
PHYS1121, PHYS1221
Elective courses totalling 12 units of credit
One course from MATH1000, PHYS1000, CHEM1000,
GEOS1000, LIFE1001
One General Education course totalling 3 units of credit

Stage 2
MATH2011 (or MATH2110 and MATH2610)
MATH2120 or MATH2130
MATH2501 or MATH2801
MATH2801 or MATH2901
MATH3201, MATH2240
PHYS2610
GEOS2811
Elective courses totalling 6 units of credit
FSCT2000 or LIFE2001
One General Education course totalling 3 units of credit

Stage 3
MATH3010
Further level III mathematics courses totalling 9 units of credit
Elective courses totalling 6 units of credit

Stage 4 (Honours)
MATH4103 or MATH4104

Pure Mathematics

Stage 1
MATH1131 or MATH1141
MATH1231 or MATH1241
MATH1081
Elective courses totalling 24 units of credit
One course from MATH1000, PHYS1000, CHEM1000,
GEOS1000, LIFE1001
One General Education course totalling 3 units of credit

Stage 2
MATH2011 (or MATH2110 and MATH2610)
MATH2120 or MATH2130
MATH2501 or MATH2801
MATH2801 or MATH2901
MATH2301
Elective courses totalling 12 Credit Points*
FSCT2000 or LIFE2001
One General Education course totalling 3 units of credit

Stage 3
MATH3010
Level III Pure Mathematics courses totalling 24 units of credit
Further Mathematics courses totalling 9 units of credit
Elective course totalling 6 units of credit
General Education courses totalling 6 units of credit

Stage 4 (Honours)
MATH4603 or MATH4604
MEDICAL PHYSICS

Medical Physics is the application of physics to diagnosis, treatment and prevention of human disease and disability. There is a continuing demand for professional physicists in this area as new physical techniques are rapidly translated into new medical instruments. There is an increasing demand for health physicists in industry and the public service to monitor environmental and occupational sources of radiation and other hazards.

This program gives an essential strong background in conventional physics including electronics and computing, a general background in the biological sciences and some specialised knowledge in biophysics and medical physics.

Honours may be awarded. The basis is a suitably weighted performance over the last three stages of this four year advanced science degree.

Medical Physics

Stage 1
BIOS1201, BIOS1101
CHEM1031 or CHEM1011
CHEM1041 or CHEM1021
MATH1131 or MATH1141
MATH1231 or MATH1241
PHYS1131, PHYS1123

Stage 2
BIOC2101
MATH2011, MATH2120
One Course from CHEM1000, GEOS1000, PHYS1000, MATH1000 or LIFE1001
PHYS2010, PHYS2020, PHYS2030, PHYS2040, PHYS2050, PHYS2060, PHYS2410, PHYS2830
General Education courses totalling 6 units of credit

Stage 3
PHPH2001
PHYS1601, PHYS1310, PHYS1320, PHYS1410
FSCT2000 or LIFE2001
General Education courses totalling 6 units of credit

Plus electives chosen to make a total of 48 Units of Credit. Those in the supplementary table below are especially recommended

Year 4
PHYS3020, PHYS3230, PHYS4411, PHYS4413
SAFE4410
Plus electives chosen to make a total of 48 Units of Credit. Those in the supplementary table below are especially recommended

Supplementary table
ANAT2120 or ANAT2111
MATH2160
PHYS2601, PHYS3010, PHYS3050, PHYS3060
PHYS3210, PHYS3310, PHYS3610, PHYS3630, PHYS3710, PHYS3720, PHYS3760

MICROBIOLOGY AND IMMUNOLOGY

Microbiology is the scientific study of the smallest forms of life namely, bacteria, viruses, archaea, fungi and protozoa. These fascinating organisms impact on our lives in many ways. On the negative side, they cause disease in humans, animals and plants, they spoil our food and can destroy textiles and structural materials. However, microorganisms are also of great benefit. Indeed, microorganisms are the key participants for the turnover of nutrients and elements and are main producers of carbon and biomass. They turn the wheels on this globe and are responsible for sustainability of life. They also contribute to a better environment via recycling of organic wastes, maintenance of soil fertility and biodegradation of pollutants. Many foodstuffs, beverages, pharmaceuticals, eg. antibiotics and other industrial products, are products of microbial action. The genetic engineering of microorganisms is a fundamental aspect of molecular biology and the way of the future.

Immunology, the study of the immune system, has contributed significantly to modern medicine in areas such as blood transfusion, organ transplantation, allergic reactions and immunity to disease. In cell biology, immunology has advanced our understanding of differentiation, cell cooperation and the triggering of proliferation and differentiation by cell surface receptors.

Both Microbiology and Immunology also provide an excellent training in the scientific method and scientific communication. We aim to provide an undergraduate training that serves as a starting point for many careers within our disciplines and beyond. An energetic honours programme provides experience of scientific research and aims to further develop a wide range of skills.

Microbiology

Stage 1
BIOS1101, BIOS1201
CHEM1031, CHEM1041
MATH1041
Elective courses totalling 12 units of credit
LIFE1001
One General Education course totalling 3 units of credit

Stage 2
MICR2201, MICR2011
LIFE2001
Choose 6 units of credit from:
BIOC2201, BIOS2011, BIOS2021, FOOD2320
Elective courses totalling 18 units of credit
One General Education course totalling 3 units of credit

Stage 3
MICR3011, MICR3021, MICR3071
Choose 6 units of credit from:
MICR3031, ICR3061, MICR3081, BIOT3081, BIOS3071, BIOT3110, BIOT3041, CHEM3901, GEOS3911, FOOD2490
Elective courses totalling 18 units of credit
General Education courses totalling 6 units of credit

Stage 4 (Honours)
MICR4013 or MICR4023

Medical Microbiology and Immunology

Stage 1
BIOS1101, BIOS1201
CHEM1031, CHEM1041
MATH1041
Elective courses totalling 12 units of credit
LIFE1001
One General Education course totalling 3 units of credit

Stage 2
MICR2201
LIFE2001
Choose 6 units of credit from:
BIOC2101, BIOC2201, MICR2011, BIOS2021, PHPH2101, PHPH2201, PATH2201
Elective courses totalling 30 units of credit
One General Education course totalling 3 units of credit

Stage 3
Choose 12 - 24 units of credit from:
MICR3041, MICR3051, MICR3061, MICR3081
Choose 0 - 12 units of credit from
MICR3021, MICR3031, PHPH3121, BIOC3261, BIOC3271, PATH3205, PATH3206
General Education courses totalling 6 units of credit
Further elective courses to give a total of 48 units of credit

Stage 4 (Honours)
MICR4013 or MICR4023
MOLECULAR BIOLOGY

Recent advances in Molecular Biology, especially the continuing development of recombinant DNA technology, have revolutionised our understanding of the structure, function and regulation of individual genes. These advances have opened up the exciting field of Molecular Genetics, one of the most rapid growth areas in biology. This marriage of Biochemistry, Molecular Biology and Genetics provides an exciting new approach for the study of all living organisms, including the human. Biochemistry and Molecular Genetics therefore represent fundamental components of biological and medical science and they will have increasingly important roles to play in many aspects of modern medicine, genetics and evolutionary biology.

Molecular Biology

Stage 1
BIOS1101, BIOS1201
CHEM1011, CHEM1021
Choose 6 units of credit from:
MATH1031**, MATH1041**
Elective courses totalling 12 units of credit
(Recommended: Physics)
LIFE1001
One General Education course totalling 3 units of credit

Stage 2
BIOC2101, BI0C2201
BIOS2021***
MICR2011
LIFE2001
Elective courses totalling 18 units of credit
One General Education course totalling 3 units of credit

Stage 3
BIOC3121***, BI0C3281***, MICR3021
Choose 6 units of credit from:
BI0C3111***, BI0C3271, BI0C3131, BI0C3301, BIOT3061, MICR3011
Elective courses totalling 18 units of credit
One General Education course totalling 6 units of credit

Stage 4 (Honours)
BI0C4428

* At least two of the Stage 2 and two of the Stage 3 courses contributing to the molecular biology study plan must be taken at the advanced level.
** Other higher level I Mathematics courses may be substituted.
Note: MATH1041 is a prerequisite for BIOS2041
*** Advanced level options for these courses are proposed.

NEUROSCIENCE

This program introduces students to the biological and behavioural aspects of the nervous system. The program is based around the neuroscience subjects offered by the Schools of Anatomy, Physiology and Pharmacology, and Psychology.

Within the neuroscience program there are two streams Behavioural neuroscience and biophysical neuroscience, details of which are included below.

Neuroscience

Stage 1
BIOS1101, BIOS1201
CHEM1011, CHEM1021
MATH1031, MATH1041 or one of
MATH1131, MATH1141 and one of
MATH1231, MATH1241
Choose 6 units of credit from either the behavioural neuroscience stream or the biophysical neuroscience stream*
LIFE1001
One General Education course totalling 3 units of credit

Stage 2
ANAT2111
BI0C2101 and BI0C2201, or
BI0C2181 and BI0C2291
PHPH2101, PHPH2201
LIFE2001
Choose 12 units of credit from either the behavioural neuroscience stream or the biophysical neuroscience stream*
One General Education course totalling 3 units of credit

Stage 3
ANAT3411, ANAT3421
PHPH3521, PHPH3531
Choose 18 units of credit from either the behavioural neuroscience stream or the biophysical neuroscience stream*
General Education courses totalling 6 units of credit

Stage 4
Subject to satisfactory progress throughout the course (normally a credit average), students may proceed to the Honours Stage. Before the commencement of Stage 2 students should consult with the appropriate Schools and the Neuroscience program coordinating committee consisting of representatives from the Schools of Anatomy, Physiology and Pharmacology, and Psychology, about the subjects required for a particular Honours program. Students should also note general guidelines for Advanced Science Stage 4.

* Students interested in Behavioural Neuroscience should choose from the following courses:

Stage 1: PSYC1001, PSYC1011
Stage 2: PSYC2071, PSYC2081
Stage 3: Level III Psychology courses totalling 12 units of credit, with one subject selected from Advanced Perceptual / Cognitive Psychology (PSYC3151, PSYC3221, PSYC3311, PSYC3321) and one subject from Advanced Biological Psychology (PSYC3151, PSYC3241, PSYC3251). An additional course totalling 6 units of credit at level II or level III to complete 48 units of credit. This course might be chosen from those offered by the School in which honours study is contemplated.

* Students interested in Biophysical Neuroscience should choose from the following courses:

Stage 1: PHYS1111 and PHYS1201; or PHYS1121 and PHYS1221; or COMP1001 and COMP1011 and COMP2811.
Stage 2: Choose 12 units of credit from: ANAT2200, ANAT2210, BIOS2021, BIOS2041, CHEM2011, CHEM2021, PSYC1001, PSYC1011, PATH2201 or level II courses totalling 12 units of credit from the schools of Mathematics, Physics or Computer Science and Engineering.
Stage 3: Choose 18 units of credit at level III from among those offered in the schools of Mathematics, Physics, Chemistry, Biochemistry, Physiology and Pharmacology, Computer Science and Engineering, Anatomy, Pathology, or 12 units of credit at level III from these schools plus PSYC2071 or PSYC2081.
PHYSICS

The Majors offered by the School of Physics reflect the importance of Physics in science and technology at both the fundamental and at the applied levels.

Physics

Stage 1
MATH1131 or MATH1141
MATH1231 or MATH1241
PHYS1131, PHYS1231,
Elective courses totalling 18 units of credit
One course from PHYS1000, CHEM1000, MATH1000, GEOS1000, LIFE1001
One General Education course totalling 3 units of credit

Stage 2
FSCT2000 or LIFE2001
MATH2011, MATH2120, MATH2520
PHYS2010, PHYS2020, PHYS2030, PHYS2040, PHYS2050, PHYS2060, PHYS2080
Elective courses totalling 9 units of credit
One General Education course totalling 3 units of credit

Stage 3
PHYS3010, PHYS3020, PHYS3030, PHYS3040, PHYS3050, PHYS3060, PHYS3080
Two of PHYS3040, PHYS3070, PHYS3110, PHYS3120
Level III elective courses totalling 18 units of credit
General Education courses totalling 6 units of credit

Stage 4 (Honours)
Choose one of PHYS4103, BSSM4013

Physics and Astronomy

This program provides the basic physics essential for a career in astronomy. It will not prevent specialisation in some other field of physics if students' interests change during their studies.

There is astronomy content in each Stage of the program. There are special lectures and projects in the version of PHYS1131 and PHYS1231 for physics majors. The other astronomy courses are PHYS2160 and PHYS3160 and lecture course and projects in the Honours Stage.

Stage 1
MATH1131 or MATH1141
MATH1231 or MATH1241
PHYS1131, PHYS1231
Elective courses totalling 18 units of credit
One course from PHYS1000, CHEM1000, MATH1000, GEOS1000, LIFE1001
One General Education course totalling 3 units of credit

Stage 2
FSCT2000 or LIFE2001
MATH2011, MATH2120, MATH2520
PHYS2010, PHYS2020, PHYS2030, PHYS2040, PHYS2050, PHYS2060, PHYS2080
Elective courses totalling 6 units of credit
One General Education course totalling 3 units of credit

Stage 3
PHYS3010, PHYS3020, PHYS3030, PHYS3040, PHYS3050, PHYS3060, PHYS3080
Two of PHYS3040, PHYS3070, PHYS3110, PHYS3120
Level III elective courses totalling 15 units of credit
General Education courses totalling 6 units of credit

Stage 4 (Honours)
PHYS4103

Physics with Computer Science

This Program (Physics with Computer Science) provides a strong background in Physics together with the computing skills necessary to fully utilise computers in research and industrial laboratories.

Stage 1
COMP1001, COMP1011
MATH1131 or MATH1141
MATH1231 or MATH1241
PHYS1131, PHYS1231, PHYS1601,
PHYS1000, CHEM1000, MATH1000, GEOS1000, LIFE1001
One General Education course totalling 3 units of credit

Stage 2
COMP2011, COMP2811
FSCT2000 or LIFE2001
MATH2011, MATH2120, MATH2520
PHYS2010, PHYS2020, PHYS2030, PHYS2040, PHYS2050, PHYS2060, PHYS2080
One General Education course totalling 3 units of credit

Stage 3
PHYS2010, PHYS3010, PHYS3020, PHYS3030, PHYS3040
Further Level III Physics courses totalling 15 units of credit
Further Level III Computer Science courses or PHYS2601 totalling 12 units of credit
General Education courses totalling 6 units of credit

Stage 4 (Honours)
PHYS4103

ENGINEERING PHYSICS

This program combines a thorough knowledge of experimental physics, electronics, computing and instrumentation, optoelectronics and communications with elements of engineering practice and management. It is designed to produce graduates with skills and knowledge appropriate to the requirements of Australian industry.

An industrial project of one session's duration with an industrial sponsor of the program is included in Stage 4.

The program prepares graduates for membership of the Institution of Engineers, Australia, within two years of initial employment in an engineering field. Graduates will be accepted for membership of the Australian Institute of Physics.

Honours may be awarded. The basis is a suitably weighted performance over the last three stages.
ENGINEERING PHYSICS

Stage 1
CHEM1817
COMP1001
MATH1131 or MATH1141
MATH1231 or MATH1241
PHYS1131, PHYS1231, PHYS1601, PHYS2630,
One course from PHYS1000, CHEM1000, MATH1000,
GEOS1000, LIFE1001
One General Education course totalling 3 units of credit

Stage 2
ELEC2031
FSCT2000 or LIFE1001
MATH2011, MATH2520, MATH2120, MATH3150
PHYS2030, PHYS2040, PHYS2050, PHYS2060, PHYS2601,
PHYS3760
One General Education course totalling 3 units of credit

Stage 3
ELEC3004, ELEC3016
MATH2839 or MATH2859
PHYS2010, PHYS2020, PHYS3020, PHYS3060, PHYS3080,
PHYS3310, PHYS3610, PHYS3630, PHYS3710/3720
General Education courses totalling 6 units of credit

Stage 4
ELEC4010, ELEC3013
PHYS3011, PHYS3030, PHYS3040, PHYS3110, PHYS3720/3710,
PHYS4764

PHYSIOLOGY AND PHARMACOLOGY

Physiology, the study of the processes and mechanisms which serve and control the various functions of the body, begins at Level II.

Students majoring in Physiology should note the prerequisites for Level III Physiology, normally: satisfactory completion of PHPH2101 Physiology 1A and PHPH2201 Physiology 1B as well as BIOC2101 and BIOC2201, or BIOC2181 and BIOC2291. Level III Physiology courses provide the 24 Level III units of credit required for a degree with a single specialisation in Physiology and can be taken with allied disciplines, such as Anatomy, Biochemistry and Molecular Genetics, Biological Science, Biotechnology, Chemistry, Microbiology and Immunology, Pharmacology or Psychology, to give a degree with a double specialisation. Note should be taken of the prerequisites and corequisites for the subjects taken with Physiology and Pharmacology subjects.

Students majoring in Pharmacology should note that the prerequisites for Pharmacology are normally the same as for Physiology, namely satisfactory completion of PHPH2101 Physiology 1A and PHPH2201 Physiology 1B as well as BIOC2101 and BIOC2201, or BIOC2181 and BIOC2291. Level III Pharmacology subjects provide 12 units of credit and students should note that the completion of the pharmacology major requires additional Level III subjects which must be chosen from the closely related courses listed below in Physiology, Biochemistry and Molecular Genetics, Microbiology and Immunology, Chemistry, or Biotechnology. Where sufficient extra courses are taken from these or allied courses such as in Anatomy, Biological Science, Biotechnology or Psychology, a degree will then be taken with double specialisation. Note should also be taken of the prerequisites and corequisites for the subjects taken with Pharmacology.

Advanced Science students who are interested in Medical Science are encouraged to consult with the Head of School regarding the possibility of transferring to the Bachelor of Medical Science degree program.

PHYSIOLOGY

Stage 1
BIOS1101, BIOS1201
CHEM1011 or CHEM1031 and CHEM1021 or CHEM1041
MATH1031, MATH1041 or one of
MATH1131, MATH1141 and one of
MATH1231, MATH1241
Elective courses totalling 6 units of credit
LIFE1001
One General Education course totalling 3 units of credit

Stage 2
PHPH2101, PHPH2201
BIOC2101 and BIOC2201, or
BIOC2181 and BIOC2291
LIFE2001
Elective courses totalling 18 units of credit
One General Education course totalling 3 units of credit

Stage 3
Choose 18 units of credit from:
PHPH3521, PHPH3531, PHPH3511, PHPH3621
Choose 6 units of credit from:
level III Physiology, level III Anatomy, PHPH3551, PHPH3651,
BIOC3201, BIOC3271, BIOC3111, BIOC3121, MIRC3041,
MICR3051, PATH3203, PATH3204
Elective courses totalling 18 units of credit
General Education courses totalling 6 units of credit

Stage 4 (Honours)
PHPH4218

Subject to satisfactory progress throughout the program (normally a credit average), students may proceed to the honours stage. Students should consult with the school of Physiology and Pharmacology, and note general guidelines for Advanced Science Stage 4.

PHARMACOLOGY

Stage 1
BIOS1101, BIOS1201
CHEM1011 or CHEM1031 and CHEM1021 or CHEM1041
MATH1031, MATH1041 or one of
MATH1131, MATH1141 and one of
MATH1231, MATH1241
Elective courses totalling 6 units of credit
LIFE1001
One General Education course totalling 3 units of credit

Stage 2
PHPH2101, PHPH2201
BIOC2101 and BIOC2201, or
BIOC2181 and BIOC2291
LIFE2001
Elective courses totalling 18 units of credit
One General Education course totalling 3 units of credit

Stage 3
Choose 12 units of credit from level III Physiology, Biochemistry, Chemistry, Microbiology and Immunology, Anatomy, Pathology, Biotechnology, Biological Science.
Elective subjects totalling 18 units of credit
General Education courses totalling 6 units of credit
Further subjects to give a total of 345 Credit Points.
One 56 hour or two 28 hour General Education subjects.
Students proposing to proceed to Stage 4 (Honours) must complete Level III subjects totalling 105 Credit Points.

Stage 4 (Honours)
PHPH4258
Subject to satisfactory progress throughout the program (normally a credit average), students may proceed to the honours stage. Students should consult with the School of Physiology and Pharmacology and note general guidelines for Advanced Science Stage 4.

**PSYCHOLOGY**

Psychology is the scientific study of human behaviour. It is a diverse discipline that includes study of the processes of perceiving, learning and memory; the assessment of abilities and attitudes; the origins of personality and emotional states; the nature and effects of social interactions with other people; brain-behaviour relationships; and the causes of abnormal behaviour. Study in the scientific discipline of psychology provides the background necessary for further training in the application of psychology in a variety of professional contexts.

Psychologists work in clinical, correctional, counselling, legal, educational and organisational settings. People with training in psychology also pursue careers in diverse areas including academic and health research; rehabilitation; occupational health and safety; advertising and marketing; and personnel selection, training and management.

**Registration as a Psychologist**

In order to become a member of the professional body, the Australian Psychological Society (APS), and for registration as a psychologist in New South Wales, students first need a University bachelor degree which includes four years of approved training in psychology. Psychology in the Advanced Science (Life Sciences) degree provides four years of approved training in Psychology. Students must also follow this by completing an accredited 5th and 6th year academic degree such as one of the Master of Psychology degrees (Clinical, Forensic or Organisational) or a combined Doctor of Philosophy/Master of Psychology degree as offered by this University. An alternative of two years of supervised experience in professional practice may be undertaken for registration as a psychologist in New South Wales.

**English Proficiency**

A high proficiency in English is needed to pass Psychology courses.

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**Psychology**

**Stage 1**

PSYC1001 and PSYC1011

Elective courses totalling 30 units of credit*

LIFE1001

One General Education course totalling 3 units of credit

**Stage 2**

LIFE 2001

PSYC2001, PSYC2061, PSYC2071, PSYC2081 and PSYC2101

Elective courses totalling 12 units of credit*

One General Education course totalling 3 units of credit

**Stage 3**

PSYC3001 and PSYC3011

Four Advanced Level III Psychology electives*

Elective courses totalling 6 units of credit*

General Education courses totalling 6 units of credit

**Stage 4 (Honours)**

PSYC4053 and PSYC4063

* Advanced Level III Psychology electives must include one course from at least three of the following four elective groups:
  - Advanced Perceptual/Cognitive - PSYC3151, PSYC3221, PSYC3311, PSYC3321
  - Advanced Biological - PSYC3051, PSYC3241, PSYC3251
  - Advanced Social - PSYC3121, PSYC3271, PSYC3281
  - Psychological Applications - PSYC3141, PSYC3201, PSYC3301, PSYC3331

* Suitable supporting courses include Anatomy, Biology, Physiology, Genetics of Behaviour, Science and Technology Studies, and Philosophy. Students may contact the School for advice.
Specialist Degrees

AVIATION

3980
Aviation Degree Course
Full Time

Bachelor of Aviation
BAv

The degree of Bachelor of Aviation is offered by the Faculty of Science and Technology with input from the Faculty of Engineering. The aim of the program is to provide an opportunity for students to prepare for a career in the aviation industry in the flying of managerial sectors, and so there are two distinct streams within the Bachelor of Aviation - Flying and Management. Each stream consists of a core subjects selected from the Faculties offering the program together with a range of options. The Flying stream additionally includes flight training to a minimum level of Commercial Pilots Licence (CPL) with additional flight training options available dependent upon student progress and requirements. In lieu of flight training, the Management stream offers a selection of subjects designed to provide students with a broad base of knowledge in managing the operational aspects of the aviation industry. It should be noted that due to the block training nature of the flight training program, teaching periods might not correspond to standard academic sessions.

A total of 144 Units of Credit including 12 Units of Credit of General Education are required for the completion of the Bachelor of Aviation.

2003
Operations Management Stream

Stage 1
AVEN1310, AVEN1910
AVIA1100, AVIA1150, AVIA1300, AVIA1850
AVIA1900
MATH1031, MATH1041
PHYS1149
SESC1560

Choose 6 units of credit from PHYS1229, ECON1103

Stage 2
AVEN2920
AVIA2400, AVIA2700

Choose 33 units of credit from:
AVEN2220, AVEN2910, AVEN2930,
AVIA2100, AVIA2500, AVIA2800, AVIA3600
PHYS2850, IROB2721, SESC2560

Elective subjects totalling 6 units of credit

Stage 3
AVEN3220, AVIA3101, AVIA3201, AVIA3710

General Education Subjects totalling 6 units of credit

Choose 24 units of credit from:
AVEN3230, AVEN3410, AVEN3610, AVEN3710, AVEN3930
AVIA3400, AVIA3800, AVIA3810, AVIA3851, MATH3270
PHYS2810

Elective subjects totalling up to 6 units of credit

BIOTECHNOLOGY

Biotechnology can be defined as the use of various biological processes to make products and perform services. The essential feature of biotechnology therefore is the use of biological processes based on living cells and biochemical macromolecules such as proteins, DNA and RNA in a rapidly expanding range of activities of benefit to mankind. As such, biotechnology makes practical use of the recent scientific advances in areas such as molecular genetics. The development of recombinant-DNA (r-DNA) technology has resulted in the ability to produce large quantities of any potentially useful protein. Based on this technology, a new generation of biopharmaceuticals, including hormones, vaccines, anti-hypertensive, anti-inflammatory agents, new therapies to treat cancer are being developed which have the potential to revolutionise medicine.

Microorganisms and viruses are being modified for use in controlling plant and animal diseases and pests. Diagnostic kits are being developed for use in forensic science and in product identification and quality control. In addition, genetic improvements in agriculture, plants and animals are becoming a reality, as is the control of inborn genetic disorders in humans.

Bioprocesses are also used in the extraction of minerals from low grade ores, and modified and novel bioprocesses are being developed for the treatment of waste and degradation of recalcitrant molecules, an area of vital importance in our increasingly polluted planet.

The future for expansion in all the above areas is immense, and an ability to cope with the problems of the 21st century will be heavily dependent on these advances.
Course Outline

The BSc (Biotechnology) Course is four years full-time and awarded with Honours to students who have distinguished themselves in coursework and in the final year project.

Degree Requirements

General Education Requirement
The University requires all students to complete a coherent sequence of General Education subjects. The General Education Program is an integral part of the BSc Biotechnology course and gives students the opportunity to address some of the key questions they will face as individuals, citizens and professionals.

Progression and Exclusion
Students whose performance is unsatisfactory will be asked to show cause at the end of the academic year why they should remain in their course of study. Any student who fails a subject twice, or is deemed to be making unsatisfactory progress, will be required to show cause.

Unsatisfactory progress may include:
- failure to achieve an average of 65 or higher in subjects attempted in an academic year;
- failing to pass Subjects totalling at least 24 units of credit in one year;
- failing to complete the requirements for stage one of the course in the first two years of study.

Students required to show cause will be informed by the Registrar in writing. Students who apply to show cause will be assessed in accordance with the University's procedures. Failure to show cause can result in exclusion from a subject, the course, or transfer to the Science and Mathematics course (3970), provided that the progression requirements in that course have been met. Also see the section on progression and exclusion ('Restrictions on Students Re-enrolling') in the Student Guide.

Progression to Stage 4 Honours Program
Progression to Stage 4 is subject to academic performance. Students seeking to enrol in a Stage 4 honours program are required to have the approval of the Head of School and normally will be required:
- to have completed the requirements for Stages 1, 2 and 3 of the course and to have completed all General Education subjects;
- to have attained an average of 65 or higher in each stage of the program.

Students who do not attain an average of 65 or higher in Stage 3 of the course are normally required to transfer to the Science and Mathematics course (3970) and take out the BSc Biotechnology award at pass level.

3052 Biotechnology Full-time Course

Bachelor of Science BSc

This program in Biotechnology offers a comprehensive education in all aspects of modern applied biology. It leads to the award of a Bachelor of Science Degree over four years full-time study, with Honours for students who perform with merit.

Graduates in Biotechnology will be able to find employment in industries and other organisations involved with biopharmaceutical production and food processing, as well as in agricultural and environmental biotechnology.

Stage 1

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOT1011</td>
<td>Introductory Biotechnology</td>
</tr>
<tr>
<td>BIOS1201</td>
<td>Molecules, Cells and Genes</td>
</tr>
<tr>
<td>CHEM1011</td>
<td>Fundamentals of Chemistry 1A and</td>
</tr>
<tr>
<td>CHEM1021</td>
<td>Fundamentals of Chemistry 1B</td>
</tr>
<tr>
<td>MATH1031</td>
<td>Mathematics for Life Sciences and</td>
</tr>
<tr>
<td>MATH1041</td>
<td>Statistics for Life and Social Sciences</td>
</tr>
<tr>
<td>or one of</td>
<td></td>
</tr>
<tr>
<td>MATH1011</td>
<td>General Mathematics 1B</td>
</tr>
<tr>
<td>MATH1131</td>
<td>Mathematics 1A</td>
</tr>
<tr>
<td>MATH1141</td>
<td>Higher Mathematics 1A</td>
</tr>
<tr>
<td>and one of</td>
<td></td>
</tr>
<tr>
<td>MATH1021</td>
<td>General Mathematics 1C</td>
</tr>
<tr>
<td>MATH1231</td>
<td>Mathematics 1B</td>
</tr>
<tr>
<td>MATH1241</td>
<td>Higher Mathematics 1B</td>
</tr>
<tr>
<td>plus additional level I courses totalling 12 units of credit : recommended</td>
<td></td>
</tr>
<tr>
<td>PHYS1111</td>
<td>Fundamentals of Physics</td>
</tr>
<tr>
<td>PHYS1201</td>
<td>Life Science Physics</td>
</tr>
<tr>
<td>CHEN1020</td>
<td>Engineering 1CE</td>
</tr>
<tr>
<td>BIOS1101</td>
<td>Evolutionary &amp; Functional Biology</td>
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</table>

Stage 2

<table>
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<tr>
<th>Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOT2101</td>
<td>Principles of Biochemistry</td>
</tr>
<tr>
<td>BIOT2201</td>
<td>Principles of Molecular Biology</td>
</tr>
<tr>
<td>BIOS2011</td>
<td>Evolutionary and Physiological Ecology</td>
</tr>
<tr>
<td>BIOS2021</td>
<td>Introductory Genetics</td>
</tr>
<tr>
<td>MICR2011</td>
<td>Microbiology 1</td>
</tr>
<tr>
<td>MICR2201</td>
<td>Introductory Microbiology</td>
</tr>
<tr>
<td>plus 6 Units of Credit at Level II to be selected from the following:</td>
<td></td>
</tr>
<tr>
<td>CHEM2021</td>
<td>Organic Chemistry</td>
</tr>
<tr>
<td>CHEM2041</td>
<td>Chemical &amp; Spectroscopic Analysis</td>
</tr>
<tr>
<td>PHPH2112</td>
<td>Physiology and Pharmacology</td>
</tr>
</tbody>
</table>

General Education Course(s)

Stage 3

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>BIOT3011</td>
<td>Biotechnology A</td>
</tr>
<tr>
<td>BIOT3051</td>
<td>Monoclonal Antibody and Genetic Techniques in Biotechnology</td>
</tr>
<tr>
<td>BIOT3071</td>
<td>Commercial Biotechnology</td>
</tr>
<tr>
<td>BIOT3121</td>
<td>Molecular Biology of Nucleic Acids</td>
</tr>
<tr>
<td>MICR3041</td>
<td>Immunology 1</td>
</tr>
<tr>
<td>plus an additional 3 Level III units to be selected from the following:</td>
<td></td>
</tr>
<tr>
<td>BIOT3111</td>
<td>Molecular Biology of Proteins</td>
</tr>
<tr>
<td>BIOT3271</td>
<td>Cellular Biochemistry &amp; Control</td>
</tr>
<tr>
<td>BIOT3281</td>
<td>Recombinant-DNA Techniques and</td>
</tr>
<tr>
<td>MICR3051</td>
<td>Environmental Biotechnology</td>
</tr>
<tr>
<td>MICR3071</td>
<td>Environmental Microbiology</td>
</tr>
</tbody>
</table>

plus an General Education Course(s)

Stage 4

<table>
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<tr>
<th>Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOT3301</td>
<td>Microbial Genetics</td>
</tr>
<tr>
<td>BIOT3321</td>
<td>Biotechnology B</td>
</tr>
<tr>
<td>BIOT4053</td>
<td>Research Project</td>
</tr>
</tbody>
</table>

3055 Bioprocess Engineering Full-time Course

Bachelor of Engineering BE

Note: There will be no 1st Year admissions in 2000.

The first two years of the course are similar to the first two years of the Chemical Engineering degree course with the addition of basic training in Biology. The third year of the course contains basic training in Biochemistry, Microbiology as well as the Chemical Engineering subjects and an introduction to Bioprocess Engineering which will be further developed in the fourth year. The course has been
designed so that graduates can find employment in the fermentation, food processing, pharmaceutical, agro-industrial and waste treatment industries.

Stage 1
CHEM1011 Fundamentals of Chemistry 1A and CHEM1021 Fundamentals of Chemistry 1B
CHEN1020 Engineering 1 CE
MATH1131 Mathematics 1A or MATH1141 Higher Mathematics 1A
MATH1231 Mathematics 1B or MATH1241 Higher Mathematics 1B
PHYS1121 Physics 1A
PHYS1221 Physics 1B
General Education courses totalling 6 units of credit

Stage 2
BIOS1201 Molecules, Cells and Genes
CEIC2020 Computing
CHEN2010 Material and Energy Balances
CHEN2020 Flow of Fluids
CHEN2031 Heat and Mass Transfer
CHEN2040 Mass Transfer Fundamentals
CHEN2050 Chemical Engineering Laboratory 1
CHEN2060 Introduction to Process Chemistry
CHEN2070 Instrumental Analysis for Chemical Engineers
MATH2031 Mathematics 2CH
MATH2899 Applied Statistics for Chemical Engineers
General Education courses totalling 6 units of credit

Stage 3
BIOT3100 An Introduction to Biochemistry
BIOT3201 An Introduction to Molecular Biology
BIOT3110 Fermentation Processes
CHEN3010 Thermodynamics
CHEN3020 Quantification of Chemical Processes
CHEN3031 Advanced Transport Phenomena
CHEN3041 Particle & Separation Processes
CHEN3064 Process Design & Economics
CHEN3065 Plant & Equipment Design
CHEN3071 Process Control
CHEN3100 Kinetic & Chemical Reaction Engineering
MICR2201 Introductory Microbiology

Stage 4
SESC3310 Social Issues in Science and Technology
BIOT4001 Research Project
BIOT4023 Biological Process Engineering
CHEN4030 Safety and Environment
CHEN4050 Process Dynamics and Control
CHEN4060 Design Project
CHEN4120 Process Plant Management and Operation
CVEN30616 Structures for Chemical Engineers

CHEMICAL ENGINEERING AND INDUSTRIAL CHEMISTRY

3100
Industrial Chemistry
Full-time

Bachelor of Science
BSc

Industrial Chemistry is a four year professional (prescribed) science course that is concerned with the application of science and technology to the chemical industry. It is a well rounded course which prepared graduates for a challenging and flexible career path. Industrial chemists are capable of fulfilling a multiplicity of roles – as research scientists, development chemists, technical representatives and as plant/company managers.

The industrial chemistry course at the University of New South Wales is the only one of its type in Australia. It has the unique advantage of being in a school which offers both science and engineering degrees. It is the only science course whose graduates are eligible for full membership of the Australian Institute of Engineers as well as the RACI. The fourth year of the course is a compulsory honours year.

Degree Program

Stage 1
CHEM1011, CHEM1021
INDC1020
MATH1131, MATH1231 or MATH1141, MATH1241
PHYS1121, PHYS1221

Stage 2
CEIC2010, CEIC2020, CHEM2021, CHEM2031
INDC2010, INDC2020, INDC2030, INDC2040
MATH2020, MATH2030, MATH2899
PHYS2920
General Education courses

Stage 3
BIOT3100
CEIC3010, CEIC4010
CHEM3829
INDC3010, INDC3031, INDC3041, INDC3050, INDC3060, INDC3070, INDC3080, INDC3090
POLY3010
General Education courses

Stage 4
APSE0002, CEIC4020
INDC4040, INDC4060, INDC4070, INDC4080, INDC4090, INDC4130
POLY4010
General Education courses

COMPUTER SCIENCE AND INFORMATION SYSTEMS

Science Programs 3978 and 3979 pass program (3 years)

Conditions for the Award of the Degree
1. A student must complete 144 units of credit including 12 units of General Education.
2. The degree must contain a Major sequence of study as set out in the program descriptions below.
3. A student must complete at least 36 units and no more than 60 units in Level I courses from at least three Schools.
4. A student must complete at least 24 units at Level II from Science Schools *.
5. No student may commence Level II courses until 24 Level I units have been successfully completed.
6. A student must complete a minimum of 84 units of credit from Science Schools *.
7. For entry to Honours a student must complete at least 24 units at Level III in the relevant Major sequence and have the permission of the Head of School.
Elective Courses

Students enrolled in any Science degree may take as electives all courses (subject to satisfying prerequisites) which are specified as electives for their degree, or available within a Major or Minor in a Program 3970.

Computer Science (Program 3978)

Entry to this program is restricted to students who have been offered a place directly (UAC code 429019). Later year transfers are treated as internal program transfers.

Computer Science involves the study of the design, construction and uses of computer systems. It is concerned with the representation of data and data structures in computer systems and the design of algorithms for automatic manipulation of this information by programming languages and machine systems. It is very much concerned with the design and development of hardware and software tools by which computer applications may be developed, but not so much with the applications themselves. It is, however, noted that noncomputing elements (such as human interface or psychological aspects) can often dictate the level of success of computing systems. At the University of New South Wales, particular emphasis is given to the comprehension of the basic principles behind computing tools, operating systems, compilers and translators, and computer hardware.

Students in other programs may take some Level I and Level II Computer Science courses. Level III studies in Computer Science are only available in other specified combined programs. Appropriate disciplines are Physics and Computing; Mathematics and Computer Science.

Computer Science

Stage 1
COMP1011, COMP1021
MATH1131 or MATH1141
MATH1231 or MATH1241
MATH1081
Elective subjects totalling 18 units of Credit points

Students who do not have a suitable background for COMP1011 are advised to take COMP1001 in session 1 and COMP1011 in session 2.

Stage 2
COMP2011, COMP2021, COMP2041
Elective subjects totalling 24 units of Credit Points
General Education courses totalling 6 units of credit

Stage 3
Level III or IV Computer Science subjects totalling 30 units of credit
Further elective subjects totalling 12 units of Credit
General Education courses totalling 6 units of credit

With the approval of the head of the School of Computer Science and Engineering, students in this program wishing to fulfill the requirements for a major in a second discipline, as well as the Computer Science requirements, may substitute a course from the other discipline for one of the Level III/IV Computer Science courses.

Students proposing to proceed to Stage 4 (Honours) must complete Level III/IV courses totalling 36 units of Credit Points

Stage 4 (Honours)
COMP4914

Psychology with Computer Science (Program 3978 only)

Stage 1
COMP1011 and COMP1021
MATH1131 or MATH1141
MATH1231 or MATH1241
MATH1081
PSYC1001 and PSYC1011
Elective courses totalling 6 Units of Credit

Stage 2
COMP2011 and COMP2041
PSYC2001, PSYC2071, PSYC2081 and PSYC2101
Elective courses totalling 6 Units of Credit from the list below* General Education courses totalling 6 units of credit

Stage 3
COMP3111, COMP3411 and COMP3511
PSYC3001 and either PSYC3151 or PSYC3221 or PSYC3311
Elective courses totalling 12 Units of Credit from the list below* General Education courses totalling 6 units of credit

Stage 4 (Honours)
COMP4913 or PSYC4053 and PSYC4063
Students proposing to proceed to the honours Stage in Psychology must take Psychology courses totalling 48 Units of Credit in Stages 2 and 3 (PSYC2001, PSYC2071, PSYC2081 and PSYC2101 at Level II and PSYC3001, either PSYC3151 or PSYC3221 or PSYC3311 and 2 other Psychology Advance courses at Level III).

Students proposing to proceed to the honours Stage in Computer Science must take Level III Computer Science courses totalling 24 Units of Credit.

* Elective List
COMP2021, Level III Computer Science courses not otherwise specified PSYC2061, PSYC3011, PSYC3141, PSYC3151, PSYC3221, PSYC3241, PSYC3251, PSYC3311 and PSYC3321.

Information Systems (Program 3979)

Entry to this program is restricted to students who have been offered a place directly (UAC code 429024). There is a strict quota on entry to later Stages of this program.

Information Systems is concerned with information systems analysis and design, data management, computer processing, EDP audit, management information systems and applied expert systems within business and government organisations. There is a growing maturity in the discipline as the underlying theory and associated principles become better understood and as advanced information processing techniques emerge. In many respects the development of the knowledge base which forms the discipline parallels developments in computing technology as new opportunities become apparent for the solution of information processing problems. Hence, information systems is concerned with the way in which computer systems are used within organisations — mainly business and government. There is a high degree of complementarity between Computer Science and Information Systems. The program is intended to develop conceptual and practical skills. After an introductory first Stage, students study systems design, database, communications and commercial programming in parallel with computer science, mathematics and management accounting courses. In the honours Stage, well qualified students may specialise in advanced information systems and data management topics.

See also Program 3971 — Business Information Technology

Stage 1
ACCT1501, ACCT1511
COMP1011, COMP1021
INFS1602, INFS1603
MATH1131 or MATH1141 or MATH1081
MATH1231 or MATH1241 or MATH1021
Stage 2
MATH2801 or MATH2841
INFS2603, INFS2657
Choose 6 units of credit from ECON1101, LEGT7711, IROB1712, ACTL1001
Elective courses totalling 12 units of credit
General Education courses totalling 6 units of credit

Stage 3
INFS3605, INFS3608
Elective level III INFS courses totalling 6 units of credit
Further elective courses totalling 30 units of credit
General Education courses totalling 6 units of credit

Stage 4 (Honours)
INFS4886, INFS4887, INFS4795, INFS4796
Choose 2 courses from: INFS4774, INFS4805, INFS4810, INFS4811, INFS4812, INFS4825, INFS4848, INFS4853, INFS4857, INFS4851
Elective courses totalling 18 units of credit

3971 Business Information Technology
Full-time
This is an industry linked education course leading to the award of the qualification Bachelor of Science. The course draws on three core disciplinary areas: Information Systems, Accounting, and Computer Science.

The course has been designed in conjunction with the Information Systems industry to provide for the needs of Australian businesses. The course combines the normal requirements for the award of the degree with coordinated industrial experience in the sponsoring organisations. A scholarship is payable from a fund donated by the sponsoring organisations. Entry to the course is limited to students awarded a scholarship through the BIT selection Procedure.

Consideration for entry to the course may proceed only on the basis of an application directly to Co-op program Office at the University of New South Wales and application through UAC.

Students who are academically acceptable for the 3971 course but who are not offered a scholarship should consider registering for first Stage entry into the 1400 program. If scholarships become available at the end of Stage 1, students undertaking the 1400 program may be offered transfer to the 3971 course.

An Honours option is also available within the four Stage BIT course. This option is available to students who perform well in Stages 1 and 2 and require additional courses in Stages 3 and 4; although it may also be possible to finalise the honours program within the first semester of a fifth Stage (possibly part-time).

Objectives of the Course
This four Stage course teaches Information Systems (see Program 1400 in Course 3979 for a description) and provides industrial training linked to that teaching. The three industrial training periods in the course are each of approximately six months duration, running from January of Stages 2 and 4, and July of Stage 3 of the program.

Degree Program

Stage 1
ACCT1501, ACCT1511
COMP1011, COMP1021
INFS1602, INFS1603
MATH1131 or MATH1141 or MATH1011
MATH1231 or MATH1241 or MATH1021

Stage 2
MATH2801 or MATH2841
INFS2603, INFS2657, INFS2691
Choose 6 units of credit from ECON1101, LEGT7711, IROB1712, ACTL1001
Elective courses totalling 12 units of credit
General Education courses totalling 6 units of credit

Stage 3
INFS3605, INFS3608, INFS3606, INFS3692, INFS4866
Elective courses totalling 18 units of credit

Stage 4
INFS4795, INFS4796, INFS4693, INFS4887
Choose one course from: INFS4774, INFS4805, INFS4810, INFS4811, INFS4812, INFS4825, INFS4848, INFS4853, INFS4857, INFS4891
Elective courses totalling 3 units of credit

ENVIRONMENTAL SCIENCE

3988 Environmental Science Degree

BEnvironSc
Full-time
The Environmental Science program allows specialisation in a number of aspects: Biology, Marine, Microbiology, Chemistry, Geography, Geology, Oceanography (as set out in Table ENVS B).

All programs include the specialisation in Environmental Science (as set out in Table ENVS A).

Conditions for the Award of the Environmental Science Degree

• A student must complete 144 units of credit including 12 units of General Education in Stages 1-3 and 48 unit Honours sequence at Stage 4.
• The degree must contain the specialisation in Environmental Science plus a specialisation in one discipline as specified in the Handbook (Tables ENVS A and ENVS B).
• A student must complete at least 36 units of credit and no more than 60 units of credit in Level I subjects.
• No student may normally commence Level 2 subjects until 24 units of credit Level I have been successfully completed unless approved by the Head of School.
• Progression to Stages 3 and 4 is subject to academic performance. A student will be required to have attained an average of 65 or higher in subjects relevant to the major area and cognate subjects in each prior stage.
• Students whose performance is unsatisfactory may be asked to show cause at the end of the academic year why they should remain in their course of study (note: The conditions under which students will be asked to show cause are the same as for Advanced Science).

Transition Rule for 2000

• Students are enrolled at all stages in the current Environmental Science Programs. New students entering in 2000 will enrol under the new Rules and Requirements. Re-enrolling students will be treated as follows:
  • Students entering Stage 2 or Stage 3 will be transferred into the new Conditions and will be required to complete 48 units of credit per year.
  • Students who are suspended or have deferred in 2000 will be required to enter under the new Conditions when they recommence.

• Students who are not offered a scholarship should consider registering for first Stage entry into the 1400 program. If scholarships become available at the end of Stage 1, students undertaking the 1400 program may be offered transfer to the 3971 course.

• Students who are academically acceptable for the 3971 course but who are not offered a scholarship should consider registering for first Stage entry into the 1400 program. If scholarships become available at the end of Stage 1, students undertaking the 1400 program may be offered transfer to the 3971 course.

• Students who are academically acceptable for the 3971 course but who are not offered a scholarship should consider registering for first Stage entry into the 1400 program. If scholarships become available at the end of Stage 1, students undertaking the 1400 program may be offered transfer to the 3971 course.
### Table ENVS A Environmental Science Program

<table>
<thead>
<tr>
<th>ENVS Core &quot;Specialisation&quot;</th>
<th>Chosen Specialisation</th>
<th>Electives (Including Gen Ed)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stage 1</strong> <em>(, , $)</em> (see footnote)</td>
<td>Minimum 6 units of credit in each (may elect for additional units of credit): ENVS1011 BIO1101 CHEM* (1011 or 1031) GEOG1071 GEOL# (1111 or 1211) MATH1041+ (or more advanced)</td>
<td>Additional level 1 courses to prepare students for the appropriate level 2 and 3 subjects eg Biology add BIOS1021 and CHEM1021 Chemistry add 6 units of credit CHEM and 6 units of credit PHYS Geophysics add GEOG1601 Geology add 6UOC of Geology and MATH1041 etc for other specialisations</td>
</tr>
<tr>
<td><strong>Stage 2</strong> <em>(, )</em> see below</td>
<td>ENVS2010 Population Analysis and Environment ENVS2020 The Urban Environment ENVS2801 Environmental Policy and Law ECON1107 Environmental Economics 6 units of credit of statistics (from list BIOS2041, GEOG2101, MATH2041, MATH2301 [MATH1041 in some cases $])</td>
<td>At least a total of 42 units of credit from level 2 or 3, with at least 18 units of credit at level 3 to meet the requirements set out for chosen specialisation$</td>
</tr>
<tr>
<td><strong>Stage 3</strong> <em>(, )</em> see below</td>
<td>BIOS3071 Conservation Biology and Biodiversity CHEM3901 Environmental Toxicology GEOG3911 Environmental Impact Assessment</td>
<td>At least a total of 42 units of credit from level 2 or 3, with at least 18 units of credit at level 3 to meet the requirements set out for chosen specialisation$</td>
</tr>
<tr>
<td><strong>Stage 4</strong> <em>(, )</em> see below</td>
<td>At least 24 units of credit Honours project selected from: ENVS4XX4 Specialisation Honours project 24 units of credit plus 24 units of credit of other courses (generally Level 3 or 4) or ENVS4XX8 Specialisation Honours project 48 units of credit</td>
<td>At least 24 units of credit Honours project selected from: ENVS4XX4 Specialisation Honours project. 24 units of credit plus 24 units of credit of other courses (usually Level 3 or 4) or ENVS4XX8 Specialisation Honours project 48 units of credit</td>
</tr>
<tr>
<td><strong>Total units of credit</strong></td>
<td>36 units of credit at Level 1 plus 42 units of credit of ENVS (Level 2 or 3) = 78 units of credit. add from next two columns 24 units of credit Honours Specialisation plus 24 units of credit of other courses</td>
<td>6 units of credit at level 1 plus 42 units of credit (Level 2 or 3) plus 24 units of credit Honours = 72 units of credit (may be less with double counting)</td>
</tr>
</tbody>
</table>

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* Where students have the necessary qualifications they are strongly encouraged to enrol in CHEM1031 and CHEM1041 instead of CHEM1011 and CHEM1021. Students may elect for additional units of credit where appropriate.

* S1 or S2 depends on students interests and timetable.

* Students may add Maths for Life Sciences where appropriate, or depending on assumed knowledge, ability and interests, substitute Mathematics 1A or Higher Mathematics 1A.

* Requirements for chosen specialisation as set out by each School

Note: Specialisation is a minimum of at least 42 (48 for Marine, Microbiology, Geography and Math) units of credit at levels 2 or 3 with at least 18 units of credit at level 3 (detail in summary).

Double counting is possible, with similar rules as proposed for Advanced Science.

* Students can elect to do the 18 units of credit of Level 3 courses (BIOS3071, CHEM3901, GEOG3911) in the ENVS Specialisation in year 4 to provide extra electives in year 3.

Students need a total of 36 units of credit Level 3 before beginning Honours project.
### Table ENVS B  Summary of Requirements for each Specialisation

<table>
<thead>
<tr>
<th>ENVS units of credit</th>
<th>BIOLOGY (currently 6861)</th>
<th>MARINE (currently 6862)</th>
<th>MICROBIOLOGY (currently 6863)</th>
<th>CHEMISTRY $ (currently 6864)</th>
<th>GEOGRAPHY</th>
<th>GEOLOGY $ (currently 6866)</th>
<th>OCEANOGRAPHY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Stage 36 units of credit</td>
<td>BIOS1201 Electives 6 units of credit</td>
<td>BIOS1201 Electives 6 units of credit</td>
<td>BIOS1201 Electives 6 units of credit</td>
<td>CHEM1021 or CHEM1041 MATH1031 Electives 6 units of credit (BIOS1101 to Yr 2)</td>
<td>GEOG1601 Electives 6 units of credit</td>
<td>GEOL1211 Electives 6 units of credit</td>
<td>MATH1131* MATH1231 PHYS1121 PHYS1221 Electives 0 units of credit (BIOS1101 to Yr 2)</td>
</tr>
<tr>
<td>2nd Stage 24 units of credit</td>
<td>BIOS2011 Bios2011# at least 6 units of credit from: BIOS2031, BIOS2051, BIOS2061 Electives 12* units of credit</td>
<td>BIOS2011 BIOS2031 BIOS2041# at least 6 units of credit from: BIOS2031, BIOS2051, BIOS2061 Electives 12* units of credit</td>
<td>BIOS2201 BIOS2011 MIRC2011 MIRC2021 Electives 6* units of credit</td>
<td>CHEM2041 or CHEM2849 &amp; 2 of 3 in stage 2 (other in stage 3) CHEM2011 or CHEM2817, CHEM2021 or CHEM2821, CHEM2031 or CHEM2839 Electives 8* units of credit</td>
<td>GEOG2101# GEOG2711 GEOG2811 Electives 12* units of credit</td>
<td>GEOL2110 GEOL2120 GEOG2111 GEOL2290 Electives 6* units of credit</td>
<td>MATH2841* MATH2011 MATH2120 MATH2240 PHYS2810 Electives 3* units of credit</td>
</tr>
<tr>
<td>3rd Stage 18 units of credit</td>
<td>BIOS3061 BIOS3071# at least 6 units of credit from specialisation Electives 12* units of credit</td>
<td>BIOS3061 BIOS3081 BIOS3091 at least 6 units of credit from specialisation Electives 12* units of credit</td>
<td>BIOS2041# BIOS3071# BIOJ3081 MICR3071 Electives 12* units of credit</td>
<td>CHEM3041 CHEM3211# (for CHEM3901#) at least 6 units of credit from: CHEM3011, CHEM3021, CHEM3031 Electives 12* units of credit</td>
<td>GEOG3711 GEOG3371 GEOG3117# at least 6 units of credit from specialisation Electives 12* units of credit</td>
<td>GEOL2260 GEOL2240 GEOL3280 GEOL2231 at least 8 units of credit from specialisation Electives 9* units of credit</td>
<td>MATH2301 MATH3121 MATH3241 MATH3261 Electives 6* units of credit</td>
</tr>
<tr>
<td>4th Stage 24 units of credit</td>
<td>ENVS4104 Specialisation Hons project. 24 units of credit. Plus 24 units of credit of other courses (usually Level 3/4) or ENVS4107 Specialisation Hons project 42 units of credit plus BIOS4511 Electives 24 units of credit</td>
<td>ENVS4204 Specialisation Hons project. 24 units of credit. Plus 24 units of credit of other courses (usually Level 3/4) or ENVS4208 Specialisation Hons project 42 units of credit plus BIOS4511 Electives 24 units of credit</td>
<td>ENVS4304 Specialisation Hons project. 24 units of credit. Plus 24 units of credit of other courses (usually Level 3/4) or ENVS4308 Specialisation Hons project 48 units of credit Electives 24 units of credit</td>
<td>ENVS4404 Specialisation Hons project. 24 units of credit. Plus 24 units of credit of other courses (usually Level 3/4) or ENVS4408 Specialisation Hons project 48 units of credit Electives 24 units of credit</td>
<td>ENVS4504 Specialisation Hons project. 24 units of credit. Plus 24 units of credit of other courses (usually Level 3/4) or ENVS4508 Specialisation Hons project 48 units of credit Electives 24 units of credit</td>
<td>ENVS4604 Specialisation Hons project. 24 units of credit. Plus 24 units of credit of other courses (usually Level 3/4) or ENVS4608 Specialisation Hons project 48 units of credit Electives 24 units of credit</td>
<td>ENVS4704 Specialisation Hons project 24 units of credit Plus 24 units of credit of other courses (usually Level 3/4) Electives 24 units of credit</td>
</tr>
</tbody>
</table>

#### Total units of credit

| Total units of credit | 48-12#$ = 36 units of credit (Levels 1 to 3) + 24 units of credit Hons=60 Total Electives 54 units of credit | 48-12#$ = 42 units of credit (Levels 1 to 3) + 24 units of credit Honours=66 Total Electives 48 units of credit | 54-12#$ = 42 units of credit (Levels 1 to 3) + 24 units of credit Honours=66 Total Electives 48 units of credit | 54-6#$ = 48 units of credit (Levels 1 to 3) + 24 units of credit Honours=72 Total Electives 48 units of credit | 54-12#$ = 42 units of credit (Levels 1 to 3) + 24 units of credit Honours=66 Total Electives 48 units of credit | 51-6#$ = 42 units of credit (Levels 1 to 3) + 24 units of credit Honours=69 Total Electives 45 units of credit | 75-12#$ = 63 units of credit (Levels 1 to 3) + 24 units of credit Honours=87 Total Electives 27 units of credit |

#### Notes:
- Students need a total of 36 units of credit at Level III before being allowed to begin their Honours project.
- Including a total of 12 units of credit of General Education during years 2 and 3.
- Double counting courses
- MATH1041 meets Statistics requirement for these Specialisations
- Students can elect to do the 18 units of credit of Level 3 courses (BIOS3071, CHEM3901, GEOG3911) in the ENVS Specialisation in year 4 to provide extra electives in year 3.
FOOD SCIENCE AND TECHNOLOGY

Food science and technology involves the understanding of basic sciences and the application of this knowledge to foods from the point of production, through handling, processing, preservation, distribution and marketing, up to consumption and utilisation by consumers. It is concerned with food processes, food commodities, food composition and food quality (including sensory properties, safety and nutritional value).

The study of food science and technology integrates many scientific disciplines. Its bases are in chemistry, physics, biochemistry and microbiology. Its borders merge with those of agriculture, engineering, human nutrition, public health, commerce, psychology and law. Biotechnology has a role of increasing importance in food science and technology.

The food scientist and food technologist are concerned with population food supplies and requirements, community wants and needs, and equitable distribution of foods to ensure human nutritional needs are met.

New knowledge is acquired in the laboratory, the pilot plant, and the community, and then applied to the development of safe, nutritious and palatable foods, beverages and food ingredients by optimisation of processes and equipment. Foods are studied in terms of their basic constituents and structures, and the changes they undergo when subjected to handling, processing and distribution.

The food scientist and food technologist are equally concerned with the development and selection of raw materials from agricultural, horticultural, animal and marine sources.

A safe, adequate, palatable and nutritious food supply is essential to human health. The food and beverage industry is of major economic importance and in Australia is the largest sector of manufacturing industry. Internationally, food production, processing and service are among the largest and most stable industries. The challenges are to increase the availability, variety, quality and quantity of foods economically and in line with the needs of the world population. The Australian industry has a major role to play in supplying high quality foods to emerging overseas markets and there is a national and international demand for professionally trained people prepared to accept responsibility for the quality and safety of food.

The Department offers a four-year full-time course leading to the award of Bachelor of Science and a six-year part-time course leading to the award of Bachelor of Science and a four-year full-time course leading to the award of Bachelor of Science and a six-year part-time course leading to the award of Bachelor of Science and a six-year part-time course leading to the award of Bachelor of Science. Graduates of both courses qualify for membership of the Australian Institute of Food Science and Technology, the US Institute of Food Technologists, and may qualify for membership of the Royal Australian Chemical Institute.

The programs provide basic preparation for food science and technology careers in the food industry, the public sector, education, research, the food service industry, public health, management and marketing. Graduates may also find careers in health and environmental sciences, management of food resources and food wastes, and communication, and in areas such as dietetics after further training.

Program Outlines

3060
Food Science and Technology
Full-time Program

This program is designed to provide depth and breadth in the relevant physical and biological sciences on which food science and technology is based. Students completing the Year 1 requirements are eligible for selection for admission to Year 2 of the program. It is strongly recommended that students obtain, before the completion of the program and during recess periods, as much professionally oriented or industrial experience as possible.

Stage 1
- BIOS1101 Evolutionary and Functional Biology
- BIOS1201 Molecules, Cells and Genes
- CHEM1011 Fundamentals of Chemistry A or
- CHEM1031 Higher Chemistry A
- CHEM1021 Fundamentals of Chemistry B or
- CHEM1041 Higher Chemistry D
- FOOD1110 Introduction to Food Science
- MATH1031 Mathematics for Life Sciences
- MATH1041 Statistics for Life and Social Sciences
- PHYS1111 Fundamentals of Physics

Stage 2
- BIOC2101 Principles of Biochemistry or
- BIOC2181 Introduction to Biochemistry
- BIOC2201 Principles of Molecular Biology or
- BIOC2291 Introduction to Molecular Biology
- CHEM2801 Analytical And Physical Chemistry for Food Science
- CHEM2921 Organic Chemistry for Food Science
- FOOD3220 Nutrition
- MICR2201 Fundamentals of Microbiology and Immunology
- General Education (total 12 units of credit)

Stage 3
- CHEM3801 Physical and Chemical Analysis of Foods
- FOOD1360 Food Processing Principles
- FOOD1370 Food Processing Laboratory
- FOOD1380 Food Processing and Packaging
- FOOD1390 Product Design and Development
- FOOD2320 Food Microbiology
- FOOD2330 Quality Assurance and Control
- FOOD2340 Food Safety

Stage 4 Stream A (New Program)
- FOOD1400 Project or
- FOOD1480 Minor Project
- FOOD5400 Industry Liaison
- Plus a combination of electives to total 30 or 36 UOC from the following list.
- FOOD1470 Postharvest Technology
- FOOD1490 Advanced Food Chemistry
- FOOD2480 Advanced Food Microbiology
- FOOD2490 Analytical Microbiology
- FOOD3440 Advanced Nutrition
- FOOD4450 Advanced Food Processing
- ACCT9001 Introduction to Accounting A
- ACCT9002 Introduction to Accounting B
- BIOT3011 Biotechnology A
- BIOT3021 Biotechnology B
- BIOT3071 Commercial Biotechnology
- ECON1101 Microeconomic Principles
- ECON1102 Macroeconomic Principles
- INFS1603 Business Data Management
- IROB2721 Managing People
- MARK2012 Marketing Fundamentals
- MARK2051 Consumer Behaviour A
- MARK2052 Marketing Research
- MARK3091 New Product and New Service Development
- or such other electives as approved by the Head of Department.
- FOOD subjects taken within the Department must be at least 30 UOC.

Stage 4 Stream B: Industry Module Program (New Program)
- FOOD5410 Industry Practicum
- FOOD5400 Industry Liaison
- Plus Electives

During Stages 3 and 4 of the program excursions are made to various food industries. Detailed reports of some of these visits may be required.
Honours in Food Science
Full-time Program

Bachelor of Science (Honours)
BSc (Hons)

This program is designed to provide extensive research training in some aspects of food science and technology, at undergraduate level. The research orientation of the program, compared to the Graduate Diploma, facilitates entry into a research higher degree (MSc/PhD) upon completion of Honours at a satisfactory level.

Entry to the program requires satisfactory completion of a Bachelor degree, or equivalent, in an area considered relevant to food science and technology. Students who have completed a four-year Bachelor program, in which Honours has already been awarded, are specifically excluded.

The major component of the program is an extensive research project, conducted throughout one year of full-time study. Candidates also take 6 units of credit of courses within the Department, or such other courses as approved by the Head of Department. Honours is awarded on the basis of performance in the research project and satisfactory completion of coursework.

Compulsory Courses
FOOD9410  Honours Research Project
FOODXXXX*  

*Courses offered by the Department of Food Science and Technology or as approved by the Head of Department and dependent upon the background of the candidate. Units of credit for coursework courses may be concentrated in one session.

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Food Science and Technology
Part-time Program

Bachelor of Science (Technology)
BScTech

This program is designed for students who are employed in the food processing industries. It extends over six part-time years of study and leads to the award of the degree of Bachelor of Science (Technology). Students are required to complete an approved program of industrial training of not less than twelve months prior to the award of the degree. Industrial training should normally be undertaken concurrently with attendance in the program, but with the approval of the Head of Department may be completed after completion of the prescribed program of study.

The program covers the same subject matter as the first three years of the full-time program. For the first two years students follow a common program in which general biology is taken, and thereafter specialise in the biological sciences, which are fundamental to the study of food science and technology. The courses of Stages 4, 5 and 6 may be available only in day-time classes, and substantial day-time release from industry may be required. Students who have completed the requirements of this program and have qualified for the award of the degree of Bachelor of Science (Technology) may proceed to the award of the degree of Bachelor of Science by attending for one full-time year and completing the courses listed in Year 4 of the full-time program. Students desiring to proceed to the award of a BSc degree must apply to the Head of the Department not later than 31 December of the year in which the sixth stage is completed.

Stages 1 and 2
BIO1101  Evolutionary and Functional Biology
BIO1201  Molecules, Cells and Genes
CHEM1011  Fundamentals of Chemistry A or
CHEM1031  Higher Chemistry C
CHEM1021  Fundamentals of Chemistry B or
CHEM1041  Higher Chemistry D

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FOOD1110  Introduction to Food Science
MATH1031  Mathematics for Life Sciences
MATH1041  Statistics for Life and Social Sciences
PHYS1111  Fundamentals of Physics

Note: Physics, Mathematics and Statistics are usually taken as Stage 1, the other courses as Stage 2

Stage 3
BIOC2101  Principles of Biochemistry or
BIOC2181  Introduction to Biochemistry
BIOC2201  Principles of Molecular Biology or
BIOC2291  Introduction to Molecular Biology
CHEM2801  Analytical and Physical Chemistry for Food Science
CHEM2921  Organic Chemistry for Food Science

Stage 4
FOOD3220  Nutrition
MICR2201  Fundamentals of Microbiology and Immunology

General Education (total 112h)

Stage 5
CHEM3801  Physical and Chemical Analysis of Foods
FOOD2320  Food Microbiology
FOOD2330  Quality Assurance and Control
FOOD2340  Food Safety

Stage 6
FOOD1360  Food Processing Principles
FOOD1370  Food Processing Laboratory
FOOD1380  Food Production and Packaging
FOOD1390  Product Design and Development

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GEOGRAPHY

Geography is the study of human and physical spatial distributions and environmental relationships.

The cultural significance of geography lies in its contribution to an understanding of the total environment. The geographer’s skills also find practical application in the conservation and planned development of resources. Increasing numbers of geographers are employed as professionals in these applications. For instance, geomorphologists and biogeographers are undertaking resource inventory surveys and environmental assessment, and human geographers are engaged as urban and regional planners.

Program outlines

The School of Geography offers a four-year full-time program (3010). This program allows specialisations in environmental systems, urban management, resource management, or special information technologies.

Themes addressed in the programs include the use and management of scarce resources, the interaction between people and environment, soil conservation, vegetation management, land use conflict, place and identity, and spatial inequalities in economic and social well-being.

First year courses involve systematic studies of the physical, human, and technological basis of geography. There is a progressive specialisation in the following years, with an emphasis on field observation, data handling, policy and management. Several units in geography include laboratory and project work.

The Geographical Society

It is hoped that students taking geography as a degree will participate in the activities organised by the Geographical Society. The Society is open to new ideas and to students who are concerned with fostering an interest in geography outside their formal studies. Informal seminars are organised on topics of interest to geographers.
Program 3010

Bachelor of Science
BSc
(4 years, full-time)

The degree will be awarded at Pass level after successful completion of stages 1, 2 & 3 of the program. The degree will be awarded at Honours level following the successful completion of stage 4 of the program. Progression to the Honours year (stage 4) is subject to achieving at least a credit average in Geography subjects contained within the first 3 stages. A student will not normally be permitted to commence stage 4 until all previous Stages have been completed.

Stage 1
All of:
- GEOG1601 Global Development, Economy & Environment
- GEOG1701 Environmental Systems & Analysis
- GEOG1801 Spatial Information Technologies

One of:
- MATH1031 Mathematics for Life Sciences
- MATH1041 Statistics for Life and Social Sciences

Or other Level I Mathematics courses approved by School

And 3 elective courses from other Schools totalling 18 units of credit

See School's Enrollment Handbook for recommended courses, and course advisers.

Stage 2
All of:
- GEOG2001 Field Techniques
- GEOG2101 Geographical Data Analysis, I

Select three of:
- GEOG2611 The Australian City
- GEOG2621 Regions, Resources & Spatial Systems
- GEOG2711 Australian Climate & Vegetation
- GEOG2721 Soils & Landforms
- GEOG2811 Introduction to Remote Sensing
- GEOG2821 Introduction to Geographic Information Systems

Select two elective courses from Geography or other Schools (Biological Science, Built Environment, Chemistry, Computer Science, Economics, Geology, Social Science and Policy) totalling at least 12 units of credit.

Select two General Education courses totalling at least 6 units of credit.

Stage 3
All of:
- GEOG3101 Geographical Data Analysis II
- GEOG3901 Australian Natural Resources

Select three of:
- GEOG3205 Geomorphology
- GEOG3411 Special Topic
- GEOG3621 Place and the Politics of Identity
- GEOG3631 Population Geography
- GEOG3671 Transport and Land Use
- GEOG3711 Biogeography
- GEOG3721 Pedology*
- GEOG3761 Environmental Change*
- GEOG3811 Remote Sensing Applications & Digital Image Analysis
- GEOG3821 Geographic Information Systems Applications
- GEOG3861 Computer Mapping
- GEOG3911 Environmental Impact Assessment
- GEOG3921 Coastal Resource Management

Select two elective course from Geography or other Schools (Biological Science, Built Environment, Chemistry, Computer Science, Economics, Geology, Social Science and Policy) totalling at least 12 units of credit. See School advisors for recommended course.

Select two General Education courses

Stage 4*
- GEOG4001 Fieldwork for Consultants
- GEOG4404 Thesis in Applied Geography (over 2 sessions)
- GEOG4301 Professional Practice in Geography

Two of:
- GEOG4052 Advanced Spatial Analysis
- GEOG4062 Advanced Environmental Analysis*
- GEOG4320 Soil Degradation and Conservation*
- GEOG4911 Vegetation Management

Or courses from other Schools with permission from Head of School

*May not be offered in 2000

GEOLOGY

Geology is 'the science of the Earth', and as such covers a broad spectrum of knowledge on the constitution and evolution of our planet. Applied geology involves a specific interest in the use of earth science for the benefit of humanity, including, for example, the search for and evaluation of metallic ore-bodies, accumulations of fossil fuels and groundwater resources or the application of geological knowledge to a range of engineering and environmental problems.

The Student Geological Society (Rock Soc) exists to provide further interaction between students and staff. The society organises a number of events during the year including field trips and an annual dinner.

Course Outlines

The Applied Geology course provides a comprehensive education in all aspects of earth science. It leads to the award of a Bachelor of Science (BSc) degree in four stages normally taken over four years full-time study, with Honours for students who perform with merit throughout the course program. The fourth stage can be taken part time over two years, normally Years 4 and 5.

Students learn the fundamental principles of geology through lectures, laboratory work, projects and field tutorials. At the same time they gain the practical skill and knowledge of geological applications necessary for employment in research, industry or government.

Graduates are prepared by the course to enter any branch of the geological profession, or to undertake further studies leading to a higher degree. They are also well equipped to change their field of employment as different opportunities arise.

No previous knowledge of geology is required to enter this course but a sound background in mathematics together with at least one other science subject is recommended.

A major or minor in Geology is also available in the Science degree program (3970). This allows students to combine geology with studies in chemistry (geochemistry), physics and mathematics (geophysics), biological sciences (palaeontology), marine science, geography or environmental systems. These programs are all of three years full-time duration, leading to a BSc at Pass level. An optional fourth year leading to Honours is available for students achieving a good academic standing.

These programs are all of three years full-time duration leading to a BSc at Pass level. An optional fourth year leading to Honours is available for students achieving a good academic standing.

Advanced Science programs are also available in geophysics and Marine and Coastal Studies. Geology can be taken as a specialisation in the Environmental Science degree program.
MATERIALS SCIENCE AND ENGINEERING

The field of Materials Science and Engineering offers unlimited possibilities for innovation and development. Attention is being focussed on developing and processing metals, ceramics, polymers and composites with improved properties.

The activities of the materials engineer range from materials production, including their extraction from ores and their refining, to the design, development, processing and recycling of materials for use in aerospace, transportation, electronics, energy conversion, and biomedical systems.

Advanced materials can provide a major competitive advantage in virtually every part of a country's manufacturing industry. Because Australia is a country rich in minerals, materials science has been designated as a priority area for research and development. Examples of recent and significant developments include the emergence of environmentally friendly and economical metal processing methods; advanced surface coatings; electrical ceramics; engineering polymers, and advanced composites.

The School of Materials Science and Engineering provides education and training for students to prepare them for a significant and important career in the materials industry.

The School of Materials Science and Engineering is in a good position to provide the increased numbers of graduates necessary for development of these new initiatives in materials. It is the only school in Australia which offers professional courses in ceramic engineering, metallurgical engineering, and materials engineering as well as providing postgraduate specialisation in these fields.

The School is extremely well equipped with a wide range of advanced computing, thermal analysis, mechanical testing, X-ray, optical and electron microscopy facilities.

Ceramic Engineering and Ceramics

The ceramic industry produces an enormous volume and variety of products used in engineering applications, building construction and in our everyday life. As well as the traditional bricks, roof tiles, sheet and container glass and tableware, ceramics have been found essential as abrasives, refractories, enamels and in electrical and electronic applications and nuclear fuels. In many of these cases, ceramic articles make possible the manufacture of other products either by being a key component, such as an electronic or magnetic part, or by forming the material of construction of, for example, a blast furnace or an abrasive wheel.

Modern ceramics comprise such a varied and complex group of materials that a high level of training is required to control their manufacture with the required precision and to supervise their proper use.

Ceramic engineers are needed in increasing numbers both in Australia and overseas countries and the School offers the only degree course in Ceramic Engineering in Australasia. This course trains students in the relation between the structure and the properties of ceramic materials, the engineering and process chemistry of their manufacture and the design principles of their use.

Careers open to graduates fall into three broad categories. Some go initially into activities associated directly with production, i.e. the design and layout of plants, supervision of their construction and control of their operations. Others move into research and development in industrial laboratories or research institutions. The final group enters fields outside of Ceramic Engineering directly.
where the graduate’s background in materials and engineering is utilised. In all cases, graduates with organisng ability frequently move into management if they have an interest in this side of the industry.

In Australia, a number of government research organisations are active in ceramic research, e.g., the Australian Nuclear Science and Technology Organisation, and the Divisions of Materials Science and Building Research of the CSIRO. Investigations with more immediate applications are carried out in industrial laboratories. Even when the basic principles of a process have been worked out in the laboratory, its successful transfer to an industrial scale requires a great deal of effort and expertise. This is an area which offers great scope for further development in Australia.

Graduates in Ceramic Engineering are eligible for membership of the Institution of Engineers, Australia, the Institute of Ceramics, Great Britain, the Royal Australian Chemical Institute and the National Institute of Ceramic Engineers, USA. It is compulsory that, before completion of the course, students in Ceramic Engineering must obtain a minimum of twelve weeks’ professionally oriented or industrial experience.

### Metallurgical Engineering

The metallurgical profession has developed in importance in keeping with growth of Australian metal and mineral industries. These industries are recognised as being important to the Australian economy and there is a strong demand for professional metallurgists in all sectors of these industries, as well as in the manufacturing industry.

Graduate metallurgists have a wide choice of type of employment and location. They may work in production, technical control or development, in metal or mineral producing plants in locations such as Newcastle, Port Kembla, Broken Hill, Mt Isa, Townsville, Gladstone, Port Pirie, Whyalla, Kwinana, Kalgoorlie or Pilbara; or in manufacturing plants, including the automobile, aircraft, and construction industries located mainly in the population centres.

In the metal industry, opportunities for a career in management are excellent, since it is a tradition in this industry that management should be in the hands of technical people. Graduates are inclined towards research and development, they will find considerable scope in various government, university, and industrial research laboratories.

The undergraduate courses in metallurgical engineering and metallurgy are broadly-based on engineering and physical sciences and have been designed to prepare graduates for employment in any field of metallurgy within the metal and manufacturing industries or in research institutions.

Graduates in Metallurgical Engineering are eligible for membership of the Institution of Engineers, Australia, the Australasian Institute of Mining and Metallurgy and the Institute of Materials Engineering Australasia. Students are required to have gained at least twelve weeks of approved industrial experience before graduation. Industrial experience is usually obtained during the long recess periods.

### Materials Engineering

Materials Engineering is a new and broad-ranging discipline which applies the principles of science and engineering to the design and development of metallic, ceramic and plastic materials and, to their manufacture into goods and their subsequent performance in service.

Materials Engineering is founded on the relationship between structure and properties, an understanding of which permits materials to be engineered to specific end use requirements. Virtually every man-made material is now the subject of study of the Materials Engineer.

Due to an increasing demand for optimised materials, graduates in Materials Engineering are presented with an outstanding range of job opportunities.

Many graduates pursue an industrial career either in the materials producing industries, the utilities, or manufacturing sector. Materials and process development and selection, supervision of manufacturing and production processes, technical trouble shooting and testing, are areas in which Materials Engineers are commonly engaged. Alternatively, graduates may pursue a research career, working in laboratories run by materials producing companies, and statutory commonwealth and state government departments.

Graduates with an organisng ability frequently move into management both in industry and research. Since materials engineering is a broadly-based scientific/engineering discipline, there is considerable flexibility in career selection. Graduates in Materials Engineering are eligible for membership of the Institution of Engineers, Australia.

Students are required to have gained at least twelve weeks of professionally oriented or industrial experience in an area of industrial setting involving processing, production, characterisation, analysis, testing etc.

### Components Common to all Materials Programs

**Stage 1**

- CHEM1011 Fundamentals of Chemistry 1A
- CHEM1021 Fundamentals of Chemistry 1B
- MATH1131 Mathematics 1A or MATH1141 Higher Mathematics 1A
- MATH1231 Mathematics 1B or MATH1241 Higher Mathematics 1B
- MATS1021 Computing in Materials Science
- MATS1111 Materials Science 1
- MECH0130 Engineering Drawing and Descriptive Geometry
- MECH0440 Engineering Statics
- PHYS1121 Physics 1A
- PHYS1221 Physics 1B

**Stage 2**

- CHEM2818 Physical Chemistry
- MATH2049 Mathematics and Statistics for Materials Science A
- MATH2059 Mathematics for Materials Science B
- MATS1002 Microstructural Analysis
- MATS1052 Materials Engineering 1B
- MATS1072 Physics of Materials
- MATS1082 Thermodynamics of Materials 1
- MATS1092 Materials and Design 1
- MATS1112 Phase Equilibria
- MATS1132 Materials Engineering 1A
- MATS1142 Crystallography and X-ray Diffraction
- MATS1162 Mechanical Properties of Materials
- General Education

**Elective Components (Stage 4)**

Each of the following subject areas has particular objectives, but specific topics are chosen by students for study and research in the fourth Stage of the program.

- MATS1244 Management 2
- MATS1254 Design Project
- MATS1464 Professional Communication & Presentation
- MATS3524 Project

### Ceramic Engineering and Ceramics

A four-year full-time course in Ceramic Engineering leading to the award of the BE degree, and a six-year part-time course in Ceramics leading to the award of the BSc (Tech) degree, are offered within the School.
3025
Ceramic Engineering Full-time Program

Bachelor of Engineering
BE

Stages 1 and 2 shown above

**Stage 3**
- FUEL0040 Fuel and Energy Engineering for Materials Processing
- MATS1093 Thermodynamics of Materials 2
- MATS1163 Chemistry of the Solid State
- MATS1243 Management 1
- MATS2153 Ceramic Processing Laboratory
- MATS2183 Refractories
- MATS2203 Physico-Chemical Ceramics Laboratory
- MATS2213 Diffusion
- MATS2223 Phase Transformations
- MATS2253 Sintering of Ceramics
- MATS2313 Chemistry of Ceramics
- MATS2343 Ceramic Processing and Design 1
- MATS2353 Ceramic Processing and Design 2
- MATS323 Modelling in Materials Engineering 1

**Stage 4**
- MATS1294 Electrical Ceramics
- MATS1354 Design with Brittle Materials
- MATS2284 Thermal Properties of Ceramics
- MATS2314 Glass Based Ceramics
- MATS2394 Pollution Control in Materials Processing
- MATS424 Modelling in Materials Engineering 2

**Stage 5**
- MATS1162 Mechanical Properties of Materials
- MATS1112 Phase Equilibria

**Stage 6**
- MATS1093 Thermodynamics of Materials 2
- MATS1163 Chemistry of the Solid State
- MATS2153 Ceramic Processing Laboratory
- MATS2183 Refractories
- MATS2263 Sintering of Ceramics
- MATS2313 Chemistry of Ceramics
- MATS5323 Modelling in Materials Engineering 1
- MINE7341 Mineral Process Engineering

**Metallurgical Engineering**

A four-year full-time program in metallurgical engineering leading to the award of the BMetE degree (Physical Metallurgy or Process Metallurgy Major) and a six-year part-time program in metallurgy leading to the award of the BSc(Tech) degree are offered within the School.

3125
Metallurgical Engineering Full-time Course

Bachelor of Metallurgical Engineering
BMetE

Students entering the Bachelor of Metallurgical Engineering program may elect to major in either Process metallurgy or Physical Metallurgy. Selection of these alternative study programs may be deferred until the end of the second year of full-time study.

The Process Metallurgy option is designed to produce graduates with training appropriate to the primary metallurgy industry while the Physical Metallurgy option provides a training more suited to the manufacturing industry.

Year 1 of the program consists of physics, chemistry, mathematics and engineering courses and is essentially the same as that for a number of other engineering and science programs offered in the Faculty of Science and Technology.

Year 2 introduces Materials Science and Materials Engineering courses supported by chemistry and mathematics and is common with Year 2 in the full-time Ceramic Engineering and materials Engineering programs.

Physical Metallurgy and Metallurgical Engineering are introduced in Years 3 and 4. In Year 3 the major strands are supported by other engineering courses and in Year 4 by a thesis project, seminar and professional electives.

Students are required to have gained at least twelve weeks of approved industrial experience before graduation, and to have submitted satisfactory reports on such work. Industrial experience is usually obtained during the long recess periods at the ends of Stages 2 and 3.

During the course, visits are made to various metallurgical works, and students are required to submit reports on some of these. Students may complete the first one or two years of their degree at their local university engineering school, and then transfer with advanced standing to UNSW.
3125
Metallurgical Engineering Full-time Program

Bachelor of Metallurgical Engineering
BMetE

Process Metallurgy Major

Stages 1 and 2 Shown above

Stage 3
MATS1093 Thermodynamics of Materials 2
MATS1183 Non-ferrous Physical Metallurgy
MATS1213 Design for Corrosion Control
MATS1243 Management 1
MATS1283 Ferrous Physical Metallurgy
MATS2213 Diffusion
MATS2223 Phase Transformations
MATS2313 Chemistry of Ceramics
MATS3443 Polymer Science
MATS4113 Fractographic Analysis and Non-destructive Testing
MATS4333 Fracture Mechanics
MATS4613 Deformation of Metals & Strengthening Mechanisms
MATS4623 Metal Forming Processes and Thermomechanical Processing of Metals
MATS5323 Modelling in Materials Engineering 1
General Education courses

Stage 4
MATS1214 Welding and Other Joining Processes
MATS1364 Composites and Electronic Materials
MATS1414 Surface Treatments and Wear
MATS1584 Alloy Steels and Heat Resisting and Light Alloys
MATS5424 Modelling in Materials Engineering 2
MATS9650 Pyrometallurgical Processes
Elective components shown above
General Education courses
Materials Engineering

A four-year full-time course in materials engineering leading to the award of the BMatE degree is offered within the School.

3615
Materials Engineering Full-time Program

Bachelor of Materials Engineering
BMatE

Stages 1 and 2 Shown above

Stage 3

MATS1093 Thermodynamics of Materials 2
MATS1183 Non-ferrous Physical Metallurgy
MATS1213 Design for Corrosion Control
MATS1243 Management 1
MATS1283 Ferrous Physical Metallurgy
MATS2213 Diffusion
MATS2223 Phase Transformations
MATS2313 Chemistry of Ceramics
MATS3443 Polymer Science
MATS4113 Fractographic Analysis and Non-destructive Testing
MATS4233 Fracture Mechanics
MATS4613 Deformation of Metals & Strengthening Mechanisms
MATS4623 Metal Forming Processes and Thermomechanical Processing of Metals
MATS5323 Modelling in Materials Engineering 1

General Education courses

Stage 4

MATS1364 Composites and Electronic Materials
MATS1414 Surface Treatments and Wear
MATS2314 Glass Based Ceramics
MATS3564 Polymer Engineering 1
MATS3574 Polymer Engineering 2
MATS4244 Modelling in Materials Engineering 2

Elective components shown above

Note: These courses are not offered in 2000. Please contact the Dean of the Faculty of Science and Technology.

Department of Textile Technology

Head of Department
Professor MT Pailthorpe

Textile Technology is concerned with the conversion of both natural and man-made fibres into an extremely wide variety of finished products. These products range from fabrics for apparel, soft furnishings, floor coverings and industrial use to such specialised textiles as tyre cord, ropes, protective clothing, sailcloth, parachute furnishings, floor coverings and industrial products. These products range from fabrics for apparel, soft furnishings, floor coverings and industrial use to such specialised products as tyre cord, ropes, protective clothing, sailcloth, parachute

Textile Technology Full-time Course

Bachelor of Science
BSc

Textile Chemistry, Textile Physics, Textile Engineering Options

The conversion of textile raw materials into their finished products is simply a succession of, and an interaction between, a number of chemical, physical and engineering processes. It follows, therefore, that the disciplines involved in the study of textile technology, in addition to the technological aspects, include a study in depth of one of the following: chemistry, engineering or physics.

Graduates will qualify for membership for one of the following professional bodies: the Royal Australian Chemical Institute; the Institution of Engineers, Australia; or the Australian Institute of Physics.

All students take a common first year, and they need not choose the option they desire to follow until the end of that year.

In Year 2 and Year 3 students specialise in one of three options of the course, viz. Textile Chemistry, Textile Physics or Textile Engineering. In Year 4 all students take the same subjects.

Textile Chemistry

Stage 3

CHEM3021 Organic Chemistry
Plus one of the following Chemistry electives
CHEM2031 Inorganic Chemistry and Structure or
CHEM3121 Synthetic Organic Chemistry or
CHEM3321 Applied Organic Chemistry

or an alternative as approved by the Head of Department

TEXT3101 Textile Structures 1
TEXT3301 Yarn Technology 2
TEXT3401 Fabric Technology 2
TEXT3501 Finishing Technology A
TEXT3601 Colour Science
TEXT3602 Colouration Technology
TEXT3801 Textile Engineering

General Education course/s

Students must complete a minimum of 40 working days approved industrial training, of which at least 30 working days training must be taken at the end of Year 3. It is important to stress that the specialised nature of the training provided within the Department of Textile Technology does not mean a restricted range of job opportunities after graduation. Career possibilities extend through the textile industry, allied industries (such as the production of textile chemicals), private consultants, government departments and authorities, teaching at secondary and tertiary levels, and pure or applied research in various organisations.

Graduates may be employed in quality control, technical management, research and development, international trade, production or general management. Within the textile industry, graduates may, for example, enter any of the following areas: the manufacture of natural and or man-made fibres, yarns, fabrics, etc; dyeing, printing and finishing of textiles, quality assurance, marketing and retailing.

Course Outlines

Note: These courses are not offered in 2000. Please contact the Dean of the Faculty of Science and Technology.
The Textile Management course provides a comprehensive knowledge of all the textile sciences and technologies. In addition the course includes studies in economics, accounting, marketing, management, and other areas of commerce.

The design and production of textile goods involves a number of manufacturing processes, and requires an understanding of basic design and manufacturing principles. The Textile Design and Technology course provides a comprehensive knowledge of all the textile science and technologies. In addition the course includes studies in economics, accounting, marketing, management, and other areas of commerce.

Textile Physics

Stage 3
PHYS2030 Laboratory*
PHYS2060 Thermal Physics
Plus Physics electives averaging not less than 3 hours per session, selected from the following:
PHYS3020 Statistical Physics
PHYS3060 Advanced Optics
PHYS3110 Experimental Physics B1
PHYS3120 Experimental Physics B2
PHYS3410 Biophysics
PHYS3710 Advanced Laser and Optical Applications
PHYS3050 Solid State Physics
or an alternative as approved by the Head of Department

Textile Engineering

Stage 3
ELEC0980 Electrical Engineering 2E
MECH2300 Engineering Mechanics 2A
MECH2310 Engineering Mechanics 2B
MECH2600 Fluid Mechanics 1
MECH2700 Thermodynamics 1
TEXT3101 Textile Structures 1
TEXT3301 Yarn Technology 2
TEXT3401 Fabric Technology 2
TEXT3501 Finishing Technology A
TEXT3601 Colour Science
TEXT3602 Colouration Technology
TEXT3801 Textile Engineering
General Education course/s

*Note: because of prerequisite requirements students wishing to take certain year 2 electives may substitute PHYS2031 Laboratory in Year 2, and take PHYS2021 Quantum Physics and Relativity in Year 3.

Textile Design and Technology Full-time Course

Bachelor of Science
BSc

The course is designed to meet the need for executives in the textile and allied industries. A wide choice of electives is available in the third year of the course. This allows students to either gain a broad knowledge of the various areas of commerce, or to specialise in one of the following areas: Applied Economics; Accounting and Financial Management; or Strategic Marketing Management. The BSc Textile Management program will be considered for accreditation by the Textile Institute as fulfilling the academic requirements for its Associateship (CTextATI). We expect to have this program accredited in 1998.

Stage 3
TEXT3101 Textile Structures 1
TEXT3301 Yarn Technology 2
TEXT3401 Fabric Technology 2
TEXT3501 Finishing Technology A
TEXT3601 Colour Science
TEXT3602 Colouration Technology
TEXT3801 Textile Engineering

Plus 2 Commerce electives selected from the following:
ACCT2522 Accounting and Financial Management 2A
ACCT2542 Accounting and Financial Management 2B
FINS2613 Business Finance 2A
IPOB1701 Industrial Relations 1A
ECOH2301 Management Strategy and Business Development
ECON2103 Business and Government
ECON2104 Australian Macroeconomic Policy
INF5602 Computer Information Systems 1
INF5603 Computer Information Systems 2
LEGT7711 Legal Environment of Commerce
LEGT7731 Marketing and Distribution Law
MARK3043 International Marketing
MARK3073 Brand Management
MARK3083 Strategic Marketing Management

or an alternative as approved by the Head of Department

General Education course/s

Stage 4
APSE0002 Social Issues in Science and Technology
MANF0420 Production Management or
TEXT4003 Project
TEXT4013 Seminar
TEXT4101 Textile Structures 2
TEXT4201 Processing Laboratory*
TEXT4202 Textile Quality Control
TEXT4501 Finishing Technology B
TEXT4601 Field Trip#
TEXT4701 Textile Industry Studies
TEXT4702 Textile Management*

*Co-Op Program students only
#Non Co-Op Program students only

3175
Textile Management Full-time Course

Bachelor of Science
BSc

The production and marketing of textile products involves a number of manufacturing processes, and requires an understanding of basic design and manufacturing principles. The Textile Design and Technology course provides a comprehensive knowledge of all the textile science and technologies. In addition the course includes studies in the history of art and design, basic design, and textile design. The course is structured to meet the needs of designers in the textile and allied industries. A wide choice of electives is available in the third year of the course. This allows students to either gain a broad knowledge of the various areas of commerce, or to specialise in one of the following areas: Applied Economics; Accounting and Financial Management; or Strategic Marketing Management. The BSc Textile Management program will be considered for accreditation by the Textile Institute as fulfilling the academic requirements for its Associateship (CTextATI). We expect to have this program accredited in 1998.

Stage 3
TEXT3101 Textile Structures 1
TEXT3301 Yarn Technology 2
TEXT3401 Fabric Technology 2
TEXT3501 Finishing Technology A
TEXT3601 Colour Science
TEXT3602 Colouration Technology
TEXT3801 Textile Engineering

Plus 2 Commerce electives selected from the following:
ACCT2522 Accounting and Financial Management 2A
ACCT2542 Accounting and Financial Management 2B
FINS2613 Business Finance 2A
IPOB1701 Industrial Relations 1A
ECOH2301 Management Strategy and Business Development
ECON2103 Business and Government
ECON2104 Australian Macroeconomic Policy
INF5602 Computer Information Systems 1
INF5603 Computer Information Systems 2
LEGT7711 Legal Environment of Commerce
LEGT7731 Marketing and Distribution Law
MARK3043 International Marketing
MARK3073 Brand Management
MARK3083 Strategic Marketing Management

or an alternative as approved by the Head of Department

General Education course/s

Stage 4
APSE0002 Social Issues in Science and Technology
MANF0420 Production Management or
TEXT4003 Project
TEXT4013 Seminar
TEXT4101 Textile Structures 2
TEXT4201 Processing Laboratory*
TEXT4202 Textile Quality Control
TEXT4501 Finishing Technology B
TEXT4601 Field Trip#
TEXT4701 Textile Industry Studies
TEXT4702 Textile Management*

*Co-Op Program students only
#Non Co-Op Program students only

3177
Textile Design and Technology Full-time Course

Bachelor of Science
BSc

The production and marketing of textile goods involves a number of manufacturing processes, and requires an understanding of basic design and manufacturing principles. The Textile Design and Technology course provides a comprehensive knowledge of all the textile science and technologies. In addition the course includes studies in the history of art and design, basic design, and textile design. The course is structured to meet the needs of designers in the textile and allied industries. A wide choice of electives is available in the third year of the course. This allows students to either gain a broad knowledge of the various areas of commerce, or to specialise in one of the following areas: Applied Economics; Accounting and Financial Management; or Strategic Marketing Management. The BSc Textile Management program will be considered for accreditation by the Textile Institute as fulfilling the academic requirements for its Associateship (CTextATI). We expect to have this program accredited in 1998.
The Science Communication program is offered for the first time in 2000. It leads to a 3 year Pass or 4 year Honours degree aimed at producing students who have a strong grounding in science together with conceptual and practical skills in communication.

Conditions governing the award of the Degree

1. A student must complete 144 units of credit including 12 units of credit of General Education.
2. The degree must contain a Communications major sequence and either a second major drawn from those approved with the BSc (excluding those from the Schools of Philosophy and Science and Technology Studies) or two approved minor sequences.
3. A student must complete at least 36 and no more than 60 units of credit in Level I subjects from at least three Schools.
4. A student must complete at least 24 units of credit at Level I from Science Schools (as defined in the rules attached to the conditions for the award of the BSc excluding the Schools of Philosophy and Science and Technology Studies).
5. No student may commence Level II courses until 24 Level I units of credit have been successfully completed.
6. A student must complete a minimum of 84 units of credit from Science Schools (see above).
7. For entry to Honours a student must complete at least 24 units of credit at Level III in the relevant Major sequence and have the permission of the Head of School.

Outline of program

The Communications major is under development and the information below is indicative. For details of Major and Minor sequences in Science see Table A on page 42.

Stage 1

<table>
<thead>
<tr>
<th>Code</th>
<th>Course</th>
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</thead>
<tbody>
<tr>
<td>SCOM1011</td>
<td>Science, Technology and Society</td>
</tr>
<tr>
<td>SCOM1021</td>
<td>Introduction to Science Communication</td>
</tr>
<tr>
<td></td>
<td>24 units of credit from two Science Schools</td>
</tr>
<tr>
<td></td>
<td>Electives totalling 12 units of credit</td>
</tr>
</tbody>
</table>

Stage 2

<table>
<thead>
<tr>
<th>Code</th>
<th>Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCOM2011</td>
<td>The Structure and Politics of Australian Science</td>
</tr>
<tr>
<td>SCOM2021</td>
<td>Professional Science Communication</td>
</tr>
<tr>
<td></td>
<td>Electives in Communication totalling 6 units of credit</td>
</tr>
<tr>
<td></td>
<td>18 units of credit in a Science Major</td>
</tr>
<tr>
<td></td>
<td>6 units of credit of General Education</td>
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</table>

Stage 3

<table>
<thead>
<tr>
<th>Code</th>
<th>Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCOM3011</td>
<td>Communicating Science – Theory and Practice</td>
</tr>
<tr>
<td>SCOM3021</td>
<td>Science Communication Internship</td>
</tr>
<tr>
<td></td>
<td>Electives in Communication totalling 6 units of credit</td>
</tr>
<tr>
<td></td>
<td>24 units of credit in a Science Major (continued for stage 2)</td>
</tr>
<tr>
<td></td>
<td>6 units of credit of General Education</td>
</tr>
</tbody>
</table>

Stage 4 (Honours)

For details consult the relevant School

3933

Bachelor of Science (Media and Communications)

BSc (Media and Communications)

The Science Media and Communication program is offered for the first time in 2000. It leads to a 3 year Pass or 4 year Honours degree aimed at producing students who have a strong grounding in science together with conceptual and practical skills in media and communication studies. Students gain creative, practical experience with digital media in the production of audiovisual and multimedia works in an advanced multimedia laboratory, together with an understanding of the history, understanding and social impacts of media technologies. This is combined with a Major or two Minors in Science.

Conditions governing the award of the Degree

1. A student must complete 144 units of credit including 12 units of credit of General Education.
2. The degree must contain a Media and Communications major sequence and either a second major drawn from those approved within the BSc (excluding those from the Schools of Philosophy and Science and Technology Studies) or two approved minor sequences.
3. A student must complete at least 36 units of credit and no more than 60 units of credit in Level 1 courses from at least three Schools.
4. A student must complete at least 24 units of credit at Level 1 from Science Schools (as defined in the conditions for the award of the BSc excluding the Schools of Philosophy and Science and Technology Studies).
5. No student may commence Level 2 courses until 24 Level 1 units of credit have been successfully completed.
6. A student must complete a minimum of 84 units of credit from Science Schools (see above).
7. For entry to Honours a student must complete at least 24 units of credit at Level 3 in the relevant Major sequence and have the permission of the Head of School.

Outline of program

For details of Major and Minor sequences in Science see Table A on page 42.

Stage 1

<table>
<thead>
<tr>
<th>Code</th>
<th>Course</th>
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</thead>
<tbody>
<tr>
<td>MDCM1000</td>
<td>New Media Technologies A</td>
</tr>
<tr>
<td>MDCM1001</td>
<td>New Media Technologies B</td>
</tr>
<tr>
<td></td>
<td>24 units of credit from two Science Schools</td>
</tr>
<tr>
<td></td>
<td>Electives totalling 12 units of credit</td>
</tr>
</tbody>
</table>
Stage 2
MDCM2000  Media, Technology and Creativity
MDCM2001  Multimedia Production
Electives in Media and Communications totalling 6 units of credit
18 units of credit in a Science major
6 units of credit of General Education

Stage 3
MDCM3000  Media Forms
MDCM3001  Advanced Multimedia
24 units of credit in a Science Major (continued from stage 2)
6 units of credit of General Education

Stage 4 (Honours)
For details consult the relevant School

MEDICAL SCIENCE

3991
Medical Science Degree

Bachelor of Medical Science
BMedSc
Full time

This three-year degree program will provide the basis for a career in biomedical research and is an appropriate first degree for students planning to enter graduate medical or paramedical programs. Medical science is the area of science which underpins the practice of medicine. It incorporates study of the structure and function of the human body (anatomy and physiology) as well as the way in which our form and function is inherited (genetics) and then develops from the fertilised ovum (embryology). It deals with the chemistry of living organisms (biochemistry) with particular reference to man, as well as drugs which are used to cure human diseases (pharmacology).

Students enrolled in this program will have the opportunity to specialise in one or more of the above disciplines. They may have the opportunity to undertake a fourth year that involves a research program leading to an Honours degree.

Stage 1
BIOS1101, BIOS1201
CHEM1011 or CHEM1031 and CHEM1021 or CHEM1041
MATH1031, MATH1041 or one of
MATH1131, MATH1141 and one of
MATH1231, MATH1241
BSSM1110
One General Education course totalling 3 units of credit
Elective courses totalling 6 units of credit offered by the following Schools: Computer Science, Physics, Science and Technology
Studies, Psychology

Stage 2
BSSM 2220
Courses totalling at least 36 units of credit from the following:
ANAT2111, ANAT2200, ANAT2210, BIOL2181 or BIOL2101, BIOL2291 or BIOL2201,
MICR2011*, PHPH2101, PHPH2201, PATH2201, BSSM2201
One General Education course totalling 3 units of credit
Elective subjects totalling up to 6 units of credit from the following areas:
Biological Science, Chemistry, Computing, Mathematics, Physics, Psychology, Science and Technology.
Students anticipating doing 4th year honours program should contact the relevant Head of School for advice.

Stage 3
Subjects totalling 42 units of credit from the following subject areas:
Anatomy, Biochemistry and Molecular Genetics, Microbiology and Immunology, Pathology, Physiology and Pharmacology, Psychology.
Students must nominate a major discipline by taking at least 18 units of credit in one of these subject areas and fulfilling other course requirements specified for that major.
General Education courses totalling 6 units of credit

Stage 4
Honours may be taken in the major discipline, subject to progress at credit level through the program. Intending Honours students should consult the Head or Honours coordinator of the appropriate School. Students who successfully complete Stage 4 of their program will be considered for the award of Honours.

Conditions for the Award of the Medical Science Degree

• A student must complete 144 units of credit including 12 units of General Education in Stages 1-3.
• Honours is available to suitably qualified students and consists of a 48 unit of credit Honours sequence at Stage 4.
• The degree must contain a sequence of study as specified in the program description.
• A student must complete at least 36 units and no more than 48 units in Level 1 courses.
• A student must complete before the end of Stage 3 the two 3 unit courses BSSM1110 and BSSM2220.
• No student may normally commence Level 2 courses until 24 Level 1 units have been successfully completed unless approved by the Head of School.
• Progression to Stages 3 and 4 is subject to academic performance. A student will be required to have attained an average of 65 or higher in courses relevant to the major area and cognate subjects in each prior stage.
• Students whose performance is unsatisfactory will be asked to show cause at the end of the academic year why they should remain in their program (note: The conditions under which students will be asked to show cause are the same as for advanced science).

OPTOMETRY

3950
Optometry Degree Program
Full-time

Bachelor of Optometry
BOptom

The School provides a four Stage full-time program in Optometry leading to the award of the degree of Bachelor of Optometry, at either the Pass or Honours level. Professional training including clinical optometry is interwoven with basic studies of visual and ocular science over the four Stages of the program. The only entry point into Optometry will be at Stage 1 level.

The Bachelor of Optometry program has been reviewed, and the revised program will be phased in over 1999 and 2000, being offered in its entirety in 2001.

Degree Program (Revised Program)

Stage 1
BIOS1401  Biology (Optometry)
CHEM1819  Biological Chemistry for Optometry A
CHEM1829  Biological Chemistry for Optometry B
OPTM1105  Optics and the Eye I

*Students taking Microbiology 1 should also enrol in Genetics.
OPTM1201  Ocular and Visual Science I
OPTM1202  Clinical Optometry I
OPTM1205  Optics and the Eye II
OPTM1207  Microbiology and Immunology for Optometry
PHYS1199  Physics (Optometry)

Stage 2
OPTM2101  Ocular and Visual Science IIA
OPTM2102  Clinical Optometry IIA
OPTM2105  Optics and the Eye III
OPTM2201  Ocular and Visual Science IIB
OPTM2202  Clinical Optometry IIB
OPTM2206  Pathology for Optometry
PHPH2121  Principles of Physiology A
PHPH2221  Principles of Physiology B

General Education subjects totalling 6 units of credit

Stage 3
OPTM3102  Clinical Optometry IIIA
OPTM3109  Visual Disease
OPTM3202  Clinical Optometry IIB
OPTM3203  Clinical Optometry IIC
OPTM3209  Environmental Optometry
PHPH3302  Pharmacology for Optometry
PSYC3516  Psychology for Optometry

General Education subjects totalling 6 units of credit

Stage 4
MDCN8001  Principles of Medicine for Optometry Students
OPTM4114  Optometry and the Professional Environment A
OPTM4210  Research project
OPTM4214  Optometry and the Professional Environment B
OPTM4311  Clinical Optometry IVA
OPTM4312  Clinical Optometry IVB
OPTM4313  Clinical Optometry IVC

Degree Program (Old Program)

Stage 3
OPTM3208  Diagnosis and Management of Ocular Disease
OPTM3301  Visual Science III
OPTM3302  Clinical Optometry III
OPTM3309  Ocular Science III
PSYC3516  Psychology for Optometry

General Education subjects totalling 6 units of credit

3951
Combined Science / Optometry Program
BSc BOptom

Conditions for the combined program leading to the award of the degrees of BSc BOptom

1. Undergraduates* of The University of New South Wales who have satisfied the examiners in at least the first two Stages of the Optometry degree program may be admitted to the Science degree program with advanced standing for the purpose of qualifying for the award of the two degrees of BSc BOptom. Such undergraduates’ performance shall have been of a high standard and their admission shall be subject to the approval of the Dean of the Faculty of Science and Technology.

2. In order to qualify for the award of the degree of BSc, students so admitted shall be required to complete the appropriate general studies subjects and no less than 21 units of credit of either Level II or Level III and a further 21 units of credit from other Level III subjects, in accordance with the Science and Mathematics Program regulations. The subjects submitted for the award of the Bachelor's degree under these regulations must include at least 21 units of credit from Level III subjects chosen from related disciplines in accordance with the Science program regulations.

3. In order to qualify for the award of the degree of BSc BOptom, students so admitted shall complete the requirements of the Optometry degree program.

*In Rule 1, the word ‘undergraduates’ includes graduands, ie persons may be admitted under these rules if they have met all requirements for a first degree which has not yet been conferred and admission under these rules shall be no bar to the subsequent award of the first degree.

PSYCHOLOGY

3432
Psychology Degree
Full-time

Bachelor of Psychology
BPsychol

Psychology is a discipline of both scientific research and applied practice. As a science, psychology is concerned with the study of behaviour and its underlying mental and neural processes. Topics of study include learning, memory, cognition, perception, motivation, life-span development, personality, social interactions, and abnormal psychology. Psychology has many areas of application, especially in clinical, correctional, counselling, educational, and organisational settings. In addition, people trained in psychology pursue careers in academic research, health research, developmental disabilities and rehabilitation; ergonomics; occupational health and safety; personnel selection, training, and management; vocational guidance; and marketing.

The four-Stage full-time program leads to the degree of Bachelor of Psychology. The degree is designed to provide the student with (1) a sound understanding of psychological theory, research skills, and psychological techniques, (2) Psychology elective studies in areas of individual interest, (3) supporting studies in science disciplines, and (4) the opportunity to study courses in other Faculties including Arts and Social Sciences, and Commerce and Economics.

Registration as a Psychologist

In order to become a member of the professional body, the Australian Psychological Society (APS), and for registration as a psychologist in New South Wales, students first need a university bachelor degree which includes four years of approved training in psychology. The BPsychol degree provides four years of approved training in psychology. Students must also follow this by completing an accredited 5th and 6th year academic degree such as one of the Master of Psychology Degrees (Clinical, Forensic, Organisational) or a combined Doctor of Philosophy / Master of Psychology Degree as offered by this University. An alternative of two years of supervised experience in professional practice may be undertaken for registration as a psychologist in New South Wales.

Degree Program

Stage 1
PSYC1001, PSYC1011 and PSYC1021
12 Science units of credit
18 elective units of credit selected from:
Arts and Social Sciences, Commerce and Economics, and Science or other approved.

Stage 2
PSYC2001, PSYC2061, PSYC2071, PSYC2081, and PSYC2101
12 Level II units of credit following on from
one of the Level I non-psychology courses
6 units of credit of General Education (56 hours)
SAFETY SCIENCE

Safety and its management has been a significant growth area for the past 15 years. Everyone is more conscious of safety and more concerned about issues such as industrial safety, child safety, traffic safety, public safety and product safety. Safety Science is evolving as a discipline with its own jargon, and common approaches to the study of safety problems and their solution involving risk assessment and control. At the same time safety impacts on so many aspects of commercial and community life that a wide range of activities are possible and a wide range of undergraduate study areas are relevant.

Career prospects in the Safety area are excellent. Organisations are becoming more aware of their legal and social responsibilities for safety and for the environment and it is increasingly recognised that these areas are not easy to manage and need specialist training. The majority of jobs in safety science involve health and safety at work. The role of the industrial safety officer has evolved into an occupational health and safety professional whose responsibilities encompass all activities relating to people's health and safety. Increasingly the career will involve environmental risk management and perhaps broadening into general risk management areas. Graduates can work in a number of fields such as: Safety, Ergonomics, Biomechanics, Occupational Hygiene, Risk Management, Toxicology, Safety and Environmental Management and Safety Engineering.

Course Outline

This four year program provides the basis for a career in safety, health and environmental (SHE) management or for entry to one of the more specialist areas such as ergonomics or toxicology. The program takes four years with the first three years covering the basic sciences and management issues and the fourth year involving more advanced study in specialist sub disciplines and a major project. Although all students must cover both the scientific and management aspects of safety, health and the environment. It is possible to select subjects to give more emphasis to either aspect. The fourth year project is normally carried our within a workplace. The program thus provides work experience as well as a good grounding in the knowledge and skills required for a career in SHE.

3877 Safety Science Full/Part-time

Bachelor of Science BSc

Stage 1
Minimum requirements are 12 units of credits in mathematics and at least 6 units of credit in Physics, Chemistry, Biological Science and Psychology. Students must study 12 units of credit in two of these disciplines and may study 12 units of credit in all four with 12 units of credit being taken in Stage 2. Students should note that elective courses in years 2 and 3 will be affected by the choice of year 1 subjects.

Stage 2
ANAT2151 Introduction Functional Anatomy
GEOG2711 Australian Climate and Vegetation
MATH2829 Statistics SU
or
MATH2839 Statistics SM1
SESC2090 Safety, Health and Environment2
SESC2100 Workplace Hazards
SESC2500 Occupational Health and Safety
General Education totalling 6 units of credit
SHE related electives totalling 24 units of credit

Recommended electives:
12 UOC of science from Stage 1
IROB1701 Industrial Relations
BIOC2201 Principles of Molecular Biology (Advanced)
BIOC2291 Fundamentals of Molecular Biology
PHYS2850 Environmental Acoustics
PSYC2061 Social and Developmental Psychology
PSYC2071 Perception and Cognition
Any Stage 2 Physics or Chemistry subjects

1 Students may substitute any Stage 2 statistics subject. A safety elective subject may also be substituted for Stage2 Statistics if MATH1041 was completed in Stage 1
2 May be taken in Stage 2 or 3
Stage 3
SESC3200  Hazard and Risk Assessment
SESC3541  Assessment of the Workplace Environment
SESC3541  Chemical Safety and Toxicology
SESC4410  Ergonomics 2
PSYC3141  Behaviour in Organisations\(^3\)  
or
PSYC3526  Workplace Psychology
GEOG3911  Environmental Impact Assessment
General Education totalling 6 units of credit
Electives to complete 48 UOC
\(^3\) Prerequisite/s: PSYC2061 and PSYC2001 (or a Stage 2 Statistics subject)

Stage 4
SESC4310  Management of Health, Safety and the Environment
SESC4900  Project Methods
SESC4924  Project
Elective subjects to 48 UOC
Professional and Combined degrees with Science

Board of Studies in Science and Mathematics and another Faculty

Combined Degrees including Science

Students may undertake the science component of most approved combined degree programs involving science. Students seeking to complete the Science component of a combined degree would normally be expected to complete a minimum of 84 units of credit in Science courses at Levels I-III, including a major as specified for program 3970. It may be difficult to undertake some plans as part of combined degree structures due to timetable constraints.

Combined Degrees including Advanced Science

Students seeking to complete the Science component of a combined degree program at Advanced level would normally be expected to complete the full Honours program for the science study plan in which they are enrolled, in addition to a minimum of 96 units of credit in relevant Science courses at Levels I-III. In practice, it may be difficult to undertake some plans as part of combined degree structures. Subject to timetable constraints, students may undertake the science component of most approved combined degree program involving science, at Advanced Level. In general, students will be restricted in the number of science courses that they can undertake in such combined degrees. Where these are insufficient to allow the student to complete the recommended study plan as outlined in the Advanced Science section of the handbook, students are advised to consult the relevant Head of School.

3930
Combined Science/Arts

3931
Combined Advanced Science/Arts

BSc/BA

The double degree of BSc/BA normally requires an additional Stage of study, and enables students to complete a major sequence in a School, Department, or Program of the Faculty of Arts and Social Sciences while proceeding with their studies in Science. In each Stage of the combined degree course, students normally take courses totalling between 24 and 36 units of credit from Science and between 18 and 30 units of credit from Arts and Social Sciences. For admission to the program, students must satisfy the entry requirements to the Board of Studies in Science and Mathematics as well as to the Faculty of Arts and Social Sciences. In addition to the requirements of the BSc program being undertaken, students must complete a minimum of 84 units of credit in courses offered by Schools, Departments or Programs within the Faculty of Arts and Social Sciences, including an approved major sequence of 48 units of credit. This degree is administered by the Board of Studies in Science and Mathematics.

3935
Combined Science/Social Science

3936
Combined Advanced Science / Social Science

BSc/BSoSc

For information about this double degree please consult with the Board of Studies in Science and Mathematics and the Faculty of Arts and Social Sciences.

4075
Combined Science / Education Course

Bachelor of Science / Bachelor of Education

BSc BED

Students seeking to complete the Science component of a combined degree program at Advanced level would normally be expected to complete the full Honours program for the science study plan in which they are enrolled, in addition to a minimum of 96 units of credit in relevant Science courses at Levels I-III. In practice, it may be difficult to undertake some plans as part of combined degree structures. Subject to timetable constraints, students may undertake the science component of most approved combined degree program involving science, at Advanced Level. In general, students will be restricted in the number of science courses that they can undertake in such combined degrees. Where these are insufficient to allow the student to complete the recommended study plan as outlined in the Advanced Science section of the handbook, students are advised to consult the relevant Head of School.

This combined, four year, degree requires the completion of a BSc degree with a major and minor in two HSC teaching subjects, plus at least one semester of first year level courses in another two teaching subjects. Additionally Education subjects are commenced in the first year (two courses), with an additional course in second and third years, and a full complement of teaching method, practice teaching, professional subjects and an educational theory subject in the fourth year.

A) Students intending to become science teachers, or wishing to graduate in the natural sciences (excluding mathematics), will be required to complete:

i) A major in one of the teaching disciplines – Physics, Chemistry, Biological Sciences, Earth and Environmental Sciences (54 units of credit). This will include at least 42 units of credit at level two and three of the discipline, of which 18 units of credit must be from level three. The major sequence excludes the upper-level General Education subjects offered in the disciplines.

ii) A minor in one of the teaching disciplines – Physics, Chemistry, Biological Sciences, Earth and Environmental Sciences (36 units of credit). The minor sequence excludes the upper-level General Education subjects offered in the disciplines.

iii) At least 8 units of credit at level one in each of the main teaching disciplines – Physics, Chemistry, Biological Sciences, Earth and Environmental Sciences – and at least 12 units of credit at level one in either Chemistry or Physics. That is a total of 12 units of credit beyond those first year units completed in the major and minor disciplines. The level one physics course can be 'Physics for Health and Life Scientists'.

iv) Completion of 72 units of credit in Education. The normal pattern is two subjects in the first year (12 units of credit), and 48 units of credit in fourth year, which include educational theory, practice teaching, teaching method, and professional subjects.
v) Completion of 12 or 18 (depending on choice of major) other units of credit from any university discipline, at levels one, two or three.

**Note:** Upper level physics and chemistry courses require completion of at least 12 units of credit of first year mathematics. Some level three physics courses require a further 6 units of credit of level two mathematics. For students doing a major or minor in physics or chemistry, the mathematics prerequisites will need to come out of these 12 or 18 'other' units of credit.

For entry to honours (fourth year) in one of the science disciplines, at least 24 units of credit need to be taken at level three in the discipline, and approval needs to be obtained from the head of the relevant science school.

B) Students wishing to become mathematics teachers, or graduate in mathematics, will be required to:

i) Complete 72 units of credit in Mathematics. These Mathematics courses must be chosen so as to fulfill the requirements for a Mathematics major in the science degree program 3970, and include the courses MATH3550 'History of Mathematics' and MATH3570 'Foundations of Calculus'.

ii) Completion of at least 6 units of credit of computing courses, which can be taken from a variety of different schools in the university.

iii) Completion of 72 units of credit in Education, including 48 units of credit in the fourth year.

iv) Completion of the balance of 192 units of credit by taking subjects from any school in the university.

**Note:** All prospective Mathematics teachers need to do the BscBEd combined degree, they can no longer (from 2000) do the BABEd degree.

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**Board of Studies in Science and Mathematics and the Faculty of Engineering**

3611 **Combined Science/Aeronautical Engineering Course**

Bachelor of Engineering/Bachelor of Science  
BE BSc

3661 **Combined Science/Industrial Engineering Course**

Bachelor of Engineering/Bachelor of Science  
BE BSc

3681 **Combined Science/Mechanical Engineering Course**

Bachelor of Engineering/Bachelor of Science  
BE BSc

3701 **Combined Science/Naval Architecture Course**

Bachelor of Engineering/Bachelor of Science  
BE BSc

3725 **Combined Science/Electrical Engineering Course**

Bachelor of Engineering/Bachelor of Science  
BE BSc

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3730 **Combined Science/Civil Engineering Course**

Bachelor of Engineering/Bachelor of Science  
BE BSc

For details of the Combined Science/Aeronautical Engineering, Industrial Engineering, Mechanical Engineering, Electrical Engineering, Civil Engineering and Naval Architecture Courses refer to the Faculty of Engineering Handbook.

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**Board of Studies in Science and Mathematics and the Faculty of Medicine**

3820 **Combined Science and Medicine Course**

Bachelor of Science/Bachelor of Medicine and Bachelor of Surgery  
BSc MB BS

For details of the Combined Science / Medicine Course refer to the Faculty of Medicine Handbook.

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**Board of Studies in Science and Mathematics and the Faculty of Commerce and Economics**

3996 **Combined Science/Commerce Course**

Bachelor of Science/Bachelor of Commerce  
BSc BCom

3529 **Combined Commerce/Science Course**

Bachelor of Commerce/Bachelor of Science  
BCom BSc

For details of the Combined Science / Commerce Courses refer to the Faculty of Commerce and Economics Handbook.

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**Board of Studies in Science and Mathematics and the Faculty of Law**

4770 **Combined Science/Law Course**

Bachelor of Science/Bachelor of Laws  
BSc LLB

This program gives the students the maximum freedom to follow their interests in the courses controlled by the Board of Studies in Science and Mathematics.

The main features of the combined Science/Law program are as follows:

1. The program is a five year full-time combined program leading to the award of the two degrees of Bachelor of Science and Bachelor of Laws (BSc LLB).
2. The first three years of the program include at least 84 units of credit in the Science program together with Law courses totalling at least 60 units of credit.

3. The 84 units of credit from the Science program must include a minimum of 36 and a maximum of 48 level 1 units of credit. Students must satisfy the requirements of a specific major as outlined in the Science Handbook.

4. Students must satisfy the normal prerequisites for entry to the Board of Studies in Science and Mathematics and to individual courses there.

There are no general faculty prerequisites to courses offered by the Faculty of Law but students must study Law courses in a sequence approved by the Faculty of Law.

5. Students desiring to enrol in the BSc degree program at Honours level are not able to complete the program in five years and must obtain approval from the Faculty of Law and the Board of Studies in Science and Mathematics for their programs. With the approval of the relevant school and of the Head of the School of Law, a student may follow a standard Honours program in Science which may be completed by an additional year of study. Alternatively the student may consider first completing a BSc degree program at Honours level (4 years) and then seek admission to the three year LLB degree program for graduates.

6. The degree of Bachelor of Science is not awarded until the completion of the full five year program, but any student who fails to complete the full program may apply for advanced standing in the Board of Studies in Science and Mathematics.

7. The total of units of credit required in law courses is from 148 to 156* (92 from compulsory courses and from 56 to 64* from elective courses).

*Students may complete 8 units of credit in either law or non-law electives.

Students contemplating enrolling in this program should consult fully with the Board of Studies in Science and Mathematics and with the School of Law before enrolment.

A typical structure of a combined Science/Law program is set out below. Subject to timetable restrictions, the full range of Science majors are available to Law students.

### Year 1
- **Level I Science courses to total 36 units of credit**
  - LAWS1051 Legal System
  - LAWS1061 Torts
  - LAWS7410 Legal Research and Writing

### Year 2
- **Science courses to total 24 units of credit**
  - LAWS1001 Criminal Law 1
  - LAWS1011 Criminal Law 2
  - LAWS1071 Contracts 1
  - LAWS1072 Contracts 2
  - LAWS2140 Public Law

### Year 3
- **Science courses to total 24 units of credit**
  - LAWS1081 Property, Equity and Trusts 1
  - LAWS1082 Property and Equity 2
  - LAWS2160 Administrative Law
  - LAWS6210 Law, Lawyers and Society

### Year 4
- **LAWS2150** Federal Constitutional Law
- **LAWS2311** Litigation 1
- **LAWS2321** Litigation 2
- **LAWS4010** Business Associations 1
- **LAWS7420** Advanced Legal Research
- **LAWS8820** Law and Social Theory or
- **LAWS8300** Legal Theory
- Law electives to the value of 8 units of credit
- Law or non-law electives to the value of 8 units of credit

### Year 5
- Law electives to the value of 48 units of credit

*See entry in Sciences Handbook.*
Course Descriptions

Undergraduate Study

Descriptions of all courses are presented in alphanumeric order within organisational units. For academic advice regarding a particular course consult with the contact for the subject as listed. A guide to abbreviations and prefixes is included in the chapter 'Handbook Guide', appearing earlier in this book.

Note/s: Some courses that appear in this section may be restricted to students for whom the course comprises a compulsory part of their program. Other courses are electives in a range of programs.

Accounting

Accounting Level I

ACCT1501
Accounting and Financial Management 1A
Staff Contact: School Office
UOC6 HPW3.5 WKS14 S1 or S2
This is the first course in a sequence of courses dealing with the profession and practice of accounting and the literature associated with it. It illustrates the analysis and design of a financial accounting system which processes financial data and produces financial reports geared to the information needs of interested parties. It introduces students to the design of accounting systems based on double-entry book-keeping and incorporating other internal controls; also, to the problems of accounting for cash, debtors, inventories and property plant and equipment. It also provides a critical introduction to the ideas underlying accounting practice and to issues associated with the uses and limitations of traditional financial reports. In so doing it introduces students to the practice of literature evaluation.

ACCT1511
Accounting and Financial Management 1B
Staff Contact: School Office
UOC6 HPW3.5 WKS14 S1 or S2
Prerequisite/s: ACCT1501
This is the second course in a sequence of accounting courses and includes financial accounting topics such as an examination of the regulatory environment of financial reporting; the definition and recognition of assets, liabilities, revenues and expenses; and accounting for corporations. Aspects of managerial and investor decision-making are covered including financial statement and cash flow analysis, and examination of cost/volume/profit relationships in a single product firms, and short term budgeting.

Accounting Level II

ACCT2522
Accounting and Financial Management 2A
Staff Contact: School Office
UOC6 HPW3 WKS14 S1
Prerequisite/s: ACCT1511
Note/s: Excluded ACCT2532
This course examines management accounting, directed towards the effective use of organisational resources. Organisations create value through the use of resources, and can enhance such value by focusing and reconfiguring their internal processes in various ways; that is, by changing the ways in which they conduct business and perform work. It is argued that, in world class organisations, the management of time, flexibility, quality, integration, variability and interdependencies is critical to sustained value generation. This course explains how management accounting supports such value generation, within changing organisational processes.

ACCT2542
Accounting and Financial Management 2B
Staff Contact: School Office
UOC6 HPW3.5 WKS14 S1 or S2
Prerequisite/s: ACCT1511
Note/s: Excluded ACCT2552
This intermediate financial accounting course builds on the foundation laid in ACCT1501 and ACCT1511. It is intended for students who will be involved in the preparation or use of financial statements whether as accountants, financial executives, auditors, financial analysts or legal advisors. The effort to establish an agreed conceptual framework. The contracting cost framework for the analysis of financial reporting. Accounting for capital instruments. More advanced aspects of the definition, recognition and measurement of assets and liabilities. Lease accounting, Tax effect accounting. An introduction of consolidated accounts. Published financial reports including analysis of the current regulatory requirements. Accounting for the extractive industries, superannuation.

Accounting Level III

ACCT3563
Accounting and Financial Management 3A
Staff Contact: School Office
UOC6 HPW3.5 WKS14 S1 or S2
Prerequisite/s: ACCT2542
Note/s: Excluded ACCT3573
This is the final financial reporting course following ACCT1501, ACCT1511 and ACCT2542. This course examines accounting, reporting and legal problems associated with the preparation of consolidated accounts for complex structures, significant investments in joint arrangements and other inter-corporate holdings, generic trust designs, securitisation structures, cross-border forex dealings and translations, off-balance sheet mechanisms and structures, business ethics, green accounting, the gender issue, Mabo and Wik determinations, cultural and heritage assets, and new generation financial instruments (derivatives).

ACCT3583
Accounting and Financial Management 3B
Staff Contact: School Office
UOC6 HPW3 WKS14 S2
Prerequisite/s: ACCT2522
Note/s: Excluded ACCT3593
This course examines strategic management accounting for the contemporary competitive environment. Topics include: environmental and value chain analysis, customer value and shareholder value analysis, strategic cost analysis, pricing, investment appraisal, product and customer profitability, strategic resource management and management information systems. These issues are explored through professional and disciplinary literature and cases describing Australian and international practice.
Anatomy

Anatomy Level II

ANAT2111
Introductory Anatomy
Staff Contact: Dr B Freeman
UOC6 HPW6 WKS14 S1
Prerequisite/s: BIOS1101, BIOS1201

Introduction to gross anatomy of the whole body, based on a study of prosected specimens. General topographical and systemic anatomy, musculoskeletal, cardiovascular, respiratory, gastrointestinal, genitourinary and nervous systems.

ANAT2151
Introductory Functional Anatomy
Staff Contact: A/Prof K Ashwell
UOC3 HPW3 WKS14 S1

Overview of basic human anatomy and physiology with an emphasis on structures and systems which are most vulnerable to chemical and physical trauma under industrial conditions, such as the eye, ear and skin. Other systems studied include the musculoskeletal system, central and peripheral nervous systems, circulatory, respiratory, gastrointestinal, endocrine and urogenital systems. Offered as a distance-education course, or on campus if enrolments are sufficient.

ANAT2200
Basic Histology
Staff Contact: Prof P Waite
UOC3 HPW3 WKS14 S1
Prerequisite/s: ANAT2200

The course provides an overview of the structure of mammalian cells and their organisation into tissues. Topics include the use of the light microscope, the preparation of tissues and the recognition of artefacts. Morphology of epithelial, connective, muscular and nervous tissues will be compared with emphasis on the practical recognition of cell types and the correlation or structure and function.

ANAT2210
Systems Histology
Staff Contact: Prof P Waite
UOC3 HPW3 WKS14 S2
Prerequisite/s: ANAT2200

The course includes the histological examination of the major body systems: cardiovascular, respiratory, lymphatic, integumentary, digestive, endocrine, urinary, reproductive and nervous systems. Emphasis is on integrating the microscopic structure of organs with their function and with abnormalities, which occur in common disease processes.

ANAT2300
Vertebrate Development A
Staff Contact: A/Prof D Walsh, Dr M Hill
UOC3 HPW3 WKS14 S1
Co-requisite/s: ANAT2200, ANAT2111

This course will cover the morphological and molecular mechanisms of segmentation and patterning responsible for organising the vertebrate body plan in the embryo. Topics will include the molecular, genetic and cellular approaches to the study of human embryology using four main vertebrate systems: frog, fish, chick and mouse.

ANAT2310
Vertebrate Development B
Staff Contact: A/Prof D Walsh, Dr M Hill
UOC3 HPW3 WKS14 S2
Prerequisite/s: ANAT2300

This course will cover fetal development through to birth, including the developmental anatomy of the organ systems. The course will examine the common principles and differences that underlie normal and abnormal development of vertebrates: specifically, the roles of cell differentiation, proliferation and migration, target recognition, interaction in the nervous system, axial polarity, cell adhesion, cell fate, and signalling in development. Emerging technologies, such as genomic analysis and the use of transgenic and dysfunctional mouse mutants in research, will be covered.

ANAT2511
Fundamentals of Anatomy
Staff Contact: Dr E Tancred
UOC6 HPW6 WKS14 S2

This course will provide an introduction to the fundamental principals of human structure. It includes an introduction to the histology of basis tissues; an overview of the functional anatomy of the major body systems; human development, growth and aging, human evolution; body imaging.

Anatomy Level III

ANAT3121
Visceral Anatomy
Staff Contact: A/Prof K Ashwell
UOC6 HPW6 WKS14 S2
Prerequisite/s: ANAT2111

Detailed study of the visceral system, including autonomic nervous system, head and neck regions and the cardiovascular, respiratory, gastrointestinal and genitourinary systems. Tutorials include clinical cases and surface and radiological anatomy.

ANAT3131
Functional Anatomy 1
Staff Contact: Prof D Tracey
UOC6 HPW6 WKS14 S1
Prerequisite/s: ANAT2111

Functional anatomy of the musculoskeletal system in the head, neck and upper limb, includes biomechanics of connective tissue; in particular bone, cartilage and tendon. Tutorials involve study of prosected specimens, X-rays and surface anatomy; students will also carry out their own dissections of the upper limb.

ANAT3141
Functional Anatomy 2
Staff Contact: Prof D Tracey
UOC6 HPW6 WKS14 S2
Prerequisite/s: ANAT3131

Functional anatomy of the musculoskeletal system in the trunk and lower limb. Includes functional aspects of muscle and a discussion of the mechanics and energetics of walking and running. Tutorials involve study of prosected specimens, X-rays and surface anatomy; students will also carry out their own dissections of the lower limb.

ANAT3231
Cell Biology
Staff Contact: Dr M Hill
UOC6 HPW4 WKS14 S1 or S2
Prerequisite/s: ANAT2200, ANAT2210, BIOC2101 or BIOC2201 or BIOC2181 or BIOC2291 or PPH2112

To develop an understanding of the anatomy and biology of the cell. Cell biology combines traditional anatomical methods with recent cell and molecular biology techniques. Key concepts will include developmental differentiation of the cell, its polarity, motility, cytoskeleton, signal transduction mechanisms and outcomes. An introduction to concepts of cell and extracellular matrix interactions will also be covered. Session in which course will run to be determined.

ANAT3411
Neuroanatomy
Staff Contact: Dr E Tancred
UOC6 HPW6 WKS14 S1
Prerequisite/s: ANAT2200, ANAT2111

Provides an overview of the anatomical organisation of the central nervous system. Topics covered include: cytoarchitecture of brain and spinal cord; functional anatomy of sensory and motor systems and higher cerebral functions such as language and emotions; blood supply of the central nervous system; cerebrospinal fluid and meninges.
ANAT3421
Neuroscience Research Seminars
Staff Contact: Prof P Waite
UOC6 HPW3 WKS14 S2
Prerequisite/s: ANAT3411
Focuses on selected areas of contemporary neuroscience research interest. Includes: brain development and axon guidance, peripheral nerve regeneration, spinal cord injury, pain pathways, visual system function, cortical plasticity, brain imaging, mechanisms of learning and memory, motor systems and the neuropathology of degenerative disorders. The course is organised in seminar format with discussion of original research papers. It is ideal for students considering doing Honours as it provides a background to current research problems and the opportunity to undertake a small project.

ANAT3521
Visceral Anatomy (Adv)
Staff Contact: A/Prof K Ashwell
UOC6 HPW6 WKS14 S2
Prerequisite/s: ANAT2111
A detailed study of the visceral system, including autonomic nervous system, head and neck regions and the cardiovascular, respiratory, gastrointestinal and genitourinary systems. In addition, tutorials include clinical cases and surface and radiological anatomy. The advanced course ANAT3521 will include an assessable detailed dissection program, incorporating submission of a report based on drawings of the student's work and a review of literature within the subject area.

ANAT3531
Functional Anatomy 1 (Adv)
Staff Contact: Prof D Tracey
UOC6 HPW6 WKS14 S1
Prerequisite/s: ANAT2111
Functional anatomy of the musculoskeletal system in the head, neck and upper limb, includes biomechanics of connective tissue; in particular bone, cartilage and tendon. Tutorials involve study of prosected specimens, X-rays and surface anatomy; students will also carry out their own dissections of the upper limb. The advanced course ANAT3531 will include an assessable detailed dissection program, incorporating submission of a report based on drawings of the student's work and a review of literature within the subject area.

ANAT3541
Functional Anatomy 2 (Adv)
Staff Contact: Prof D Tracey
UOC6 HPW6 WKS14 S2
Prerequisite/s: ANAT3531
Functional anatomy of the musculoskeletal system in the trunk and lower limb. Includes functional aspects of muscle and a discussion of the mechanics and energetics of walking and running. Tutorials involve study of prosected specimens, X-rays and surface anatomy; students will also carry out their own dissections of the lower limb. The advanced course ANAT3541 will include an assessable research affiliation program, incorporating discussion and evaluation of a research project, and submission of a research report based on literature within the subject area.

ANAT3631
Cell Biology (Adv)
Staff Contact: Dr M Hill
UOC6 HPW4 WKS14 S1 or S2
Prerequisite/s: ANAT2200, ANAT2210, BIoc2101 or BIOC2201 or BIOC2181, BIOC2291 or PHHP2112
To develop an understanding of the anatomy and biology of the cell. Cell biology combines traditional anatomical methods with recent cell and molecular biology techniques. Key concepts will include development, differentiation of the cell, its polarity, motility, cytoskeleton, signal transduction mechanisms and outcomes. An introduction to concepts of cell and extracellular matrix interactions will also be covered. The advanced course ANAT3631 will include an assessable research affiliation program, incorporating discussion and evaluation of a research project, and submission of a research report based on literature within the subject area. Session in which course will run to be determined.

ANAT4508
Anatomy 4
Staff Contact: A/Prof K Ashwell
UOC48 WKS28 S3
Prerequisite/s: Completion of the first three years of any Science program with a major in Anatomy
An honours program consisting of the preparation of a research thesis and participation in School seminars.

Aviation

AVIA1002
Flying Training 1
Staff Contact: Capt G Clynick
UOC12 WKS8-14 S2
Note/s: Restricted to course3980 program 2001, excluded AVIA1000
Practical flying training and associated ground training for stage 1. Covering practical and theory requirements for issue of PPL (Private Pilots Licence) and theory requirements for CPL (Commercial Pilots Licence). This subject encompasses flight-training phases: 1, 2, 3, 4, & 5 as detailed in UNSW Manual of Flight Training.

AVIA1100
Crew Resource Management 1
Staff Contact: Capt J Faulkner
UOC3 S1 HPW 2
Note/s: Excluded PROF0102
This subject deals with the effective use of all resources in the aviation decision making process with focus on the mechanism of communication within the hierarchy of the cockpit and the cabin. Evaluation of communication will focus on the impact of modern technology, changes in methods of communication, and the reduction in crew numbers.

AVIA1150
Air Traffic Control
Staff Contact: Mr J Guseli
UOC3 HPW2 S1
Note/s: Excluded AVIA1103
This subject is concerned with the history, development and practical application of Air Traffic Services and their relationship to the commercial and regulatory aspects of commercial aviation. The topics are focused on both operational and administrative structures within the industry. Emphasis is placed on the role of ATS from the perspective of a service provider. Topics include ATC history, structure, legal aspects and implications. Other significant aspects include communications, safety, noise abatement and the development of future systems.

AVIA1300
Aeronautical Knowledge
Staff Contact: Prof J Middleton
UOC3 HPW2 WKS8-14 S2
Designed for management students who may not have or intend to gain any flying experience, this subject provides a broad based cross section of the fundamental theory of flight operation similar to that addressed within the initial theory component for stage 1 flying stream students. Topics include basic theory of flight, aircraft systems and performance, regulations and navigation.

AVIA1850
Airport Management 1
Staff Contact: Mr R Sullivan
UOC3 HPW4 WKS8-14 S2
This subject provides an introduction to issues concerning management of an airport, including definitions of an airport's functions and facilities, describing the overall regulatory...
requirements, managing the airport as a business, managing the operations, both landslide and airside, managing the development of an airport and consideration of community relations.

AVIA1900
Aviation Economics
Staff Contact: Mr R Robertson
UOC3 HPW4 Weeks1-7 S2
Note/s: Excluded PROF0203
This subject covers the economics of an airline and how the management of economic problems are analysed. Demand analysis and its relation with price and economic conditions covers revenue issues. Costs and supply are studied with reference to available airline costing information. The interaction of demand and supply are then studied and how airlines manage this aspect.

AVIA2003
Flying Training 2
Staff Contact: Capt G Clynick
UOC18 S1
Prerequisite: AVIA1002
Note/s: Restricted to course 3980 program 2001. Excluded AVIA2000
Practical flying training and associated ground training for stage 2. Covering theory requirement for CIR (Command Instrument Rating), practical requirements for CPL (Commercial Pilots Licence), theory and practical requirements for issue of a NVFR (Night Visual Rating) and a Multi Engine aircraft endorsement; this subject encompasses phases 6, 7 and 8 as detailed in UNSW Manual of Flight Training.

AVIA2100
Crew Resource Management 2
Staff Contact: Capt J Faulkner
UOC3 HPW2 S2
Prerequisites: AVIA1100
Note/s: Excluded PROF0202
The interrelationships between Captain and crew will be used to illustrate the principle of the hierarchy of command. Effective teamwork will be developed through negotiation of the principles of communications and effective decision management. This course will build on the principles illustrated in CRM 1.

AVIA2400
Aviation Regulations 1
Staff Contact: Mr R Bartsch
UOC3 HPW2 S1
Prerequisites: AVIA2403
Note/s: Excluded AVIA2400
Aviation Regulations 1 introduces the Laws and regulations under which an aviation operation functions. Beginning with regulatory authority and source, this subject develops an understanding and awareness of both the direct operational aspects of regulations and the commercial considerations that they demand. The emphasis is that of routine implications of the Civil Aviation Act, Civil Aviation Regulations and Orders.

AVIA2500
Airline Marketing
Staff Contact: Mr R Robertson
UOC3 HPW2 S1
This subject uses the classic approach to marketing management but is mostly entirely focused on how this is achieved in the industry. The approach is of a practical nature. The course studies airline market research, marketing strategy development, product development, Pricing strategies, and yield management, distribution and promotion strategies. The course encourages and emphasises current airline marketing behaviour as examples of the theory.

AVIA2700
Flight Safety 1
Staff Contact: Capt J Faulkner
UOC3 HPW2 S1
Note/s: Excluded PROF0201
This subject covers the use of quick access recorders for fleet performance monitoring, corporate structures for safety departments and accident/incident analysis. Safety auditing, emergency planning and in-flight security will be studied.

AVIA2800
Management of General Aviation
Staff Contact: Ms S Davis
UOC3 HPW2 S1
This subject covers broad range of the management decisions faced by the airlines. This subject introduces the aviation environment within which the airline management functions and makes economic decisions. Revenue issues are studied with demand analysis and an airline ability to manage price and to predict loads. The key elements of supply and cost are analysed by reference to available airline data. The final aspect studied is the combination of the demand and supply issues.

AVIA3004
Advanced Flying Training
Staff Contact: Capt G Clynick
UOC24 S2
Prerequisite: AVIA2003
Note/s: Restricted to course 3980 program 2001. Excluded AVIA3000
Practical flying training and associated ground training for stage 3. Covering practical and theory requirements for issue of CIR (Command Instrument Rating), theory and practical requirements for issue of a Grade Three Instructor Rating* and theory requirements for the issue of an ATPL (Airline Transport Pilots Licence) and final refresher flying, this subject encompasses flight training phases; 9, 10, 11 and 12 as detailed in UNSW Manual of Flight training
*In lieu of the Grade three Instructor ratings, students may select from options of; Airline entry training or advance aircraft endorsement

AVIA3101
Airline Management
Staff Contact: Mr R Robertson
UOC6 HPW4 S1
Prerequisites: AVIA1900, AVIA2003 or AVIA2400
Corequisite: AVIA2700
Note/s: Excluded AVIA3002
This subject considers the main facets of corporate airline management, and begins with airlines organisational practice, management's visions and objective setting. It proceeds with the main corporate processes of business planning, schedule planning, fleet planning and external relationships such as outsourcing. Financial aspects and global alliance matters are introduced.

AVIA3201
Airline Resource Management
Staff Contact: Mr R Robertson
UOC6 HPW4 S2
Prerequisite: AVIA3101
Note/s: Excluded AVIA3002
This subject follows AVIA3005 and introduces management of airline activities at an operational level. Issues include engineering and maintenance, crew planning and scheduling, airport planning for airlines, operations control issues, emergency procedure management, and freight and punctuality management.

AVIA3400
Aviation Regulations 2
Staff Contact: Mr R Bartsch
UOC3 HPW2 S2
Prerequisites: AVIA2400
Note/s: Excluded AVIA2413
Aviation Regulations 2 builds on the fundamental concepts introduced in Aviation Regulations 1. The emphasis of this subject is the legal ramification for pilots and operations managers imposed by the Civil Aviation Act and associated regulations. Specific case studies will form a large part of this subject.
AVIA3600
Simulations Applications
Staff Contact: Capt G Clynick
UOC3 HPW2 S2
Notes: Excluded AVIA2603
This subject addresses the broad application of simulation to the aviation industry. While the emphasis will be on aircraft simulations, aspects of operations systems simulations will also be covered. The perspective of this subject will be that of end user application. Particularly from management and training of human resource basis.

AVIA3710
Air Transport Safety 2
Staff Contact: Dr G Braithwaite
UOC6 HPW4 S2
Prerequisite: AVIA2700,
Notes: Excluded PROF3001, AVIA3700
The subject develops the knowledge of aviation safety, which has been gained by students in both Flight Safety 1, and Crew Resource Management 1 & 2 lectures. It will emphasise the development of analytical research skills for the investigation of aviation safety occurrences and problems. The subject will cover both the development of research and report writing skills in the context of air transport safety, and contemporary aviation safety issues with specific reference to technical, human and organisational factors. Each student will be required to undertake a structured, supervised research project on an aviation safety issue to be agreed with the lecturer-in-charge.

AVIA3800
Management of Regional Airlines
Staff Contact: Capt G Clynick
UOC3 HPW2 S1
A further development to AVIA2800, this subject will provide students with the information pertinent to business and corporate operations with the regional airlines sectors of the industry. Aspects covered include requirements for low capacity airlines, AOC’s and current state and national regulations for such operations.

AVIA3810
Airport Management and Security
Staff Contact: Mr R Armstrong
UOC3 HPW2 S2
Notes: Excluded AVIA3703
This is an industry-based subject, which brings the generalities of large management into the specific context of senior airport authorities. Aviation regulations and local government issues that pertain will also be covered.

AVIA3851
Airport Management 2
Staff Contact: Mr R Sullivan
UOC6 HPW4 S1
Prerequisite: AVIA1007
This subject follows AVIA1850 and provides an in-depth coverage of the key elements outlined in Airport Management 1. Issues include the regulatory environment, including licensing and obligations, an evaluation of various ownership models, the economics of running the airport as a business, including costs, revenues, subsidies and performance indicators, client relations and services, and general airport administration. Airside operations include practical operational requirements as well as necessary documentation. Other planning issues include managing terminal and landside operations, emergency and crisis management, infrastructure development, socio-economic impacts on the community, and environmental impacts.

Banking and Finance

Banking and Finance Level II

FINS2613
Business Finance
Staff Contact: School Office
HPW3
Corequisite/s: FINS2612 or any two of ACCT1511, ECON1102 and ECON1203
This subject looks at the essential aspects of financial decision-making in business firms. Financial mathematics is used to value securities and make capital expenditure decisions. Portfolio theory is introduced to provide a foundation for determining the relationship between expected risk and returns in financial and real asset investments. Dividend payouts and the choices between debt and equity financing are then covered. The subject will also include: alternative approaches to valuation; factors affecting the formulation of the capital structure; and influence of the capital market environment. Finally, the implications of financial risk, taxation, arbitrage, and the conflict of interest between managers and investors on the value of business firms will be introduced.

Banking and Finance Level III

FINS2612
Capital Markets and Institutions
Staff Contact: School Office
HPW3
Corequisite/s: ECON1101 and ECON1202
This subject focuses on the major financial markets, including the equity, money, bond, exchange rate and derivatives markets. Students will learn about the basics of financial instruments in these markets, such as bank bills, treasury bonds, futures and options. In addition, students are exposed to the tools of analyses and the roles and innovations of major financial institutions. These include the banks and non-banks, such as finance companies, building societies and credit unions, life and insurance companies as well as funds management companies.

Banking and Finance Level III

FINS2624
Portfolio Management of Financial Assets
Staff Contact: School Office
HPW3
Prerequisite/s: FINS2613
This subject introduces modern investment theories with an equal emphasis on theory and practice. Numerous finance models including the Markowitz model, CAPM, SIM, and the Black-Scholes option pricing models are discussed in detail to provide students with a solid background knowledge so that they can understand and appreciate the practical implications of these models on investment management. Topics include: bond valuation and analysis; the impact of tax on the choice of bonds; the application of the duration concept to gap management and bond trading strategy; stock valuation models and technical analysis; understanding the formula and implications of the Black Scholes option pricing model; the pricing of share futures and bond futures; the strategic use of options and futures for hedging and investment; the use of attribution analysis to evaluate portfolio performance and asset allocation among the money, bond and stock markets. The lecture program is complemented by a coherent laboratory program. The latter is aimed to introduce spreadsheet applications to securities pricing and investment theories. The hands-on experience of using spreadsheet applications to generate graphics allows students to see for themselves the relationships among financial variables presented in the textbooks.
Biochemistry and Molecular Genetics

Head of School: A/Prof M Edwards
Coordinator of Undergraduate Studies: Dr A Bagnara
School Secretary: Ms G McWhinney

Registration for Laboratory Classes in Biochemistry

It is essential for all students to register for a laboratory class for each biochemistry course. This is normally done through the pre-enrolment process by completing the appropriate registration form (Form BIOC/REG/00) during the pre-enrolment. Failure to do this may prejudice your chances of obtaining a place for your preferred laboratory class.

Note: Some course that appear in this section may be restricted to students for whom the course comprises a compulsory part of their plan.

Biochemistry Level II

BIOC2101
Principles of Biochemistry (Advanced)
Staff Contact: Dr I McFarlane, A/Prof M Edwards
UOC6 HPW6 WKS14 S1
Prerequisite/s: BIOS1101 and BIOS1201, CHEM1101 and CHEM1201
Note/s: Excluded BIOC1319, BIOC2181, CHEM2929. Enrolment in this course may be subject to quota restrictions. Such restrictions will only apply to students taking this course as an elective part of their plan.

Introduces modern biochemistry, covers fundamental aspects of the structure-function relationships of proteins and an overall coverage of intermediary metabolism. Major topics covered include: the nature and function of enzymes; the metabolic working of cells, tissues and organs; the interrelationships between pathways of carbohydrate, lipid and amino acid metabolism; the vital roles of enzymes and hormones in catalysis and metabolic regulation; the energy-trapping mechanisms of animals and plants; interesting variations on the central metabolic pathways in various life forms. Practical work to complement the lectures and to introduce the principles of biochemical analysis.

BIOC2181
Fundamentals of Biochemistry
Staff Contact: Dr A Bagnara, A/Prof M Edwards
UOC6 HPW6 WKS14 S1
Prerequisite/s: BIOS1101 and BIOS1201, CHEM1101 and CHEM1201
Note/s: Excluded BIOC1319, BIOC2101, CHEM2929. This course provides a comprehensive introduction to Biochemistry as an alternative to BIOC2101 for students who do not intend to proceed to Level III Biochemistry. It does not fulfill the prerequisite requirements for Level III Biochemistry but the Head of School may give approval for students with a grade of credit to enrol in Level III courses.

Introduces modern biochemistry, covers fundamental aspects of the structure-function relationships of proteins and an overall coverage of intermediary metabolism. Major topics covered include: the nature and functions of enzymes; the metabolic working of cells, tissues and organs; the interrelationships between pathways of carbohydrate, lipid and amino acid metabolism; the vital roles of enzymes and hormones in catalysis and metabolic regulation; the energy-trapping mechanisms of animals and plants; interesting variations on the central metabolic pathways in various life forms. Practical work to complement the lectures and to introduce the principles of biochemical analysis. This subject covers essentially the same material as in BIOC2101 Principles of Biochemistry (Advanced), but in less detail and with more emphasis on the function of organisms and less emphasis on some of the underlying chemical mechanisms.
Biochemistry Level III

BIOC3111 Molecular Biology of Proteins
Staff Contact: Dr G King
UC06 HPW6 WKS14 S1
Prerequisite/s: BIOC2101 and BIOC2201, CHEM2021 or CHEM2041

Modern aspects of the structure function relationships of proteins including discussion of the latest techniques of protein characterisation. Topics include: separation and analytical procedures; determination of amino acid sequence data; the nature of protein and protein ligand interactions including aspects of substrate binding, enzyme kinetics and enzyme mechanisms; the molecular architecture of proteins from the standpoint of the relationships among primary, secondary, tertiary and quaternary structures; aspects of protein engineering. Practical work illustrates and complements the lectures and provides experience with modern techniques of protein molecular biology.

BIOC3121 Molecular Biology of Nucleic Acids
Staff Contact: Dr L Lutze-Mann
UC06 HPW6 WKS14 S1
Prerequisite/s: BIOC2101 and BIOC2201, CHEM2021 or CHEM2041

Detailed analysis of gene structure and function including: structure and properties of polynucleotides such as DNA and RNA; structure of chromatin; mechanisms and regulation of gene replication, transcription and translation; recombinant DNA technology, nucleic acid sequencing, DNA-DNA and DNA-RNA hybridisation as important tools of modern molecular biology; protein production using recombinant DNA systems. Practical work illustrates and complements the lectures and provides experience with contemporary molecular techniques.

BIOC3131 Biochemistry and Genetic Engineering of Plants
Staff Contact: Dr I McFarlane
UC06 HPW6 WKS14 S1
Prerequisite/s: BIOC2101 and BIOC2201

The techniques of recombinant DNA technology and plant tissue culture with their application to the modification and improvement of plant productivity. Plant organ, tissue and cell culture, organogenesis, embryo genesis and clonal plant propagation. The long term preservation of germplasm and plant genetic resources. Products from cultures, plant cells and the technology of plant cell culture. Structure and expression of plant genes. Plant molecular biology including cloning plant genes and vectors for gene cloning. Genetic manipulation of plants to improve their natural resistance to pests, disease and environmental stress. Practical work provides training in the basic techniques of plant tissue culture with application of selected techniques to plant genetic engineering.

BIOC3141 Human Genetics
Staff Contact: Dr L Lai
UC06 HPW6 WKS14 S2
Prerequisite/s: BIOS2021

The principles and concepts of human genetics and methods used to study the nature and extent of genetic differences; mechanisms of inheritance and gene expression, gene linkage and patterns of inheritance; principles and applications of population genetics and cyto genetics; modern molecular techniques for human gene mapping, gene localisation, disease and the prospects of gene therapy; genetic fingerprinting and current ethical issues in human genetics.

BIOC3151 Genetics and the Analysis of Individual Variation
Staff Contact: Dr A Wilton, Dr W Sherwin
UC06 HPW6 WKS14 S1
Prerequisite/s: BIOS2021
Corequisite/s: BIOS2041 or MATH2841 or another Mathematics or Computing course approved by the coordinator

This course aims to develop a student's abilities to use molecular and traditional genetic data to solve genetic problems that arise in a variety of applications, from industry and human biology, to wildlife management. Computer simulations and projects with Industries will be used extensively. Natural or recombinant genes interact with one another and the environment to produce whole organisms and the variation between them. The course will present modern methods for investigating the molecular basis of heritable characteristics as diverse as morphology and behaviour, in a variety of species, at levels from the family to the population. Identification of quantitative trait loci and variation will be examined including natural selection, artificial selection, forensics and ethical issues.

BIOC3251 Human Biochemistry
Staff Contact: Dr A Bagnara
UC06 HPW6 WKS14 S2
Prerequisite/s: BIOC2101 and BIOC2201

Covers the aspects of metabolism that are of particular relevance to the human. The major topics covered will be selected from: Nutrition, exercise, neurochemistry, xenobiotics, nucleotide and one carbon metabolism, genetic diseases and molecular aspects of parasitology. The role of triglyceride, cholesterol and lipoprotein metabolism in human health, and other selected areas of human nutrition. Specialised aspects of endocrinology and neurochemistry including prostaglandins, leukotrienes, erikaphilins and endorphins. The interrelation of purines, pyrimidines, folate and cobalamin metabolism in humans. Xenobiotics: the metabolism of foreign compounds by humans. Biochemical aspects of genetic disease including the use of recombinant DNA techniques for prenatal diagnosis and carrier detection. Molecular studies of malaria and other parasites of the human. Practical work to amplify the lectures.

BIOC3271 Molecular Cell Biology
Staff Contact: Dr L Lutze-Mann
UC06 HPW6 WKS14 S2
Prerequisite/s: BIOC2101 and BIOC2201

Cell biology from a molecular viewpoint. Biochemical aspects of cellular organisation and how they are integrated and controlled. The arrangement of the component molecules of organelles, their function in integrated cellular metabolism and the molecular interactions between the cells of multicellular organisms. The biochemistry of the cytoskeleton, carriers and intracellular transport systems. The regulation of cellular processes at the molecular endocrine level. Growth and differentiation. Aspects of cancer metabolism, the biochemistry of cell to cell communication and the structure and function of the extracellular matrix. Practical work amplifies the lectures.

BIOC3281 Recombinant DNA Techniques and Eukaryotic Molecular Biology
Staff Contact: A/Prof T Stewart
UC06 HPW6 WKS14 S2
Prerequisite/s: BIOC3121

The organisation of the genomes of higher organisms derived mainly from the application of recombinant DNA technology and related techniques. Methods used for the isolation, identification and characterisation of eukaryotic genomes in terms of the organisation of single copy and repeated sequences and of coding and non-coding sequences and of several gene clusters, eg the alpha and beta globin gene cluster. Mechanisms known to operate in the control of eukaryotic gene expression, both at the DNA level and at the level of RNA processing. Review of several specialised genetic systems in plants and animals such as mitochondria, chloroplasts and RNA and DNA tumour viruses. Practical work provides training in the use of sterile techniques and in working with polynucleotides under nuclease-free conditions, using basic techniques such as hybridisation and DNA sequencing.

BIOC3329 Genes, Genomes and Evolution
Staff Contact: Prof I Dawes
UC06 HPW6 WKS14 S2
Prerequisite/s: BIOS2021

Current concepts and theories in genetics concentrating on eukaryotes including humans. The generation of variation examined at the molecular level for fundamental genetic processes of mutation,
recombination and repair. The evolution of the genome, maintenance of variation, the effects of mutations and their relevance to disease. Ecological genetics and molecular evolution, genetics of cellular division process and developmental genetics. Practical uses of genetics including the use of transposable elements to manipulate genetic stock, transgenesis, genetics of cancer, pedigree analysis, disease gene mapping, gene therapy, cytogenetics. Unusual genetic mechanisms. Perspectives on genetics, history and future. Practical work and exercises to complement the lectures.

**BIOSC3301**
Biochemistry Laboratory Project (Advanced)
*Staff Contact: A/Prof M Edwards*
UOC6 WKS51 S1 or S2
*Note/s: Prerequisites or Corequisites: This course is restricted to Advanced Science students enrolled in Biochemistry, Genetics or Molecular Biology Plans*

The course involves directed reading, laboratory work and use of World Wide Web resources. Students will work on a research project under the supervision of a member of the academic staff. It is designed to introduce students to research methodology, and to stimulate critical and lateral thinking in the context of problem solving. Enrolment in this course is by invitation and is based on academic performance. Interested students should contact the Head of School.

**Biochemistry Level IV**

**BIOSC4318**
Biochemistry 4 (Honours)
*Staff Contact: Dr V Murray*
UOC48
*Prerequisite/s: Completion of Stages 1-3 of the Biochemistry Plan in Advanced Science with credit level at Stage 3*

Advanced training in selected areas of biochemistry including a supervised research program that places emphasis on the use of specialised techniques relevant to the research area. A written thesis on the research is required. The General Education requirements are met within the Honours Plan by seminars, an essay and participation in discussion groups.

**BIOSC4428**
Molecular Biology 4 (Honours)
*Staff Contact: Dr V Murray*
UOC48
*Prerequisite/s: Completion of Stage 1-3 Molecular Biology Plan in Advanced Science with credit level at Stage 3*

Advanced training in selected areas of molecular biology including a supervised research program that places emphasis on the use of specialised techniques relevant to the research area. A written thesis on the research is required. The General Education requirements are met within the Honours Plan by seminars, an essay and participation in discussion groups.

**Servicing Subjects**

These are subjects taught within courses offered by other faculties. For further information regarding the following subjects see the Faculty of Medicine Handbook.

**BIOSC1319**
Biochemistry for Medical Students

**BIOSC2329**
Medical Biochemistry and Genetics

### Biological Science

**Biological Science Registration Centre**

(for courses offered by the School of Biological Science)

Registration will be held in Room G21, Biological Sciences Building as follows:

- 16-17 Feb (Wed-Thurs) 10.00am-3.00pm
- 21-24 Feb (Mon-Thurs) 10.00am-4.00pm

Students must obtain practical slots at that time for:

- BIOSC2011 Evolutionary and Physiological Ecology
- BIOSC2061 Vertebrate Zoology
- BIOSC2062 Genetics (Advanced Level)
- BIOSC2051 Flowering Plants
- BIOSC2061 Vertebrate Zoology
- BIOSC3071 Conservation Biology and Biodiversity
- BIOSC3071 Conservation Biology and Biodiversity (Advanced Level)
- BIOSC3111 Population and Community Ecology
- BIOSC3111 Population and Community Ecology (Advanced Level)

Pre-enrolment or enrolment in another faculty does not automatically entitle you to a place in your chosen practical time. You must obtain a seat from the Biological Science Registration Centre.

Students enrolling in other Biological Science courses not listed above, do not need to sign on at the Biological Science Registration Centre but must attend the first lecture of the relevant course for practical assignments and further details.

The location and timetable of lectures and practicals for all courses in the School of Biological Science can be obtained from the notice boards on the fifth floor of the Biological Sciences Building.

**BIOSC1101**
Evolutionary and Functional Biology
*Staff Contact: A/Prof P Adam*
UOC6 HPWS S2
*Note/s: Practical and tutorial seat assignments must be obtained at the Biological Science Student Office (Rm G21 Biological Sciences Bld) BEFORE Session 2 starts. The course guide is available for purchase at the same time*

The course examines the evolutionary history of life on earth from origins to humans and the relationship between environment, adaptation and function. Animal (particularly human) and plant physiology are covered with an emphasis placed on adaptation to Australian context.

**BIOSC1201**
Molecules, Cells and Genes
*Staff Contact: A/Prof P Adam*
UOC6 HPWS S1
*Prerequisite/s: HSC Exam Score Required: 2 unit Science (Physics) 53-100, or 2 unit Science (Chemistry) 53-100, or 2 units Science (Geology) 53-100, or 2 units Science (Biology) 53-100, or 3 unit Science 90-150, or 4 unit Science 1-50*

*Note/s: Practical and tutorial seat assignments must be obtained at the Biological Enrolment Centre on the day of enrolment. The course guide is available for purchase during enrolment week. Equipment required for practical classes is listed in the Course Guide and must be purchased before session starts. Students must consult it for details of the course and assessments*

The course is concerned with the basic characteristics of all life, from viruses to humans. The chemistry of life is covered and emphasis is placed on the ways in which organisms construct and break down macromolecules. Cell biology, the structure and function of cell components, is a major component of the course. The final topic of the course is genetics - the nature of the genetic code in all organisms, how the genetic code is inherited and how it can be modified.
BIOS1401  Biology (Optomotry)
Staff Contact: A/Prof P Adam
UOC6 HPW4 S1
Notes: Available only to students in Optomotry programs 3950 and 3951

The course covers the basic principles of cellular and animal biology. Includes practical work.

BIOS2011  Evolutionary and Physiological Ecology
Staff Contact: A/Prof P Steinberg
UOC6 HPW5 S1
Assumed Knowledge: BIOS1101 and BIOS1201
Notes: Students must enrol at the Biological Science Registration Centre, Room G21, Biological Sciences Building

Introduction to functional relationships between living organisms and the environments in which they live. Emphasis on interactions within and between populations, ecological energetics, ecosphysiology, and the theory of evolution by natural selection. Plants, animals and microbes are covered. Also serves as an introduction to the process of scientific enquiry.

BIOS2021  Genetics
Staff Contact: Dr W Sherwin, Dr A Wilton
UOC6 HPW5 S2
Assumed Knowledge: BIOS1101 and BIOS1201, CHEM1011 or CHEM1011
Notes: Excluded BIOS2621. Enrolment in this course may be subject to quota restrictions. Such restrictions will only apply to students taking this course as an elective. Students must enrol at the Biological Science Registration Centre, Room G21, Biological Sciences Building


BIOS2621  Genetics (Advanced Level)
Staff Contact: Dr W Sherwin, Dr A Wilton
UOC6 HPW6 S2
Assumed knowledge: BIOS1101, BIOS1201, CHEM1011
Notes: Excluded BIOS2621. Available to students in 3990 (Advanced Science, Life Sciences) and, subject to availability of places, to other high performing students. Students must enrol at the Biological Science Registration Centre, Room G21, Biological Sciences Building


BIOS2031  Biology of Invertebrates
Staff Contact: Dr I Suthers
UOC6 HPW5 S2
Assumed Knowledge: BIOS1101 and BIOS1201
Notes: Enrolment in this course may be subject to quota restrictions. Such restrictions will only apply to students taking this course as an elective. There is a compulsory field camp during mid session break

A comparative study of morphology, taxonomy, functional biology and evolutionary relationships of invertebrates. Emphasis on major phyla and marine forms. Practical work includes anatomy of living and preserved specimens (including dissections). Personal expenses will be incurred.

BIOS2041  Biometry
Staff Contact: A/Prof R McMurtrie
UOC6 HPW5 S1
Assumed Knowledge: BIOS1101 and BIOS1201 and MATH1041

BIOS2051  Flowering Plants
Staff Contact: Prof A Ashford
UOC6 HPW5 S2
Assumed Knowledge: BIOS1101 and BIOS1201
Notes: Enrolment in this course may be subject to quota restrictions. Such restrictions will only apply to students taking this course as an elective. Students must enrol at the Biology Enrolment Centre, Room G21, Biological Sciences Building

Basic plant biology including cell structure, plant morphology and anatomy, water and sugar transport, seed structure and physiology, plant growth and development, morphology, leaves and photosynthesis, roots, micro-organisms and nutrition, evolution of land plants and plant taxonomy. Practical work: plant anatomy and light microscopy; collection of numerical data and a statistical analysis, plant identification.

BIOS2061  Vertebrate Zoology
Staff Contact: Dr P Banks
UOC6 HPW5 S1
Assumed Knowledge: BIOS1101 and BIOS1201
Notes: Practical class allocations must be obtained during re-enrolment week from room G21, Biological Science Building. Enrolment in this course may be subject to quota restrictions. Such restrictions will only apply to students taking this course as an elective

Comparative study of the Chordata, with particular reference to the vertebrates, including morphology, systematics, evolution and natural history, with reference to selected aspects of physiology and reproduction. Practical work to supplement lectures.

BIOS3601  Advanced Field Biology
Staff Contact: Dr P Banks
UOC6 HPW45 WKS1 S2
Assumed knowledge: Familiarity with principles of systematics and with major taxa of plants
Notes: Available to students in 3990 (Advanced Science, Life Sciences) with unfilled places available to students in courses 3976 (Environmental Science, Biological Environments) and 3970 (Biological Science and Ecology Majors with a credit average)

An advanced practical training in diversity, systematics, biology and identification of terrestrial animals and plants. The course is run principally as an intensive 1 week course at Smiths Lake Field Station between sessions 1 and 2. Students will receive theoretical and practical training in current methods of trapping, collecting and identifying animals and plants, estimation of population size, biodiversity, the conduct of animal surveys, and data analyses. The course coverage will include both vertebrate and invertebrate animals and plants.
BIOS3011
Animal Behaviour
Staff Contact: Dr D Croft
UOC6 HPW5 S2
Assumed Knowledge: Animal systematics and morphology with BIOS2031 or BIOS2061 recommended

Theory and practice in the biological study of animal behaviour: ethology and behavioural ecology. The observation and description of behaviour along with the development, function and evolution of behaviour in an ecological context are examined as important elements in the analysis of behaviour, particularly social behaviour. Topics include foraging behaviour, communication, home range, territorial behaviour, aggression and dominance, sexual behaviour, mate choice, mating systems, play and social organisation. Examples are drawn from the Australian fauna and both field and laboratory work are included.

BIOS3021
Comparative Animal Physiology
Staff Contact: A/Prof A Beal
HPW 6
Assumed Knowledge: Animal systematics and morphology, with BIOS2031 or BIOS2061 recommended

The physiology of invertebrates and vertebrates including the special features of Australian mammals. The topics examined include reproduction, hormones, nerves, blood, circulation, respiration and kidneys with emphasis on the control and integration of organ systems and body functions.

BIOS3031
Ecological Physiology
Staff Contact: Prof T Dawson, A/Prof P Greenaway
UOC6 HPW5 S2
Assumed Knowledge: Animal systematics and morphology with BIOS2031 or BIOS2061 recommended

Physiological adaptation to habitat in animals. The problems imposed by environmental conditions on salt and water balance, excretion, gas exchange, metabolism and temperature regulation/acclimation will be considered. Underlying themes include the colonisation of land from aquatic habitats and adaptation to severe habitats. Emphasis will be placed on the Australian fauna. A field trip to Western NSW is part of the course and students will incur expenses.

BIOS3061
Plant Ecosystem Processes
Staff Contact: Dr G Hyde
UOC6 HPW5 S1
Assumed Knowledge: BIOS2051


BIOS3071
Conservation Biology and Biodiversity
Staff Contact: Dr W Sherwin
UOC6 HPW5 S1
Assumed Knowledge: BIOS1101 and BIOS1201
Note/s: Excluded BIOS3671. Students must enrol at the Biology Enrolment Centre, Room G21, Biological Sciences Building

Applications of community biology, population ecology and genetics to management of environmental problems in nature and artificial ecosystems, including Australian examples. Nature and importance of global diversity. Management and design of programs for the conservation of species and ecosystems, including reserves, off site conservation, and computer simulations. Field excursions are compulsory and will involve expense to individual students.

BIOS3671
Conservation Biology and Biodiversity (Advanced Level)
Staff Contact: Dr W Sherwin
UOC6 HPW6 WKS14 S1
Assumed Knowledge: BIOS1101 and BIOS1201
Note/s: Excluded BIOS3071. Available to students in 3990 (Advanced Science, Life Sciences) and, subject to availability of places, to other high performing students. Students must enrol at the Biology Enrolment Centre, Room G21, Biological Sciences Building

Applications of community biology, population ecology and genetics to management of environmental problems in nature and artificial ecosystems, including Australian examples. Nature and importance of global diversity. Management and design of programs for the conservation of species and ecosystems, including reserves, off site conservation, and computer simulations. Field excursions are compulsory and will involve expense to individual students. Current conservation issues will be addressed in small group projects.

BIOS3081
Ocean Biology and Fisheries
Staff Contact: Dr I Suthers
UOC6 HPW6 WKS14 S1
Assumed Knowledge: BIOS2031 and BIOS2041
Note/s: Excluded BIOS3681. A compulsory field trip will be held during the mid-session break

Marine pelagic and estuarine habitats. The practical application of theory to the ocean environment and its effect on the life of marine organisms. Emphasis on the biology of phytoplankton, zooplankton and fish, together with the study of fisheries. Includes management, marine technology, computer simulations, conservation, other marine vertebrates, aquaculture and environmental concerns. Technical skills, taxonomy and sampling design. Personal expenses will be incurred.

BIOS3681
Ocean Biology and Fisheries (Advanced Level)
Staff Contact: Dr I Suthers
UOC6 HPW6 WKS14 S1
Assumed Knowledge: BIOS2031, BIOS2041
Note/s: Excluded BIOS3081. Available to students in 3990 (Advanced Science, Life Sciences) and, subject to the availability of places, to students in BEnvironSci (Biology and Marine) and in 3970 (Biological Science Ecology and Biological Oceanography Majors with a credit average or better in BIOS courses). A compulsory field trip will be held during the mid-session break

Marine pelagic and estuarine habitats. The practical application of theory to the ocean environment and its effect on the life off marine organisms. Emphasis on the biology of phytoplankton, zooplankton and fish, together with the study of fisheries. Includes management, marine technology, computer simulations, conservation, other marine vertebrates, aquaculture and environmental concerns. Technical skills, taxonomy and sampling design. Personal expenses will be incurred.

BIOS3091
Marine and Aquatic Ecology
Staff Contact: A/Prof P Steinberg
UOC6 HPW5 S2
Assumed Knowledge: BIOS2011 or BIOS2041

Ecology of marine and freshwater systems, emphasising benthic communities. Population and community dynamics of these systems. Evolution of life histories in the light of constraints of aquatic systems. Emphasis on experimental approaches to aquatic ecology. Special topics considered include chemical ecology, plant/herbivore ecology, and applied aspects of the topic such as mariculture. A section on the biology and taxonomy of marine algae (seaweeds) is included. Fieldwork is an important component of the course.
BIOS3111
Population and Community Ecology
Staff Contact: Prof B Fox
UOC6 HPW5 S2
Assumed Knowledge: BIOS1101 and BIOS2011 and MATH1041
(or higher level of statistics)
Note/s: Excluded BIOS3611
Factors regulating dynamics of interacting populations, renewable resource management, ecosystem stability, cycles and chaos, simulation modelling in ecology, niche theory, competition, habitat selection, community structure, species diversity, island biogeography, ecological gradients. Succession following disturbance (fire, mining, or logging). Practical work is essential and may involve a field component.

BIOS3611
Population and Community Ecology (Advanced Level)
Staff Contact: Prof B Fox
UOC6 HPW6 WKS14 S2
Assumed Knowledge: BIOS1101, BIOS2011, BIOS2041 and MATH1041 (or higher level of statistics)
Note/s: Excluded BIOS3111. Available to students in 3990 (Advanced Science, Life Sciences) and, subject to availability of places, to students in BEnvironSc (Biology and Marine) and in 3970 (Biological Science, Ecology and Biological Oceanography Majors with a credit average or better in BIOS courses)
Factors regulating dynamics of interacting populations, renewable resource management, ecosystem stability, cycles and chaos, simulation modelling in ecology, niche theory, competition, habitat selection, community structure, species diversity, island biogeography, ecological gradients, succession following disturbance (fire, mining or logging). Students will be required to undertake, and write a report on, an approved research project, as part of their assessment in this subject. The topics for these studies will be drawn from the lecture content. Participation in a field component of practical work will be an integral part of this subject and will complement an advanced level of data analysis using a variety of different computer packages.

BIOS3121
Evolution in the Australian Flora
Staff Contact: A/Prof C Quinn
UOC6 HPW5 S1
Assumed Knowledge: BIOS2051
Techniques of plant systematics, including the recognition and classification of species, genera and higher order taxa. Assessment of evolutionary relationships using molecular and other data, and the use of computer models to reconstruct and test hypothetical phylogenies, illustrated by applications to some of the major groups. Traces some important lineages in the Australian land flora and examines the relationships of these beyond Australia.

BIOS3131
Mammalogy
Staff Contact: Dr S Hand
UOC6 HPW5 S2
Assumed Knowledge: BIOS2061
An introduction to the origin and nature of mammals, their evolutionary patterns, diversity, contemporary and historical biogeography, community structure, life history strategies compared with those from other lands, field techniques and aspects of conservation biology. Focus on endemic Australian mammals: monotremes, marsupials, bats, cetaceans, rodents, dingos and humans. Includes field excursions. Field excursions may incur personal expenses; personal expenses may be incurred.

BIOS3301
Ecology for Environmental Engineers
Staff Contact: Prof B Fox
UOC3 HPW3 S2
Note/s: Restricted Environmental Engineering Programs
Factors regulating dynamics of interacting populations, renewable resource management, ecosystem stability, cycles and chaos, simulation modelling in ecology, niche theory, competition, habitat selection, community structure, species diversity. Plant and animal succession following disturbances such as fire, mining and logging. Rehabilitation and restoration procedures following disturbance. Appropriate tutorial topics.

BIological Science Level IV
Two types of Honours plan are offered at Level 4 with four disciplinary streams in each. Strand A is research oriented and includes a 42UOC research project and training in associated research skills. Strand B offers a broader training and includes 24UOC project and 24 UOC course work.

Strand A
Full year (42UOC) research project and "Essential Skills for Biology Honours".
Required course material comprises:
BIOS4511 Essential skills for Biology Honours
BIOS4521 Special topics in Biology
One 42UOC project course from the list below:
BIOS4517 (BIOS4513 if PT) Biological Science Honours A
BIOS4527 (BIOS4523 if PT) Botany Honours A
BIOS4537 (BIOS4533 if PT) Zoology Honours A
BIOS4547 (BIOS4543 if PT) Ecology Honours A
Staff Contact: A/Prof C Quinn
S1, S2, S3
Prerequisite/s: Completion of requirements for Stages 1-3 of the Advanced Science Plan in Ecology or Biological Science, or a Major in Ecology or Biological Science with 36UOC in stage 3 courses at a credit average or better
Note/s: If enrolment for Stage 4 is part time, students must complete the course work requirements in year 1 and the research project in year 2.

Strand B
Half year (24UOC) research project and 24UOC of course work.
Required course material comprises:
BIOS4511 Essential skills for Biology Honours
BIOS4521 Special topics in Biology
One 24UOC project course from the list below:
BIOS4514 (BIOS4512 if PT) Biological Science Honours B
BIOS4524 (BIOS4522 if PT) Botany Honours B
BIOS4534 (BIOS4532 if PT) Zoology Honours B
BIOS4544 (BIOS4542 if PT) Ecology Honours B
and 12 UOC biology courses at Stage 3 (that have not been completed previously) or other science courses approved by the Honours Coordinator.
Staff Contact: A/Prof C Quinn
S1, S2, S3
Prerequisite/s: Completion of requirements for Stages 1-3 of the Advanced Science Plan in Ecology or Biological Science, or a Major in Ecology or Biological Science with a credit average or better in stage 3 courses
Note/s: If enrolment for Stage 4 is part time, students must complete the course work requirements in year 1 and the research project will be conducted in year 2

BIOS4511
Essential Skills for Biology Honours
Staff Contact: A/Prof C Quinn
UOC6 S1 S2
Prerequisite/s: Completion of requirements for Honours in biology or other discipline area
Corequisite/s: An Honours research project in biology or related discipline area
The course covers essential skills needed for the Honours project and any subsequent degree as well as in outside employment. Principal topics covered include presentation skills (written, oral and audiovisual including computer-aided presentations), database and library usage, information retrieval and usage of major computer packages as well as more specific research skills which may be tailored to particular interest groups.
BIOS4521
Special Topics in Biology
Staff Contact: A/Prof C Quinn
UOC6  S1  S2
Note/s: Available to students enrolled in Strand B of BIOS Honours, Strands B and C of ENVIS Honours and other Honours students in a biological discipline as approved by the Honours Coordinator

Literature research and presentation assignments in areas of biology not specifically covered in other courses in the program. The program is designed to expand coverage of biological topics and to integrate material present in earlier BIOS courses; Provide experience in location, presentation and discussion of biological information.

BIOS0005
Biological Science Special Program
Staff Contact: Head of School
UOC6  S1 or S2
Note/s: Individually designed project courses generally available to overseas students

BIOS0006
Biological Science Special Program
Staff Contact: Head of School
UOC6  S1 or S2
Note/s: Individually designed project courses generally available to overseas students

BIOS0007
Biological Science Special Program
Staff Contact: Head of School
UOC12  S1 or S2
Note/s: Individually designed project courses generally available to overseas students

BIOS0008
Biological Science Special Program
Staff Contact: Head of School
UOC18  S1 or S2
Note/s: Individually designed project courses generally available to overseas students

BIOS0009
Biological Science Special Program
Staff Contact: Head of School
UOC24  S1 or S2
Note/s: Individually designed project courses generally available to overseas students

Biotechnology

Biotechnology Level I

BIOT1011
Introductory Biotechnology
Staff Contact: Dr D Glenn
UOC6  HPW4  WKS14  S2
This subject will focus on the overview of the impact of biotechnology in the achievement of contemporary objectives in the field of medicine, plant and animal science, in food, marine and environmental sciences and draw comparisons with conventional technologies. The concepts of bioethics, patenting and other regulatory issues will also be introduced. The subject is intended to cover the broad concept of biotechnology, its historical and contemporary relevance.

Biotechnology Level II

BIOT3021
Biotechnology B
Staff Contact: Prof P Rogers
UOC6  HPW6  WKS14  S2
Prerequisite/s: BIOT3011

Application of principles of biotechnology to the analysis and design of microbial processes of industrial relevance (ethanol, single cell protein, fermented foods and beverages, amino acids and vitamins, microbial polysaccharides, microbial enzymes, secondary metabolites including antibiotics, products of mammalian cell culture, waste treatment processes, microbial leaching and metal recovery from low grade minerals). Emphasis on quantitative approach: mass and heat balance calculations, kinetic and thermodynamic analysis, equipment design and specification, process design, process simulation, plant location, application of optimisation techniques. The economics of microbial processes are considered and comparison made with alternative modes of production or treatment. The economics of agroindustry in Australia using microbial processes. Marketing of fermentation products, clinical trials required, legal constraints, patent rights. Technical and economic feasibility studies. A design project is included based on experimental data.

BIOT3031
Microbial Genetics
Staff Contact: Dr R Cavicchioli
UOC6  HPW6  WKS14  S1
Prerequisite/s: BIOS2021, BIOC2101, BIOC2201 and MICR2011
Note/s: See MICR3021. Not offered in 2000

Suitable for students majoring in Microbiology, Biochemistry, Biotechnology and Genetics. Major topics include genetics of bacteriophage, bacteria and yeasts, mutation and repair, plasmids, gene transfer, transposable genetic elements, gene cloning (genetic engineering) and two component regulatory systems. The practical component includes a range of contemporary microbial genetics experiments that complement lecture material. They may include experiments involving bacteria, archaea or yeast involving transposon mutagenesis, gene library construction, gene complementation using recombinant plasmids, gene expression and regulation studies, UV mutagenesis and DNA repair, restriction/ modification systems, promoter rescue experiments, and a variety of gene exchange techniques.

BIOT3041
Biotechnology and Food
Staff Contact: Dr Dianne Glenn
UOC3  HPW3  WKS14  S1
Prerequisite/s: BIOC2181, BIOC2291

The subject consists of lectures augmented with case studies and selected practicals, and provides students with an overview of biotechnology relevant to the food industry. Areas to be covered include: transgenic technology as applied to microbial, plant and animal systems and their impact on food production and processing, intellectual property considerations, developments in biocatalysts (including bacterial, yeast and plant whole cell systems, novel enzymes and role of protein engineering in food biotransformations); bioreactor and bioprocess design and operation used in the production of food ingredients; biotransformations of food wastes, regulations and ethical issues with respect to the use of GMO's in food, position of genetically engineered foods in the market place; application of analytical biotechnology in the assay of ingredients and trace contaminants.

The basic principles involved in the operation of microbial processes on an industrial scale. Includes: the selection, maintenance and improvement of microorganisms using conventional and recombinant genetics; the influence of physical and chemical factors on the microbial environment; the control of environmental factors; the effects of operational patterns on batch and continuous flow cultivation; aeration and agitation; scaleup of microbial processes; air and media sterilisation; the harvesting, purification and standardisation of products; the principles involved in microbial processes for chemical, pharmaceutical and food production. The laboratory component includes manipulation of industrially important microorganisms, and laboratory scale fermenter operation, and may include industrial seminars. A review of current research directions in biotechnology.

BIOT3021
Biotechnology B
Staff Contact: Prof P Rogers
UOC6  HPW6  WKS14  S2
Prerequisite/s: BIOT3011

Application of principles of biotechnology to the analysis and design of microbial processes of industrial relevance (ethanol, single cell protein, fermented foods and beverages, amino acids and vitamins, microbial polysaccharides, microbial enzymes, secondary metabolites including antibiotics, products of mammalian cell culture, waste treatment processes, microbial leaching and metal recovery from low grade minerals). Emphasis on quantitative approach: mass and heat balance calculations, kinetic and thermodynamic analysis, equipment design and specification, process design, process simulation, plant location, application of optimisation techniques. The economics of microbial processes are considered and comparison made with alternative modes of production or treatment. The economics of agroindustry in Australia using microbial processes. Marketing of fermentation products, clinical trials required, legal constraints, patent rights. Technical and economic feasibility studies. A design project is included based on experimental data.

BIOT3031
Microbial Genetics
Staff Contact: Dr R Cavicchioli
UOC6  HPW6  WKS14  S1
Prerequisite/s: BIOS2021, BIOC2101, BIOC2201 and MICR2011
Note/s: See MICR3021. Not offered in 2000

Suitable for students majoring in Microbiology, Biochemistry, Biotechnology and Genetics. Major topics include genetics of bacteriophage, bacteria and yeasts, mutation and repair, plasmids, gene transfer, transposable genetic elements, gene cloning (genetic engineering) and two component regulatory systems. The practical component includes a range of contemporary microbial genetics experiments that complement lecture material. They may include experiments involving bacteria, archaea or yeast involving transposon mutagenesis, gene library construction, gene complementation using recombinant plasmids, gene expression and regulation studies, UV mutagenesis and DNA repair, restriction/modification systems, promoter rescue experiments, and a variety of gene exchange techniques.

BIOT3041
Biotechnology and Food
Staff Contact: Dr Dianne Glenn
UOC3  HPW3  WKS14  S1
Prerequisite/s: BIOC2181, BIOC2291

The subject consists of lectures augmented with case studies and selected practicals, and provides students with an overview of biotechnology relevant to the food industry. Areas to be covered include: transgenic technology as applied to microbial, plant and animal systems and their impact on food production and processing, intellectual property considerations, developments in biocatalysts (including bacterial, yeast and plant whole cell systems, novel enzymes and role of protein engineering in food biotransformations); bioreactor and bioprocess design and operation used in the production of food ingredients; biotransformations of food wastes, regulations and ethical issues with respect to the use of GMO's in food, position of genetically engineered foods in the market place; application of analytical biotechnology in the assay of ingredients and trace contaminants.

The basic principles involved in the operation of microbial processes on an industrial scale. Includes: the selection, maintenance and improvement of microorganisms using conventional and recombinant genetics; the influence of physical and chemical factors on the microbial environment; the control of environmental factors; the effects of operational patterns on batch and continuous flow cultivation; aeration and agitation; scaleup of microbial processes; air and media sterilisation; the harvesting, purification and standardisation of products; the principles involved in microbial processes for chemical, pharmaceutical and food production. The laboratory component includes manipulation of industrially important microorganisms, and laboratory scale fermenter operation, and may include industrial seminars. A review of current research directions in biotechnology.
BIOT3061
Monoclonal Antibody and Genetic Techniques in Biotechnology
Staff Contact: Dr S Mahler
UOC6 HPW6 WKS14 S2
Prerequisite/s: BIOT2101, BIOT2201
Recent breakthroughs in biotechnology have seen the development of techniques and processes widely applied in clinical, veterinary and agricultural research laboratories and in industry. Human therapeutics and diagnostics are entering an exciting era with the evolution of new methods in the production of human monoclonal antibodies and recombinant proteins, somatic cell gene therapy and the use of gene probes as markers for genetic disease. The human genome project is generating enormous amounts of nucleotide and protein sequence data, accelerating the development of a new discipline termed bioinformatics in order to manage this data. The course is designed to give a detailed insight into some of these innovative technologies including: monoclonal antibody technology including antibody production by hybridoma technology and antibody engineering techniques; production of recombinant proteins by genetic engineering methods; aspects of fermentation and downstream processing, and characterisation of recombinant products using new tools in analytical biotechnology such as mass spectrometry; the use of gene probes as markers for genetic disease; somatic cell gene therapy including stem cell and ribozyme technology; bioinformatics and the human genome project. The practical work is designed to complement the lecture material, and includes a block of "on line" bioinformatics tutorials using the WebANGIS interface.

BIOT3071
Commercial Biotechnology
Staff Contact: Prof P Gray
UOC6 HPW4 WKS14 S2
This subject covers aspects important to the commercialisation of biotechnology and related industries and includes: The definition, generation and protection of intellectual property (IP), issue and protection of patents in Australia and overseas, trademarks and copyright, role of confidentiality in protecting non-patentable IP, licencing arrangements and trading in IP. Innovation Management, planning and management of R&D programs, preparation and assessment of business plans. Sources of funding for biotechnology R&D, both corporate and government, establishment of business ventures, joint ventures and strategic alliances. Regulatory and legislative aspects of genetically modified organisms (GMO’s) and environmental considerations and concerns, policies in Australia, USA and Europe regarding their use in agricultural, food and pharmaceutical industries. Introduction to the concepts of good manufacturing practice (GMP) for therapeutic goods; regulatory procedures for biotechnology derived therapeutics, process validation. Marketing, licensing and business case studies.

BIOT3081
Environmental Biotechnology
Staff Contact: Dr John Foster
UOC6 HPW6 WKS14 S2
Prerequisite/s: Highly recommended: MICR3071
This subject discusses the commercial applications of bioprocesses to environmental problems. The principles of microbial sensing and adaptation to extreme environments, as discussed in Environmental Microbiology (MICR3071), are expanded in the bioremediation of polluted environments and the recovery of important minerals and precious metals. Similarly, the application of microorganisms in other key environmental areas of viodeterioration, biomineralogy, biodegradable plastics, waste and water treatment and biocontrol are also discussed in this subject.

BIOT3100
Fundamentals of Biotechnology
Staff Contact: Dr F Foong/Dr J Foster
UOC3 HPW2 WKS14 S2
Note/s: Restricted to courses 3040, 3055 and 3100
This subject introduces important fundamental principles of biotechnology including fermentation and biocatalysis, protein synthesis and engineering and recombinant DNA technology. The applications of these principles are then explored in a series of lectures focusing on environmental biotechnology, drug recovery and production, plant biotechnology, bioresources and the economics of bioprocesses. The subject is designed to provide an understanding of the principles and applications of biotechnology both in its own and as alternatives to chemical synthesis.

BIOT4053
Research Project
Staff Contact: Dr S Mahler
UOC18 HPW18 WKS28 SS1 and 2
Note/s: Restricted to courses 3052
The experimental investigation of some aspects of biotechnology.

BIOT4063
Research Project
Staff Contact: Prof P Rogers/Dr C Marquis
UOC12 HPW/WKS 28 SS1 and 2
Note/s: Restricted to courses 3055
The experimental investigation of some aspects of bioprocess engineering.

BIOT4073
Biotechnology (Honours)
Staff Contact: Dr D Glenn
UOC24 WKS28 SS1 and 2
Prerequisite/s: Completion of Level III subjects totalling 120
Credit Points 4 of which must be Biotechnology
Note/s: Restricted to courses 3990
Advanced formal training in selected areas of biotechnology and participation in one of the School’s research projects.

BIOT4083
Biotechnology (Honours)
Staff Contact: Dr D Glenn
UOC48 WKS 28 S1 & S2
Prerequisite/s: Completion of Level 111 subjects totalling 120
Credit Points, 4 of which must be
Note/s: Restricted to courses 3990
Advanced formal training in selected areas of biotechnology and participation in one of the School’s research projects.

BIOT4093
Biological Process Engineering
Staff Contact: Dr C Marquis
UOC12 HPW6 WKS28 SS1 and 2
Prerequisite/s: MICR2201
Note/s: Restricted to courses 3055
This course includes coursework material in bioprocess engineering principles, aspects of food engineering and modern biotechnology techniques. Also incorporated in this subject is a practical component. Bioprocess engineering principles covered include basic metabolic pathways, stoichiometry and kinetics of growth and product formations, heat balances, secondary metabolic productions and structural kinetic models, sterilisation, oxygen mass transfer, mixing, instrumentation, down-stream processing, legal and ethical issues related to biotechnology products. Food engineering areas covered include the application of modelling techniques to drying and heat transfer. Modern biotechnology methods covered include a variety of methods to generate and characterise production of monoclonal antibodies including hybridoma production, recombinant methods and phage display of antibodies.
Board of Studies in Science and Mathematics

BSSM1110
Perspectives in Medical Science 1
Staff Contact: Dr B Freeman
UOC3  HPW2  S2
For information regarding this course, please contact the School of Anatomy.

BSSM2220
Perspectives in Medical Science 1
Staff Contact: Dr B Freeman
UOC3  HPW2  S2
For information regarding this course, please contact the School of Anatomy.

Board of Studies in Science and Mathematics Level IV

BSSM4013
Geology and Physics 4 (Honours)
Staff Contact:
Prerequisite/s: Completion of Program 0100 including Level III subjects totalling 120 Credit Points
Combines Geology and Physics in Program 0100, made by arrangement with the Heads of the two Schools.

BSSM4023/BSSM4029
Ecology 4 (Honours)
Staff Contact: Prof B Fox
UOC48  S3
Prerequisite: Completion of Program 6851, 6852 or 6853 including Level III subjects totalling 36 units of credit

BSSM4103
Genetics 4 (Honours)
Staff Contact: Prof I Dawes
UOC48
Prerequisite/s: Completion of Genetics Plan in Advanced Science including Level III subjects totalling 90
The General Education requirements are met by participation in the program offered by the supervisor's School.

Chemistry

Chemistry Level I

CHEM1000
Chemistry at the Cutting Edge
Staff Contact: Dr G Moran
UOC3  WPW2  WKS14S2
Note/s: Restricted to Advanced Science students
Just what are the big issues in contemporary chemistry? This course takes an investigative approach to thinking about some of the challenging issues and frontiers in chemistry such as molecular machines, the chemical basis of memory, green chemistry, smart materials and the chemical origins of life.

CHEM1011
Fundamentals of Chemistry 1A
Staff Contact: Dr P Chia
UOC6  HPW6  WKS14  S1  S2
Assumed Knowledge: a basic knowledge of chemistry (equivalent to one year of high school chemistry)

CHEM1021
Fundamentals of Chemistry 1B
Staff contact: Dr P Chia
UOC6  HPW6  WKS14S2  X1
Prerequisite: CHEM1011

CHEM1031
Higher Chemistry 1C
Staff contact: Dr P Chia
UOC6  HPW6  WKS14S1
Assumed knowledge: equivalent to a good standard in high school chemistry (HSC 2 unit chemistry (75-100) or equivalent)

CHEM1041
Higher Chemistry 1D
Staff contact: Dr P Chia
UOC6  HPW6  WKS14S2
Prerequisite: CHEM1031

CHEM1817
Chemistry 1ME
Staff Contact: Dr P Chia
UOC3  HPW3  WKS14S2
Note/s: Excluded CHEM1101, CHEM1201. Restricted to Plan 3610, 3653, 3680, 3685, 3700 and 3985 program 0176
Chemistry Level II

CHEM2011
Physical Chemistry
Staff Contact: A/Prof R Read
UOC6 HPW6 WKS14 S2
Prerequisite/s: CHEM1101, CHEM1201 and MATH1231 or MATH1241 or MATH1021 or MATH1031


CHEM2021
Organic Chemistry
Staff Contact: Dr R Read
UOC6 HPW6 WKS14 S2
Prerequisite/s: CHEM1101, CHEM1201

Applications of spectroscopy in structure elucidation. Reactive intermediates, addition and rearrangement reactions, carbonyl group chemistry. Chemistry of aromatic compounds.

CHEM2031
Inorganic Chemistry and Structure
Staff Contact: Dr R Read
UOC6 HPW6 WKS14 S1
Prerequisite/s: CHEM1101, CHEM1201


CHEM2041
Chemical and Spectroscopic Analysis
Staff Contact: Dr R Read
UOC6 HPW6 WKS14 S1
Prerequisite/s: CHEM1101, CHEM1201 and MATH1231 or MATH1241 or MATH1031

Note/s: Excluded CHEM2839

Principles and applications of chemical and analytical spectroscopy. Statistical treatment of data. Titrimetric and potentiometric analysis. Separation techniques.

CHEM2817
Physical Chemistry
Staff Contact: A/Prof R Read
UOC6 HPW6 WKS14 S1
Prerequisite/s: CHEM1101, CHEM1201, MATH1231 or MATH1241 or MATH1021

Note/s: Excluded CHEM2031, CHEM2818


CHEM2821
Biological Organic Chemistry
Staff Contact: A/Prof R Read
UOC6 HPW6 WKS14 S1
Prerequisite/s: CHEM1101, CHEM1201

Note/s: A satisfactory performance in CHEM2821 may be accepted as a prerequisite for CHEM3021. Consult the School of Chemistry


CHEM2839
Inorganic Chemistry
Staff Contact: A/Prof R Read
UOC6 HPW6 WKS14 S2
Prerequisite/s: CHEM1101, CHEM1201

Note/s: Excluded CHEM2031

Electronic structure of atoms and molecules structure, energetics and banding in the solid state. Principles of co-ordination chemistry. Occurrence, preparation, properties and reactions of selected compounds of transition and main group elements.

CHEM2849
Analytical Chemistry
Staff Contact: A/Prof R Read
UOC6 HPW6 WKS14 S2
Prerequisite/s: CHEM1101, CHEM1201 and MATH1231 or MATH1241 or MATH1021 or MATH1031

Note/s: Excluded CHEM2041


Chemistry Level III

Note/s: All courses are available only if there is sufficient demand.

CHEM3011
Physical Chemistry
Staff Contact: Dr N Duffy
UOC6 HPW6 WKS14 S1
Prerequisite/s: PHYS1002 or PHYS1022, CHEM2011, CHEM2031 or CHEM2839, CHEM2041

Elements of symmetry and group theory appropriate to molecular structure and spectroscopy. Quantum chemistry; atomic and molecular spectroscopy - principles and applications.

CHEM3021
Organic Chemistry
Staff Contact: Dr N Duffy
UOC6 HPW6 WKS14 S1
Prerequisite/s: CHEM2021


CHEM3031
Inorganic Chemistry
Staff Contact: Dr N Duffy
UOC6 HPW6 WKS14 S1
Prerequisite/s: CHEM2031 or CHEM2839

Descriptive chemistry and bonding, stereochemistry, magnetic and spectroscopic properties, stabilities of complexes of normal and inner transition series elements. Stabilisation of oxidation states. Aspects of the chemistry of p-block elements including the inert pair effect.

CHEM3041
Analytical Chemistry
Staff Contact: Dr N Duffy
UOC6 HPW6 WKS14 S1
Prerequisite/s: CHEM2041 or CHEM2849

Instrument design, theory and operating principles for the following instrumental areas: electrochemical, atomic and molecular spectroscopy, chromatography, mass spectrometry, automated analysis.
CHEM3011
Project Laboratory in Chemistry
Staff Contact: Dr N Duffy
UOC6 HPW6 WKS14 S2
Prerequisite/s: Any one of CHEM3011, CHEM3021, CHEM3031, CHEM3041

Group projects in instrumental and synthetic chemistry. Students choose two 7-week projects, one in each area. The subject includes familiarisation with literature and database searching, project planning and risk assessment, preparation of oral and written project reports.

CHEM3201
Topics In Contemporary Chemistry A
Staff Contact: Dr N Duffy
UOC6 HPW6 WKS14 S2
Prerequisite/s: Any one of CHEM3011, CHEM3021, CHEM3031, CHEM3041
Note/s: Re CHEM3201 and 3202 Topics in Contemporary Chemistry: A wide range of topics will be offered each year (8-12 topics depending on availability and interest). Students can select 4 topics (6UOC) or 8 (12UOC)

An interdisciplinary subject emphasising the latest advances in chemistry. A diverse range of topics will be offered each year from which students will select four. Topics will vary depending on availability and interest. Indicative Topics: supramolecular chemistry and molecular recognition; synthetic strategies in organic chemistry; molecular modelling and drug design; organometallic chemistry; surface chemistry and analysis; solid-state chemistry; polymer structure and characterisation; introduction to chemometrics; mass spectrometry.

CHEM3202
Topics In Contemporary Chemistry B
Staff Contact: Dr N Duffy
UOC12 HPW6 WKS14 S2
Prerequisite/s: Any one of CHEM3011, CHEM3021, CHEM3031, CHEM3041
Note/s: Re CHEM3201 and 3202 Topics in Contemporary Chemistry: A wide range of topics will be offered each year (8-12 topics depending on availability and interest). Students can select 4 topics (6UOC) or 8 (12UOC)

An interdisciplinary subject emphasising the latest advances in chemistry. A diverse range of topics will be offered each year from which students will select eight. Topics will vary depending on availability and interest. Indicative Topics: supramolecular chemistry and molecular recognition; synthetic strategies in organic chemistry; molecular modelling and drug design; organometallic chemistry; surface chemistry and analysis; solid-state chemistry; polymer structure and characterisation; introduction to chemometrics; mass spectrometry.

CHEM3301
Chemistry In Biological Systems
Staff Contact: Dr N Duffy
UOC6 HPW6 WKS14 S2
Prerequisite/s: CHEM3021

Aspects of bioorganic, bioinorganic and bioanalytical chemistry including: Natural products chemistry; antibiotics and drugs; herbicides and pesticides. The occurrence, coordination and role of metals in biology, enzyme and immunosassays in chemical analysis, biosensors.

CHEM3311
Environmental Chemistry
Staff Contact: Dr N Duffy
UOC6 HPW6 WKS14 S2
Prerequisite/s: CHEM3041

Selected topics in advanced environmental chemistry. Topics will be offered from a list including: heavy metals, detoxification mechanisms and inorganic speciation; sampling and strategies for environmental analytical chemistry; atmospheric chemistry and pollution mechanisms; case studies of organic pollutants and remediation mechanisms. The laboratory component includes environmental project work and an introduction to regulatory requirements.

CHEM3801
Physical and Chemical Analysis of Food
Staff Contact: Dr N Duffy
UOC6 HPW6 WKS14 S1
Prerequisite/s: CHEM2921 or CHEM2021 and CHEM2801 or CHEM2041 or CHEM2849


CHEM3901
Environmental Toxicology
Staff Contact: Dr N Duffy
UOC6 HPW6 WKS14 S2
Prerequisite/s: CHEM1002 or CHEM1101 and CHEM1201
Note/s: This course is only available in the Environmental Science Degree. Students enrolled in other programs may seek permission to include this course

Classification and properties of toxic substances. Biological properties of important classes of chemical compounds. Fate of xenobiotics in the human body, including detoxification and bioactivation. Chemical transformations of pollutants in the environment; air, water and soil pollution. Analysis of environmental pollutants at trace levels.

Chemistry Level IV
CHEM4003/CHEM4004
Chemistry 4 (Honours)
Staff Contact: Dr G Edwards
UOC48
Prerequisite/s: Completion of an approved plan leading to a major in Chemistry including at least 24 UOC of Level III Chemistry

Consists of selected series of lectures on advanced topics in Chemistry and a research project. Students intending to seek admission to this program should consult the School re selection of courses in the earlier years and apply to the Head of the School for consideration for admission at the end of Stage 3 (or completion of requirements for the award of the pass degree). Students in course 4075 program 0268 (Science/Education) and course 4770 (Science/Law) who wish to undertake an honours year should consult with the School of Chemistry regarding requirements.

Servicing Subjects
These are subjects taught within courses offered by other Faculties or Schools.

CHEM1817
Chemistry 1ME
Staff Contact: Dr P Chia
UOC3 HPW3 WKS14 S2
Note/s: Excluded CHEM1101, CHEM1201. Restricted to Plan 3610, 3663, 3680, 3685, 2700 and 3985 program 0176


CHEM1819
Biological Chemistry for Optometry Students A
Staff Contact: Dr P Chia
UOC6 HPW6 WKS14 S1
Prerequisite/s: Assumed knowledge: good knowledge of chemistry (corresponding to HSC 2 unit chemistry
Note/s: Restricted to course 3950

CHEM1829
Biological Chemistry for Optometry Students B
Staff Contact: Dr P Chia
UOC6 HPW6 WKS14 S2
Prerequisite/s: CHEM1819
Note/s: Restricted to course 3950

CHEM2801
Analytical and Physical Chemistry for Food Science
Staff Contact: A/Prof R Read
UOC6 HPW6 WKS14 S2
Prerequisite/s: CHEM1101, CHEM1201 and MATH1231 or MATH1241 or MATH1021 or MATH1031

CHEM2818
Physical Chemistry for Materials Science and Engineering
Staff Contact: Prof RF Howe
UOC4 HPW5 WKS14 S1
Prerequisite/s: CHEM1101, CHEM1201, MATH1231 or MATH1241 or MATH1021
Note/s: Excluded CHEM2011
Thermodynamics: first, second and third laws, applications to materials science. Chemical equilibria. Electrochemistry, electrochemical cells. Surface, interface and colloid chemistry. Chemical kinetics

CHEM2921
Organic Chemistry for Food Science
Staff Contact: Dr R Read
UOC6 HPW6 WKS14 S1

CHEM3829
Organic Chemistry
Staff Contact: Prof D Black
UOC6 HPW6 WKS14 S1
The spectroscopic identification of organic compounds, free radical chemistry and electroorganic processes, various aspects of the organic industrial processes such as industrial synthesis based on petrochemicals, and organometallic reactions of industrial interest. Selected topics from the dyestuff, pharmaceutical and agricultural industries.

Computer Science and Engineering

Computer Science and Engineering Level I

COMP1001
Introduction to Computing
Staff Contact: Dr T Papagelis
UOC6 HPW5 WKS14 S1 or S2
Introductory concepts and basic skills training for competence with personal computers. Foundational concepts of hardware and software. History of computers, leading to modern practice in data processing, sound, graphics, animation, interfaces, the use of applications, programming languages and networks including the Internet. Practical training in MS Office applications and other software tools for the IBM PC, for graphic manipulation, Web page design, word processing, database, spreadsheet and elementary Visual Basic programming. Introduction to social and ethical issues of computer crime. The discriminating use of such technologies for a better world.

COMP1011
Computing 1A
Staff Contact: Mr R Buckland
UOC6 HPW6 WKS14 S1, S2
Prerequisite/s: HSC Math: 2 unit (90-100), or 2 & 3 unit (100-150), or 3 & 4 unit (100-200) or COMP1001
Corequisite/s: MATH1131 or MATH1141
Note/s: Excluded COMP1811 (science equivalent)
Defining problems. Reasoning about and solving problems using Logic, Abstraction, Specification, Algorithms and Data Structures. Exposure to a functional programming language (Haskell) for practical experience with these concepts. Introduction to software engineering and professional ethics Lab: programming assignments.

COMP1021
Computing 1B
Staff Contact: Dr A Taylor
UOC6 HPW6 WKS14 S1, S2
Prerequisite/s: COMP1011
Note/s: Excluded COMP1821 (science equivalent)

Computer Science and Engineering Level II

COMP2011
Data Organisation
Staff Contact: Dr A Mahidadia
UOC6 HPW5 WKS14 S1, S2
Prerequisite/s: COMP1012 or COMP1821
Data types and data structures: abstractions and representations; dictionaries, priority queues and graphs; AVL trees, splay trees, B-trees, heaps. File Structures: storage device characteristics, keys, indexes, hashing. Memor management. Lab: programming assignments including group project.

COMP2021
Digital System Structures
Staff Contact: Dr Jayasooriah
UOC6 HPW5 WKS14 S1 S2
Prerequisite/s: COMP1021 or COMP1821
Note/s: Excluded ELEC2012
Digital Systems: switches and gates, boolean algebra, minimisation techniques, combinational and sequential design, timing analysis, finite state machines; analysis, design and realisation of modest digital subsystems, understanding major subsystems in a model computer. Assembly language programming: translation of higher level programming abstractions and data structures to a real computer using an assembler as a target; study of the relationships between the programming model and the hardware model of a computer; understanding of instruction execution. Lab: take-home logic kits; programming assignments.

Computer Science and Engineering Level III

COMP3111
Software Engineering
Staff Contact: A/Prof A Nymeyer
UOC6 HPW5 WKS14 S1 S2
Prerequisite/s: COMP2011
Note/s: Excluded COMP9008
Informal specification: Data flow diagram methodology, analysis, design, testing, management and documentation of software. Formal
specification: set theory, logic, schema calculus, case studies. The Z specification notation. Managing the project life cycle. CASE tools. A major group project is undertaken.

COMP3211
Algorithms and Programming Techniques
Staff Contact: Mr P Bukland
UOC6 HPW5 WKS14 S2
Prerequisite/s: COMP2011
Note/s: Excluded COMP9102


COMP3101
Parsing and Translation
Staff Contact: Dr J Xue
UOC6 HPW5 WKS14 S2
Prerequisite/s: COMP2011
Note/s: Excluded COMP9102


COMP3211
Computer Architecture
Staff Contact: A/Prof H Elgindy
UOC6 HPW5 WKS14 S2
Prerequisite/s: COMP2021 or ELEC2012
Note/s: Excluded COMP2011

- Combinatorial and sequential circuit design: synchronisation, communication and arbitration; register transfer specification (Moda). Arithmetic Design Strategies. Memory Organisation: physical and virtual address space; operating system and compiler support; memory mapping and caching. Communications Organisation: shared memory, memory mapping; network systems. Processor Design: the instruction pipeline; hardwired and micro-programmed control; instruction sets; RISC and object-based processor organisation. Error Detection/Correction and Fault Tolerance; coding theory. Lab: major design project.

COMP3221
Microprocessors and Embedded Systems
Staff Contact: Dr WS Matheson
UOC6 HPW5 WKS14 S2
Prerequisite/s: COMP2021
Note/s: Excluded ELEC2041, ELEC3020, COMP9221

- The concept of a microprocessor system, busses, address spaces, memory devices, bus timing, bus standards, the VME bus, I/O device interfacing, polling, interrupts, DMA interfaces, the 68000 processor family, the C programming language, device drivers, the device software environment, other microprocessors, advanced topics.
- Laboratory work involves interfacing to and programming MC68000-series microprocessor-based systems. Lab: experimental work involving hardware and software.

COMP3231
Operating Systems
Staff Contact: A/Prof G Heiser
UOC6 HPW5 WKS14 S1 S2
Prerequisite/s: COMP2011, COMP2021
Note/s: Excluded COMP9201


COMP3311
Database Systems
Staff Contact: Dr J Shepherd
UOC6 HPW5 WKS14 S2
Prerequisite/s: COMP2011
Note/s: Excluded COMP9311, INF3608


COMP3331
Computer Networks and Applications
Staff Contact: Dr S Jha
UOC6 HPW5 WKS14 S2
Prerequisite/s: COMP2011
Note/s: Excluded COMP9331, ELEC4352

- Networking technology and protocol overview. Local Area Networks: architectures; media, generalised Medium Access Control methods. IEEE802 LAN standards. Data link layer: design principles and protocols such as stop and wait, sliding windows, and Automatic Repeat Request schemes. Network Layer: design principles; addressing; message routing; congestion and traffic control. Internetworking: issues; bridges and routers. The Internet Protocol (IP) and the Internet. Internet Routing via exterior and interior router level protocols such as EGP, RIP, OSPF and HELO. Internet Transport Control Protocol (TCP) and Session control. Network management using SNMP. The Domain Name System (DNS). Mail systems. File transfer protocols. Encryption and Security. A view to the future of networking.

COMP3411
Artificial Intelligence
Staff Contact: Dr A Hofmann
UOC6 HPW5 WKS14 S1
Prerequisite/s: COMP2011
Note/s: Excluded COMP9414


COMP3421
Computer Graphics
Staff Contact: Dr T Lambert
UOC6 HPW5 WKS14 S1
Prerequisite/s: COMP2011
Note/s: Excluded COMP9415, COMP9701


COMP3511
Human-Computer Interaction
Staff Contact: Dr G Mann
UOC6 HPW5 WKS14 S2
Prerequisite/s: COMP2011
Note/s: Excluded COMP9511

- Provides an introduction to user-system interactions, both analysis and design. The approach is cognitive, focusing on matching user goals with computer technologies. Topics: the human information processing system, models of interaction, strategies for and process of design and evaluation. Project work is emphasised.
Computer Science and Engineering Level IV

COMP4914
Computer Science 4
Staff Contact: Dr A Sowmya
For details regarding this course, contact the School of Computer Science and Engineering.

Economics

Economics Level I

ECON1101
Microeconomics 1
Staff Contact: School Office
UOC4 HPW3 S1 or S2
Prerequisite/s: HSC minimum mark required - 2 unit
Contemporary English (60-100), or 2 unit General English (60-100)
This course introduces economics as a social science: scarcity, resource allocation and opportunity cost; an introductory analysis of consumer behaviour; the economics of firms and markets; production and costs; the classification and analysis of markets; efficiency concepts and market failure; the gains from international trade and the impact of trade restrictions; economic growth and structural change.

ECON1102
Macroeconomics 1
Staff Contact: School Office
UOC4 HPW3 S1 or S2
Prerequisite/s: ECON1101
This course provides an introduction to the analysis of aggregate output, employment and economic growth and their relationship to the policy issues of unemployment, inflation and the balance of payments. Other topics include: social accounting and aggregate income and expenditure analysis; macroeconomic models of income determination; consumption and investment functions; the role of money and financial institutions; interactions between goods and money markets in equilibrium and disequilibrium situations; and an analysis of recent Australian macroeconomic experience.

ECON1103
Business and Government
Staff Contact: School Office
UOC4 HPW3 S1 or S2
Prerequisite/s: ECON1101 or ECON1103
This course examines how government affects the business environment at the microeconomic level. The case for intervention and the benefits of deregulation and privatisation are analysed, with reference to particular industries. The effects on business of government instrumentalities such as the Productivity Commission and the Australian Consumer and Competition Commission are examined. Issues relating to microeconomic reform, economic rationalism, market failure and government business enterprises are explored.

ECON2104
Applied Macroeconomics
Staff Contact: School Office
UOC4 HPW3 S1 or S2
Prerequisite/s: ECON1102 or ECON1104
This course examines economic growth and fluctuations and the effect this has on the business environment and the community. Explains the main macroeconomic tools and techniques used by governments and the central bank to implement fiscal, monetary and incomes policies. The implications for inflation, unemployment, interest rates and exchange rates, and foreign debt are discussed.

Electrical Engineering

Electrical Engineering Level I

ELEC1011
Electrical Engineering 1
Staff Contact: Dr R Ramer
UOC6 HPW6 S1 or S2
Corequisite/s: PHYS1969 or equivalent

Electrical Engineering Level II

ELEC2031
Circuits and Systems
Staff Contact: Dr K C Daly
UOC3 HPW3 S1S2
Prerequisite/s: ELEC1011
Note/s: Excluded ELEC2032
Revision of basic circuit theory; RLC circuits; sinusoidal circuit response; mutual inductance and transformers; operational amplifiers; computer aided circuit design; state space circuit representations and time responses; homogenous and particular solutions for first and second order linear differential equations; computer aided analysis of signals and systems, including state space representations; continuous time signals, sinusoids and signal norms; convolution, impulse and step responses; phasors; AC circuits (transient and steady state responses); complex power; frequency responses of circuits and systems; three-phase circuits.
Environmental Science Level I

ENVS1011

Environmental Science 1
Staff Contact: Prof B Fox
UOC6  HPW6

Notes: Restricted to the Environmental Science Programs (6861-6869)

An overview of some of the many problems encountered by Environmental Scientists: climatic change, disturbance events (such as logging, fire and mining), management and conservation of marine and terrestrial resources, water management and pollution are considered. These problems are placed in perspective with regional case studies to highlight specific issues using seminars, workshops, field excursions and group projects. Special emphasis is placed on the political aspects and values inherent in environmental issues.

Environmental Science Level II

ENVS2010

Population Analysis and Environment
Staff Contact: Prof B Fox or A/Prof I Burnley
UOC6  HPW3

Notes: ENVS1011

The impact of human population growth on all aspects of resource management in the environment. Limiting resources, time lags, survivorship and the relation to their effects on demographic processes in human populations. The impact of the world population on global-scale environmental problems in terms of different cultures and developmental levels is compared to the Australian situation.

ENVS2020

The Urban Environment
Staff Contact: Prof B Fox
UOC6  HPW3

Notes: ENVS1011

Consideration of the special impacts which urbanisation has on the environment and of the urban public as a component of the environment. The impacts of industrial and residential activities, conflicts between these, and government regulatory mechanisms.

ENVS2801

Aspects of Environmental Policy and Law
Staff Contact: Prof B Fox
UOC6  HPW4

Notes: ENVS1011

This subject examines the legal issues likely to be encountered by an environmental scientist and addresses the question: Is the adversary system the most appropriate method of dealing with conflict in determining the appropriate method of dealing with conflict in determining the appropriate use of resources? The difficulties encountered with the multiplicity of authorities and interactions between local government regulations, state and federal laws and international law are considered. Case studies examined at each of these levels are used to provide a brief overview of current environmental law in Australia and the World, with examples.

Environmental Science Level IV

Three types of honours projects (A, B or C) may be taken in stage 4 of the Environmental Science Course 3968. These are set out for each of the specialisations:

ENVS4104
Environmental Science 4 Biology B (Honours)

ENVS4204
Environmental Science 4 Marine B (Honours)

ENVS4304
Environmental Science 4 Microbiology B (Honours)

ENVS4404
Environmental Science 4 Chemistry B (Honours)

ENVS4504
Environmental Science 4 Geography B (Honours)

ENVS4604
Environmental Science 4 Geology B (Honours)

ENVS4704
Environmental Science 4 Mathematics B (Honours)

Notes: Completion of 144UOC (with credit average) of appropriate Environmental Science program

Half year research project and thesis.

ENVS4107 (Plus BIOS4511)
Environmental Science 4 Biology A (Honours)
(ENVS4103 If P/T)
Food Science and Technology

**FOOD1110 Introduction to Food Science**
*Staff Contact: Dr JM Cox*
UOC6 HPW6 WKS14 S2

This course will provide students with an introduction to the Department and the breadth of food science and technology, as well as provide knowledge of and practical opportunities to develop generic skills in oral and written communication required by students in their career within and beyond the University environment. Topics to be covered include food science and technology include: an introduction to the principles of food production and consumption; food in history, society, economics and politics; development of the food industry in Australia; nutritional, physiological and psychological roles of food; role of microbiology and biotechnology in production of innovative, yet safe, nutritious, quality food products. Topical issues include: food irradiation - risk versus benefit; genetic engineering and biotechnology - new food sources; food additives - necessary evils; environmental impact of food processing; food marketing and education - who should the consumer believe? Coverage of generic skills will include: approaches to oral communication; creating visual aids; academic argument/debate; writing of reports; public communication; anatomy, search and critique of scientific literature; working in teams; time management; experimental design.

**FOOD1360 Food Processing Principles**
*Staff Contact: Dr RH Driscoll, Prof KA Buckle*
UOC6 HPW6 WKS14 S1

This course is presented as a series of lectures and some discussion groups that cover methods of preservation and processing used in the food industry. Preservation principles and technologies covered include heating, chilling, freezing, dehydration, salt, sugar, acids, chemical preservatives, ionising radiations and novel methods. Basic principles of processing covered are mass and energy balances, heat transfer, fluid flow. Methods of processing include refrigeration, evaporation, dehydration, fermentation, extrusion, chemical and physical separation, and particle size reduction. The course is run in conjunction with a laboratory course (FOOD1370) designed to demonstrate key principles in a practical context.

**FOOD1370 Food Processing Laboratory**
*Staff Contact: Dr JE Paton*
UOC6 HPW6 WKS14 S1

Corequisites: FOOD1360

This course is presented as a series of laboratory, pilot plant, and tutorial classes that demonstrate in a practical context the basic principles of food preservation and food processing. It runs concurrently with FOOD1360 Food Processing Principles. Concepts covered include, use of preservatives, food freezing, dehydration, refrigeration, heat processing, heat transfer and fluid flow.

**FOOD1380 Food Processing and Packaging**
*Staff Contact: Dr RH Driscoll, Dr JE Paton*
UOC6 HPW6 WKS14 S2

Corequisites: FOOD1360 and FOOD1370

This course is presented as an integrated lecture-laboratory program that covers production principles of a number of primary food commodities including dairy, marine and meat products, fruit and vegetables, sugars and cereal products. The laboratory component demonstrates the effect of processing on aspects of food such as functionality and quality. In addition aspects of plant design such as factory layout, hygienic design and operation, cleaning in-place and application and comparison of HACCP and HAZOP and introduction to new technologies such as high pressure processing and ohmic heating are covered. This course also provides fundamental principles of packaging including properties of packaging materials, selection and evaluation of packaging materials and systems.

**FOOD1390 Product Design and Development**
*Staff Contact: A/Prof M Wootton, Dr JE Paton*
UOC6 HPW6 WKS14 S2

Corequisites: CHEM2921, FOOD1360, FOOD1370

This course provides a series of lecture and laboratory classes that cover the basic theoretical and practical concepts associated with the design and development of new food products and processes. The product development process: the need for new products, types of new products, the development team, idea generation, steps in new product development process; the role and specific tasks of market research, market research techniques, target markets, limitations of market research. Roles of advertising and supermarkets in new product success; product lifecycles, reasons for new product failure and preventative strategies. Ingredient and additive behaviour and contributions in foods: properties of the major food components in relation to food properties, storage stability and nutritional properties of foods. Impact of new technology. Sensory analysis: basic sensory analysis techniques, expert vs consumer panels, interpretation and implementation of sensory testing data, sensory rankings from different target markets.
FOOD1400
Project
Staff Contact: A/Prof M Wootton
UOC12 HPW6 WKS58 S3
Prerequisite/s: Completion of Year 3 courses
Note/s: Restricted to course 3060

The student undertakes an individual project involving a literature survey, an experimental investigation, the preparation of a detailed report on a selected topic in food science and technology, and presentation of seminars on a literature review and experimental results.

FOOD1470
Postharvest Technology of Foods
Staff Contact: Dr JE Paton
UOC6 HPW6 WKS14 S1
Prerequisite/s: FOOD1380


FOOD1480
Minor Project
Staff Contact: A/Prof M Wootton
UOC6 HPW6 WKS14 S1
Prerequisite/s: Completion of all Year 3 courses

The student will be required to undertake a literature-based study of a research problem, submit a project thesis and present seminars arising from the project.

FOOD1490
Advanced Food Chemistry
Staff Contact: A/Prof M Wootton
UOC6 HPW6 WKS14 S2
Prerequisite/s: CHEM3801

Chemistry and analysis of food flavours. Measurement, fractionation and structural determination of proteins, starch and its derivatives, non-starch polysaccharides, dietary fibre constituents and lipids. Detection and measurement of mycotoxins. Analysis of selected vitamins. Application of advanced separation techniques to food components.

FOOD2320
Food Microbiology
Staff Contact: Prof GH Fleet
UOC6 HPW6 WKS14 S1
Prerequisite/s: MICR2201

This is a lecture-laboratory course that introduces the basic concepts of food microbiology, covering the ecology, biochemistry, isolation, enumeration and identification of bacteria, yeasts, fungi and viruses associated with foods and beverages. Food spoilage: specific food microorganism associations; taxonomy and biochemistry of major spoilage species; chemical and physical changes to food properties; spoilage of specific commodities. Foodborne microbial disease: foods as vectors of disease and food poisoning; statistics and epidemiology; ecology and taxonomy of foodborne pathogenic microorganisms; control and prevention by hygiene, microbiological standards and legislation. Food fermentation: microbial ecology and biochemistry of fermentations; fermentations of alcoholic beverages, bakery products, dairy products, meats, vegetables, cocoa beans, soy sauce; production of food ingredients and processing aids by fermentation. Microbiological examination of foods: sample preparation and sampling plans; sublethal injury; standard methods for determination of total plate counts, indicator organisms, foodborne pathogenic species, principal spoilage species. Microbiological quality assurance: specifications and standards; decision criteria; hazard analysis and critical control point (HACCP) concept; cleaning and sanitation.

FOOD2330
Quality Assurance and Control
Staff Contact: Dr JM Cox
UOC6 HPW6 WKS14 S2

This course aims to provide students with a knowledge base of concepts in quality assurance (QA) and quality control (QC) in the context of the food industry. What are quality, QA, QC? Organisation-wide quality management, quality costs, Total Quality Management and ISO9000-based Quality Management Systems. Tools in quality management, brainstorming and other qualitative tools, benchmarking. Production-level QA and QC, HACCP, risk analysis and management, statistical quality/process control, sampling and sampling plans, cleaning and sanitation. QA in the laboratory, accreditation, metrology, proficiency testing. Regulatory aspects of QA/QC. Auditing quality. Staff training.

FOOD2340
Food Safety
Staff Contact: Prof GH Fleet, Prof KA Buckle
UOC6 HPW6 WKS14 S2

This course presents a package of information and exercises designed to demonstrate (i) the public health risk associated with the production and consumption of foods and (ii) the strategies adopted by industry, government and consumers to manage and control these risks. Topics covered include: chemical risks - natural, additives and residues; microbiological risks - bacterial, fungal, viral, algal, parasites, prions; nutrition - diet and health; genetically modified foods - concepts and specific safety issues; management of food safety by industry - TQM, HACCP, ISO; management of food safety by government - food law, national and international regulation and issues; legal and insurance issues; consumer concerns - education, social, moral and ethical issues.

FOOD2480
Advanced Food Microbiology
Staff Contact: Prof GH Fleet
UOC6 HPW6 WKS14 S2
Prerequisite/s: FOOD2320 or equivalent

This course consists of a series of lectures, discussion groups and visits to local food companies that takes food microbiology from its basic concepts to advanced consideration of current issues on food spoilage, foodborne microbial disease, food and beverage fermentations and the use of microorganisms as processing aids and sources of food ingredients and additives. With a focus on commodity groups it considers industry structure, food properties and processing operations that impact on the growth, survival and biochemical activity of microorganisms as they relate to spoilage, safety and desirable fermentations. Commodities considered include dairy products, fruit and vegetables, meat products (red meats, poultry, seafoods) and alcoholic beverages. Advanced concepts of microbial taxonomy, biochemistry, physiology, detection and enumeration are covered as well as the use of microorganisms as sources of colours, flavours, polysaccharides, vitamins, amino acids and as probiotic and biocontrol agents.

FOOD2490
Analytical Microbiology
Staff Contact: Dr JM Cox
UOC6 HPW6 WKS14 S2
Prerequisite/s: FOOD2320 or equivalent

The aim of this course is to provide students with an understanding of the underlying principles of and practical exposure to modern and rapid methods of microbiological analysis, with specific reference to foods. The course begins with a history of the development of methods of analysis and criteria for the evaluation of methods. Methods considered include improved and advanced cultural methods, automated biochemical identification systems, ATP and lux bioluminescence, methods of assessing hygiene, ice nucleation, impedance technology, immunoassay, electrophoretic and chromatographic techniques for strain characterisation and identification, nucleic acid probes, PCR and ‘genechip’ technology.
FOOD3220
Nutrition
Staff Contact: Dr J Arock
UOC6 HPW6 WKS14 S2
Prerequisite/s: BIOC2101/2181

This course consists of a series of lectures and practical exercises that provide students with knowledge about the occurrence of nutrients in foods and their role in human physiology, health and disease. Structure, properties and sources of nutrients. Role of nutrients in human structure and function. Introduction to food groups, tables of food composition, food labels, dietary recommendations. Food guides. Nutrition in health and disease. Nutritional needs of vulnerable groups: infants, pregnant and lactating women, the aged. Dietary intolerance, disorders related to the affluent diet including coronary heart disease, dental caries, diabetes, hypertension and cancer. Problems of undernutrition including protein, energy, mineral and vitamin deficiencies. Physiological and nutritional aspects of dietary fibre, alcohol. Assessment of nutritional status using dietary and anthropometric techniques. Practical exercises on anthropometric techniques and measurement of nutrient intake using computer systems on an individual and group basis.

FOOD3440
Advanced Nutrition
Staff Contact: Dr J Arock
UOC6 HPW6 WKS14 S1
Prerequisite/s: FOOD3220 or equivalent

This course consists of lecture and discussion classes that build on the basic concepts of nutrition with respect to the food supply, giving advanced treatment of the following topics. Food and nutrition policy; structure of the population; Food supplies, food consumption, nutritional epidemiology. Population dietary references. Food programs such as food fortification, supplementary feeding schemes, nutritional rehabilitation, nutritionally modified foods, nutritional regulations and standards, nutrition education, dietary and nutrition interventions (ORT, family planning, infection control, growth monitoring). Principles, practice and evaluation of applied nutrition programs. Advanced assessment methods in nutrition: nutrient bioavailability studies, nitrogen balance tests, vitamin load tests, sodium and potassium excretion, creatinine excretion, fitness assessment, biochemical assessment, design and evaluation of nutritional epidemiology studies, food intake studies.

FOOD4450
Advanced Food Processing
Staff Contact: Dr RH Driscoll, Prof KA Buckle
UOC6 HPW6 WKS14 S1

This course consists of lectures and discussion groups covering advanced aspects of modern food processing and preservation. This includes food bulk and thermal properties, rheological properties and models of heat transfer (analytical, graphical and numerical methods, computer packages, microwave, infrared, and radio frequency irradiation), process modelling and control, dehydration, evaporation and distillation.

FOOD5410
Industry Practicum
Staff Contact: Prof KA Buckle
UOC24 HPW25 WKS14 S1 or S2
Prerequisite/s: Completion of Year 3 courses or equivalent

This course involves a structured program of activity within food processing or related company as approved by the course coordinator. The aim is to provide a detailed insight into aspects of company structure and activity through project work, reports and seminars.

FOOD9410
Honours Research Project
Staff Contact: Dr JM Cox
UOC42 HPW21 WKS28 S3
Note/s: Restricted to course 3065

An extensive research project on some aspects of food science and technology, including preparation of a literature review, conduct of laboratory-based research, presentation of two seminars, and submission of a thesis based on the results of the research project. Candidates will undertake corequisite formal coursework as approved by the Head of Department.

FOOD4240
Food Science and Technology (Honours)
Staff Contact: Prof KA Buckle, Prof GH Fleet
UOC48 HPW24 WKS28 S3
Prerequisite/s: Completion of Program 3800 including Level III courses totalling 48UOC

Advanced training in selected areas of Food Science and Technology; a formal component consisting of lectures, seminars, tutorials and written assignments plus a supervised research program in a specified area of food science and technology. Students intending to do this program should consult with the Department about selection of courses in earlier years.

Geography

Geography Level I

GEOG1601
Global Development, Economy and Environment In Australia
Staff Contact: Mr K Dunn
UOC6 HPW5 WKS14
Note/s: Excluded GEOG1621, GEOG1062, GEOG1064


GEOG1701
Environmental Systems and Analysis
Staff Contact: Mr D Edwards
UOC6 HPW5 WKS14
Note/s: Excluded GEOG1721, GEOG1031, GEOG1073

An introduction to the role of environmental processes in shaping the patterns of the physical environment. The operation of global environmental systems. Emphasis on the interaction of humans with their environment and the causes of environmental crises. Topics include water resources, circulation of the atmosphere and oceans, weather and climate, the formation of the Earth, fluvial and coastal landforms, land degradation, the biosphere and ecosystems,
Australian biotic patterns, human impact on natural systems. Instruction is given on methods used to analyse climatic patterns and climate change, soils and landform relationships, vegetation patterns, land degradation, and human impacts on the environment.

**GEOG1801**
**Spatial Information Technologies**
*Staff Contact: School Office*
UOC6 HPW5 WK514
A foundation course relating to the integration and computer processing of a wide range of spatial data. Introductory topics include earth shape and coordinate systems, map projections, Global Positioning Systems (GPS), aerial photography, photogrammetry, and cartographic mapping and representation. Follow on topics include vector and raster data, topology and basic analysis procedures within Geographical Information Systems (GIS), the acquisition and processing of broad band optical, hyperspectral, thermal and radar remote sensing and 3 dimensional digital terrain analysis. Applications relating to physical and human geography and the environmental sciences are reviewed. Computer skills and experience with a wide range of image processing (ERDAS Image, IDL ENVI) and GIS (ArcView, Arc/Info) software will be acquired.

**Geography Level II**

**GEOG2001**
**Field Techniques**
*Staff Contact: Mr K Dunn, Mr D Edwards*
UOC6 HPW4 WK514
Prerequisite/s: 12 Units of Credit of Level I Geography
Note/s: Excluded GEOG2000, GEOG2052
An introduction to the field techniques used in geography. Usually composed of a five day field trip in the mid-year recess. Field methods and skills in both physical and human geography. Workshops in report writing, critical analysis, and research practice.

**GEOG2101**
**Geographical Data Analysis**
*Staff Contact: Mr S Filan*
UOC6 HPW4 WK514
Prerequisite/s: 12 Units of Credit of Level I Geography
Note/s: Excluded GEOG2013
The exploration, description, understanding and presentation of data used within the sub-fields of geography. Subject matter is taught in a contextual and applied manner, with a specific focus on problem solving. Introduction to hypothesis testing and sampling in geography. Computing literacy for human and physical geographers. Includes the use of the SPSS and Excel software packages.

**GEOG2511**
**The Australian City**
*Staff Contact: A/Prof I Burnley, Mr K Dunn, Ms B Scott*
UOC6 HPW4 WK514
Prerequisite/s: GEOG1601 or GEOG1621 or GEOG1062 or GEOG1064
Note/s: Excluded GEOG2092
Explanation for social and economic change in Australia's cities. Issues of planning and social policy in cities like Sydney. Outlines both traditional and contemporary perspectives on the city. A comparison of theories of urbanisation, urban-based conflict and social well-being in the city. Examines the origin of contemporary urban social theory.

**GEOG2621**
**Regions, Resources and Spatial Systems**
*Staff Contact: Dr M Sant*
UOC6 HPW4 WK514
Prerequisite/s: GEOG1601 or GEOG1621 or GEOG1062 or GEOG1064
Note/s: Excluded GEOG2061 and GEOG3192
This subject introduces students to basic concepts and theories in economic geography. These will include theories of location and regional development, spatial interaction, uneven development, and structural change. Subject will focus on economic and regional problems in Australia. Computer-based workshops will be used to develop practical skills in regional and spatial analysis.

**GEOG2711**
**Australian Climate and Vegetation**
*Staff Contact: A/Prof M Fox, Dr S Mooney*
UOC6 HPW4 WK514
Prerequisite/s: GEOG1701 or GEOG1721 or GEOG1031 or GEOG1073
Note/s: Excluded GEOG2025 and GEOG3062
Characteristics of the Australian climatic region. The nature of climate change with particular emphasis on the Quaternary. The development of a distinct Australian biogeography. Patterns and processes in the distribution of Australian vegetation types. Classification, ordination and mapping of vegetation.

**GEOG2721**
**Soils and Landforms**
*Staff Contact: Mr J Sammut*
UOC6 HPW4 WK514
Prerequisite/s: GEOG1701 or GEOG1721 or GEOG1031 or GEOG1073
Note/s: Excluded GEOG2051, GEOG3011 and GEOG3025
The physical and chemical properties of soil, and the processes and factors of soil formation. Soil classification schemes. The relationship between soils and the landforms on which they form. The evolution of landforms in fluvial, arid and coastal environments. Emphasising current processes and Quaternary history.

**GEOG2811**
**Introduction to Remote Sensing**
*Staff Contact: School Office*
UOC6 HPW4 WK514
Note/s: Excluded GEOG2021
An essential knowledge base for future work and study in remote sensing. Topics include electromagnetic theory, principles of remote sensing, field and laboratory measurement of energy, aerial photography and photogrammetry, past, present and future sensors, and practical remote sensing using coarse resolution optical sensors, hyperspectral and thermal sensors, altimeters and radar. Computer-based laboratories use a wide range of images and provide familiarity with ERDAS Imagine and IDL ENVI and experience in image preprocessing, analysis and interpretation techniques.

**GEOG2821**
**Introduction to Geographic Information Systems**
*Staff Contact: School Office*
UOC6 HPW4 WK514
Note/s: Excluded GEOG3122, GEOG3123 and GEOG3142
An introduction to Geographic Information Systems (GIS). Emphasis on raster-based GIS for resource mapping and case study evaluation. Topics include cartographic output and mapping, spatial statistics and various raster analysis techniques such as overlay analysis.

**Geography Level III**

**GEOG3101**
**Geographical Data Analysis II**
*Staff Contact: Mr S Filan, A/Prof I Burnley*
UOC6 HPW4 WK514
Prerequisite/s: GEOG2101
Intermediate topics in exploration, analysis and presentation of geographic data. Emphasis on applications based on Chi-square tests, correlation, regression, analysis of variance; and on research design including use of sampling methods in geography.

**GEOG3025**
**Geomorphology**
*Staff Contact: Prof B Thom*
UOC6 HPW4 WK514
Prerequisite/s: GEOG2051 or GEOG2721
Drainage basin processes including: weathering, the production of runoff and sediment, sediment tracing, sediment budgets and
denudation histories. Coastal and lake landforms, morphometrics and limnological processes. There will be an emphasis on the application of geomorphic principles to land management.

GEOG3122
Geographic Information Systems
Staff Contact: Mr S Filan
UOC6 HPW4 WKS14
Prerequisite/s: Successful completion of at least one year of program 3978.0600 Computer Science or GEOG3118 or GEOG3119 or SOCA2106.
Note/s: Enrolments in this subject are contingent on availability of laboratory facilities. All enrolments must be approved by the Head, School of Geography, or representative.

An introduction to geographic information systems with special reference to computer-based systems for resource evaluation. Case study evaluation, application of the MAP and other GIS software.

GEOG3311
Professional Geography
Staff Contact: School Office
UOC6 HPW4 WKS14
Prerequisite/s: Successful completion of a Year 2 program in Science, Arts or Social Science.
Note/s: This subject is available only to students who will be completing a pass degree with a major in Geography.

Seminars with practitioners in the fields of urban, regional and environmental studies. Project management (consultancy work, government projects, preparation of proposals, grant capture, justification of budgets). Career planning and applying for positions.

GEOG3411
Special Contact:
Staff Contact: A/Prof I Burnley
UOC6 HPW4 WKS14
Note/s: Excluded GEOG3333

Admission by permission to suitable students with good passes in at least four subjects at Upper Level. Individually supervised reading and assignments as an approved topic in Geography not otherwise offered.

GEOG3611
Surveys and Interviewing in Geography
Staff Contact: A/Prof I Burnley, Mr K Dunn
UOC6 HPW4 WKS14
Prerequisite/s: GEOG1062 or GEOG1064 or GEOG1601 or GEOG1621
Note/s: Excluded GEOG3101. Not offered in 2000

An introduction to sample surveys and interview techniques. Construction of questionnaires and interview guides. Census data collection. The collection, assembly, analysis (NUD.IST) and presentation of qualitative data.

GEOG3621
Place and the Politics of Identity
Staff Contact: Dr K Dunn, Ms B Scott
UOC6 HPW4 WKS14 S2
Prerequisite/s: GEOG2092 or GEOG2611 or SOCA2703 or SOCA2106
Note/s: Excluded GEOG1166

Issues of place, identity, territory and representation. Case studies cover a range of axes of difference including religion, place, gender, sexuality, nationalism and popular culture. Key theories of identity. Creative and official representations of places and of peoples. The deployment and representation of cultural difference.

GEOG3631
Population Geography
Staff Contact: A/Prof I Burnley, Ms B Scott
UOC6 HPW4 WKS14
Prerequisite/s: GEOG1062 or GEOG1064 or GEOG1601 or GEOG1621
Note/s: Excluded GEOG3172, ENV52010

The geographical aspects of population change in an economic, social and environmental context. Contemporary and future trends in World population growth and population trends in Australia.

Attention to fertility, mortality, migration, ageing and inequalities in well being. Reference to investigations at different scales.

GEOG3671
Transport and Land Use
Staff Contact: Dr B Parolin
UOC6 HPW4 WKS14
Prerequisite/s: GEOG2092 or GEOG2621 or GEOG2611 or PLAN1011
Note/s: Excluded GEOG2071, GEOG3181, ENV52020

Introduction to the complex interactions between transport, land use, and the environment in urban areas. Special focus on the long term environmental consequences of transport decisions. Introduction to the various methods used to analyse and predict the consequences of policy changes. Australian cities as case studies.

GEOG3711
Biogeography
Staff Contact: Dr S Mooney, A/Prof M Fox
UOC6 HPW4 WKS14
Prerequisite/s: GEOG2711, or two of BIOS1101, BIOS1201, BIOS1301
Note/s: Excluded GEOG2025


GEOG3721
Pedology
Staff Contact: School Office
UOC6 HPW4 WKS14
Prerequisite/s: GEOG2721, or both BIOS1101 & BIOS1201, or both GEO1101 & GEO1201, or both GEO1101 & GEO1201, or both.
Note/s: Excluded GEOG3011. May not be offered in 2000

Soil physical and chemical properties and their interrelationships. Clay mineral structure and behaviour, soil solution chemistry, soil water movement. Soil properties in natural, rural, urban landscapes. Assessment of soil fertility, swelling, dispersibility, erosion and aggregate stability. Laboratory analysis with emphasis on properties associated with land capability assessment.

GEOG3761
Environmental Change
Staff Contact: Dr S Mooney
UOC6 HPW4 WKS14
Prerequisite/s: Successful completion of a Year 2 Program in Science, or Arts and Social Science.
Note/s: Excluded GEOG3062


GEOG3811
Remote Sensing Applications and Digital Image Analysis
Staff Contact: School Office
UOC6 HPW4 WKS14
Prerequisite/s: GEOG2611 or GEOG2021
Note/s: Excluded GEOG3032

Using a diverse range of case studies, this course demonstrates broad remote sensing applications in forestry, agriculture, natural resource management, wildlife conservation, environmental change, pedology, oceanography, geology, meteorology, and politics. Specific applications relate to the assessment of tropical and sub-tropical land cover change, ecosystem dynamics and biogeochemical cycles, vegetation biophysical properties, wetlands management and monitoring, fire, pollution, urban studies and cold region hydrology. Computer-based laboratories allow the student to explore a range of optical, thermal and radar data appropriate to particular applications, and provide exposure to practical image processing.
and interpretation techniques including classification, change detection, formation of indices and derivation of empirical relationships. Practical experience with IDL ENVI and Erada Imagine is provided radiometric, geometric and atmospheric correction of remotely sensed data, image classification.

GEOG3921
Geographic Information Systems Applications
Staff Contact: School Office
UOC6 HPW4 WKS14
Prerequisite/s: GEOG2821 or GEOG3122 or GEOG3123
Note/s: Excluded GEOG3142
Emphasis on vector-based GIS for resource and environmental management and urban and regional analysis. Topics include spatial data bases, data attributes, networks, spatial data analysis and modelling and data visualisation with application-orientated laboratories.

GEOG3861
Computer Mapping
Staff Contact: Mr S Filan
UOC6 HPW4 WKS14
Prerequisite/s: GEOG1801 or GEOG2811 or GEOG2822 or GEOG3123
Note/s: Excluded GEOG3161
Introduction to theoretical and practical problems in displaying data graphically and constructing thematic maps by computer using the MapInfo desktop mapping package. The emphasis is on developing skills in automated cartography through hands-on experience culminating in the preparation of a folio of maps of selected census data. No previous computing expertise is required.

GEOG3901
Australian Natural Resources
Staff Contact: Dr M Sant
UOC6 HPW4 WKS14
Prerequisite/s: GEOG1601 or GEOG1621, and either GEOG1701 or GEOG1721
Note/s: Excluded GEOG3000. Not offered in 2000
The problems of exploiting Australia's biological, water and land resources. A synthesis of human and physical geography. Land degradation. Habitat loss and fragmentation. Introduction to environmental auditing, state-of-the environment reporting, and policy changes. Field and analytical techniques applicable to resource management.

GEOG3911
Environmental Impact Assessment
Staff Contact: Dr D Sammut
UOC6 HPW4 WKS14
Prerequisite/s: 12 Units of credit of Level II Geography or by permission of Head of School.
Note/s: Excluded GEOG3042

GEOG3921
Coastal Resource Management
Staff Contact: School Office
UOC6 HPW4 WKS14
Prerequisite/s: GEOG3901 and GEOG2721

Geography Level IV

GEOG4001
Field Work for Consultants
Staff Contact: Dr S Mooney, A/Prof I Burnley
UOC6 HPW4 WKS14
Note/s: Subject only available to BSc Applied Geography (3010) students
Develop skills in problem formulation and team-based field work. Preparation and presentation of professional quality reports of applied geographical analysis. Define problem, plan strategy for appropriate investigation. Conduct field studies, and report results of investigation. Field work of five days is compulsory. Students will incur some personal expenses in connection with this subject.

GEOG4404
Thesis in Applied Geography
Staff Contact: Dr B Parolin
UOC24 WKS24
Note/s: The deadline for submission of project reports is the end of Week 9 of Session 2
Independent and original research project. Formulation under the direction of a supervisor; preparation of a project report.

GEOG4301
Professional Practice in Geography
Staff Contact: Dr B Parolin
UOC6 HPW4 WKS14
Note/s: Subject only available to BSc Applied Geography (3010) students
Seminars with practitioners in the fields of urban and regional analysis, and environmental studies including environmental impact statements: research proposals, report writing, the roles of government agencies and consultants; and budgeting for research projects; applying for positions and personal skills development.

GEOG4052
Advanced Spatial Analysis
Staff Contact: Dr B Parolin
UOC6 HPW4
Note/s: Subject only available to BSc Applied Geography (3010) students
Selected topics in economic and physical geography chosen to illustrate developments at the frontiers of research in spatial analysis.

GEOG4062
Advanced Environmental Analysis
Staff Contact: School Office
UOC6 HPW4 WKS14
Note/s: Subject only available to BSc Applied Geography (3010) students. May not be offered in 2000
Selected topics in the study of human and physical environments, chosen to illustrate contemporary frontiers of research and development in environmental studies.

GEOG4320
Soil Degradation and Conservation
Staff Contact: School Office
UOC6 HPW4 WKS14
Prerequisite/s: Completion of Stage 3 of a four-year degree program. Contact hour include some fieldwork which forms a compulsory part of this subject. Students will incur some personal costs for fieldwork. May not be offered in 2000
Identification, assessment and analysis of the main process of soil degradation, including the role of climate, vegetation, geomorphology and pedology in controlling the processes. Discussions of appropriate management strategies for reducing degradation for reclaiming degrade landscapes. Topics include: surface wash, gully erosion, wind erosion, soil acidification soil...
structure decline, salinisation, accumulation of toxins and desertification.

**GEOG4414**
Honours Geography  
*Staff Contact:* Dr B Parolin  
UOC48 HPW16 WKS28  
*Prerequisite(s):* Science students have completed program 2527, 2700 or 6851, including Level III subjects  
*Notes:* Excluded GEOG4050 and GEOG4100  

Students are required: 1. To undertake an original piece of work extending throughout the year and to submit a thesis based upon it. 2. To participate in seminars and fieldwork as notified by the School of Geography. Seminars include workshops on professional practice in geography and ethical issues in research.

**GEOG4011**  
Advanced Techniques in Remote Sensing  
*UOC:* 6  
*Note:* Not offered in 2000

**GEOG4911**  
Vegetation Management  
*Staff Contact:* A/Prof M Fox  
UOC6 HPW4 WKS14  
*Prerequisite(s):* GEOG3901 and GEOG2711  
*Notes:* Excluded GEOG4300  


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**Geology**

Field tutorials are an essential part of some of these courses, and are held during weekends and/or recesses. Dates and costs are available during the first week of the course. Attendance is compulsory.

**Geology Level I**

**GEOL1111**  
Earth Systems and Dynamics  
*Staff Contact:* Dr DR Cohen  
UOC6 HPW5 WKS14 S1  
*Notes:* Excluded GEOL1101. Two days of fieldwork is a compulsory part of this subject and students will incur personal costs. Details will be provided in the first week of the subject  


**GEOL1211**  
Earth Environments and Resources  
*Staff Contact:* Dr DR Cohen  
UOC6 HPW5 WKS14 S2  
*Notes:* Excluded GEOL1201. Three days of fieldwork is a compulsory part of this subject and students will incur personal costs. Details will be provided during the first week of the subject  


**Geology Level II**

**GEOL2100**  
Field Studies: Sedimentology and Palaeoecology  
*Staff Contact:* A/Prof CR Ward  
UOC3  
*Prerequisite(s):* GEOL1111/1101 or GEOL1211/1201, GEOL2120  
*Notes:* Excluded GEOL2031. Geological fieldwork up to five days in total is an essential part of this subject. Students will incur personal costs  

Geological studies of sediments, fossils and sedimentary rock strata in selected coastal and inland locations, to illustrate features imparted by different depositional environments; introduction to geological data gathering and field measurement techniques applicable to sedimentary successions, and to regional integration of such data in palaeogeographic interpretations.

**GEOL2110**  
Mineralogy  
*Staff Contact:* Dr AC Dunlop  
UOC3 HPW3 S1  
*Prerequisite(s):* GEOL1111/1101 or GEOL1211/1201  
*Notes:* Excluded GEOL2031, GEOL7223  

Principles of optical crystallography and the use of the polarising microscope to identify minerals and rocks. Rock-forming minerals: physical properties in hand specimen and under the microscope, crystal chemistry, stability and occurrence.

**GEOL2120**  
Sedimentary Environments and Processes  
*Staff Contact:* A/Prof CR Ward  
UOC3 HPW3 S1  
*Prerequisite(s):* GEOL1111/1101 or GEOL1211/1201  
*Notes:* Excluded GEOL2031, GEOL7233, GEOL7321, GEOL8220  

Mechanisms of sediment transport and deposition; nature and origin of depositional structures. Analysis of depositional environments including: fluvial deposits, deltaic and estuarine deposits; marine sediments including shoreline, shelf and deep sea; carbonate and reef deposits; lacustrine deposits; glacial and desert sediments; and volcaniclastic sediments. Sedimentary facies and facies successions; introduction to sequence stratigraphy. Practicals in sediment analysis, drill core studies and sedimentary strata interpretation.

**GEOL2131**  
Geomapping 1  
*Staff Contact:* A/Prof GR Taylor  
UOC6 HPW5 S1  
*Notes:* Excluded GEOL2062, GEOL8380. Fieldwork of up to 2 days is a compulsory part of this subject for which students may incur personal costs. Details are provided during the first week of the subject  


**GEOL2170**  
Earth Structures 1  
*Staff Contact:* Dr PG Lennox  
UOC3 HPW3 S2  
*Prerequisite(s):* GEOL1111/1101 or GEOL1211/1201  
*Notes:* Excluded GEOL2022
Interpretation of geological structures observed at outcrop scale within the context of the geological history of an area. Understanding brittle and some ductile structures using stereographic projection techniques, including use of computer methods. Application of the techniques in practical field situations.

GEOL2180
Introduction to Igneous and Metamorphic Rocks
Staff Contact: Dr AC Dunlop
UOC3 HPW3 S1
Prerequisite/s: GEOL1111/1101 or GEOL1211/1201
Corequisite/s: GEOL2110
Note/s: Excluded GEOL2051, GEOL2221
Staff Contact: Mr D Palmer
UOC6 HPW5 S2
Prerequisite/s: GEOL2180 or alternative as approved by Subject Authority
Note/s: Excluded GEOL2031

GEOL2200
Field studies: Petrology, Structure and Field mapping
Staff Contact: Dr PG Lennon
UOC3 HPW3
Prerequisite/s: GEOL1111/1101 or GEOL1211/1201, GEOL2170 and GEOL2180
Note/s: Geological field work of up to five days in total is an essential part of this course. Students will incur personal costs.

GEOL2220
Sedimentary Rocks and Clay Minerals
Staff Contact: A/Prof CR Ward
UOC3 HPW3 S2
Prerequisite/s: GEOL2110
Note/s: Excluded GEOL2220, GEOL7223

Sedimentary Petrology: Textures and composition of sandstones, limestones, tuffs, phosphorites, cherts, evaporites and other sedimentary rocks; chemical, physical and biological processes, before, during and after sediment deposition; microscopic and other studies of sedimentary materials. Clay Mineralogy: Crystal structure, composition and properties of the clay minerals; X-ray diffraction and other methods of clay analysis; clay-water systems; ion exchange, flocculation and dispersion; role of chemical weathering, transport and diagenesis in the formation and distribution of clay minerals.

Geology Level II/III

GEOL231
Environmental Geophysics
Staff Contact: Dr AC Dunlop
UOC6 HPW5 S2
Prerequisite/s: GEOL2180 or GEOL2221
Note/s: Geophysical methods with an emphasis on the near surface applications to environmental and urban studies, as well as the related areas of groundwater and geotechnical investigations. The methods covered include gravity, magnetics, electrical, seismic and radar. The course content and presentation are also designed to accommodate those students with interests in environmental subjects but not necessarily with strong backgrounds in mathematics or physics.

GEOL2240
Engineering and Environmental Geology
Staff Contact: Dr J Jankowski
UOC3 HPW3 S2
Prerequisite/s: GEOL1111/1101 or GEOL1211/1201 or ENVS1101
Note/s: Excluded GEOL3072, GEOG3250


GEOL2260
Geomapping 2
Staff Contact: A/Prof GR Taylor, Dr DR Cohen
UOC3 HPW3 S2
Prerequisite/s: GEOL2131 or equivalent as approved by the School

GEOL2290
Groundwater Hydrology
Staff Contact: Dr J Jankowski
UOC3 HPW3 S1
Note/s: Excluded GEOL2072. Fieldwork of 1 day is a compulsory part of this subject for which students may incur personal costs. Details are provided during the first week of the session.
The hydrological cycle; saturated and unsaturated zones; porosity and permeability; water table; flow; unconfined and confined aquifers; geological activity of groundwater; thermal springs and geysers; alteration of groundwater systems; drilling methods; well design and completion; coastal aquifers; karst and carbonate terrain; saline environments; sedimentary, fractured, multilayered and crystalline aquifers; alteration and water quality; types and sources of contamination; geotechnical problems; flow system a microbial population; resources - development, exploration and management; modelling; groundwater and economic mineralisation; groundwater in Australia - principal hydrogeological divisions; environmental problems and resources.

Geology Level III

GEOL3101
Ore Deposits
Staff Contact: Dr AC Dunlop
UOC6 HPW5 S1
Prerequisite/s: GEOL2180 or alternative as approved by Subject Authority

Geological setting, characteristics and genesis of the major categories of metallic and non-metallic ore deposits. Laboratory study of hand specimens, thin sections and polished sections from these deposit types.

GEOL3110
Igneous and Metamorphic Processes
Staff Contact: Dr AC Dunlop
UOC3 HPW3 S1
Prerequisite/s: GEOL2180 or GEOL222
Note/s: Excluded GEOL2031

The genesis of silicate melts: partial melting in the crust and upper mantle of the Earth. The use of major and trace elements, and radiogenic and stable isotopes, in the study of fractionation processes of magmas. The chemical evolution of the crust and upper mantle through geological time. Stability relations of mineral assemblages as a function of pressure, temperature and fluid activity.
Geobarometry and thermometry: Static and dynamic metamorphism during orogenic processes. The role of fluids and deformation in metamorphic reactions. Practical: Case studies of igneous and metamorphic provinces.

**GEOL3120**

**Stratigraphy and Palaeontology**  
*Staff Contact: A/Prof CR Ward*

**Prerequisite/s:** GEOL1111/1101 or GEOL1211/1201  
**Notes:** Excluded GEOL3031

Classification of sedimentary basins; depositional systems; role of tectonics, sea-level and other changes in development of basin sequences; application of lithostratigraphic, biostratigraphic, chronostratigraphic and magnetostratigraphic principles; geophysical well logging; lithologies and palaeocurrent analysis; introduction to sequence stratigraphy; provenance studies in sedimentary basins; morphology, evolution and use of key invertebrate fossil groups; geological development of Australian sedimentary basins and fold-belt sequences.

**GEOL3131**

**Field Studies: Stratigraphy, Structure and Geological Mapping**  
*Staff Contact: Dr AC Dunlop*

**UOC6**  
**Prerequisite/s:** GEOL1111/1101 or GEOL1211/1201, GEOL2170 and GEOL3120  
**Notes:** Geological fieldwork of up to eight days duration is a compulsory part of this subject. Students may incur personal costs  

Field mapping in a selected area of mildly deformed sedimentary and volcanic rocks; practical use of geological mapping techniques; integration of stratigraphic, lithological, structural and palaeontological concepts.

**GEOL3170**

**Earth Structures 2**  
*Staff Contact: Dr PG Lennox*

**UOC3 HPW3 S1**  
**Prerequisite/s:** GEOL2170 or GEOL2022 or GEOL8121  
**Notes:** Excluded GEOL3082

Use of ductile and to a lesser extent brittle structures at outcrop scale to understand the geological history of simply to multiply deformed areas. Development of conceptual links between outcrop structures and terranes, blocks and tectonics.

**GEOL3201**

**Field Studies: Ore Deposits, Structural and Metamorphic Geology**  
*Staff Contact: Dr AC Dunlop*

**UOC6**  
**Prerequisite/s:** GEOL3110 and GEOL3101 or alternative as approved by the Subject Authority  
**Notes:** Geological fieldwork of up to nine days duration is a compulsory part of this subject. Students will incur personal costs  

Geologic setting of different ore deposit types in central-west and far western New South Wales; application of geological techniques and principles to mineral exploration and mining; use of geological mapping techniques in a structurally-complex high-grade metamorphic terrane (Broken Hill Block); Quaternary processes and environmental geology in the arid zone.

**GEOL3231**

**Exploration and Environmental Geochemistry**  
*Staff Contact: Dr AC Dunlop, Dr DR Cohen*

**UOC3 HPW3 S2**  
**Notes:** Excluded GEOL3092. Geological fieldwork of up to one day duration is a compulsory part of this subject. Students may incur personal costs  


**Geology Level IV**

**GEOL4100**

**Geological Communications**  
*Staff Contact: Dr AC Dunlop*

**UOC3 HPW3 S1**  

Construction and preparation of reports, theses and scientific papers; library and database search techniques; critical reviewing of literature; citation of references; editing of report drafts and development of abstracts and conclusions; use of tables, figures and photographs; drafting and illustration techniques; verbal presentation of geological material to a large audience; computer graphics and desk-top publishing techniques; preparation of resumes; meeting procedures, minutes and chairmanship.

**GEOL4102**

**Special Topics In Applied Geology**  
*Staff Contact: Dr PG Lennox*

**UOC12 HPW10 S1**  
**Notes:** Some fieldwork may be involved; students may need to meet personal costs  

Instruction by lectures, tutorials and assignments in advanced aspects of geological science and its applications. Individual students will select four modules from a list prepared for each year by the School. These modules will cover a number of specialised fields including mineral exploration, mine geology, sedimentary basin studies, geophysics, engineering and environmental geology, as well as fundamental geology topics. Some modules may be delivered at other universities through the Sydney Universities Consortium of Geology and Geophysics.
GEOL4130 Interpretation of Geological Data  
Staff Contact: Dr DR Cohen  
UOC3 HPW3 S1  
Prerequisite/s: GEOL2131 or alternative as approved by Subject Authority  

GEOL4140 Project Management  
Staff Contact: Dr AC Dunlop  
UOC3 HPW3 S1  
Organisation and costing of geological field programs; land tenure, exploration and mining titles, drilling programs, ore core logging; use of geological database and modelling systems; estimation of resources and reserves; liability and ethics in geological practice.

GEOL4180 Analysis of Natural Materials  
Staff Contact: Dr DR Cohen  
UOC3 HPW3 S1  

GEOL4203 Field Project (P/T)  
Staff Contact: Dr PG Lennox  
UOC24 HPW10 S3  
Note/s: Geological fieldwork of up to six weeks duration may be required. Students may incur personal costs  
A major field and laboratory project spread over two sessions for part-time study, which may include geological mapping and interpretation of other geological data (possibly including satellite imagery, geophysical datasets, geochemical or geohydrological information). The project may involve aspects of resource development, engineering or environmental geology, regional geology and groundwater studies.

GEOL4204 Field Project  
Staff Contact: Dr PG Lennox  
UOC24 HPW10 S2  
Note/s: Geological fieldwork of up to six weeks duration may be required. Students may incur personal costs  
A major field and laboratory project, which may include geological mapping and interpretation of other geological data (possibly including satellite imagery, geophysical datasets, geochemical or geohydrological information). The project may involve aspects of resource development, engineering or environmental geology, regional geology and groundwater studies.

GEOL4303 Geology Honours  
Staff Contact: Dr PG Lennox  
UOC48 HPW20 S3  
Prerequisite/s: Completion of Geology major or equivalent, plus permission of Head of School  
Note/s: An extensive field project is a compulsory part of this subject. Students will incur personal costs. Details will be provided in the first week of the subject  
Students with a double major in geology will follow the program set for Year 4 students in Course 3000 Applied Geology. Students with a single major will follow a course of advanced study that includes geological topics subject to approval of the Head of School.

GEOL4313 Earth and Environmental Science Honours  
Staff Contact: Dr PG Lennox  
UOC48 HPW40 S3  
Prerequisite/s: Completion of Geology or Environmental Systems major, or equivalent, plus permission of Head of School  
Note/s: Geological fieldwork of up to six weeks duration may be required. Students may incur personal costs  
A combination of advanced coursework and a major field and laboratory project, which may include geological mapping and interpretation of geological and environmental data. The project may involve aspects of environmental geology, environmental geophysics, environmental geochemistry and/or groundwater studies. The course also includes a selection of advanced courses in a range of disciplines, usually undertaken in S1.

GEOL4333 Earth and Environmental Science Honours P/T  
Staff Contact: Dr PG Lennox  
UOC24 HPW10 S3  
Prerequisite/s: Completion of Geology or Environmental Systems major, or equivalent, plus permission of Head of School  
Note/s: Extensive field work is a compulsory part of this subject and students will incur personal expenses. Details will be provided in the first week of the subject  
Students will follow a course of advanced study which extends over 4 sessions and includes geological subjects that are approved by the Head of School.

GEOL4343 Geology Honours P/T  
Staff Contact: Applied Geology Office  
UOC24 HPW10 S3  
Prerequisite/s: Completion of Geology or Environmental Systems major, or equivalent, plus permission of Head of School  
Note/s: Extensive field work is a compulsory part of this subject and students will incur personal expenses. Details will be provided in the first week of the subject  
Students with a double major in geology will follow the program set for Year 4 students in Course 3000 Applied Geology but over 4 sessions in a prescribed sequence. Students with a single major in geology will follow a course of advanced study which extends over 4 sessions and includes geological subjects that are approved by the Head of School.

GEOL7401 Earth Environments Honours by Research  
Staff Contact: Dr PG Lennox  
UOC48 HPW20 S3  
Prerequisite/s: Completion of Geology or Environmental Systems major, or equivalent, plus permission of Head of School  
Note/s: Field work is a compulsory part of this subject and students will incur personal expenses. Details will be provided in the first week of the subject  
Students will undertake a project, that is approved by the Program advisor. It extends over 2 sessions and includes both geological subjects and a project that involves the writing of a thesis.

GEOL7402 Earth Environments Honours by research(P/T)  
Staff Contact: Dr PG Lennox  
UOC24 HPW10 S3  
Prerequisite/s: Completion of Geology or Environmental Systems major, or equivalent, plus permission of Head of School  
Note/s: Field work is a compulsory part of this subject and students will incur personal expenses. Details will be provided in the first week of the subject  
Students will undertake a project, that is approved by the Program advisor. It extends over 4 sessions and involves the writing of a thesis.
GEOL7403
Earth Environments Honours
Staff Contact: Dr PG Lennox
UOC48 HPW20 S3
Prerequisite/s: Completion of Geology or Environmental Systems major, or equivalent, plus permission of Head of School
Notes: Field work is a compulsory part of this subject and students will incur personal expenses. Details will be provided in the first week of the subject.

Students will follow a course of advanced study that has to be approved by the Program advisor. It extends over 2 sessions and includes both geological subjects and a project that involves the writing of a thesis.

GEOL7404
Earth Environments Thesis
Staff Contact: Dr PG Lennox
UOC24 HPW10 S1 or S2
Prerequisite/s: Completion of Geology or Environmental Systems major, or equivalent, plus permission of Head of School
Notes: Field work is a compulsory part of this subject and students will incur personal expenses. Details will be provided in the first week of the subject.

Subject to the approval by the Program advisor, students will undertake a project that involves the writing of a thesis.

Geology Servicing Subjects

GEOL5211
Geology for Mining Engineers 1
Staff Contact: Dr PG Lennox
UOC3 HPW3 S2
Notes: Fieldwork of up to 1 day is a compulsory part of this subject. Students will incur personal costs. This is a servicing subject taught within courses offered by other schools or faculties.


GEOL5301
Physical Geology for Petroleum Engineers
Staff Contact: Dr PG Lennox
UOC3 HPW3 S2
Notes: Fieldwork of up to 2 days is a compulsory part of this subject. Students will incur personal costs. This is a servicing subject taught within courses offered by other schools or faculties. Not offered in 2000.

Introduction to earth sciences nature and properties of rocks and minerals; sedimentation, sedimentary structures and sedimentary environments; stratigraphy and the geological time scale; geological maps and structures; introduction to plate tectonics. Nature and occurrence of groundwater. Formation of coal and petroleum. Regional geology of Australian petroleum basins.

GEOL5311
Geology for Mining Engineers 2
Staff Contact: Dr PG Lennox
UOC3 HPW3 S1
Prerequisite/s: GEOL5211
Notes: This is a servicing subject taught within courses offered by other schools or faculties.

Structural geology including stereographic projection and fracture analysis as applied to mining operations. Origin and properties of coal, oils, oil shales and natural gas. Principles of hydrogeology including the significance of groundwater in mining operations. Mineralogy of important non-metallic resources, processes of ore formation. Exploration methods.

GEOL5312
Petroleum Geology and Geophysics
Staff Contact: A/Prof CR Ward
UOC3 HPW3 S2
Prerequisite/s: GEOL5301
Notes: Excluded GEOL5321

Petroleum Geology. Petroleum generation including kerogen types and maturation, migration, entrapment and degradation; sedimentary features of reservoir sequences. Structural traps, diapirs and fractured rock reservoirs; coal-bed methane; porosity development; exploration and resource evaluation. Petroleum Geophysics: fundamentals of seismic wave propagation, seismic data acquisition and interpretation; three dimensional seismic methods; case studies.

GEOL5321
Petroleum Geology and Geophysics
Staff Contact: A/Prof CR Ward
UOC6 HPW8 S2
Notes: Excluded GEOL5301, GEOL5302, GEOL5312

Introduction to the Earth sciences: nature and properties of rocks and minerals; sedimentation and sedimentary environments; stratigraphy and the geological time scale; geological maps and structures; introduction to plate tectonics. Nature and geological properties of petroleum; petroleum generation, migration, entrapment and degradation; sedimentology of petroleum-bearing sequences; primary and secondary porosity; structural and stratigraphic traps; formation waters; coal-bed methane, oil shale and other non-conventional petroleum sources; geological and geophysical methods in petroleum exploration and development; regional geology of selected petroleum basins.

GEOL5331
Petroleum Reservoir Geology
Staff Contact: Dr PG Lennox
UOC3 HPW3
Prerequisite/s: GEOL5302
Notes: Excluded GEOL5401. Not offered in 2000

Analysis of petroleum provinces, basins and fields, including their tectonic setting and hydrocarbon habitat; reservoir sedimentology and basin development; petroleum systems; subsurface geologic maps and sections; traps and trapping mechanisms; geological and geophysical characteristics of selected reservoir types; microscopic features of reservoir rocks; fundamentals of seismic reflection methods, including wave propagation, data acquisition, processing and interpretation; three-dimensional and time-lapse seismic methods; introduction to sequence stratigraphy; estimation of petroleum resources.

GEOL5332
Petroleum Reservoir Geophysics
Staff Contact: Mr D Palmer
UOC3 HPW3
Prerequisite/s: GEOL5331
Notes: Excluded GEOL5401. Not offered in 2000

Interpretation of 2D and 3D seismic reflection data, including horizontal and vertical slices, presentation parameters, horizon autotracking, fault mapping, stratigraphic and structural interpretation, reservoir evaluation. Inversion of seismic reflection data to determine petrophysical properties. Direct hydrocarbon indicators, including amplitude variation with offset.

GEOL5412
Special Topics in Petroleum Geoscience
Staff Contact: A/Prof C.R. Ward
UOC8 HPW6 S2
Notes: Subject to approval

Instruction by lectures, tutorials and assignments in aspects of geoscience and their application to the petroleum industry. Individual students will select modules, in consultation with the Head, School of Geology, covering topics such as sedimentary rocks and clay minerals, groundwater hydrology, geophysics, coastal monitoring and environmental assessment, complemented by a relevant project task.
Industrial Relations and Organisational Behaviour

IROB2721
Managing People

Staff Contact: Mr D Morgan
UOC6 HPW3 WKS14 S1

Focuses on managing in a rapidly changing environment. Topics include: leadership, decision-making and innovation; power, legitimacy, and the socialisation process; the structure and design of organisations; organisation and domination, the evolution of ethical awareness; intergroup conflict and conflict resolution; skills of managing - communication, negotiation, coaching and objectives setting; organisational culture and transformation.

Information Systems

Information Systems Level II

INFS1602
Computer Information Systems

Staff Contact: School Office
UOC6 HPW3 WKS14 S1 or S2

This subject provides students with a basic understanding of the content of information systems; the types of information systems; the current roles of information systems in organisations; and the opportunities for and limitations of information systems within organisations and society. The subject also provides an overview of the tools, techniques and frameworks used to analyse information systems; the range of Information Technologies used to support information systems and to explain their use; the alternative approaches for the development and implementation of information systems; the current technologies for the development of personal information systems and for information searches from a range of sources; and the ethical responsibilities of both the Information System professional and the private user of information.

INFS1603
Business Data Management

Staff Contact: School Office
UOC6 HPW3 WKS14

This subject provides an introduction to the concepts, design techniques and technology for the storage and management of data. Students gain the required knowledge and practical skills to model data including the use of entity/relationship models and object models; design simple databases in an organisational environment; understand the role of data in business; and understand the quality assurance issues in collecting, storing and using data. Students acquire and exercise skills in a number of data modelling and design techniques as well as develop a simple system using Microsoft Access.

INFS2603
Systems Analysis and Design

Staff Contact: School Office
UOC6 HPW3 S1 or S2
Prerequisite/s: INFS1602 and INFS1603

This subject examines system analysis and design: requirements analysis and specification; logical and physical design of business systems. More specifically, the object-oriented (OO) methodology and structured methodology (SDLC) are covered. Hands-on experience with CASE tools used by information systems practitioners is provided (ie MetaEdit and RationalRose).

INFS2607
Business Data Networks

Staff Contact: School Office
UOC6 HPW3 WKS14 S2
Prerequisite/s: INFS1602

Note/s: Excluded INFS2617 and INFS3607. Replaced INFS3607 in 1996

This subject provides students with an understanding of data communication and distributed data processing in a business environment; and an understanding of the management issues associated with telecommunication systems. Main topics include data communication concepts; computer networks; reference to international standards and common industry communications software packages; local/metropolitan/wide area networks; network management; telecommunications services; and data security.

INFS2609
Software Implementation

Staff Contact: School Office
UOC6 HPW3 WKS14 S1
Prerequisite/s: INFS1602
Note/s: Excluded: COMP1021 and COMP1811

This subject covers programming in the business context with a commercial object-oriented programming language; defining problems and designing structured programs to solve problems; use of data types, selection, iteration, functions, arrays and data structures in procedural programs; and the use of an interactive development environment.

INFS2611
Requirements Elicitation

Staff Contact: School Office
UOC3 HPW1.5 WKS14 S2

Students learn how to establish and verify user requirements for information systems; become familiar with the instruments for requirements definition and the criteria for requirements quality assessment; and refine analytical skills for the evaluation of customer needs.

INFS2617
Global Data Networks

Staff Contact: School Office
UOC6 HPW3 WKS14 S2
Prerequisite/s: INFS1602
Note/s: Excluded: INFS2607 and INFS3607

Data communications concepts, computer networks, reference to international standards and common industry communications software packages; local/metropolitan/wide area networks; network management; tele-communications services and other options; data security.

Information Systems Level II/III

INFS2691
Industrial Training 1

Prerequisite/s: INFS1602, INFS1603
Note/s: Available only to BIT students. Restricted to Course 3971

A practical treatment of the characteristics of commercial information systems. Topics include analysis of an existing information system; development of overview documentation of the system; evaluation of the interface design; consideration of the role of security and control mechanisms.

Information Systems Level III

INFS3603
Business Intelligence Systems

Staff Contact: School Office
UOC6 HPW3 WKS14 S1
Prerequisite/s: INFS1652 and INFS1603

This subject examines the process of decision making and work group activity by professional and managerial people; the tools and techniques available in information technology to support these processes and when they can be advantageously used; some of the reasons why so many executive support systems do not achieve their intended objectives; and the cultural and organisational issues involved in the use of Information Technology tools and techniques.
INFS3604 Information Technology Management

Staff Contact: School Office
UOC6 HPW3 WKS14 S2
Prerequisite(s): INF52603

This subject introduces the strategic and operational management issues involving information systems and software. Consideration is given to both quantitative and qualitative management techniques, including the practical application of tools and concepts for software project management, as well as material on software metrics and software quality. In addition, techniques are covered for strategic planning of information systems and ensuring business contribution.

INFS3605 Implementation Workshop

Staff Contact: School Office
UOC6 HPW3 WKS14 S1
Prerequisite(s): INF52609 or COMP1021

Students implement an information systems project using a commercial object-oriented programming language in a workshop environment. Topics include advanced program design; computer aided software engineering techniques; a comparison of a range of programming languages; test data specification; implementation procedures; interfacing an application with a commercial database such as Oracle; the production of system documentation; and the production of quality software.

INFS3606 Telecommunications for Electronic Commerce

Staff Contact: School Office
UOC6 HPW3 WKS14 S2
Prerequisite(s): INF52607

Note(s): Excluded INF3618

This subject considers the strategic issues in telecommunications in business; current and emerging technologies for data networking; and the specification of corporate networks including local and wide area networks; a detailed understanding of the Internet protocol suite; TCP/IP - IP version 4, subnets, TCP, UDP, inter-router protocols, multicasting, IP version 6; security threats, Internet application security issues, firewalls, encryption, digital signatures, network management; and an understanding of non TCP/IP peer to peer networking protocols.

INFS3608 Advanced Database Systems

Staff Contact: School Office
UOC6 HPW3 WKS14 S1
Prerequisite(s): INF51602 and INF51603

This subject provides students with an in-depth understanding of database application design and database management for large and small businesses; practical experience using formal database design methodologies in systems development; and an understanding of the technological issues of database systems in a modern IT infrastructure. The main topics include advanced modelling of business applications, database logical design, normalisation through decomposition and synthesis, physical design, concurrency, security, and transaction management issues, contemporary issues of object-oriented databases, advanced database applications, multimedia databases, data warehousing, data mining, OLAP, and client/server design on the Internet.

INFS3611 Design Workshop

Staff Contact: School Office
UOC6 HPW3 WKS14 S2
Prerequisite(s): INF52603

This subject consists of a real-life systems development project, conducted in a workshop environment. It provides practical experience in the application of object-oriented methods for the specification and design of commercial business systems. Requirements definitions, system specifications and logical designs are developed to a professional standard (using automated tools).

INFS3616 Commercial Programming Principles

Staff Contact: School Office
UOC6 HPW3 WKS14 S2
Prerequisite(s): INF53605
Corequisite(s): INF53692

Note(s): Available only to BIT students

This subject focuses on the advanced treatment of the practice of implementing commercial systems. Topics include: the use of library code; program design for performance; project control and reporting practice; programming standards; interactive interface; software testing; CASE tools; documentation; security and control and maintenance.

INFS3618 Advanced Global Data Networks

Staff Contact: School Office
UOC6 HPW3 WKS14 S2
Prerequisite(s): INF52607 or INF53607 or INF52617

Note(s): Excluded: INF53606


INFS3621 Alternative System Design Methodologies

Staff Contact: School Office
UOC3 HPW1.5 WKS14 S1
Prerequisite(s): INF52603

This subject reviews current systems analysis methodologies, including the process-driven approach, data-driven approach, object-oriented approach and general approaches such as Soft Systems Methodology. It examines the foundations and philosophies, lifecycle stages and resource demands, applied modeling tools and beneficial applications of each approach.

INFS3622 Distributed Application Design and Implementation

Staff Contact: School Office
UOC3 HPW1.5 WKS14 S1
Prerequisite(s): INF52603

This subject considers the design and implementation of distributed and client/server applications. Specific topics include the design, coding, testing and implementation of distributed applications; middleware (eg. CORBA) and its impact on the application design; and distributed computing environments.

INFS3623 Multimedia Systems Design

Staff Contact: School Office
UOC3 HPW1.5 WKS14 S2
Prerequisite(s): INF52603

This subject teaches the cognitive principles, concepts and design techniques required in implementing multimedia information systems. Students also gain practical experience with the use of commercial multimedia design software.

INFS3685 Electronic Commerce Management

Staff Contact: School Office
UOC6 HPW3 WKS14 S1
Prerequisite(s): INF51602 and INF51603

Note(s): Approval from the Head of School

This subject has been designed to help students develop specific skills relating to the management and application of electronic commerce as well as an understanding of essential concepts and technologies. Topics include: types of electronic commerce; Internet and World Wide Web applications; security; payment systems; applications in the banking, retail and manufacturing industries; problems relating to implementations of electronic commerce; and essential concepts/technologies supporting electronic commerce.
INFS3692
Industrial Training 2
Staff Contact: School Office
Prerequisite/s: INFS2609 or INFS3605
Corequisite/s: INFS3616
Note/s: Available only to BIT students. Restricted to Course 3971
An in-depth practical exposure to information systems development. Topics include the structure and management of the implementation teams; the roles of users and information staff in implementation; scheduling and control during implementation.

INFS4693
Industrial Training 3
Staff Contact: School Office
Corequisite/s: INFS3611
Note/s: Available only to BIT students. Restricted to programs Course 3971
In depth practical work in information systems analysis and design. Topics include the structure and management of analysis and design teams; the roles of users and Information Systems staff in analysis and design; scheduling and control during analysis and design.

Information Systems Level IV

INFS4003
Information Systems (Honours) Thesis
Staff Contact: School Office
Prerequisite/s: Completion of program 1400 including Level III subjects totalling 90 Credit Points.

INFS4774
Information Systems Security
Staff Contact: School Office
UOC6 HPW3 WKS14 S1
Prerequisite/s: INFS1603, INFS2607 and admission to BCom degree course at Honours level majoring in Information Systems.
As for INFS5984. See Graduate Study: Course Descriptions.

INFS4795
Thesis Part A
Staff Contact: School Office
UOC6 S1
Note/s: Available only to Year 4 (Honours) students
The thesis is undertaken in the last two semesters of the Honours year. Students undertake directed research work in an approved area under the guidance of a member of the lecturing staff. This course represents the research literature section of the thesis.

INFS4796
Thesis Part B
Staff Contact: School Office
UOC8 S2
Note/s: Available only to Year 4 (Honours) students
The thesis is undertaken in the last two semesters of the Honours year. Students undertake directed research work in an approved area under the guidance of a member of the lecturing staff. This course represents the research literature section of the thesis.

INFS4805
Information Systems Auditing
Staff Contact: School Office
HPW3
Prerequisite/s: Admission to BSc degree course at Honours level majoring in Information Systems.
As for INFS5905. See Graduate Study: Course Descriptions.

INFS4810
Advanced Data Management
Staff Contact: School Office
HPW3
Prerequisite/s: Admission to BSc degree course at Honours level majoring in Information Systems.
As for INFS5926. See Graduate Study: Course Descriptions.

INFS4811
Knowledge Based Information Systems
Staff Contact: School Office
HPW3
Prerequisite/s: Admission to BSc degree course at Honours level majoring in Information Systems.
As for INFS5927. See Graduate Study: Course Descriptions.

INFS4812
Software Engineering Management
Staff Contact: School Office
HPW3
Prerequisite/s: Admission to BSc degree course at Honours level majoring in Information Systems.
As for INFS5928. See Graduate Study: Course Descriptions.

INFS4825
Object-Oriented Information Systems
Staff Contact: School Office
HPW3
Prerequisite/s: INFS3605 and admission to BSc degree course at Honours level majoring in Information Systems.
As for INFS5925. See Graduate Study: Course Descriptions.

INFS4848
Information Systems Project Management
Staff Contact: School Office
HPW3
Prerequisite/s: Admission to BSc degree course at Honours level majoring in Information Systems.
As for INFS5948. See Graduate Study: Course Descriptions.

INFS4853
Information Systems Management
Staff Contact: School Office
HPW3
Prerequisite/s: Admission to BSc degree course at Honours level majoring in Information Systems.
As for INFS5953. See Graduate Study: Course Descriptions.

INFS4857
Information and Decision Technology
Staff Contact: School Office
UOC6 HPW3 WKS14 S1
Prerequisite/s: Admission to BSc degree course at Honours level majoring in Information Systems.
As for INFS5957. See Graduate Study: Course Descriptions.

INFS4886
Research Topics in Information Systems 1
Staff Contact: School Office
UOC6 HPW3 WKS14 S1
Prerequisite/s: Admission to BSc degree course at Honours level majoring in Information Systems.
As for INFS5986. See Graduate Study: Course Descriptions.

INFS4887
Research Topics in Information Systems 2
Staff Contact: School Office
UOC6 HPW3 WKS14 S2
Prerequisite/s: Admission to BSc degree course at Honours level majoring in Information Systems.
As for INFS5987. See Graduate Study: Course Descriptions.

INFS4891
Decision Support Systems
Staff Contact: School Office
UOC6 HPW3 WKS14 S1
Prerequisite/s: Admission to BSc degree course at Honours level majoring in Information Systems.
As for INFS5991. See Graduate Study: Course Descriptions.
Japanese and Korean Studies

In addition to its core language program, the Department of Japanese and Korean Studies in the Faculty of Arts and Social Sciences offers a range of Japanese and Korean language and non-language area studies elective courses to students, including courses in Japanese and Korean cultural studies, business and management and technical language. For students with HSC or other Japanese and Korean language studies, a multipoint entry system operates and, subject to an individual placement test, students will be allocated to the most suitable course level.

Note/s: For students admitted in their first year of studies to JAPN2000 or KORE2000 or higher on the grounds of ability and/or previous study, such courses will be counted as Level 1 courses in terms of degree regulations. No student will be permitted to enrol in courses carrying more than 12 upper level units of credit in any School/area of studies under this provision.

JAPN1000
Japanese Communication 1A
Staff Contact: School Office
UOC6 HPW5 S1
Introduction to modern Japanese interactive skills, ie. listening, speaking, reading, writing, rules of communication, and socio cultural knowledge of present-day Japan and local Japanese community, essential to basic survival interaction with Japanese. Emphasis on conversational skills. Hiragana, katakana and approximately 50 Kanji are introduced.

JAPN1001
Japanese Communication 1B
Staff Contact: William Armour
UOC6 HPW5 S2
Prerequisite/s: JAPN1000 or equivalent
Further development of interactive skills in basic Japanese, regarding everyday non-technical topics. Introduction of approximately 150 new Kanji.

JAPN2000
Japanese Communication 2A
Staff Contact: Yoshinori Sasaki
UOC6 HPW5 S1
Prerequisite/s: JAPN1001 or equivalent
Further development of beginner's Japanese interactive skills. Prepares students to become competent in anticipated Australia - Japan contact situations and basic survival situations in Japan. Continued emphasis on oral-aural skill acquisition. Approximately 100 new Kanji are introduced.

JAPN2001
Japanese Communication 2B
Staff Contact: Yoshinori Sasaki
UOC6 HPW5 S2
Prerequisite/s: JAPN2000 or equivalent
Consolidation of oral-aural skills up to intermediate level. Development of reading and writing skills, with another 150 Kanji introduced.

JAPN3000
Japanese Communication 3A
Staff Contact: Chihiro Kinoshita Thomson
UOC6 HPW5 S1
Prerequisite/s: JAPN2001 or equivalent
Equips students with solid linguistic skills at intermediate level, with increasing emphasis on reading and writing. Introduction to a variety of local Australia-Japan contact situations and expanding practical usage of students' interactive skills. Approximately 150 new Kanji are introduced.

JAPN3001
Japanese Communication 3B
Staff Contact: Chihiro Kinoshita Thomson
UOC6 HPW5 S2
Prerequisite/s: JAPN3000 or equivalent
Further development of communicative skills and competence attained in JAPN3000. Students use Japanese in a wider context, thereby increasing vocabulary and knowledge of grammatical structures. Another 150 Kanji are introduced.

JAPN2300
Professional Japanese Communication
Staff Contact: Department of Japanese and Korean Studies
UOC6 HPW3 S1
Prerequisite/s: JAPN1001 or equivalent
Note/s: Excluded JAPN3001 or above. Not offered in 2000
Students develop communicative competence in spoken and written professional Japanese at early intermediate level, relevant to a variety of business and commercial situations. The course emphasises professional language use including both linguistic and para-linguistic politeness.

JAPN2500
Japanese Society, Culture and Economy
Staff Contact: Department of Japanese and Korean Studies
UOC6 HPW3 S1
Prerequisite/s: JAPN1001
An introduction to Japanese society, history, culture, politics and economy. Topics include social stratification, the role of women, demographic change, the education system, electoral politics, interest-group representation, Japan's economic growth, agriculture and industrial development, the role of the state, Japan's underworld Yakuza and traditional Kabuki theatre.

IBUS2103
Hospitality Japanese
Staff Contact: School of International Business Office
UOC6 HPW3 S2
Prerequisite/s: JAPN1001 or ECON11101
Recent Japanese business and economic performance; corporate strategy; organisational change and human resource management practices; impact of culture on management style and decision-making; industrial organisation and business groups; corporate finance and governance; role of small and medium scale enterprises; quality control and just-in-time production; information structures in the Japanese firm; subcontracting and assembler-supplier relations; FDI and overseas production; Japanese multinational enterprises; human resource management transfer; government-business relations.

IBUS3100
Japanese Communication 3A
Staff Contact: Chihiro Kinoshita Thomson
UOC6 HPW5 S1
Prerequisite/s: JAPN2001 or equivalent
Further development of communicative skills and competence attained in JAPN3000. Students use Japanese in a wider context, thereby increasing vocabulary and knowledge of grammatical structures. Another 150 Kanji are introduced.
JAPN3500
Business Japanese
Staff Contact: Kazue Okamoto
UOC6 HPW3 S2
Prerequisite/s: JAPN3000 or equivalent
Note/s: Excluded JAPN4100 or above
Concentrates on interactive skills for business situations, including reading and writing. Introduction to technical language of accounting, finance, economics and marketing and develops skills needed in typical formal and informal business contact situations, such as business introductions and meetings, business conversation, written channels of communication and business etiquette.

JAPN4000
Japanese Communication 4A
Staff Contact: Hiromi Masumi-So
UOC6 HPW5 S1
Prerequisite/s: JAPN3001 or equivalent
Concentrates on acquisition of late-intermediate to early-advanced interactive skills in Japanese with continued emphasis on reading and writing. Introduction to basic linguistic features of advanced level Japanese and provides opportunities to practice skills needed in typical formal and informal Australia-Japan contact situations. Approximately 150 Kanji are introduced.

JAPN4001
Japanese Communication 4B
Staff Contact: Kazuo Kato
UOC6 HPW5 S2
Prerequisite/s: JAPN4000 or equivalent
Concentrates on acquisition of late-intermediate to early-advanced interactive skills in Japanese with continued emphasis on reading and writing. Introduction to basic linguistic features of advanced level Japanese and provides opportunities to practice skills needed in typical formal and informal Australia-Japan contact situations. Another 150 Kanji are introduced.

JAPN4100
Japanese Communication 5A
Staff Contact: Kazuo Kato
UOC6 HPW5 S1
Prerequisite/s: JAPN4001 or equivalent
Focuses on mid-advanced Japanese interactive skills. Increasing emphasis is placed upon further development of reading and writing abilities. Autonomous learning is encouraged and assisted in acquisition of more advanced interactive skills. Students are given opportunities to improve on competence in professional and business settings. Another 150 Kanji are introduced.

JAPN4101
Japanese Communication 5B
Staff Contact: Kazuo Kato
UOC6 HPW5 S2
Prerequisite/s: JAPN4100 or equivalent
Honors of reading and writing skills attained in JAPN4100. Continued instruction in more advanced conversational and grammatical structures and useful vocabulary for the purpose of business/professional and related areas of communication. A further 250 Kanji are introduced.

JAPN4200
Japanese Communication 6A
Staff Contact: Kazuo Kato
UOC6 HPW5 S1
Prerequisite/s: JAPN4101 or equivalent
Concentrates on further acquisition of interactive skills required in a wider variety of Australia-Japan contact situations. Continued emphasis on autonomous learning and self-monitoring of problem areas in interactive skills. Approximately 250 new Kanji are introduced.

JAPN4201
Japanese Communication 6B
Staff Contact: Kazuo Kato
UOC6 HPW5 S2
Prerequisite/s: JAPN4200 or equivalent
Refining of linguistic and communicative skills acquired in JAPN4200. Another 250 Kanji are introduced, ie. the remaining Jocoyo Kanji.

JAPN4300
Advanced Reading in Japanese A
Staff Contact: Kazuo Kato
UOC6 HPW5 S1
Prerequisite/s: JAPN4201 or permission from Head of Department
Provides opportunity for advanced learners of Japanese with intensive and extensive reading in the language on selected topic(s). Accumulation of Kanji, vocabulary and idiomatic expressions is emphasised.

JAPN4301
Advanced Reading in Japanese B
Staff Contact: Kazuo Kato
UOC6 HPW5 S2
Prerequisite/s: JAPN4300 or permission from Head of Department
Learners are required to continue reading on the selected topic(s) from JAPN4300, prepare a paper and give a formal oral presentation to a group of native Japanese speakers.

JAPN4400
Special Topics in Advanced Japanese
Staff Contact: Department of Japanese and Korean Studies
UOC6 HPW5 S1
Prerequisite/s: Credit average in JAPN courses or permission of Head of Department
Provides students with a framework for analysing problems in the field of Japanese Studies, including a theoretical framework and types and sources of problems. Where possible, students carry out empirical data collection and are guided through the analysis of and search for possible solutions to these problems.

JAPN4401
Readings in Japanese Studies
Staff Contact: Department of Japanese and Korean Studies
UOC6 HPW5 S2
Prerequisite/s: A credit average in JAPN courses or permission of Head of Department
Students read Japanese and English writings in selected fields of Japanese Studies. Students intending to enter Honours program read extensively in the area of their research fields. They develop the ability to read academic writings proficiently and critically, acquire comprehensive understanding of the fields and produce an annotated bibliography of their reading.

Major Sequence in Korean Studies
A major sequence in Korean Studies comprises 42 units of credit, including 38 units of credit from Korean language courses plus IBUS2104 Korean Business.

KORE1000 Korean Communication 1A
KORE1001 Korean Communication 1B
KORE1100 Korean for Background Speakers 1A
KORE1101 Korean for Background Speakers 1B
KORE2000 Korean Communication 2A
KORE2001 Korean Communication 2B
KORE2100 Korean for Background Speakers 2A
KORE2101 Korean for Background Speakers 2B
KORE3000 Korean Communication 3A
KORE3001 Korean Communication 3B
KORE3100 Korean for Background Speakers 3A
KORE3101 Korean for Background Speakers 3B
IBUS2104 Korean Business

KORE1000
Korean Communication 1A
Staff Contact: Department of Japanese and Korean Studies
UOC6 HPW5 S1
Designed to provide beginners with practical language skills for effective communication. Emphasis is on use of the language in basic survival situations. Communicative methods are used to develop in students the four language skills: listening, speaking, reading and writing, within a cultural context. The Korean script, Han-gul, is taught progressively.
KORE1001
Korean Communication 1B
Staff Contact: Department of Japanese and Korean Studies
UOC6 HPW5 S2
Prerequisite/s: KORE1000 or equivalent
Further development of communicative skills in introductory Korean, with emphasis on a variety of real life situations. New communicative functions, vocabulary and grammatical structures are progressively added to knowledge and skills acquired in KORE1000.

KORE1100
Korean for Background Speakers 1A
Staff Contact: Department of Japanese and Korean Studies
UOC6 HPW5 S1
Prerequisite/s: Korean background speakers
Note/s: Contact the Department for the internal eligibility guideline

KORE1101
Korean for Background Speakers 1B
Staff Contact: Department of Japanese and Korean Studies
UOC6 HPW5 S2
Further consolidation and development of language skills acquired in KORE1100. A wider range of texts and authentic materials are used. Approximately 150 new Hanja are introduced.

KORE2000
Korean Communication 2A
Staff Contact: Department of Japanese and Korean Studies
UOC6 HPW5 S1
Prerequisite/s: KORE1001 or equivalent
Further development of communicative skills on the groundwork covered in introductory-level Korean. Allows students to build upon their spoken and written language skills, enabling them to interact in a wider range of communicative situations.

KORE2001
Korean Communication 2B
Staff Contact: Department of Japanese and Korean Studies
UOC6 HPW5 S2
Prerequisite/s: KORE2000 or equivalent
Consolidates and further expands knowledge and skills developed in the previous courses as well as laying the foundation for students who wish to proceed to a third year program. A number of selected Hanja, Sino-Korean characters are introduced to further enhance the students skills to read and comprehend modern Korean mixed script.

KORE2100
Korean for Background Speakers 2A
Staff Contact: Department of Japanese and Korean Studies
UOC6 HPW5 S1
Further development of communicative skills covered in KORE1100 and KORE1101. Concentrates on aspects of language styles, complex grammar, translating techniques, interpretation of texts and cultural aspects in Korean speaking contexts. Approximately 100 new Hanja are introduced.

KORE2101
Korean for Background Speakers 2B
Staff Contact: Department of Japanese and Korean Studies
UOC6 HPW5 S2
Continuation of the work done in KORE2100. Further development of communicative skills covered in KORE1100 and KORE1101. Concentrates on aspects of language styles, complex grammar, translating techniques, interpretation of texts and cultural aspects in Korean speaking contexts. Approximately 100 new Hanja are introduced.

KORE3000
Korean Communication 3A
Staff Contact: Department of Japanese and Korean Studies
UOC6 HPW5 S1
Prerequisite/s: KORE2001 or equivalent
Consolidation of students communicative skills in both spoken and written Korean at intermediate level, with increasing emphasis on reading and writing. It introduces a wider range of communicative topics, vocabulary and grammatical structures and further expands practical usage of students knowledge and interactive skills. Approximately 100 new Hanja are also introduced.

KORE3001
Korean Communication 3B
Staff Contact: Department of Japanese and Korean Studies
UOC6 HPW5 S2
Prerequisite/s: KORE3000 or equivalent
Further development of communicative skills attained in KORE3000 and a new orientation to specific needs in everyday business situations. It equips students with a variety of practical language skills and background information necessary not only for everyday conversation but also for Korean-Australian business situation. Includes systematic practice of communicative skills in the classroom and some field work at the real-life situations in the Sydney Korean business community. Another 150 Hanja are introduced.

KORE3100
Korean for Background Speakers 3A
Staff Contact: Department of Japanese and Korean Studies
UOC6 HPW5 S2
Further consolidates and expands background speakers communicative skills in both spoken and written Korean at an advanced level. Greater emphasis on written language and language styles, complex grammar, translating techniques, interpretation of texts and cultural issues in Korean-speaking contexts. Includes a 1 hour per week seminar on cross-cultural communication. Approximately 100 new Hanja are introduced.

KORE3101
Korean for Background Speakers 3B
Staff Contact: Department of Japanese and Korean Studies
UOC6 HPW5 S2
Continues on from work done in KORE3100. Further consolidates and expands background speakers communicative skills in both spoken and written Korean at an advanced level. Greater emphasis on written language and language styles, complex grammar, translating techniques, interpretation of texts and cultural issues in Korean-speaking contexts. Includes a 1 hour per week seminar on cross-cultural communication. Approximately 100 new Hanja are introduced.

IBUS2104
Korean Business
Staff Contact: School of International Business
UOC6 HPW3 S2
Prerequisite/s: 48 units of credit in the faculties of Arts and Social Sciences, Law, Science or Commerce
An introduction to Korean Economy and Business practice. Topics include: Korea's economic development and growth; economic policies; government-business relations; corporate structure and enterprise groupings; Chaebol; industry system; workplace practices; decision-making procedures; business negotiations and socio-cultural elements in business and management.
Business Law and Taxation

Business Law and Taxation Level I

LEGT1711
Legal Environment of Commerce
Staff Contact: School Office
UOC6 HPW3 WKS14 S1 or S2
Prerequisites: HSC minimum mark required – 2 unit
Contemporary English (60-100), or 2 unit General English (60-100) or 2 unit (50-100) or 3 unit (1-50)
Notes: Restricted to programs 1400, 6810 and Courses 3971 and 3979
The entire fabric of commerce is woven from a complex legal regime, judicial and statutory, which regulates all commercial activity. This course deals with the Australian legal system; the Constitution and Commonwealth/State relations; Parliament and statute law; the courts and case law; the executive and administrative law; the legal process and alternative dispute resolution. Areas of substantive law relevant to commerce are examined including property law (with particular reference to intellectual property), torts law (with particular reference to negligence), contract law, criminal law, commercial entities and transactions, competition and consumer protection.

LEGT1731
Marketing and Distribution Law
Staff Contact: School Office
UOC6 HPW3 WKS14 S1
The marketing and distribution of goods and services operates within a comprehensive regulatory framework. This course examines that framework. Topics include restrictive trade practices implications of distribution with special reference to collusive activity, exclusive dealing, resale price maintenance and abuse of market power; consumer protection and fair trading implications of sales promotion with particular reference to misleading or deceptive conduct and other unfair practices; advertising self regulation; product liability; protection of intellectual property; franchising, licensing and character merchandising.

LEGT1751
Law of Finance and Securities
Staff Contact: School Office
UOC6 HPW3 WKS14 S2
This course examines the regulatory environment for banking and finance with particular reference to lending transactions and the securities taken by all financial institutions that lend for profit. Topics include legal concepts underlying the bank-customer relationship and duties of a banker and customer; foreign currency loans; consumer issues in lending; electronic banking; use and regulation of negotiable instruments (cheques, promissory notes and bills of exchange); corporate fund raising; domestic and international methods of fund raising.

Business Law and Taxation Level II

LEGT7721
Business Transactions
Staff Contact: School Office
UOC6 HPW3 WKS14 S2
Prerequisite/s: LEGT7711
Contract law forms the basis of all important commercial transactions and is essential to a proper understanding of more specialised areas of commercial law. This course examines the general principles of contract law and how they are developed and expanded in relation to specialised commercial transactions including agency, contracts for the sale of goods, guarantees, bankruptcy, negotiable instruments, securities and insurance law. Relevant areas of consumer protection and competition law are also discussed. The common contractual themes in which these areas are grounded will be highlighted, along with the different requirements attaching to the rights and obligations of parties to the transaction in such areas.

LEGT7771
Information Technology Law
Staff Contact: School Office
UOC6 HPW3 WKS14 S2
Prerequisite/s: LEGT7711 or INFS1602
The laws governing information technology. The topics examined include intellectual property law - patents, copyright and confidential information; licensing; technology contracts; tortious liability; product liability; computer crimes; data protection and privacy; and current issues.

Business Law and Taxation Level III

LEGT7741
Business Entities
Staff Contact: School Office
UOC6 HPW4 WKS14 S2
Prerequisite/s: LEGT7721
The law relating to the legal structures available for business including partnerships, joint ventures, trusts and companies. The primary focus is on the modern company and its operation under the Corporations Law. Topics include the nature of the corporate entity; establishing the company and fund raising; shares and dividends; the rights and duties of directors; the position of management; shareholders rights and remedies for their enforcement; insolvency and liquidation.

LEGT7751
Business Taxation
Staff Contact: School Office
UOC6 HPW4 WKS14 S1
Prerequisite/s: LEGT7721
The complexity and comprehensiveness of the Australian taxation system means that tax considerations must be taken into account in most business decisions. An understanding of the structure of the Australian taxation system and of the policy factors that guide legislatures is essential to professional business advisors. This course concentrates on income taxation in Australia. Topics include: concepts of income; allowable deductions; tax accounting; taxation of partnerships, trusts and corporations; anti-avoidance provisions; tax administration; capital gains tax; fringe benefits tax.

Faculty of Life Sciences

LIFE1001
Life Sciences Advanced Seminar I
Staff Contact: Dr L Lutze-Mann
UOC3 HPW2 WKS14 S2
Note/s: Restricted to Advanced Science students
An introduction some to key advances that have taken place in research across the broad range of Life Sciences, and their impacts on their fields. Examples of the latest research and future directions from a broad range of disciplines will be examined critically, with fields covered including biomedical science, environmental science, biotechnology and psychology. Library and WWW searches will consolidate material which will focus on research activities and facilities within the University, including laboratory visits, and discussions with laboratory staff.

LIFE2001
Life Sciences Advanced Seminar II
Staff Contact: Dr P March
UOC3 HPW2 WKS14 S1
Corequisite/s: LIFE1001
Note/s: Restricted to Advanced Science Students
An introduction to the nature of research in the life sciences, theories of the research process, research ethics, the nature of creativity in research and the concepts of discovery and innovation. Literature and electronic information resources for research, written and oral communication of science. Critical evaluation of scientific data and its presentation. Small group analysis of a specialised and innovative aspect of research.
Marine Science

Note: Some subjects that appear in this section may be restricted to students for whom the subject comprises a compulsory part of their program.

Marine Science Level II

MSCI2001
Introductory Marine Science
Staff Contact: Director, Centre for Marine and Coastal Studies
UOC6 HPW4 S1 or S
Note/s: Fieldwork
Ocean basins, sediments, properties of seawater, ocean circulation, coasts and coastal processes. Marine biology and ecology, primary and secondary productivity. Personal expenses will be incurred.

MSCI2051
Coral Reefs: Environment and Ecology
Staff Contact: Professor J Middleton
UOC3
Note/s: Available February and July
Basic oceanographic processes and how these apply in the Great Barrier Reef, the characteristics of the waters of the Great Barrier Reef; the types and development of reefs, corals and reef communities, environmental damage to corals and exploitation of the reef, management by Great Barrier Reef Marine Park Authority. Laboratory classes include a study of the reef flat, its inhabitants, their distributions and interactions, the reef environment and its measurement. Personal expenses will be incurred.

MSCI6200
Coastal Monitoring Techniques
Staff Contact: A/Prof A Albani
UOC6 HPW5 WKS14
Note/s: Field work of up to 4 days is a compulsory part of this subject. Students will incur personal costs. Excluded: GEOL6231

Marine Science Level III

MSCI3001
Physical Oceanography
Staff Contact: Dr MH England or CMCS Director
UOC6 HPW4 WKS14 S2
Prerequisite/s: MSCI2001
Assumed Knowledge: MATH1032 or MATH1231 or MATH1042 or MATH1241
Note/s: Laboratory and fieldwork.
An introduction to the physical properties and circulation of the oceans.
The geography of the sea and properties of seawater. Understanding what controls coastal ocean currents, water-mass formation, upwelling, storm surges and large-scale ocean flow. The dynamics of a range of ocean processes, including waves, tides, beach currents and the El-Nino/Southern Oscillation. Oceanographic instrumentation and the design of ocean measuring programs.

MSCI6300
Coastal Environmental Assessment
Staff Contact: A/Prof A Albani
UOC6 HPW5 WKS14
Note/s: Field work of up to 3 days is a compulsory part of this subject. Students will incur personal costs. Details will be provided in the first week of the course. Excluded: GEOL6231

Marine Science Level IV

MSCI4003
Marine Science 4 (Honours)
Staff Contact: Director, Centre for Marine and Coastal Studies
UOC48 HPW30 WKS28
Prerequisite/s: Completion of program 6831, 6832, 6833 or 6834 including Level III subjects totalling 36 units of credit
The General Education requirements are met within the Honours program by seminars, an essay and participation in discussion groups.

Mathematics

1. Many courses in the School of Mathematics are offered at two levels. The higher level caters for students with superior mathematical ability. Where both levels are offered, the proportion of Distinction and High Distinction grades is lower in the ordinary level. The proportion is lower still in the General Mathematics courses.

2. Students proceeding to Year 4 (Honours) in Mathematics may be required to take some of their Mathematics courses at the higher level. However, students should not think that the higher level courses are intended only for those who are proposing to do Honours. Any student with the ability to undertake higher courses benefits from so doing.

3. Where a course is mentioned at the ordinary level, the equivalent course at the higher level (if any) may be substituted. The higher equivalent of MATH2011 is the pair of courses MATH2110 and MATH2610.

Mathematics Level I

Students whose program requires them to take Mathematics courses in later years must take the standard first year courses MATH1131 Mathematics 1A and MATH1231 Mathematics 1B or their higher equivalents MATH1141 Higher Mathematics 1A and MATH1241 Higher Mathematics 1B. The higher versions cover all of the material in MATH1131 and MATH1231, often at greater depth, and are intended for students who have obtained very high marks in the 3 or 4 unit Mathematics courses of the Higher School Certificate.

Students who do not intend studying Mathematics beyond Year 1 may instead take the courses MATH1011 General Mathematics 1B and MATH1021 General Mathematics 1C or the courses MATH1031 Mathematics for Life Sciences and MATH1041 Statistics for Life and Social Sciences. However, students who select these courses should weigh seriously the implications of their choice because only a limited number of further Mathematics courses will be available to them. (See also the note above on grades awarded.) The single course MATH1011 is also available to students seeking an alternate prerequisite for MATH1131 in cases where they do not meet the normal HSC prerequisites. Students should note, however, that only one of MATH1011 and MATH1131 can be counted in their degree.
The course MATH1081 Discrete Mathematics is an additional Level I course which is highly recommended for all students who intend to major in Mathematics. It may be taken in Stage 1 or Stage 2, depending on the mathematical background of the student.
The course MATH1090 Discrete Mathematics for Electrical Engineers is restricted to students in Electrical Engineering and Telecommunications programs.

MATH1000
Modelling Real-World Phenomena
Staff Contact: School Office
UOC3 HPW2 S2
Note/s: Restricted to students in Advanced Science
Introduction to the process of constructing mathematical models of real-world processes and situations. The emphasis is on using high school and first year university mathematics to seek reasonable solutions to open-ended problems, not on the application of particular mathematical techniques. Examples will be taken from biology,
finance, operations management, computer science, meteorology and other fields. Students will research a large project in teams and present a written and oral report on their results.

MATH1011
General Mathematics 1B
Staff Contact: School of Mathematics First Year Office
U0C6 HPW6 S1 or S2
Prerequisite/s: HSC mark range required: 2 unit Mathematics (60-100) or 2 and 3 unit Mathematics (1-150) or 3 and 4 unit Mathematics (1-200). (These ranges may vary from year to year).
2 unit Mathematics in this instance refers to the 2 unit Mathematics subject which is related to the 3 unit Mathematics subject. It does not refer to the subjects Mathematics in Society or Mathematics in Practice
Note/s: Excluded MATH1031, MATH1131, MATH1141, MATH1151, ECON1202, ECON2291

Functions (and their inverses), limits, asymptotes, continuity; differentiation and applications; integration, the definite integral and applications; inverse trigonometric functions; the logarithmic and exponential functions and applications; sequences and series; mathematical induction; the binomial theorem and applications; introduction to probability theory; introduction to 3-dimensional geometry; introduction to linear algebra.

MATH1021
General Mathematics 1C
Staff Contact: School of Mathematics First Year Office
U0C6 S2 HPW6 or SS HPW9
Prerequisite/s: MATH1011 or MATH1131 or MATH1141
Note/s: Excluded MATH1031, MATH1231, MATH1241, MATH1251, ECON1202, ECON2291

Techniques for integration, improper integrals; Taylor's theorem; first order differential equations and applications; introduction to multivariable calculus; conics; finite sets; probability; vectors, matrices and linear equations.

MATH1031
Mathematics for Life Sciences
Staff Contact: School of Mathematics First Year Office
HPW6 S1
Prerequisite/s: As for MATH1011
Note/s: Excluded MATH1011, MATH1021, MATH1131, MATH1141, MATH1151, MATH1231, MATH1241, MATH1251, ECON1202, ECON2291


MATH1041
Statistics for Life and Social Sciences
Staff Contact: School of Mathematics First Year Office
HPW6 S2
Prerequisite/s: As for MATH1011
Note/s: Excluded MATH2819, MATH2870, MATH2889, ECON1203, ECON2292


MATH1049
Aviation Statistics 1A
Staff Contact: School Office
UOC3 HPW6 WKS8-17 S2
Prerequisite/s: As for MATH1011
Note/s: This course is only available to students in the Aviation program. Its content is the first half of MATH1041. Excludes MATH1041 and all courses excluded by MATH1041.

MATH1059
Aviation Statistics 1B
Staff Contact: School Office
UOC3 HPW6 WKS8-14 S2
Prerequisite/s: MATH1049

Note/s: This course is only available to students in the Aviation program. Its content is the second half of MATH1041. Excludes MATH1041 and all courses excluded by MATH1041.

MATH1081
Discrete Mathematics
Staff Contact: School of Mathematics First Year Office
U0C6 HPW6 S1 or S2
Prerequisite/s: As for MATH1131
Corequisite/s: MATH1313 or MATH1141
Note/s: Excluded MATH1090


MATH1090
Discrete Mathematics for Electrical Engineers
Staff Contact: School of Mathematics First Year Office
UOC3 HPW3 S1
Prerequisite/s: As for MATH1131
Corequisite/s: MATH1313 or MATH1141
Note/s: Excluded MATH1081. Not available in the Science program unless specified as part of a combined degree program

The role of proof in mathematics, logical reasoning and implication, different types of proofs. Sets, algebra of sets, operations on sets, mathematical logic, truth tables, syntax, induction. Recursion, recursive logic, recurrence relations.

MATH1131
Mathematics 1A
Staff Contact: School of Mathematics First Year Office
U0C6 HPW6 S1 or S2
Prerequisite/s: HSC mark range required: 2 unit Mathematics (90-100), or 2 and 3 unit Mathematics (100-150) or 3 and 4 unit Mathematics (1-200). (These ranges may vary from year to year).
2 unit Mathematics in this instance refers to the 2 unit Mathematics subject which is related to the 3 unit Mathematics subject. It does not refer to the subjects Mathematics in Society or Mathematics in Practice
Note/s: Excluded MATH1011, MATH1031, MATH1131, MATH1141, MATH1151, ECON1202, ECON2291

Complex numbers, vectors and vector geometry, linear equations, matrices and matrix algebra, determinants. Functions, limits, continuity and differentiability, integration, polar coordinates, logarithms and exponentials, hyperbolic functions, functions of several variables. Introduction to computing and the Maple symbolic algebra package.

MATH1141
Higher Mathematics 1A
Staff Contact: School of Mathematics First Year Office
U0C6 HPW6 S1
Prerequisite/s: HSC mark range required: 2 and 3 unit Mathematics (145-150) or 3 and 4 unit Mathematics (145-150) (these numbers may vary from year to year)

Note/s: Excluded MATH1101, MATH1031, MATH1131, MATH1151, ECON1202, ECON2291

As for MATH1131 but in greater depth.

MATH1151
Mathematics for Actuarial Studies and Finance 1A
Staff Contact: School Office
UOC6 HPW6 S1
Prerequisite/s: As for MATH131
Note/s: Excluded MATH1011, MATH1031, MATH1131, MATH1141, ECON1202, ECON2291
Vectors and vector geometry, linear equations, matrices and matrix algebra, basic input-output linear models, determinants, least squares approximation, probability and statistics, continuous and differentiable functions, mean value theorem, fundamental theorem of calculus, functions of several variables, Lagrange multipliers, introduction to Matlab.

MATH1231
Mathematics 1B
Staff Contact: School of Mathematics First Year Office
UOC6 S2 HPW6 or SS HPW9
Prerequisite/s: MATH1131 or MATH1141
Note/s: Excluded MATH1021, MATH1031, MATH1241, MATH1251, MATH1151, ECON1202, ECON2291

MATH1241
Higher Mathematics 1B
Staff Contact: School of Mathematics First Year Office
HPW6 S2
Prerequisite/s: MATH1131 or MATH1141, each with a mark of at least 65
Note/s: Excluded MATH1021, MATH1031, MATH1231, MATH1251, ECON1202, ECON2291
As for MATH1231 but in greater depth.

MATH1251
Mathematics for Actuarial Studies and Finance 1B
Staff Contact: School Office
UOC6 S2 HPW6
Prerequisite/s: MATH1151
Note/s: Excluded MATH1021, MATH1031, MATH1231, MATH1241, MATH1251, ECON1202, ECON2291
Complex numbers, vector spaces, polynomial interpolation, linear transformations, Markov processes, eigenvalues and eigenvectors, exact and numerical solution of ordinary differential equations, sequences.

Mathematics Level II
The courses MATH2029 Engineering Mathematics 2A, MATH2039 Engineering Mathematics 2B and MATH2019 Engineering Mathematics 2CE are servicing courses for some Engineering programs and are not available for students in the Science program except where specified as part of a combined degree program. The courses MATH2020 Mathematics 2A and MATH2030 Mathematics 2B are available for students in the Science program who wish to take no more than 6 units of credit in Level II Mathematics.

MATH2029
Engineering Mathematics 2A
Staff Contact: School Office
UOC6 HPW6 S1
Prerequisite/s: MATH1021(CR) or MATH1231 or MATH1241
Note/s: Not available in the Science program unless specified as part of a combined degree program

MATH2039
Engineering Mathematics 2B
Staff Contact: School Office
UOC3 HPW3 S2
Prerequisite/s: MATH1231 or MATH1241
Note/s: Only available to students for whom it is specifically required as part of their program

MATH2049
Mathematics and Statistics for Materials Science A
Staff Contact: School Office
UOC3 HPW3 S1
Prerequisite/s: MATH1231 or MATH1241
Note/s: Only available to students for whom it is specifically required as part of their program
Statistics: graphical data analysis, random variables and their properties, normal and binomial distributions, functions of random variables and their simulation using computers, one and two sample inference methods, simple and multiple linear regression. Mathematics: functions of two variables, double integrals.
MATH2059
Mathematics for Materials Science B
Staff Contact: School Office
UOC3 HPW3 S2
Prerequisite/s: MATH1231 or MATH1241
Note/s: Only available to students for whom it is specifically required as part of their program

Applied Mathematics Level II

MATH2110
Higher Vector Analysis
Staff Contact: School Office
UOC3 HPW2.5 S1
Prerequisite/s: MATH1231 or MATH1241, each with a mark of at least 70
Note/s: Excluded MATH2101, MATH2100
Properties of vectors and tensors; divergence, gradient, curl of a vector; line, surface and volume integrals. Gauss and Stokes theorems. Curvilinear coordinates.

MATH2120
Mathematical Methods for Differential Equations
Staff Contact: School Office
UOC3 HPW2.5 S1 or S2
Prerequisite/s: MATH1231 or MATH1241
Note/s: Excluded MATH2130
Introduction to qualitative and quantitative methods for ordinary and partial differential equations. The following topics are treated by example. Ordinary differential equations: linear with constant coefficients, first-order systems, singularities, boundary-value problems, eigenfunctions, Fourier series. Bessel's equation and Legendre's equation. Partial differential equations: characteristics, classification, wave equation, heat equation, Laplace's equation, separation of variables methods, applications of Bessel functions and Legendre polynomials.

MATH2130
Higher Mathematical Methods for Differential Equations
Staff Contact: School Office
UOC3 HPW2.5 S1 or S2
Prerequisite/s: MATH1231 or MATH1241, each with a mark of at least 70
Note/s: Excluded MATH2120
As for MATH2120 but in greater depth.

MATH2160
Linear Programming
Staff Contact: School Office
UOC3 HPW2 S1
Prerequisite/s: MATH1231 or MATH1241 or MATH1079
Corequisite/s: MATH2501 or MATH2601
A first course in mathematical modelling and solution techniques for linear problems. The revised simplex and dual simplex methods, theory and application of sensitivity analysis, duality theory. Networks, transportation and assignment problems. Examples, applications and computing methods are prominent features.

MATH2180
Operations Research
Staff Contact: School Office
UOC3 HPW2 S2
Prerequisite/s: MATH2160
Modelling and solution techniques for optimization problems of interest to business and industry. Topics are selected from linear programming, integer programming, (discrete) dynamic programming, project scheduling, game theory, queuing theory, inventory theory and simulation. Software packages are used to solve realistic problems.

MATH2200
Discrete Dynamical Systems
Staff Contact: School Office
UOC3 HPW2 S2
Prerequisite/s: MATH1231 or MATH1241
Corequisite/s: MATH2501 or MATH2601
The study of dynamical systems whose states change at discrete points in time. Difference equations, general properties. Linear systems, stability, oscillations, Z-transforms. Nonlinear systems, critical points, periodic cycles, chaotic behaviour. Applications selected from engineering, biological, social and economic contexts.

MATH2220
Continuous Dynamical Systems
Staff Contact: School Office
UOC3 HPW2 S1
Prerequisite/s: MATH1231 or MATH1241
The study of continuous dynamical systems. One-dimensional systems, kinematic waves, applications include traffic flow and waves in fluids. An introduction to the modelling of physical, biological and ecological systems, stability, oscillations and resonance.

MATH2240
Introduction to Oceanography and Meteorology
Staff Contact: School Office
UOC3 HPW2 S1
Prerequisite/s: MATH1231 or MATH1241
An introduction to mathematical models for the circulation of the atmosphere and oceans. The equations of motion are exploited so as to provide simplified models for phenomena including: waves, the effects of the Earth's rotation, the geostrophic wind, upwelling, storm surges. Feedback mechanisms are also modelled: the land/sea breeze, tornadoes, tropical cyclones. Models for large-scale phenomena including El Nino and the East Australian Current will be discussed as well as the role of the atmosphere-ocean system in climate change.

MATH2301
Mathematical Computing A
Staff Contact: School Office
UOC3 HPW4 S1
Prerequisite/s: MATH1231 or MATH1241
An introduction to mathematical computing, programming and visualization using Matlab, with a focus on mathematical modelling and simulation. Introduction to Matlab, floating point arithmetic, difference equations, nonlinear equations, numerical differentiation and integration, initial value problems.

Pure Mathematics Level II

MATH2400
Finite Mathematics
Staff Contact: School Office
UOC3 HPW2 S1 or S2
Prerequisite/s: MATH1081 or MATH1231 or MATH1241
Note/s: MATH1081 Discrete Mathematics is recommended
Positional number systems, floating-point arithmetic, rational arithmetic, congruences. Euclid's algorithm, continued fractions, Chinese remainder theorem, Fermat's theorem, applications to computer arithmetic. Polynomial arithmetic, division algorithm, factorization, interpolation, finite field. Codes, error correcting codes, public-key cryptography.

MATH2410
Automata and Algorithms
Staff Contact: School Office
UOC3 HPW2 S2
Prerequisite/s: MATH1231 or MATH1241
Note/s: MATH1081 Discrete Mathematics is recommended. Not offered in 2000
Finite automata, regular languages and Kleene's theorem. Analysis of fast algorithms for matrix, integer and polynomial manipulation, sorting etc. Discrete and Fast Fourier Transform and applications.
MATH2501
Linear Algebra
Staff Contact: School Office
UOC6 HPW5 S1 or S2
Prerequisite/s: MATH1231 or MATH1241
Note/s: Excluded MATH2509, MATH2501


MATH2509
Linear Algebra for Engineers
Staff Contact: School Office
UOC3 HPW3 S2
Prerequisite/s: MATH1231 or MATH1241
Note/s: Excluded MATH2501, MATH2601. Not available in the Science program unless specified as part of a combined degree program


MATH2510
Real Analysis
Staff Contact: School Office
UOC3 HPW2.5 S1
Prerequisite/s: MATH1231 or MATH1241
Note/s: Excluded MATH2011, MATH2610

Multiple integrals, partial differentiation. Analysis of real valued functions of one and several variables.

MATH2520
Complex Analysis
Staff Contact: School Office
UOC3 HPW2.5 S1 or S2
Prerequisite/s: MATH1231 or MATH1241
Note/s: Excluded MATH2509

Analytic functions, Taylor and Laurent series, integrals. Cauchy's theorem, residues, evaluation of certain real integrals.

MATH2601
Higher Linear Algebra
Staff Contact: School Office
UOC6 HPW5 S1
Prerequisite/s: MATH1231 or MATH1241, each with a mark of at least 70
Note/s: Excluded MATH2501, MATH2509

As for MATH2501, but in greater depth, and with additional material on unitary, self-adjoint and normal transformations.

MATH2610
Higher Real Analysis
Staff Contact: School Office
UOC3 HPW2.5 S1
Prerequisite/s: MATH1231 or MATH1241, each with a mark of at least 70
Note/s: Excluded MATH2011, MATH2510

As for MATH2510 but in greater depth.

MATH2620
Higher Complex Analysis
Staff Contact: School Office
UOC3 HPW2.5 S2
Prerequisite/s: MATH1231 or MATH1241, each with a mark of at least 70
Note/s: Excluded MATH2520

As for MATH2520 but in greater depth.

Statistics Level II
The courses MATH2829, MATH2839, MATH2859 and MATH2899 are not available to Science students unless specified as part of a combined degree program. The course MATH2841 Statistics SS is available for students who wish to take no more than 6 units of credit in Level II Statistics. It cannot be followed by any Level III Statistics courses.

MATH2801
Theory of Statistics
Staff Contact: School Office
UOC6 HPW4 S1
Prerequisite/s: MATH1021(CR) or MATH1231 or MATH1241
Note/s: Excluded MATH2819, MATH2841, MATH2870, MATH2901, BIOS2041

Probability, random variables, standard distributions, bivariate distributions, transformations, central limit theorem, sampling distributions, point estimation, interval estimation, hypothesis testing.

MATH2810
Statistical Computing for Categorical Data
Staff Contact: School Office
UOC3 HPW2 S2
Prerequisite/s: MATH2801
Note/s: Excluded MATH2910

This course will focus on the statistical computing tools appropriate for discrete-valued data. Exploratory and graphical analysis of data using modern statistical packages. Data visualisation. Analysis of cross-tabulated data. Logistic and Poisson regression for analysis of binary and count data. Log-linear models for contingency tables.

MATH2829
Statistics SU
Staff Contact: School Office
UOC3 HPW3 S1
Prerequisite/s: MATH1231 or MATH1241
Note/s: Not available to Science students except where specified as part of a combined degree

Introduction to probability theory, random variables and distributions, sampling distributions, including those of chi-square, t and F. Estimation procedures, including confidence interval estimation with an emphasis on least squares and surveying problems, and computer based exercises.

MATH2831
Linear Models
Staff Contact: School Office
UOC6 HPW4 S2
Prerequisite/s: MATH2801, MATH2810
Note/s: Excluded MATH2931, BIOS2041


MATH2839
Statistics SM
Staff Contact: School Office
UOC3 HPW3 S2
Prerequisite/s: MATH1021 or MATH1231 or MATH1241
Note/s: Excluded MATH1041, MATH2841, MATH2870, MATH2801, MATH2901. Not available in the Science program unless specified as part of a combined degree program

Graphical data analysis. Review of probability, random variables and their properties. The normal and binomial distributions, the central limit theorem. Applications to statistical quality control. Theory of statistical inference including confidence intervals and hypothesis testing with applications to one and two sample problems based on the t- and F- test. Simple and multiple linear regression including data transformations to normality. Design and analysis of experiments, analysis of variance, introduction to factorial designs. Applications will be drawn primarily from the fields of mechanical and mining engineering and industrial design.
MATH2841
Statistics SS
Staff Contact: School Office
UOC6 HPW4 S2
Prerequisite/s: MATH1021 or MATH1231 or MATH1241
Note/s: Excluded MATH2801, MATH2870, MATH2891, MATH2819, BIOS2041. Statistics MATH2841 is included for students desiring to attempt only 6 units of credit in Level II Statistics

An introduction to the theory of probability, with finite, discrete and continuous sample spaces. The standard univariate distributions: binomial, Poisson and normal, an introduction to multivariate distributions. Standard sampling distributions, including those of chi-square, t and F. Estimation by moments and maximum likelihood (including sampling variance formulae, and regression); confidence interval estimation. The standard tests of significance based on the above distributions, with a discussion of power where appropriate. An introduction to experimental design; fixed, random effect models.

MATH2859
Probability, Statistics and Information
Staff Contact: School Office
UOC3 HPW3 S1 or S2
Prerequisite/s: MATH1231 or MATH1241
Note/s: Excluded MATH1041, MATH2841, MATH2870, MATH2801, MATH2901. Not available in the Science program unless specified as part of a combined degree program


MATH2899
Applied Statistics for Chemical Engineers
Staff Contact: School Office
UOC3 HPW3 S2
Prerequisite/s: MATH1231 or MATH1241
Note/s: Not available to Science students except where specified as part of a combined degree

Graphical data analysis. Review of probability, random variables and their properties. The normal and binomial distributions, the central limit theorem. Applications to statistical quality control. Theory of statistical inference including confidence intervals and hypothesis testing with applications to one and two sample problems based on the t- and F-test. Simple and multiple linear regression including data transformations to normality. Design and analysis of experiments, analysis of variance, introduction to factorial designs. Applications will be drawn primarily from the fields of chemical, bioprocess and petroleum engineering. Statistical computing will be based on Matlab.

MATH2901
Higher Theory of Statistics
Staff Contact: School Office
UOC6 HPW4 S1
Prerequisite/s: MATH1231 or MATH1241
Note/s: Excluded MATH2819, MATH2841, MATH2870, MATH2801, BIOS2041

As for MATH2801 but in greater depth.

MATH2910
Higher Statistical Computing for Categorical Data
Staff Contact: School Office
UOC3 HPW2 S2
Prerequisite/s: MATH2901
Note/s: Excluded MATH2810

As for MATH2810 but in greater depth.

MATH2931
Higher Linear Models
Staff Contact: School Office
UOC6 HPW4 S2
Prerequisite/s: MATH2901
Note/s: Excluded MATH2831, BIOS2041

As for MATH2831 but in greater depth.

Mathematics Level III
Students taking a Mathematics major must take MATH3010 unless the professional education requirement is being met in the other discipline of a double major. Normally MATH3010 is taken in Stage 3, but it may be taken in Stage 2 with permission of the Head of School.

Not all Level III courses in Mathematics and Statistics are offered every year. Contact the School for details.

Students proceeding to Year 4 (Honours) in some area of Mathematics should consult with the relevant Department before making a final choice of Level III courses.

MATH3000
Mathematics/Statistics Project
Staff Contact: School Office
UOC6 HPW2 S1 or S2
Prerequisite/s: At least 12 units of credit in Level II Mathematics.
Note/s: Enrolment is subject to approval by the Head of School

Under supervision of an academic staff member of the School of Mathematics a student will undertake a course in reading and/or research on a topic in mathematics or statistics or on applications of mathematics or statistics to other disciplines such as physical, biological or social sciences, economics, finance, computing, etc. The student is expected to write an essay summarizing the results of their project.

MATH3001
Mathematics/Statistics Project
Staff Contact: School Office
UOC6 HPW4 S1 or S2
Prerequisite/s: At least 12 units of credit in Level II Mathematics.
Note/s: Enrolment is subject to approval by the Head of School

Under supervision of an academic staff member of the School of Mathematics a student will undertake a course in reading and/or research on a topic in mathematics or statistics or on applications of mathematics or statistics to other disciplines such as physical, biological or social sciences, economics, finance, computing, etc. The student is expected to write an essay summarizing the results of their project.

MATH3002
Mathematics/Statistics Project
Staff Contact: School Office
UOC12 HPW8 S1 or S2
Prerequisite/s: At least 12 units of credit in Level II Mathematics.
Note/s: Enrolment is subject to approval by the Head of School

Under supervision of an academic staff member of the School of Mathematics a student will undertake a course in reading and/or research on a topic in mathematics or statistics or on applications of mathematics or statistics to other disciplines such as physical, biological or social sciences, economics, finance, computing, etc. The student is expected to write an essay summarizing the results of their project.

MATH3010
Professional Issues and Ethics in Mathematics
Staff Contact: School Office
UOC3 HPW2 S2
Prerequisite/s: Completion of stage 2 of a Mathematics plan or during stage 2 with permission of the Head of School
Note/s: Compulsory for students in most Mathematics plans

Applied Mathematics Level III

Before attempting any Level III Applied Mathematics course, a student must have completed at least 12 units of credit in Level II Mathematics, including the prerequisites specified for individual courses.

Skill in practical numerical computing is highly recommended for students majoring in Applied Mathematics, so they are encouraged to take MATH2301, or an equivalent course, if they have not already done so.

The course MATH3141 is not available to Science students unless specified as part of a combined degree program.

MATH3101
Computer Methods for Differential Equations
Staff Contact: School Office
UOC6 HPW4 S1
Note/s: Excluded MATH3141. This course includes a substantial computing component, and assumes some familiarity with Matlab.

Most mathematical models in engineering, finance and science are based on differential equations. In general these equations cannot be readily solved analytically. This course introduces computational methods for solving, to high accuracy, systems of both initial and boundary value problems for ordinary differential equations. There is a substantial computing component involving implementation of the methods and simulation of some mathematical models using the MATLAB software package on UNIX and Windows-based computer systems. Introduction to approximation of functions based on global interpolation and splines. Explicit and implicit computer methods for non-stiff and stiff initial value problems for ordinary differential equations. Introduction to the shooting, finite difference and orthogonal collocation numerical methods for boundary value problems. Direct computer algebra methods for matrix equations. Implementation of the modern computer methods using MATLAB Spline Toolbox and Ode Suite Package.

MATH3121
Mathematical Methods
Staff Contact: School Office
UOC6 HPW4 S1
Prerequisite/s: MATH2120, MATH2520
Note/s: Excluded MATH3141, MATH3150


MATH3141
Mathematical Methods EE
Staff Contact: School Office
UOC6 HPW4 S2
Prerequisite/s: MATH2501 or MATH2509 and one of MATH2100 or MATH2510 or MATH2111
Note/s: Excluded MATH2120, MATH2130, MATH3101. Not available in the Science program unless specified as part of a combined degree program.


MATH3150
Transform Methods
Staff Contact: School Office
UOC6 HPW2 S2
Prerequisite/s: MATH2520

MATH3161
Optimization Methods
Staff Contact: School Office
UOC6 HPW4 S1
Prerequisite/s: MATH2501, and one of MATH2101 or MATH2100 or MATH2510
Development, analysis and application of methods for optimization problems. Theory of multivariable optimization, including necessary and sufficient optimality conditions, stationary points, Lagrange multipliers, Kuhn-Tucker conditions, convexity and duality. Numerical methods for one dimensional minimization, unconstrained multivariable minimization (including steepest descent, Newton, quasi-Newton and conjugate gradient methods) and constrained multi-variable minimization (including linear programming and quadratic programming).

MATH3181
Optimal Control
Staff Contact: School Office
UOC6 HPW4 S2
Prerequisite/s: MATH2101 or MATH2100 or MATH2510
An introduction to the optimal control of dynamical systems. Mathematical descriptions of dynamical systems. Stability, controllability, and observability. Optimal control. Calculus of variations. Dynamic programming. Examples and applications are selected from biological, economical and physical systems.

MATH3201
Dynamical Systems and Chaos
Staff Contact: School Office
UOC6 HPW4 S2
Prerequisite/s: MATH2120 or MATH3540 or MATH3541
Regular and irregular behaviour of nonlinear dynamical systems. A selection from topics developing the theory of nonlinear differential and difference equations, with applications to physical, biological and ecological systems. Topics from: stability and bifurcation theory, Floquet theory, perturbation methods, Hamiltonian dynamics, resonant oscillations, chaotic systems, Lyapunov exponents, Poincaré maps, homoclinic tangles.

MATH3241
Fluid Dynamics
Staff Contact: School Office
UOC6 HPW4 S1
Prerequisite/s: MATH2011 or MATH2100, MATH2120
The mathematical modelling and theory of problems arising in the fluid of fluids. Cartesian tensors, kinematics, mass conservation, vorticity, Navier-Stokes equation. Topics from inviscid and viscous fluid flow, gas dynamics, sound waves, water waves.

MATH3261
Atmosphere-Ocean Dynamics
Staff Contact: School Office
UOC6 HPW4 S2
Prerequisite/s: MATH2011 or MATH2100, MATH2120
Note/s: Excluded MATH3270
The dynamics underlying the circulation of the atmosphere and oceans are detailed using key concepts such as geostrophy, the deformation radius and the conservation of potential vorticity. The role of Rossby waves, shelf waves, turbulent boundary layers and stratification is discussed. The atmosphere-ocean system as a global heat engine for climate variability is examined using models for buoyant forcing, quasi-geostrophy and baroclinic instability.
MATH3301
Mathematical Computing B
Staff Contact: School Office
UOC6 HPW4 S2
Prerequisite/s: MATH2120, MATH2301

The design and use of computer programs to solve practical mathematical problems. Introduction to Fortran90, partial differential equations, heat equation, iterative methods for linear systems, sparse matrix techniques, mathematical software libraries, code optimization and high performance computing.

Pure Mathematics Level III

Before attempting any Level III Pure Mathematics course, students must have completed at least 12 units of credit in Level II Mathematics, including the prerequisites specified for individual courses. For higher courses, the average performance in the above 12 units of credit should be at distinction level, but this requirement may be relaxed with permission of the Head of Department.

Students wishing to enrol in Level III Higher Pure Mathematics courses should consult with the Pure Mathematics Department before enrolling. The courses MATH3680, MATH3740 and MATH3780 are normally offered only in even numbered years and the courses MATH3670, MATH3730 and MATH3770 only in odd numbered years.

MATH3400
Logic and Computability
Staff Contact: School Office
UOC3 HPW2 S1

The propositional calculus, its completeness and consistency; Turing machines; unsolvable problems; computability and Church's thesis; Godel's incompleteness theorems.

MATH3411
Information, Codes and Ciphers
Staff Contact: School Office
UOC6 HPW4 S2
Note/s: MATH1081 Discrete Mathematics is recommended

Discrete communication channels: information theory, compression and error control coding, cryptography.

MATH3430
Symbolic Computing
Staff Contact: School Office
UOC3 HPW2 S2
Note/s: MATH1081 Discrete Mathematics is recommended

Principles of, uses of and algorithms underlying symbolic computing systems. Applications in pure and applied mathematics using a variety of symbolic computing systems.

MATH3511
Transformations, Groups and Geometry
Staff Contact: School Office
UOC6 HPW4 S2
Note/s: Excluded MATH3710, MATH3780

Euclidean geometry, geometry of triangles, transformations, groups, symmetries, projective geometry.

MATH3521
Algebraic Techniques in Number Theory
Staff Contact: School Office
UOC6 HPW4 S1
Note/s: Excluded MATH3710, MATH3740

The integers, residue class arithmetic, theorems of Lagrange, Fermat and Euler, groups of units, Chinese remainder theorem, primitive roots, Gaussian integers, division algorithm and principal ideals in Z[i], quadratic residues, algebraic number fields, extensions, Eisenstein's test, ruler and compass constructions.

MATH3531
Topology and Differential Geometry
Staff Contact: School Office
UOC6 HPW4 S2
Prerequisite/s: MATH2011 or MATH2510
Note/s: Excluded MATH3760

Elementary combinatorial topology of surfaces, classification of surfaces, Euler characteristic, curves and surfaces in space, Gaussian curvature, Gauss theorem, Gauss-Bonnet theorem.

MATH3541
Differential Equations
Staff Contact: School Office
UOC6 HPW4 S1
Prerequisite/s: MATH2501, MATH2520
Note/s: Excluded: MATH3641

Initial value problems, linear systems, variation of parameters, applications to physical and biological systems, autonomous nonlinear systems, Lyapunov's method, linear approximations, plane autonomous systems, cycles and bifurcations, the Poincare-Bendixson theorem, introduction to first order PDEs, classification and normal forms for second order equations, the Cauchy-Kowalewski Theorem, Dirichlet and Neumann problems associated with the Laplace operator in two variables.

MATH3560
History of Mathematics
Staff Contact: School Office
UOC3 HPW2 S2

Topics from the history of mathematics, with emphasis on the development of those ideas and techniques used in undergraduate courses. Students are expected to read widely and to present written material based on their readings.

MATH3570
Foundations of Calculus
Staff Contact: School Office
UOC3 HPW2 S1
Note/s: Excluded MATH3610

Properties of the real numbers, convergence of sequences and series, properties of continuous and differentiable functions of a real variable.

MATH3610
Higher Real Analysis
Staff Contact: School Office
UOC3 HPW2 S1
Prerequisite/s: MATH2610 or MATH2011(CR) or MATH2510(CR)
Note/s: Excluded MATH3570

The limit processes of analysis, metric spaces, uniform convergence, Arzelà-Ascoli theorem, Stone-Weierstrass theorem, Riemann integral.

MATH3620
Higher Functional Analysis
Staff Contact: School Office
UOC3 HPW2 S2
Prerequisite/s: MATH3610, MATH2601 or MATH2510(CR)


MATH3630
Higher Integration and Mathematical Probability
Staff Contact: School Office
UOC3 HPW2 S2
Prerequisite/s: MATH3610

MATH3641
Higher Differential Equations
Staff Contact: School Office
UOC6 HPW2 S1
Prerequisite/s: MATH2501(CR) or MATH2601, MATH2520 (CR) or MATH2620
Note/s: Excluded MATH3541
As for MATH3541 but in greater depth.

MATH3670
Higher Set Theory and Topology
Staff Contact: School Office
UOC3 HPW2 S1
Corequisite: MATH3610
Note/s: This course is offered in odd numbered years only eg. not offered in 2000
Set theory, axiom of choice, ordinals and cardinals, topological spaces, compactness, quotient topologies.

MATH3680
Higher Complex Analysis
Staff Contact: School Office
UOC3 HPW2 S1
Corequisite: MATH2620 or MATH2520 (CR)
Note/s: MATH3610 is recommended. This course is offered in even numbered years only
Topics in advanced complex function theory from: conformal mappings, analytic continuation, entire and meromorphic functions, elliptic functions, asymptotic methods, integral formulae, harmonic functions, Riemann surfaces.

MATH3710
Higher Algebra I
Staff Contact: School Office
UOC3 HPW2 S1
Prerequisite/s: MATH2601 or MATH2501(CR)
Note/s: Excluded MATH3511, MATH3521
Groups, sub-groups, factor groups, matrix groups, Sylow theorems, isomorphism theorems, rings, ideals, factor rings, fields, algebraic and transcendental extensions, constructability, finite fields.

MATH3720
Higher Algebra II
Staff Contact: School Office
UOC3 HPW2 S2
Prerequisite/s: MATH3710
Galois theory, additional group theory, representations and characters of finite groups.

MATH3730
Higher Advanced Algebra
Staff Contact: School Office
UOC3 HPW2 S2
Prerequisite: MATH3710
Note/s: This course is offered in odd numbered years only eg. not offered in 2000
Topics from: rings, commutative rings, factorisation theory, modules, associative and Lie algebras, Wedderburn theory, category theory.

MATH3740
Higher Number Theory
Staff Contact: School Office
UOC3 HPW2 S2
Note/s: Excluded MATH3521. This course offered in even numbered years only
Topics from: elementary number theory, prime numbers, number theoretic functions, Dirichlet series, prime number theorem, continued fractions, Diophantine approximation, quadratic reciprocity, algebraic number theory, class number theorem.

MATH3760
Higher Topology and Differential Geometry of Surfaces
Staff Contact: School Office
UOC3 HPW2 S1
Prerequisite/s: MATH2601 or MATH2501(CR), MATH2610 or MATH2011(CR) or MATH2510(CR)
Note/s: Excluded MATH3531
Classification of surfaces: homotopy, homology, Euler characteristic. Embedded surfaces: differential geometry, Gauss-Bonnet and de Rham theorems.

MATH3770
Higher Calculus on Manifolds
Staff Contact: School Office
UOC3 HPW2 S2
Prerequisite: MATH3760
Note/s: This course is offered in odd numbered years only eg. not offered in 2000
Manifolds, vector fields, flows, introduction to Morse theory, differential forms, Stokes theorem, de Rham cohomology.

MATH3780
Higher Geometry
Staff Contact: School Office
UOC3 HPW2 S2
Prerequisite/s: MATH2601 or MATH2501(CR), MATH3710
Note/s: Excluded MATH3511. This course offered in even numbered years only
Axiomatic geometry, affine geometry, Desargues theorem, projective geometry, spherical and hyperbolic geometry.

Statistics Level III
Not all level III statistics subjects are offered every year. Contact the department of statistics for details.

MATH3801
Probability and Stochastic Processes
Staff Contact: School Office
UOC6 HPW4 S1
Prerequisite/s: MATH2501, MATH2011 or MATH2510, MATH2601
Note/s: Excluded MATH3901

MATH3811
Statistical Inference
Staff Contact: School Office
UOC6 HPW4 S1
Prerequisite/s: MATH2831
Note/s: Excluded MATH3840, MATH3850, MATH3911, MATH3940, MATH3950

MATH3821
Statistical Modelling and Computing
Staff Contact: School Office
UOC6 HPW4 S2
Prerequisite/s: MATH2831, MATH2810
Note/s: Excluded MATH3800, MATH3810
Use of major statistical packages such as Splus, SAS, Matlab. Model selection and regression diagnostics in multiple linear regression. Theory and application of generalised linear model and nonlinear

MATH3830
Design and Analysis of Experiments
Staff Contact: School Office
UOC6 HPW4 S2
Prerequisite/s: MATH2801
Note/s: Excluded MATH3930
Prerequisites: MATH2840, MATH2940, MATH3931
Note/s: Excluded MATH3820, MATH3870, MATH3920, MATH3941, MATH3970
Prerequisite/s: MATH3820, MATH3870, MATH3920, MATH3941, MATH3970
Note/s: Excluded MATH3930
Prerequisite/s: MATH2840, MATH2940, MATH3931
Note/s: Excluded MATH3820, MATH3870, MATH3920, MATH3941, MATH3970

MATH3841
Statistical Analysis of Dependent Data
Staff Contact: School Office
UOC6 HPW4 S2
Prerequisite/s: MATH3811
Note/s: Excluded MATH3820, MATH3870, MATH3920, MATH3941, MATH3970
Prerequisite/s: MATH3820, MATH3870, MATH3920, MATH3941, MATH3970
Note/s: Excluded MATH3941, MATH3970
Prerequisite/s: MATH3820, MATH3870, MATH3920, MATH3941, MATH3970
Note/s: Excluded MATH3930
Prerequisite/s: MATH2840, MATH2940, MATH3931
Note/s: Excluded MATH3820, MATH3870, MATH3920, MATH3941, MATH3970

MATH3890
Advanced Probability
Staff Contact: School Office
UOC6 HPW4 S2
Prerequisite/s: MATH3801
Note/s: Excluded MATH3980
Prerequisite/s: MATH3801
Note/s: Excluded MATH3980
Note/s: Excluded MATH3811, MATH3840, MATH3850, MATH3940, MATH3950
As for MATH3811 but in greater depth.

MATH3911
Higher Statistical Inference
Staff Contact: School Office
UOC6 HPW4 S1
Prerequisite/s: MATH2931
Note/s: Excluded MATH3811, MATH3840, MATH3850, MATH3940, MATH3950
As for MATH3811 but in greater depth.

MATH3930
Higher Design and Analysis of Experiments
Staff Contact: School Office
UOC6 HPW4 S2
Prerequisite/s: MATH2901
Note/s: Excluded MATH3830
As for MATH3830 but in greater depth.

MATH3931
Higher Statistical Methods in Social and Market Research
Staff Contact: School Office
UOC6 HPW4 S2
Prerequisite/s: MATH2901
Note/s: Excluded MATH2840, MATH2940, MATH3931
As for MATH3831 but in greater depth.

MATH3941
Higher Statistical Analysis of Dependent Data
Staff Contact: School Office
UOC6 HPW4 S2
Prerequisite/s: MATH2901
Note/s: Excluded MATH3820, MATH3841, MATH3920, MATH3970
As for MATH3841 but in greater depth.

MATH3980
Higher Advanced Probability
Staff Contact: School Office
UOC6 HPW4 S2
Prerequisite/s: MATH2901
Note/s: Excluded MATH3880
As for MATH3880 but in greater depth.

Mathematics Level IV
To enter Mathematics Level IV, students must have completed a MATH major in the Science program, including at least 30 units of credit in Level III Mathematics, or have completed Stage 3 of one of the MATH plans in the Advanced Science program. In addition, students must have permission from the Head of the appropriate Department.

Students will normally be required to have a credit average in their Level III Mathematics courses and to have shown some evidence of the ability to undertake independent study. In special cases, other courses may be substituted for the Mathematics courses. Students should discuss their selection of Level III courses with the Head of the appropriate Department. For Honours Pure Mathematics, some higher level Mathematics courses should normally be included at Levels II and III.

Courses MATH4003/MATH4004, MATH4103/MATH4104, MATH4803/MATH4804 and MATH4903/MATH4904 lead to the award of an Honours degree.

The Mathematics and Finance plan in the Advanced Science program is a four year plan in which honours may be awarded based on a weighted average of all the courses studied in the plan.

MATH4003
Mathematics and Computer Science Honours
Staff Contact: School Office
UOC48
Prerequisite/s: Completion of a double major in Computer Science and Mathematics in program 3978 or completion of Stage 3 of the Mathematics and Computer Science plan in the Advanced Science program. Approval by the Head of School is also required
Note/s: See the preamble for Mathematics Level IV
Undergraduate thesis in Applied Mathematics or Pure Mathematics together with advanced lectures on topics chosen half from MATH4103 or MATH4603, and half from Computer Science.

**MATH4004**

Mathematics and Computer Science Honours (Part time)

*Staff Contact: School Office*

*UOC48*

Prerequisite/s: Completion of a double major in Computer Science and Mathematics in program 3978 or completion of Stage 3 of the Mathematics and Computer Science plan in the Advanced Science program. Approval by the Head of School is also required

*Note/s:* See the preamble for Mathematics Level IV.

Undergraduate thesis in Applied Mathematics or Pure Mathematics together with advanced lectures on topics chosen half from MATH4103 or MATH4603, and half from Computer Science

**MATH4012**

Mathematics and Finance Thesis Project

*Staff Contact: School Office*

*UOC12  HPW5*

Prerequisite/s: Completion of Stage 3 of the Mathematics and Finance plan in the Advanced Science program.

Under the supervision of a member of the academic staff of the School of Mathematics a student will undertake a major project in mathematics and finance. The project could range from reading and/or research on theoretical aspects to financial engineering involving implementation of a practical model in C/C++. Research interaction with the finance industry is encouraged. The student will write a thesis summarising the result of their project and make a presentation of it.

**MATH4103**

Applied Mathematics 4 (Honours)

*Staff Contact: School Office*

*UOC48*

Prerequisite/s: Completion of a major in Mathematics or Physical Oceanography/Meteorology in the Science program, including at least 30 units of credit of Level III Mathematics, or completion of Stage 3 of the Applied Mathematics or Physical Oceanography/Meteorology plan in the Advanced Science program. Approval from the Head of Department is also required

*Note/s:* See the preamble for Mathematics Level IV

Skill in practical numerical computing is highly recommended for students taking this course. Those students who have not already taken a suitable computing course may be required to take a short bridging course. Undergraduate thesis together with advanced lectures on topics chosen from the following fields: advanced mathematical methods for applied mathematics, advanced optimization, numerical analysis, theory of linear and non linear dynamical systems, optimal control, operations research, functional analysis and applications, mathematics of economic models and of economic prediction, fluid mechanics, oceanography, micro-hydrodynamics, and analytical and numerical solution of partial differential equations. May also include advanced lectures given by other Departments or Schools.

**MATH4104**

Applied Mathematics 4 (Honours) (part time)

*Staff Contact: School Office*

*UOC48*

Prerequisite/s: Completion of a major in Mathematics or Physical Oceanography/Meteorology in the Science program, including at least 30 units of credit of Level III Mathematics, or completion of Stage 3 of the Applied Mathematics or Physical Oceanography/Meteorology plan in the Advanced Science program. Approval from the Head of Department is also required

*Note/s:* See the preamble for Mathematics Level IV

Skill in practical numerical computing is highly recommended for students taking this course. Those students who have not already taken a suitable computing course may be required to take a short bridging course

Undergraduate thesis together with advanced lectures on topics chosen from the following fields: advanced mathematical methods for applied mathematics, advanced optimization, numerical analysis, theory of linear and non linear dynamical systems, optimal control, operations research, functional analysis and applications, mathematics of economic models and of economic prediction, fluid mechanics, oceanography, micro-hydrodynamics, and analytical and numerical solution of partial differential equations. May also include advanced lectures given by other Departments or Schools.

**MATH4603**

Pure Mathematics 4 (Honours)

*Staff Contact: School Office*

*UOC48*

Prerequisite/s: Completion of a major in Mathematics in the Science program, including at least 30 units of credit of Level III Mathematics, or completion of Stage 3 of the Pure Mathematics plan in the Advanced Science program. Approval from the Head of Department is also required

*Note/s:* See the preamble for Mathematics Level IV

Undergraduate thesis together with advanced lectures on topics chosen from the fields of current interest in Pure Mathematics. May also include advanced lectures given by other Departments or Schools.

**MATH4604**

Pure Mathematics 4 (Honours) (part time)

*Staff Contact: School Office*

*UOC48*

Prerequisite/s: Completion of a major in Mathematics in the Science program, including at least 30 units of credit of Level III Mathematics, or completion of Stage 3 of the Pure Mathematics plan in the Advanced Science program. Approval from the Head of Department is also required

*Note/s:* See the preamble for Mathematics Level IV

Undergraduate thesis together with advanced lectures on topics chosen from the fields of current interest in Pure Mathematics. May also include advanced lectures given by other Departments or Schools.

**MATH4903**

Theory of Statistics 4 (Honours)

*Staff Contact: School Office*

*UOC48*

Prerequisite/s: Completion of a major in Statistics in the Science program, including at least 18 units of credit of Level III Statistics and a further 12 units of credit of Level III Mathematics or Statistics, or completion of Stage 3 of the Statistics plan in the Advanced Science program. Approval from the Head of Department is also required

*Note/s:* See the preamble for Mathematics Level IV

Undergraduate thesis together with advanced lectures on topics chosen from the following fields: mathematical basis, experimental design, response surfaces, stochastic processes, theories of inference, sequential analysis, nonparametric methods, multivariate analysis, mathematical programming, information theory, discrete distributions. May also include advanced lectures given by other Departments or Schools.

**MATH4904**

Theory of Statistics 4 (Honours) (part time)

*Staff Contact: School Office*

*UOC48*

Prerequisite/s: Completion of a major in Statistics in the Science program, including at least 18 units of credit of Level III Statistics and a further 12 units of credit of Level III Mathematics or Statistics, or completion of Stage 3 of the Statistics plan in the Advanced Science program. Approval from the Head of Department is also required

*Note/s:* See the preamble for Mathematics Level IV

Undergraduate thesis together with advanced lectures on topics chosen from the following fields: mathematical basis, experimental design, response surfaces, stochastic processes, theories of inference, sequential analysis, nonparametric methods, multivariate analysis, mathematical programming, information theory, discrete distributions. May also include advanced lectures given by other Departments or Schools.
Materials Science and Engineering

MATS1002
Microstructural Analysis
Staff Contact: Dr P Krauklis
UOCC HPW3
Note(s): Restricted to Combined degree course 3681

MATS1021
Introduction to Computing
Staff Contact: Dr MJ Hoffman
UOCC HPW2 WKS14
The aim of the course is to gain a basic understanding of the computing applications and practices that are relevant to materials engineering degrees and industry practice. Topics covered are: a brief overview of the place in computing in materials engineering, use of common materials software packages, using the internet as a part of the degree, search engines, email, website composition, and computer programming to solve materials-based problems involving heat transfer and stress analysis.

MATS1052
Materials Engineering 1B
Staff Contact: School Office
UOCC HPW3 WKS14
Heat applications of principles of steady and unsteady heat transfer in the production and application of materials. Course examples are drawn from materials engineering practice in the broadest sense. Heat flow in materials processing involving high temperature solid, liquid and gaseous phases. Thermal properties of dense and porous materials. Heat treatment, casting, sintering, corrosion, etc. Computer programs for calculating heat flow in materials.

MATS1072
Physics of Materials
Staff Contact: Dr S Bandyopadhyay
UOCC HPW3 WKS14
Prerequisite(s): PHYS1002
Interatomic bonding in solid materials. Types of interatomic bonds, metallic, covalent, ionic. Introductory quantum mechanics in one dimension, free electron theory, effects of periodic potential, density of states curves. Effect of electron to atom ratio on conductivity and crystal structure; semiconductors; intrinsic, extrinsic. Exchange energy; ferromagnetism, antiferromagnetism. Elementary perturbation theory, coherent bond; crystal structures, properties. Ionic bond, force models, properties.

MATS1082
Thermodynamics of Materials 1
Staff Contact: A/Prof O Ostrovski
UOCC HPW3 WKS14

MATS1092
Materials and Design 1
Staff Contact: A/Prof A Crosby
UOCC HPW2 WKS14
An appreciation of the relationships between the properties of materials, component design, manufacturing and product performance. Materials selection as an integral part of successful design. Long-term potential for materials improvement and substitution.

MATS1093
Thermodynamics of Materials 2
Staff Contact: A/Prof O Ostrovski
UOCC HPW2 WKS14
Prerequisite(s): MATS1082

MATS1111
Materials Science 1
Staff Contact: A/Prof A G Crosby
UOCC HPW1 WKS14

MATS1112
Phase Equilibria
Staff Contact: School Office
UOCC HPW2 WKS14

MATS1132
Materials Engineering 1A
Staff Contact: Dr V Sahajwalla and Dr S Bandyopadhyay
UOCC HPW4 WKS14
Unit 1 Fluid Flow
S1 HPW3
Dr V Sahajwalla
Fluid flow in materials processing. Application of the principles of fluid flow in the production and application of ceramic and metallic materials. Examples are drawn from ceramic, materials and metallurgical engineering practices in the broadest sense.
Unit 2 Materials Process Principles
S2 HPW1
Dr S Bandyopadhyay
Introduction to engineering calculations. Material balances. Techniques for solving problems including selection of the basis for calculations. General energy balances. Unsteady state material and energy balances. Examples are drawn from ceramic, materials and metallurgical engineering practices.

MATS1142
Crystallography and X-Ray Diffraction
Staff Contact: Dr V Sahajwalla
UOCC HPW3 WKS14

MATS1162
Mechanical Properties of Materials
Staff Contact: Dr P Krauklis
UOCC HPW3 WKS14
MATS1183
Chemistry of the Solid State
Staff Contact: Prof CC Sorrell
UOC3 HPW2 WKS14
Crystal chemistry; nature of bonding in solids, silicate structures; and structure-composition relationships. Glass and glass-ceramics. Reaction with solids, grain boundary and interfacial effects, ceramic reactions, and polymorphic transformations (oxides, non-oxides, alumino-silicates).

MATS1183
Non-Ferrous Physical Metallurgy
Staff Contact: Dr P Krauklis
UOC3 HPW2 WKS14
Constitution, microstructure, processing and properties of non-ferrous alloys. Cast and wrought alloys based on aluminium, copper, magnesium, lead, tin and zinc.

MATS1213
Design for Corrosion Control
Staff Contact: Prof DJ Young
UOC3 HPW2 WKS14

MATS1214
Welding and other Joining Processes
Staff Contact: A/Prof A Crosky
UOC3 HPW2 WKS14
Fusion welding. Capabilities, advantages and limitations. Metallurgical aspects of fusion welding. Cause of welding defects and weldability of carbon and alloy steels, stainless steels, aluminium and other common non-ferrous alloys. Design of welded fabrications to reduce distortion and the risk of failure by fatigue, brittle fracture, etc. Soldering, brazing, adhesive bonding.

MATS1243
Management 1
Staff Contact: Dr P Krauklis
UOC4 HPW3 WKS14

MATS1244
Management 2
Staff Contact: Dr P Krauklis
UOC6 HPW4 WKS14
The major issues, research findings and management strategies relating to the human side of enterprise. Topics include management and power, leadership and innovation, managerial decision-making, stress at work, group dynamics and inter-group conflict, organisational design, goal setting and performance appraisal, approaches to personal and organisational development. Marketing and sales; marketing research, marketing strategies, customer relations, total product package. Project management: project planning and scheduling, contract planning and control, recent developments.

MATS1254
Design Project
Staff Contact: A/Prof A Crosky
UOC4 HPW4 WKS28
This project will cover the design of a selected piece of processing equipment or an engineering component. It will involve selection and specification of materials and other relevant aspects covered within the undergraduate program.

MATS1283
Ferrous Physical Metallurgy 1
Staff Contact: Dr P Krauklis
UOC3 HPW3

MATS1294
Electrical Ceramics
Staff Contact: Dr OC Standard
UOC4 HPW3

MATS1333
Pyrometallurgy-1
Staff Contact: A/Prof O Ostrovski
UOC6 HPW2
Unit 1 Refractories
Staff Contact: Prof C Sorrell
S2 HPW 2
Classification of refractories. Chemical and physical properties of refractories. Introduction to raw materials and manufacturing technology. A detailed study of chemical reactions occurring between refractories and solid, liquid and gas phases in ferrous and non-ferrous metal industry. Review of phase equilibria.
Unit 2 Pyrometallurgical Processes 2
Staff Contact: A/Prof O Ostrovski
S2 HPW 4
The unit includes two components: (1) extractive etallurgy laboratory and (2) metallurgical plant practice.

MATS1344
Pyrometallurgy-2
Staff Contact: A/Prof O Ostrovski
UOC8 HPW6
Pre-requisites: MATS9650 Pyrometallurgical Processes The subject includes three components: (1) selective topics in iron making (advanced blast furnace and alternative iron making), steel making (BOF process) and non-ferrous metallurgy, (2) extractive metallurgy laboratory and (3) metallurgical plant practice.

MATS1364
Composite and Electronic Materials
Staff Contact: A/Prof A Crosky
UOC3 HPW3 S2
Unit 1 Composite Materials
Unit 2 Electron Materials
Semiconductor devices: materials, principles, properties, fabrication and applications.

MATS1414
Surface Treatments and Wear
Staff Contact: Dr P Krauklis
UOC3 HPW2
MATS1464
Professional Communication and Presentation
Staff Contact: Prof CC Sorrell
UOC3 HPW1 WKS28

MATS1534
Design with Brittle Materials
Staff Contact: Dr MJ Hoffman
UOC4 HPW3 WKS14
Incorporates MATS4333 Fracture Mechanics plus effects of composition, microstructure, and physical properties on the mechanical properties of ceramics, design approaches for ceramics, inspection and non-destructive testing of ceramics, and case studies.

MATS1584
Specialty Alloys
Staff Contact: Dr P Krauklis
UOC4 S2
Prerequisite/s: MATS1283

MATS2153
Ceramic Processing Laboratory
Staff Contact: Dr OC Standard
UOC3 HPW3 WKS14
Laboratory program illustrating processing and engineering aspects of ceramic technology. Students are required to take part in a series of factory inspections.

MATS2183
Refractories
Staff Contact: Prof CC Sorrell
UOC3 HPW2 WKS14
Classification of refractories. Chemical and physical properties of refractories. Introduction to raw materials and manufacturing technology. A detailed study of chemical reactions occurring between refractories and solid, liquid and gas phases in ferrous and nonferrous metal industries. Review of phase equilibria.

MATS2203
Physico Chemical Ceramics Laboratory
Staff Contact: Prof CC Sorrell
UOC3 HPW3 WKS14
Laboratory program illustrating the physical and chemical properties associated with the processing and performance of ceramic materials. Students are required to take part in a series of factory inspections.

MATS2213
Diffusion
Staff Contact: Prof DJ Young
UOC3 HPW2 WKS14
Fick’s first and second laws. Solutions for short and long times by analytical and numerical methods. Boundary conditions for solid-fluid and solid-solid interfaces. Diffusion couples. Atomic level diffusion theory.

MATS2223
Phase Transformations
Staff Contact: School Office
UOC4 HPW3 WKS14

MATS2263
Sintering of Ceramics
Staff Contact: Dr OC Standard
UOC3 HPW2 WKS14 S1

MATS2284
Thermal Properties of Ceramics
Staff Contact: Prof CC Sorrell
UOC3 HPW2 WKS14

MATS2313
Chemistry of Ceramics
Staff Contact: Prof CC Sorrell
UOC3 HPW2 WKS14
Geological origin and classification of ceramic raw materials. Composition, crystal structures, physical properties, chemical reactions, and physical aspects of production of: clay minerals and commercial clays, silicates, porcelain, whitewares, cements and plaster, advanced high purity ceramics, refractory oxides, and ceramics.

MATS2314
Glass-Based Ceramics
Staff Contact: Dr OC Standard
UOC3 HPW2 WKS14

MATS2343
Ceramic Processing and Design 1
Staff Contact: Dr OC Standard
UOC3 HPW2 WKS14 S1
MINET341 Mineral Process Engineering (HPW2) and introduction to the ceramic processing (HPW1) which consists of the nature of ceramics; scope of the ceramic industry and overview of unit operations; preparation of raw materials; powder processing; body formulation; objectives of ceramic forming methods; particle packing; introduction to forming methods used in ceramics processing; and introduction to drying and firing of ceramics.
MATS2353 Ceramic Processing and Design 2
Staff Contact: Dr OC Standard
UOC4 HPW2 WKS14
Prerequisite/s: MATS2343


MATS3443 Polymer Science and Engineering
Staff Contact: Dr S Bandyopadhyay
UOC3 HPW3


MATS3524 Project
Staff Contact: Dr V Sahajwalla
UOC12 HPW6 WKS28

An experimental or technical investigation or design related to some aspects of materials engineering in the specific discipline (ceramic engineering, metallurgical engineering or materials engineering).

MATS3564 Polymer Engineering 1
Staff Contact: Dr S Bandyopadhyay
UOC4 HPW3 WKS14
Prerequisite/s: MATS3443


MATS3574 Polymer Engineering 2
Staff Contact: Dr S Bandyopadhyay
UOC3 HPW3 WKS14
Prerequisite/s: MATS3443


MATS4113 Fractographic Analysis and Non-Destructive testing
Staff Contact: A/Prof A Crosby
UOC4 HPW4 WKS14
Unit 1 Fractographic Analysis
S2 HPW3

Classification of macroscopic and microscopic fracture mechanisms. Initiation and propagation of ductile brittle, fatigue, stress corrosion and corrosion fatigue fractures. Effect of material defects, design deficiencies and incorrect processing on the origin and cause of fracture. Analysis of various modes of fracture using fractographic techniques involving optical microscopy and scanning and transmission electron microscopy.

Unit 2 Non-Destructive Testing
S2 HPW1


MATS4333 Fracture Mechanics
Staff Contact: Dr MJ Hoffman
UOC3 HPW2 WKS14


MATS4613 Deformation of Metals and Metal Forming Processes
Staff Contact: A/Prof A Crosby
UOC3 HPW3 WKS14 S1


MATS4623 Strengthening Mechanisms In Metals
Staff Contact: A/Prof P Munroe
UOC3 HPW2

Strengthening mechanisms, creep, fracture, grain size dependence of strength. Introduction to generation of deformation and recrystallisation textures. Measurements of age-hardening, activation energy of strain ageing.

MATS5253 Metallurgical Reaction Engineering
Staff Contact: A/Prof O Ostrovski
UOC3 HPW2 WKS14


MATS5273 Extractive Metallurgy
Staff Contact: A/Prof O Ostrovski
UOC8 HPW4 WKS14

Unit 1 Mineral Process Engineering
Staff Contact: School of Mining Engineering,
S1 HPW2


Unit 2 Hydrometallurgical Processes
Staff Contact: School of Chemical Engineering and Industrial Chemistry
S1 HPW2

Application of principles of aqueous thermodynamics, electrochemistry, chemical and electrochemical kinetics to hydrometallurgical processes: leaching of mineral and concentrates, solution purification, precipitation, and other separation processes, ion-exchange and liquid-liquid extraction, electrowinning and electrefining.
Unit 3 Pyrometallurgical Processes 1
Staff Contact: A/Prof O Ostrovski
S1 HPW2

MATS5313
Kinetics and Mass Transfer in Metallurgical Processes
Staff Contact: Dr A Yu
UOC8 HPW6 WKS14
Unit 1 Kinetics of Metallurgical Processes
Staff Contact: A/Prof A Yu
S1 HPW4

Unit 2 Heat, Fluid and Mass Flow in Materials Processing
Staff Contact: Dr V Sahajwalla
S1 HPW2
In-depth understanding of fundamental principles dictating transport phenomena in materials processing. Development of governing equations related to the transfer of fluid, energy and mass and their inter-dependence based upon fundamentals to analyse and solve problems encountered in current metallurgical operating environments. Application of understanding developed to the emerging new technologies for metals processing such as direct reduction and smelting for iron making and near net shape casting.

MATS5323
Modelling in Materials Engineering
Staff Contact: Dr A Yu
UOC3 HPW4
The subject introduces a range of numerical and analytical modelling techniques and then applies them to situations faced in materials science and engineering. Initially the pre-requisite knowledge is reviewed. Topics then covered are finite difference modelling and finite element modelling. These techniques are then applied to stress analysis, fluid flow and heat transfer. A number of commercial software packages are introduced as well as designing computer programs to suit specific situations.

MATS5384
Air Pollution Control In the Metallurgical Industry
Staff Contact: Dr V Sahajwalla
HPW 1
Air pollutants from the different metallurgical industries. Technical principles and equipment to control the emission of pollutants. Examples from the primary and secondary metallurgical industries.

MATS5394
Pollution Control In Materials Processing
Staff Contact: Dr V Sahajwalla
UOC3 HPW2 WKS14
Pollutants from the different materials processing routes. Technical principles and equipment to control the emission of pollutants. Examples from the metallurgical and ceramic industries.

MATS9520
Engineering Materials
Staff Contact: A/Prof A Crosky
UOC3 HPW3 WKS14
Microstructure and structure-property relationships of the main types of engineering materials (metals, polymers, ceramics and composites). Micromechanisms of elastic and plastic deformation. Fracture mechanisms for ductile, brittle, creep and fatigue modes of failure in service; corrosion. Metal forming by casting and wrought processes. Phase equilibria of alloys; microstructural control by thermomechanical processing and application to commercial engineering materials. Laboratory and tutorial work includes experiments on mechanical testing, cast and recrystallised structures, ferrous and non-ferrous microstructures, and fracture and failure analysis.

MATS9530
Materials Engineering
Staff Contact: Prof CC Sorrell
HPW3 S2
Prerequisite(s): MATS9520
Materials used in Mechanical Engineering and related fields (Manufacturing Engineering Management, Aerospace Engineering, Naval Architecture) are discussed with emphasis on the dependence of properties and performance on microstructure. Aspects of materials selection during the design of engineering components that affect the service performance in applications, where failure can occur by brittle fracture, corrosion, creep or fatigue, will also be discussed.

MATS9550
Pyrometallurgical Processes
Staff Contact: A/Prof O Ostrovski
UOC3 HPW2 WKS14 S2
Principles and development of pyrometallurgical processes and a review of the unit operations, roasting, sintering, smelting and refining for the treatment of ferrous and non-ferrous minerals.

MATS9712
Materials and Techniques in Design Craft 1
Staff Contact: Prof CC Sorrell
UOC4 HPW3 WKS14 S1
An introduction to the science and technology of materials, emphasizing relationships between structure, composition and properties. Introduction to processing of metallic, ceramic and fibrous materials. Materials recognition and design possibilities are discussed.

MATS9722
Materials and Techniques in Design Craft 2B
Staff Contact: Prof CC Sorrell
UOC4 HPW3 WKS14 S2
Metals: Casting, working, and surface finishing of metals and alloys; soldering, brazing, and welding. Gemstones: survey of gem materials (crystalline, massive, organic) and identification methods. Enamels: practical considerations and skills.

MATS9732
Materials and Techniques in Design Craft 2C
Staff Contact: Prof CC Sorrell
UOC4 HPW3 WKS14 S2

Mechanical and Manufacturing Engineering

Mechanical and Manufacturing Engineering Level I

AVEN1310
Basic Mechanics
Staff Contact: Dr K Zarrabi
UOC3 HPW2 S1
The subject explains the basic concepts in statics and strength of materials including Newton’s Laws, SI system of units, two-dimensional force systems, moments and couples, equilibrium in two dimensions, stress, strain, stiffness and flexibility, analysis of
bars, bending stress and measurement of strain, material properties, theories of failure and composite materials.

AVEN1910
Introduction to Aircraft Engineering
Staff Contact: Mr J Page
UOC3 HPW2 S1
An explanation of how aircraft fly and how the engineering technologies relate to the vehicle. Concepts and nomenclature relating to flight vehicles and the significance of aircraft configurations and flight systems

MANF1100
Workshop Technology
Staff Contact: Dr P Mathew
UOC3 HPW3 S1
Note/s: Protective equipment (e.g., safety glasses, safety boots, etc.) is required in order to comply with the Occupational Health and Safety Act. Students must already possess or purchase these items before commencing the course. The price of the items is approximately $100. Students who have done Industrial Arts for the HSC have an appropriate trade or certificate qualification, or are suitably employed, may qualify for exemption from this subject.

The implementation of design and its interaction with manufacturing equipment and processes. Manufacturing capabilities and tolerancing. Approximately 30 hours of practical training which includes welding, fitting and machining.

MECH1120
Design and the Engineering Profession
Staff Contact: A/Prof RB Frost
UOC3 HPW3 WKS14 S1
To introduce the engineering profession; to assess abilities in written expression, to develop a consciousness of the importance of written, pictorial and oral expression in engineering life and to begin to develop these skills; to begin to develop an awareness of the professional attitude. Introduction to engineering hardware and components; geometry, function, manufacture and reasons for various configurations. The design process, problem identification, search for solution concepts, non-technical considerations in design, decision techniques, detail.

MANF1130
Introduction to Manufacturing
Staff Contact: A/Prof P Mathew
UOC6 HPW7 WKS14 S2
Note/s: Protective items (eg safety glasses, safety boots, overalls or dustcoat, etc) are required for the practical training in order to comply with the Occupational Health and Safety Act. Students must possess these items before commencing the course. Students who have done appropriate technology based subjects at school or who have an appropriate trade or certificate qualification or are suitably employed, may seek an exemption for the practical training classes. Excluded MANF1100, MANF1110, MANF1120.

The relationship between product design and manufacturing processes is introduced with theoretical and practical classes. Description and elementary analysis of manufacturing processes such as forming from liquid or solid and material removal. Introduction to drawing techniques for engineering communication which includes freehand sketching and orthogonal projections. Use of computer graphics for modelling and production of detailed drawings of components. Elementary functional analysis of product design for manufacturing and performance. Practical training of approximately 33 hours will involve processes such as welding, fitting and machining as well as introduction to safety in a manufacturing environment.

MECH1300
Engineering Mechanics 1
Staff Contact: A/Prof RAJ Ford
UOC6 HPW4 WKS14 S1S2
Prerequisite/s: As a suitable preparation for this course, it is strongly recommended that students have taken Corequisite/s: MATH1131 or MATH1141
Note/s: Excluded MECH0330

MECH1400
Mechanics of Solids 1
Staff Contact: A/Prof R Randall
UOC6 HPW4 WKS14 S1S2
Corequisite/s: MECH1300 or MECH0330 or MECH0440
Note/s: Excluded MECH0430
Resultants and equilibrium in three-dimensions; stress and strain; internal forces; stresses, deformation and strain energy due to axial loading, bending and torsion; helical springs.

MECH1500
Computing 1M
Staff Contact: Dr MJ Tordon
UOC3 HPW3 WKS14 S1
Introduction: history, applications, hardware, software, a model of a computer system, editors, operating systems. Networking and the internet. Program design and development: programming objectives, data structures, algorithms, symbolic names, translation of algorithms, steps in programming, programming style, errors and debugging. Data: data types, declarations, input output, file control. Programming constructs: arithmetic expressions, assignments, relational and logical expressions, selection. Application in sorting, word processing, graphics and plotting, simultaneous linear algebraic equations.

Mechanical and Manufacturing Engineering Level II

AVEN2220
Aviation Engineering Experimentation 1
Staff Contact: Mr J Page
UOC3 HPW2 S2
Note/s: Excluded AVEN2200
Exposure to the practical skills associated with aircraft maintenance conducted at the Aeroskills Center at Padstow TAFE. Introduction to workshop environment and practices including health and safety aspects. Development of respect for the skills of aircraft maintenance craftsmen.

AVEN2910
Aviation Technologies 1
Staff Contact: Mr Z Vulovic
UOC3 HPW2 S2
Note/s: Excluded AVEN2210

AVEN2920
Aviation Technologies 2
Staff Contact: Dr R Casey, Mr J Page
UOC3 HPW2 S2
Note/s: Excluded AVEN2700, AVEN2900
Aircraft propulsion – Elements of internal-combustion (piston) engine cycles, performance and operations, piston engine fuel systems, performance augmentation and engine condition monitoring, elements of propellers, basic propeller thrust equations, variable
pitch propellers. Aircraft performance – Flight environment aircraft
classifications, operational requirements, payload-range,
economics, break even point field requirement. Accelerated and
unaccelerated flight manoeuvering and gust envelope, energy
height, power and wind loading.

AVEN3290
Aviation Technologies 3
Staff Contact: Dr N Ahmed, A/Prof D Kelly
UOC3 HPW2 S2
Prerequisites: AVEN1310
Note/s: Excluded AVEN2400, AVEN2600
Aerodynamics – Introduction to basic aerodynamics of lift and drag.
Dimensional analysis to relate wind tunnel results to actual flight
test. Bernoulli's equation. Indicated and corrected airspeed. Airframe
Analysis and Maintenance – Aircraft structural layout, configuration
of wing and fuselage structures. Bending, shear and torsional
stiffness. Materials selection. Elements of aeroelasticity including
control reversal. Structure failure modes.

MECH2411
Mechanics of Solids 2A
Staff Contact: Dr HL Stark
UOC3 HPW3 WK514 SIS2
Prerequisite/s: MECH1231 or MECH1241
Corequisite/s: MECH1400
Note/s: Excluded MECH2401
Revision of Statics. The variation with orientation of stress at a point
in 2D, Mohr's circle. The variation with orientation of stress at a
point in 3D given one principal stress. The variation with orientation
of strain at a point, Mohr's circle, strain gauges. The relationships
between stress and strain during linear elastic deformation.
The interdependence of elastic moduli. The variation with orientation
of stress at a point in the general 3D case. Octahedral stresses. Strain
energy stored in a linearly elastic body resulting from volume change
and from distortion. Yield criteria. Fatigue, stress concentrations,
Miner's rule. Material properties and testing.

MECH2412
Mechanics of Solids 2B
Staff Contact: Dr HL Stark
UOC3 HPW3 WK514 SIS2
Prerequisite/s: MECH2411
Corequisite/s: MECH1400
Note/s: Excluded MECH2402
Simple bending and unsymmetrical bending of beams. Second
moments of area. Bending of composite beams, reinforced concrete
beams. Transverse shear stresses in beams, Shear centre.
Combined stresses in beams. Column buckling. Membrane stresses.

MECH2600
Fluid Mechanics 1
Staff Contact: Prof GL Morrison
UOC3 HPW2
Prerequisite/s: MATH1131 or MATH1141, PHYS1918
Fluid properties. Fluids in static equilibrium. Buoyancy. Pressures
in accelerating fluid systems. Steady flow energy equations. Flow
measurement. Momentum equation. Dimensional analysis and
similarity. Incompressible laminar and turbulent flow in pipes; friction
factor. Laminar flow between parallel plates and in ducts. Elementary
boundary layer flow; skin friction and drag. Pumps and turbines.
Pump and pipe-line system characteristics.

Mechanical and Manufacturing Engineering Level III

AVEN3220
Aviation Engineering Experimentation 2
Staff Contact: Dr N Ahmed
UOC3 HPW2 S2
Note/s: Excluded AVEN3200
A selection of experiments from airframes analysis, flight mechanics,
aircraft propulsion, aircraft systems and aerodynamics. Experiments
will make use of the wind-tunnels, systems laboratories, engines
laboratories and structural testing facilities in the Engineering Faculty.

AVEN3230
Aviation Systems and Avionics
Staff Contact: Mr Z Vulovic
UOC3 HPW2 S1
Prerequisites: AVEN2910
Note/s: Excluded AVEN3210
Typical aircraft system operation and management. Multiplexing and
system degradation. Communications, internal and external. Fly-by-
wire control system. Aircraft state sensors, air data sensors and inertial
sensors. Radio and dead reckoning navigation systems. External
world sensor systems. Engine control and management system.

AVEN3410
Airframe Analysis and Maintenance
Staff Contact: A/Prof DW Kelly, Dr RA Platfoot
UOC3 HPW2 S1
Prerequisites: AVEN2930
Note/s: Excluded AVEN3400
Analysis of the airframe. Load paths and stress concentration.
Introduction to fatigue, corrosion and erosion. Nondestructive
inspection and repair technologies. Crash simulation. Development of
a conditioned based maintenance program for aircraft. Preventative
maintenance, condition monitoring and reliability centered
maintenance.

AVEN3510
Aerodynamics, Stability and Control
Staff Contact: Dr N Ahmed, Mr J Page
UOC3 HPW2 S1
Prerequisites: AVEN2930
Note/s: Excluded AVEN3600, AVEN3900
Drage of an aircraft. Techniques and devices to reduce drag. Airfoil
characteristics at low Reynolds number. Lift and drag at high Mach
number. Effect of supercooled droplets, drizzle, rain and icing on airfoil
performance. Stability – longitudinal and lateral static and dynamic
stability, stability and manoeuvre margins, aircraft loading strategies,
reduced stability aircraft. Control-trimmed flight, aircraft response
to control input, limits of controllability.

AVEN3710
Aircraft Propulsion
Staff Contact: Dr R Casey
UOC3 HPW2 S1
Prerequisites: AVEN2920
Revision of piston engines and propellers. Propeller noise, stall,
gyroscopic effects and slipstream. Elements of gas turbine engines,
gas turbine engine classification, gas turbine engine cycles,
performance and operation, high altitude operating characteristics.
Gas turbine engine condition monitoring, surge, engine re-starting.

AVEN3930
Aircraft Evaluation
Staff Contact: Mr J Page
UOC3 HPW2 S2
Prerequisites: AVEN2920
Evaluation of fitness for purpose, route matching, range load graphs,
environmental constraints, indirect and direct and operating costs,
maintenance requirements, fleet capacity, crew requirements, safety
and reliability.

Medicine

MDCN8001
Principles of Medicine for Optometry Students
Staff Contact: A/Prof L Simons (St Vincent's Hospital)
UOC3 HPW1 WK514 S1
Note/s: Students normally take the subject in Year 4 of course
3950. Restricted to course 3950
An overview of historical, epidemiological, pathophysiological,
diagnostic, therapeutic and public health aspects of disease in man
and the various clinical categories of practice.
Microbiology and Immunology

Note: Some subjects that appear in this section may be restricted to students for whom the subject comprises a compulsory part of their program.

Microbiology and Immunology Level II Subjects

Students must enrol in practical classes for level II Microbiology and Immunology subjects. Enrol for MICR2201 practical classes at the start of session 1, enrol for MICR2011 practical class at the start of session 2. To enrol come to The Microbiology and Immunology School Office on the Friday immediately preceding week 1 of classes.

MICR2011 Microbiology 1
Staff Contact: Dr P March
UOC6 HPW6 WK514 S2
Prerequisite/s: BIOS1101, BIOS1201, MICR2201
Corequisite/s: BI0C2201 and BIOS2021
This subject is for students majoring in microbiology and who wish to enlarge their knowledge and skills in microbiology beyond those obtained in Fundamentals of Microbiology & Immunology or equivalent subjects at other institutions. The biology, diversity and function of bacteria. Modern approaches to bacterial diversity through the use of bioinformatics. Comparative aspects of microbial growth. Bacterial nutrition and biosynthetic pathways. Microbial survival and global responses to environmental stimuli. Theory and practice of sterilization. Action of antimicrobial agents. Introduction to microbial ecology, medical and industrial microbiology.

MICR2201 Fundamentals of Microbiology and Immunology
Staff Contact: Dr I Cooperwhite
UOC6 HPW6 WK514 S1
This subject is designed to give undergraduate and post graduate students a solid background in fundamentals of microbiology and immunology regardless of whether they have had previous experience in biological sciences or not. It should be noted that this subject is not suitable for students without a strong background in science based disciplines. The subject introduces the student to the fascinating world of microorganisms: their ubiquity, peculiarities and the three domains of life i.e. Eubacteria, Archaea and Eucarya. Most of the subject will consider bacteria, fungi, yeasts and viruses in our every day life and how their activities impinge on our well being. Metabolism and growth, microbial death & microbial genetics will be introduced to the students. Practical aspects of microbiology will be considered such as food intoxication, infection, spoilage and food fermentation. The immune system & the study of immunology will also be introduced in this subject. This introduction will encourage the student to question controversial areas of microbiology and immunology such as AIDS. Immunization, environmental pollution, food hygiene, food spoilage causes and prevention etc.

Microbiology and Immunology Level III

MICR3011 Microbial Physiology: a Molecular Approach
Staff Contact: Dr R Cavicchioli, Dr P March
UOC6 HPW6 WK514 S2
Prerequisite/s: MICR2011, MICR3021
Note/s: Exclusion: Maximum enrolment limited to 18 students. If oversubscribed, placements awarded according to achievements in Levels 1, 2 and 3 subjects
The goal of this subject is to combine theory introduced in previous subjects with an understanding of how modern research endeavours are approached. This goal will be achieved by linking lectures and laboratories to contemporary research in microbial physiology. Lectures will address molecular mechanisms involved in: determining microbial cell shape, cell division, sensing and responding to environmental signals, strategies for survival in extreme environments, and regulation of the synthesis of gene products. Students will be challenged to identify relevant research problems, to generate feasible solutions to these problems, and to carry out critical peer review. The lecture series also contains a module outlining the commercialisation of scientific discoveries. The practical program involves planning and implementing a research project in consultation with subject supervisors. The research training provides a solid basis for undertaking research in the Honours year.

MICR3021 Microbial Genetics
Staff Contact: Dr R Cavicchioli
UOC6 HPW6 WK514 S1
Prerequisite/s: BIOS2021, BI0C2201 and MICR2011
Note/s: Exclusion: BI0T3031
Essential for students majoring in microbiology. Major topics include genetics of bacteriophage, bacteria and yeasts, mutation and repair, plasmids, gene transfer, transposable genetic elements, gene cloning (genetic engineering) and two component regulatory systems. The practical component includes a range of contemporary microbial genetics experiments that complement lecture material. They may include experiments involving bacteria, archaea, or yeast involving transposon mutagenesis, gene library construction, gene complementation using recombinant plasmids, gene expression and regulation studies, UV mutagenesis and DNA repair, restriction/ modification systems, promoter rescue experiments, and a variety of gene exchange techniques. The socioeconomic impact of microbial genetics is also discussed.

MICR3031 Eucaryotic Microbiology (UTS)
Staff Contact: Dr H Mitchell
UOC6 HPW6 WK514 S2
Prerequisite/s: MICR2011
Note/s: Exclusion: Maximum enrolment limited to 20 students. If oversubscribed, placements awarded according to achievements in Level 1, 2 and 3 subjects
This course provides an opportunity for students interested in a broad education in medical microbiology to undertake studies in the areas of parasitology and mycology. The unit is offered by agreement with the University of Technology, Sydney, and is taught at the Gore Hill Campus of UTS. The course offers students training in the principals and practices of medical laboratory parasitology and mycology. The parasitology component covers the identification of parasitic worms, insects and protozoa. Mechanisms of disease is also covered. The mycology component examines pathogenic yeasts and fungi, their identification and mechanisms of disease. The course is supported by a comprehensive laboratory program.

MICR3041 Immunology I
Staff Contact: Dr M Cooley
UOC6 HPW6 WK514 S1
Prerequisite/s: BI0C2101 or BI0C2181
Introductory immunology, covering the fundamental principles underlying the immune response. Topics addressed include the components of the immune response and how they interact; aspects of the regulation of the immune response; immunity to infection; allergy, transplantation and autoimmune. An element of choice in assessment tasks enable students to pursue in some depth an area of immunology which particularly interests them.

MICR3051 Immunology 2
Staff Contact: Dr A Collins
UOC6 HPW6 WK514 S2
Prerequisite/s: MICR3041
Advanced immunology. Controversies in immunology, including issues surrounding vaccination, are a major focus of this subject. Students are also introduced to research strategies ranging from the use of knockout and transgenic animals to mathematical modelling, and are encouraged to develop a more critical approach to the scientific literature. In addition, major topics of study include the immunogenetics of the molecules of recognition, cytokines and their regulation, and lymphocyte biology.
MICR3061
Viruses and Disease
Staff Contact: Dr G Grohmann
UOC8 HPW6 WKS14 S2
Prerequisite/s: MICR2011
Note/s: Highly recommended: BIOC2201
Major topics include virus structure, classification and replication strategies, epidemiology, molecular virology and laboratory diagnosis. The pathogenesis of a number of human diseases is discussed in the context of virus-host interactions, the persistence, transfer and control of virus infections in the community. Finally, a consultancy brief is undertaken by students providing the opportunity to gain experience in working in consultancy teams, producing a report and a short seminar.

MICR3071
Environmental Microbiology
Staff Contact: Prof S Kjelleberg
UOC8 HPW6 WKS14 S1
Prerequisite/s: MICR2201
The subject consists of five key themes in contemporary environmental microbiology and microbial ecology. These are: Microbial communities and interactions, sensing and adaptive responses, Biogeochemical cycling, Molecular environmental microbiology including detection, phylogeny and tracking, and Microbial biofilms and biofouling. An understanding of these themes fuels commercial applications and development of sustainable resources, as expanded in Environmental Biotechnology (BIOT3081).

MICR3081
Bacteria and Disease
Staff Contact: Dr H Mitchell
UOC6 HPW6 WKS14 S1
Prerequisite/s: MICR2011 Highly recommended: MICR3041
Note/s: Half of the compulsory practical component of this subject consists of seven practical classes run over three and one half days during the mid-session break. In-session time practical classes will be run only in weeks 1 and 2, and weeks 10 through 14.
Bacteria and Disease aims to develop a high level understanding of bacterial pathogenesis, disease control and prevention. We examine in depth a select number of pathogens that portray the diverse characteristics seen in different pathogenic bacterial species. In conjunction with the lecture program, contemporary medical laboratory training is given through a simulated diagnostic unit. Development of communication skills constitutes part of this subject.

Microbiology and Immunology Level IV

MICR4013
Microbiology and Immunology 4 (Honours)
Staff Contact: Dr P March
UOC48 WKS28 S3
Prerequisite/s: Completion of program 4400 or 4410 including Level III subjects totalling 120 Credit Points, 60
Advanced training in selected areas of Microbiology and Immunology: a formal component consisting of seminars, tutorials, use of information science in biology and written assignments, plus a supervised research program in a specific area of microbiology or immunology.

Optometry
Optometry subjects are restricted to course 3950 and are listed in the course outline. For further information on Optometry subjects consult the School.

OPTM1105
Optics and the Eye I
Staff Contact: Mr G Dick
UOC8 HPW6 S1
Prerequisite/s: OPTM1105, BIO1101

OPTM1201
Ocular and Visual Science I
Staff Contact: Dr G Boneham
UOC4 HPW4 S2
Prerequisite/s: OPTM1105, BIO1101
Objectives: An understanding of the anatomy of the eye (particularly the anterior eye), the adnexa and visual system, and detailed information on some aspects of vision that form the foundation of Clinical Optometry. These subjects are studies in greater depth in later years. Brief Curriculum: Introduction to the gross anatomy of the eye, orbit and adnexa; the microscopic anatomy of the cornea, lens, uvea, eyelids and lacrimal apparatus.

OPTM1202
Clinical Optometry I
Staff Contact: Dr H Swarbrick
UOC6 HPW6 S2

OPTM1205
Optics and the Eye II
Staff Contact: Mr G Dick
UOC4 HPW4 S2
Prerequisite/s: OPTM1105, PHYS1999
Corequisite/s: OPTM1201
Objectives: Understanding of the optics of the eye and spectacle lenses.

OPTM1207
Microbiology and Immunology for Optometry
Staff Contact: Dr P Anderton
UOC4 HPW4 S2
Prerequisite/s: BIOT1401, CHEM1819
Corequisite/s: CHEM1829
Objectives: An understanding of basic microbiology applied to optometric practice. Brief Curriculum: Biology, metabolism and genetics of microbes. Theory of infection and disease propagation. Antibiotics and bacteria. Immunology: Basics, T-cell types and functions, immunoglobulins, cell-mediated immunity, hypersensitivity,

OPTM2101
Ocular and Visual Science IIA
Staff Contact: Dr P Anderton
UOC6 HPW6 S1
Prerequisite/s: OPTM2101, CHEM1829
Corequisite/s: PPH2121

OPTM2102
Clinical Optometry IIA
Staff Contact: Dr B Junghans
UOC6 HPW6 S1
Prerequisite/s: OPTM2101, OPTM2102, OPTM2105
Corequisite/s: OPTM2101, OPTM2105
Objectives: Development of good communication skills. Acquisition of technical skills to carry out an evaluation of the health of the ocular and visual system and of refractive status with a view to prescribing spectacles for the uncomplicated patient. Brief Curriculum: Ocular health: history and symptoms, introduction to diagnostic drugs, slit lamp biomicroscopy, tonometry, direct ophthalmoscopy, external eye examination. Ametropia: aetiology and management of refractive errors, objective and subjective refraction, cycloplegic refraction and prescribing lenses.

OPTM2105
Optics and the Eye III
Staff Contact: Mr G Dick
UOC3 HPW3 S1
Prerequisite/s: OPTM2105
Corequisite/s: OPTM2101, OPTM2102

OPTM2201
Ocular and Visual Science IIB
Staff Contact: Dr P Anderton
UOC6 HPW6 S2
Prerequisite/s: OPTM2101, OPTM2102
Corequisite/s: PPH2221, OPTM2202
Objectives: Build on the material in OPTM2101, Brief Curriculum: Vegetative functions of the retina, the roles of retinal glia, and mechanisms of normal and abnormal development of retinal vasculature. Origins of extracellular potentials including the ERG, EOG, and VECP, and use in clinical diagnosis. The nature of normal and abnormal eye movements, the neural pathways governing eye movements. Psychophysical functions of binocular vision, visual acuity and space perception.

OPTM2202
Clinical Optometry IIB
Staff Contact: Dr B Junghans
UOC6 HPW6 S2
Prerequisite/s: OPTM2101, OPTM2102, OPTM2105
Corequisite/s: OPTM2201, OPTM2206
Objectives: Building on OPTM2102 in equipping the student to be professional in manner with good communication and technical skills and able to carry out a logically sequenced primary care evaluation of the health of the ocular and visual system, refractive status and binocular coordination with a view to prescribing spectacles for the uncomplicated patient. Brief Curriculum: Interviewing skills. Ocular health: biomicroscopy, tonometry, ophthalmoscopy. Ametropia: objective and subjective refraction. Binocular vision: sensory and motor aspects of binocular vision, introduction to binocular vision anomalies. Accommodation/convergence imbalances.

OPTM2206
Pathology for Optometry Students
Staff Contact: Dr P Herse
UOC3 HPW3 S2
Prerequisite/s: OPTM2107, OPTM2102

OPTM3208
Diagnosis and Management of Ocular Disease
Staff Contact: Dr P Herse
UOC6 HPW3 S3
Prerequisite/s: OPTM2106, OPTM2107, OPTM2208
Corequisite/s: OPTM3301, OPTM3302, OPTM3309
Objectives: Session 1: to introduce diagnosis and optometric management of posterior eye disease. Session II: to investigate the role of optometry in the rehabilitation of people with visual impairment. Brief Curriculum: the pathophysiology, diagnostic signs and symptoms, and optometric management of diseases of the uvea, retina, glaucoma, optic nerve, pupila, cranial nerves, and visual pathway. Other topics discussed include diplopia and trauma. In Session 2, a series of seminars from community based speakers will focus on rehabilitation issues relevant to ocular disease.

OPTM3301
Visual Science III
Staff Contact: Dr P Anderton
UOC6 HPW3 S3
Prerequisite/s: OPTM2301

OPTM3302
Clinical Optometry III
Staff Contact: Dr L Asper
UOC23 HPW13 S3
Prerequisite/s: OPTM2106, OPTM2107, OPTM2208, OPTM2301, OPTM2302, OPTM2303, PSYC2116
Corequisite/s: OPTM3208, OPTM3301, OPTM3309
Objectives: To produce a student with professional attitude and good communications skills who has the ability to integrate scientific and clinical aspects of optometry and make well-reasoned decisions while undertaking patient care at the UNSW Optometry Clinic under supervision of a registered optometrist. To advance student knowledge in dispensing, refraction, low vision, colour vision, ocular health assessment, binocular vision, public health, paediatric vision, contact lenses, and pharmacology. To stimulate students interest in optometric subspecialties such as Low Vision, Colour Vision, Binocular Vision, Public Health, Paediatric Vision care, and Contact Lenses. Lectures, tutorials and practical classes will deal with: Refraction: practical aspects. Binocular vision: diagnosis and management of strabismus and amblyopia, aniseikonia. Contact lenses: soft and rigid contact lens design and manufacture, fitting techniques and evaluation, care and maintenance of contact lenses, complications, modifications, special applications, advanced topics. Low Vision. Paediatric Optometry: child development, behavioural optometry, perceptual dysfunction, paediatric ocular disease and low vision, contact lenses, and special needs children. Pharmacology: basic and ocular aspects. Public Health Optometry: basic principles, eye protection, vision screening, visual ergonomics. Dispensing: Practical aspects. Clinical Assessment: binocular vision,
contact lenses, gonioscopy, ophthalmoscopy, visual fields, colour vision. Examination of patient: management and treatment of ocular conditions and diseases. In the second session, students will examine patients in the primary care optometry clinic.

OPTM3309
Ocular Science III
Staff Contact: Dr P Anderton
UOC6 HPW3 S3
Prerequisite/s: OPTM2301
Objectives: To understand the major physiological processes governing the ocular fluids, the cornea and the lens. Physiological principles are applied to gain an understanding of the normal aging process and of common abnormalities. Students are encouraged to integrate their knowledge of general physiology, ocular anatomy and biochemistry, and pathology in this subject to appreciate the basis of selected disorders, and the mechanisms by which the disorders might be prevented or remedied. Brief Curriculum: Physiology and biochemistry of the cornea, Physiology of the eyelids and lacrimal system, The tear film, Physiology and biochemistry of the lens and cataract, Aqueous humor and the intraocular pressure, pathophysiology and pharmacology of glaucoma, Ocular Circulation, The physiology of accommodation and presbyopia.

OPTM4114
Optometry and the Professional Environment A
Staff Contact: Dr P Herse
UOC3 HPW3 S1
Corequisite/s: OPTM4311, OPTM4312, OPTM4313
Objectives: To make optometry students aware of the purposes and consequences of their education, to develop an awareness of professional and ethical action in optometric practice; to ensure that students are aware of their social responsibilities as optometrists. Brief Curriculum: Optometry's role in health care, Morals and ethics, The law and optometry, Accounting and taxation, Marketing, Harassment and discrimination in the consulting room, Dealing with change, Computers and optometry, Indigenous eye care, Co-management.

OPTM4210
Research Project
Staff Contact: Dr P Herse
UOC3 HPW3 S2
Prerequisite/s: OPTM3208, OPTM3301, OPTM3302, OPTM3309
Objectives: This subject seeks to develop students skills in searching the literature, critical analysis of publications, developing hypotheses, designing and running experiments, statistical data analysis and oral and written presentation of reports. Students in groups of 2 to 4 carry out a small research project under the guidance of an academic staff member. In November each group makes a presentation to a symposium.

OPTM4214
Optometry and the Professional Environment B
Staff Contact: Dr P Dziegielewski
UOC3 HPW3 S2
Prerequisite/s: OPTM4114
Corequisite/s: OPTM4311, OPTM4312, OPTM4313
Objectives: to make optometry students aware of the purposes and consequences of their education, to develop an awareness of professional and ethical action in optometric practice; to ensure that students are aware of their social responsibilities as optometrists. Brief Curriculum: History of optometry and optics, Legal aspects of optometry, Medicare, State law and how it affects optometry, Starting an optometric practice, Modes of practice, Practice information systems, Optometric business dynamics, Continuing education, Challenges in optometry.

OPTM4311
Clinical Optometry IVA
Staff Contact: Mr D Pye
UOC12 HPW6 S3
Prerequisite/s: OPTM3208, OPTM3301, OPTM3302, OPTM3309, PSYC3506
Corequisite/s: OPTM4312, OPTM4313
Objectives: Further development of the clinical skill to examine competently patients in optometric practice and recommend appropriate treatment and strategies for patients presenting for primary eye care. Brief Curriculum: Clinical experience in primary eye care, Diagnosis, management and treatment of these patients will be emphasised.

OPTM4312
Clinical Optometry IVB
Staff Contact: Mr D Pye
UOC12 HPW6 S3
Prerequisite/s: OPTM3208, OPTM3301, OPTM3302, OPTM3309, PSYC3506
Corequisite/s: OPTM4311, OPTM4313
Objectives: Further development of the clinical skill to examine competently patients in optometric practice and recommend appropriate treatment and strategies for patients presenting for primary eye care. Brief Curriculum: Clinical experience in the following areas; colour vision, low vision, Occular disease, participation in patient review clinics. Diagnosis, management and treatment of these patients will be emphasised.

OPTM4313
Clinical Optometry IV C
Staff Contact: Mr D Pye
UOC12 HPW6 S3
Prerequisite/s: OPTM3208, OPTM3301, OPTM3302, OPTM3309, PSYC3506
Corequisite/s: OPTM4311, OPTM4312
Objectives: further development of the clinical skill to examine competently patients in optometric practice and recommend appropriate treatment and strategies for patients presenting for primary eye care. Brief Curriculum: clinical experience in the following areas; contact lenses, dispensing, vision training, sports vision and paediatric clinics. Diagnosis, management and treatment of these patients will be emphasised.

Pathology

Pathology Level II

PATH2201
Processes in Disease
Staff Contact: Dr Mark Dziegielewski
UOC6 HPW4 S1
Pre-requisite/s: BIOS1101 and BIOS1201
Co-requisite/s: Any 2 of ANAT2201, ANAT2111, PHPH2101 or BIOC2101/BIOC2181

Lectures, tutorials and museum study sessions aimed at increasing understanding of important disease processes. Comparisons between normal and abnormal cell, tissue and organ function will be made. Includes processes of cell and tissue degeneration, acute and chronic inflammation, regeneration and repair, infection, atherosclerosis, thrombosis, embolism and infarction. Particular examples include diseases of practical importance such as pneumonia, tuberculosis, pulmonary embolism and myocardial infarction. Aberrations of cell growth introduces neoplasia with examples of common tumours.

Pathology Level III

PATH3203
Mechanisms of Human Disease A
Staff Contact: Dr Mark Dziegielewski
UOC6 HPW4 S1
Pre-requisite/s: BIOS1101 and BIOS1201. Advantage in having previous understanding of anatomy (ANAT2111, ANAT2211), physiology (PHPH2112), biochemistry (BIOC2101, BIOC2181) or equivalent.
Note/s: This course will only be offered in 2000 and is only available to Stage 3 students.

Lectures, tutorials and practical classes aimed at increasing understanding of the molecular basis of disease with particular emphasis on classification of disease processes, clinical outcomes and disease prevention. Comparisons between normal and abnormal cell, tissue and organ function will be made. Includes processes of cell and tissue degeneration, acute and chronic inflammation, infection, atherosclerosis, thrombosis, embolism and infarction. Particular examples include diseases of practical importance such as pneumonia, tuberculosis, pulmonary embolism and myocardial infarction. Skin wounds and fractures will be used to illustrate healing and regeneration. The impact of modern biology on understanding disease mechanisms will be demonstrated in practical classes which complement the lectures.

PATH3204
Mechanisms of Human Disease B
Staff Contact: Dr Mark Dziegielewski
UOC6 HPW4 S2
Pre-requisites: PATH3203
Note/s: This course will only be offered in 2000 and is only available to Stage 3 students.

In this course, lectures, tutorials and research/casebook projects will be used to introduce modern concepts relevant to the understanding of cancer, congenital diseases and musculoskeletal diseases. Aberrations of cell growth introduces neoplasia and carcinogenesis with examples of common tumours including colorectal, breast and lung carcinomas. There will be detailed discussion of degenerative joint disease, arthritis and back pain and an overview of diseases involving the gastrointestinal and urinary systems.

Pathology Level IV

PATH0005/PATH0006
Pathology (Honours)
Staff Contact: Prof C Geczy
UOC48
Pre-requisite: completion of program 7000 including Level III subjects totaling 36 Credit Points

Research component of thesis: basic mechanisms of human disease processes, including inflammation, rheumatoid arthritis, asthma, uveitis, infection bone and biomaterials, tumour biology, vascular biology, atherosclerosis and genetics. Projects can include techniques such as tissue culture and cell biology, microbiology and genetics, protein chemistry, histology and microscopy, immunology and enzymology. Projects may be undertaken within the School of Pathology or at a laboratory of an affiliated institute or hospital department associated with the School.

Philosophy

Philosophy is a wide-ranging discipline, catering for a great diversity of interests, for instance, in science, reasoning, persons, and social issues, and encouraging critical and imaginative thought about the foundations of other subjects and disciplines. Apart from providing considerable choices for students majoring in Philosophy, the diversity of Upper Level subjects makes it possible for students majoring in other disciplines to select subjects complementing their main interest.

Philosophy Level I

First Enrolment in Philosophy
There are Five Level I courses:
Each of these has a 6 Units of Credit value. They can be taken separately, and students can gain Upper Level status in Philosophy (quality to enrol in Upper Level subjects) by passing in only one. However, students wishing to major in Philosophy must complete any two of the four.

PHIL1007
Knowledge and the Knower
Staff Contact: S Hetherington
UOC6HPW3 S2
An introduction to the philosophy of knowledge and of knowers, generally called epistemology. We study questions about how we can claim to know things, and what, indeed, it is to know things. What are the limits on human knowledge? How can we ever be certain of anything? What about scientific knowledge? Or religious knowledge? Are these objective or subjective? There is a lot of important philosophy in this area, and we will look at a number of the biggest issues.

PHIL1008
Ethics and Society
Staff Contact: S Cohen
UOC6 HPW3 S2
This is political philosophy and moral philosophy at the intersection of the political with the personal. When we make decision in important areas like euthanasia, reproductive freedom and reproductive technology, the allocations of health resources, the suppression of smoking and other drugs, censorship, the environment, penal reform and capital punishment, we must balance the rights and duties of the individual with the demands and obligations of society. In this team-taught course, we consider current debate about the above questions.

PHIL1009
Metaphysics: The World and Us
Staff Contact: To be advised
UOC6 HPW3 S2
Note/s: Not offered in 2000

In subjects like science, sociology, psychology, politics and history we raise a number of important philosophical questions: Is the world the way it seems to be? Is there a real world out there, or is it all in the mind? What is the nature of this mind which tries to know the world? The mind, the person, is part of the world too - does its nature or its embodiment influence the way it knows the world or the way it knows itself? Is there such a thing as value-free knowledge of the world, or are we trapped inside our individual perspectives? This course is an introduction to the Philosophy of reality.

PHIL1010
Thinking about Reasoning
Staff Contact: P Staines
UOC6 HPW3 S1
Note/s: Excluded GENT0604

Thinking clearly, reasoning productively, arguing well. These are skills essential in life in general and at University in particular. Philosophy has a lot to say about these practices, and also about the whole nature of human reason. This course involves practical work on reasoning and argumentative strategies, and an introductory investigation into what good reasoning actually is. There is a great deal of modern philosophical investigation into these matters.

PHIL1011
Minds, Bodies and Persons
Staff Contact: R Diprose
UOC6 HPW3 S1
What are we, what are we like? What is a person? Are only humans persons? Are we mind, body or both? These are among the most puzzling and compelling questions that humans can ask. This course is an introduction to some of the many ways philosophers have approached these and related questions. Some philosophical perspectives on the subject have a moral focus, some a psychological, some a computational, some a political. We look at the works of ancient philosophers and of philosophers working today.

Value of Upper Level Subjects in Philosophy

All Upper Level courses are 6 units of credit

Specialisation in Philosophy

Students specialising in Philosophy must complete any two of the School's Level I subjects (12 units of credit): PHIL1007 (Knowledge and the Knower), PHIL1008 (Ethics and Society), PHIL1009
Level II Status in Philosophy consists in being in second or later year of university study, and also having passed at least one Level I Philosophy course. The prerequisite may be waived in certain cases by the School.

Level III Status in Philosophy consists of having an overall standard of credit or higher in Philosophy courses totalling 48 units of credit.

PHIL2106 Logic
Staff Contact: S Hetherington
UOC6 HPW3 S1
Prerequisite/s: Upper Level status
Note/s: Excluded MATH3400

This course is about deductive logic (in particular, propositional logic and predicate logic). Aims to construct - and to understand - a precise, unambiguous, formal language. Many important parts of English are translatable into it, hence many arguments of English are translated into it too. It is a language with which we can better understand the concept of deductive proof.
Follows from PHIL2106 logic, and is intended to introduce students to the ways various logics have been deployed within philosophy, with a view to illuminating such topics as linguistic meaning, content of thought, modalities, necessity and possibility, contrary-to-fact conditionals, law of nature, action value, deductibility and fiction.

PHIL2118
Philosophy and Biology
Staff Contact: M Michael
UOC6 HPW3 S2
Prerequisite/s: Upper Level status in Philosophy or 30 units of credit in History and Philosophy of Science
Note/s: Excluded HPST3012, HPST3117

Our understanding of ourselves is powerfully shaped by our conception of our biological nature. Central in this conception is the idea that we have evolved so the theory of evolution plays an important role in our understanding of ourselves. This course aims at being an in-depth examination of some of the conceptual and philosophical issues which are raised by evolutionary theory. In particular, we will be looking at the explanatory structure of modern evolutionary theory and its relationship to the vexed issue of classification.

PHIL2206
Contemporary Philosophy of Mind
Staff Contact: P Cam
UOC6 HPW3 S1
Prerequisite/s: Upper Level status in Philosophy

An introduction to some central concerns and major debates about the nature of mind, with concentration upon contemporary discussion. Addresses questions such as: can our conscious mental life be the object of scientific study? What is the relation between mind and brain? Is our ordinary understanding of how people think basically mistaken?

PHIL2207
Issues in the Philosophy of Psychology
Staff Contact: P Cam
UOC6 HPW3 S2
Prerequisite/s: Upper Level in Philosophy or PSYC1001 or PSYC1011

Philosophical issues in theoretical psychology, drawn from philosophical and psychological writings on personal identity, consciousness and self-knowledge, perceptual illusions, psychology and brain science.

PHIL2208
Epistemology (Scepticisms)
Staff Contact: S Hetherington
UOC6 HPW3 S1
Prerequisite/s: Upper Level status in Philosophy

All of us acknowledge that there are things we do not know. But such humility can turn to perplexity when we encounter epistemological sceptics. A sceptic typically denies us either vast amounts of knowledge or justification, or some select, but extremely everyday, sorts of apparent knowledge or justification. In short, sceptics argue for surprising denials of knowledge or justification. This course examines some prominent sceptical arguments - of less, and more recent vintage. They will attack knowledge of, or justified belief in, such areas as: the external world, the unobserved, linguistic meaning, everything.

PHIL2209
Epistemology (Knowledge and Justification)
Staff Contact: S Hetherington
UOC6 HPW3
Prerequisite/s: Upper Level status in Philosophy
Note/s: Not offered in 2000

Epistemology is officially the Theory of Knowledge. One of its most important questions is therefore What is knowledge? Answering this generally leads to another question What is justified belief? (For most epistemologists think knowledge is a sort of justified belief.) This course is built around these questions. We will consider various attempts that epistemologists have made to answer them. Topics include: perception, false belief, defeated evidence, causality, reliability, cognitive responsibility, perspectives.

PHIL2215
The Struggle for Human Nature
Staff Contact: To be advised
UOC6 HPW3 S2
Prerequisite/s: Upper Level status in Philosophy

Theories about human nature often figure as fundamental, though often implicit, assumptions in views about rationality, about knowledge bases, about equality or justice, and in fields as diverse as politics, anthropology, economics and sociobiology. Explores the work that invoking the concept of human nature does in various areas of debate. Topics include the traditional philosophical debates about innateness, recent discussions of knowledge of language, assumptions about human nature implicit in some economic theories and sociobiological accounts of human nature.

PHIL2217
Personal Identity
Staff Contact: To be advised
UOC6 HPW3 S1
Prerequisite/s: Upper Level status in Philosophy

Controversy about the nature of persons and the criteria for personal identity has usually centred on the questions of whether persons are bodies or are minds and whether the criteria for their identity are physical or psychological. Philosophers have frequently ignored the social dimensions of personhood or, at best, given it only a peripheral place in the discussion. The notion that people are socially constructed will be given due weight and an attempt made to integrate the differing approaches to what it is to be a person.

PHIL2218
Philosophical Foundations of Artificial Intelligence
Staff Contact: P Staines
UOC6 HPW3 S2
Prerequisite/s: Upper Level status in Philosophy

Artificial intelligence: an examination of its assumptions, history, goals achievements and prospects.

PHIL2219
Topics in Philosophy of Language
Staff Contact: To be advised
UOC6 HPW3
Prerequisite/s: Upper Level status in Philosophy
Note/s: Not offered in 2000

Part 1 of the course focuses on the relation between words and the world. Here the central topic is theories of truth: the coherence theory, the correspondence theory, the redundancy theory, etc. An important and related topic is theories of reference. Readings include selections from Aristotle, William James, Russell, Kripke and others. Part 2 focuses on the relation between language and the people that use it. The central concept here is meaning. We investigate such issues as the relation between language and thought, the nature of convention, nature of communication, what sort of knowledge is involved in knowing a language. Readings include fragments from Locke, Descartes, Grice, Austin, Wittgenstein, Lewis, Quine and others.

PHIL2226
Twentieth Century Analytic Philosophy
Staff Contact: M Pearson
UOC6 HPW3 S1
Prerequisite/s: Upper Level status in Philosophy

The aim of this course will be twofold. First, to become acquainted with some of the important figures and movements in analytic philosophy, discussing the ideas and arguments offered by each. Second, to ask what is distinctive about analytic philosophy; to what extent new methods are being offered to deal with old philosophical problems, to what extent new philosophical problems are being raised, what assumptions, if any, are shared by the tradition. As well as asking ourselves how modern Anglo-American philosophy is different from its predecessors, we shall also be looking at ways in which its ideas and concerns are continuous with those of other epochs and traditions. Some of the philosophers that we will be looking at will be: Frege, Russell, Wittgenstein, Quine, Kripke, Putnam. No prior familiarity with these writers will be assumed. Moreover, we shall steer clear of papers that make heavy use of formal logic.
Teaching and Assessment: Will be advised at the beginning of Session.
Texts: A set of readings available from the School of Philosophy.

PHIL2228
Themes In Seventeenth Century Philosophy
Staff Contact: M Michael
UOC6 HPW3 S2
Prerequisite/s: Upper Level status in Philosophy
This course will study a range of topics drawn from the writings of the seventeenth century philosophers John Locke, Rene Descartes, Benedict de Spinoza and Gottfried Leibniz. Topics will be selected from the following: substance, minds and bodies, freedom, contingency, possibility and necessity, time and space.

PHIL2229
Themes In Eighteenth Century Philosophy
Staff Contact: A Haas
UOC6 HPW3 S1
Prerequisite/s: Upper Level status in Philosophy
This course will study a range of topics drawn from the writings of the eighteenth century philosophers George Berkeley, David Hume, Jean-Jacques Rousseau and Immanuel Kant. Topics will be selected from the following: idealism, human nature, the self, enlightenment, ideals of reason, the idea of progress.

PHIL2309
The Heritage of Hegel
Staff Contact: A Haas
UOC6 HPW3 S2
Prerequisite/s: Upper Level status in Philosophy
Hegel is one of the towering presences in contemporary philosophy. Long recognised as an influence on European philosophy from Marx to Lacan, Derrida and Kristeva, the Hegelian philosophy of identity, difference, subjectivity and desire, is essential to anyone who wants to understand current directions in critical theory. Covers a close reading of Phenomonology of Spirit together with selections from Hegel's lectures on logic. The second half of the course looks at important readings of Hegel by Derrida, Habermas, Irigaray, etc.

PHIL22316
Philosophy of Religion
Staff Contact: K Lai
UOC6 HPW3 S1
Prerequisite/s: Upper Level status in Philosophy
Aims to study the phenomenon of religion, its relation to ways of life, and its construction of stories and myths. Drawing from a variety of religious sources, it analyses the different categories and forms in and through which religious ideas are expressed and justified. Topics covered include arguments for the existence of God, the concept of evil, faith and mysticism, human relation to the natural world, religion and morality, religion and gender, and free will and determinism.

PHIL2407
Contemporary European Philosophy: Vision and Transgression
Staff Contact: A Haas
UOC6 HPW3 S1
Prerequisite/s: Upper Level status in Philosophy
The earliest philosophy attached myth and poetry; the most recent philosophy wonders if it is possible to live without them. The writers studied in this course criticise the moral and the aesthetic values of their culture; they demand new ways of feeling and thinking, new modes of behaviour and language. Their visions are troubling and sometimes violent, but we cannot simply dismiss them. The purpose is to reach a better understanding of the work of Nietzsche, the Surrealists, Bataille and Deleuze, in order to evaluate their critique of modernity; these writers have been chosen because of their impact on current theoretical debates in the social sciences, literature and art.

PHIL2409
Speaking through the Body: Feminism, Psychoanalysis, Literature
Staff Contact: To be advised
UOC6 HPW3
Prerequisite/s: Upper Level status in Philosophy
Note/s: Not offered in 2000
How natural is sex anyway? Do we act the parts of masculine and feminine or do they act us? The language of the body if symbolic; even sexual difference is nothing without its codes. Thus the search for a body that speaks takes us to culture. Explores the idea of sexual polarity or binarism and some influential criticisms or refusals of it. Topics include: transvestitism and gender ambivalence; alternatives to heterosexuality; relations between feminism and language. Readings will be taken from the work of Freud, Virginia Woolf, Oscar Wilde, Rousseau, Deleuze and Guattari, Shakespeare and contemporary feminism.

PHIL2416
Power, Knowledge and Freedom
Staff Contact: R Diprose
UOC6 HPW3 S1
Prerequisite/s: Upper Level status in Philosophy
Note/s: Excluded EURO2400
In Nietzsche and Foucault we find a powerful critique of philosophical conceptions of knowledge, subjectivity, morality, truth, desire and power. The Nietzschean project, seminal to Foucault, is continued by such maverick figures in contemporary philosophy as Bataille, Artaud and Deleuze, who imagine the relations between body, freedom and transgression in startling ways.

PHIL2417
Relativism: Cognitive and Moral
Staff Contact: To be advised
UOC6 HPW3
Prerequisite/s: Upper Level status in Philosophy, or contact School
Note/s: Not offered in 2000
Do people in alien cultures see the same world as we do? If knowledge is socially constructed can there be a sense in which world views clash? Is there a difference between what is subjective and what is relative? Could there be no true morality? Is there such a thing as reason or rationality? Even if there is, could such a thing be other than specific to our culture? Are there other, non-rational, ways of understanding the world? These and a host of other questions introduce the notion of relativism. Aims to clarify and examine some of the various questions and issues that arise from the issue of relativism. Topics may include moral relativism, cognitive relativism, the absolute conception of the world, truth, conceptual schemes and semantic relativism.

PHIL2418
Ethical Issues
Staff Contact: K Lai
UOC6 HPW3
Prerequisite/s: Upper Level status in Philosophy
Note/s: Not offered in 2000
An examination of a range of current ethical issues involved in topics such a abortion, surrogacy, foetal tissue research, euthanasia, AIDS.

PHIL2419
Ethics, Difference and Embodiment
Staff Contact: R Diprose
UOC6 HPW3
Prerequisite/s: Upper Level status in Philosophy
Note/s: Not offered in 2000
Explores an approach to ethics originating in ancient Greek thought and developed by 20th century existential phenomenologists (such as Sartre, de Beauvoir, Merleau-Ponty and Levinas). Topics covered include how we embody ethics (i.e. An habitual way of life is socially constituted; what is the basis of our social relations with others; and possible applications of these ideas to analyses of the ethics of sexual difference, cultural difference and some issues in medical ethics.)
PHIL2420
Environmental Ethics
Staff Contact: K Lai
UOC6 HPW3 S1
Prerequisite/s: Upper Level status in Philosophy
Note/s: Upper Level status in Year 2 or later of University study. (Students need not have upper level status in Philosophy)
Aims to familiarise students with both the content and the processes involved in ethical decision-making in issues concerning the natural environment. Begins with an enquiry into basic concepts operative in discussions in environmental ethics such as value, nature, natural and environment. There is also an examination of various approaches to environmental debates including applied ethics, deep ecology, holism and ecofeminism. Students are encouraged to consider arguments arising from different value commitments and to understand the importance of, and the procedures associated with, the justification of a particular position.

PHIL2506
Classical Political Philosophy
Staff Contact: To be advised
UOC6 HPW3
Prerequisite/s: Upper Level status in Philosophy
Note/s: Not offered in 2000
Examination of the work of some central figures in the history of political philosophy, with regard to the basis of political society, its various functions and its relation to the individuals in it. Through an investigation of works by Hobbes, Locke, Rousseau, and J.S. Mill, topics include the idea of a state of nature, theory of a social contract, the establishment of political rights and obligations, and the relation of moral and political concerns within a political society.

PHIL2508
Theories in Moral Philosophy
Staff Contact: S Cohen
UOC6 HPW3 S1
Prerequisite/s: Upper Level status in Philosophy
Note/s: Not offered in 2000
Examination of three moral theories central in the history and development of moral philosophy: David Hume, Immanuel Kant, and John Stuart Mill present different kinds of moral theories, differing approaches to arriving at a moral theory, and specific theories which are markedly different from each other. Each moral theory is investigated in itself and in comparison with the other two.

PHIL2509
Philosophy of Law
Staff Contact: S Cohen
UOC6 HPW3
Prerequisite/s: Upper Level status in Philosophy
Note/s: Not offered in 2000
Selected conceptual and normative issues in the philosophy of law, centering around the broad areas of law (e.g. its nature, validity, bindingness and relation to morality), liberty, justice, responsibility (including strict, vicarious and collective liability), and punishment.

PHIL2517
Representation and Sexual Difference
Staff Contact: R Diprose
UOC6 HPW3
Prerequisite/s: Upper Level status in Philosophy
Note/s: Excluded WOMS2500. Not offered in 2000
Considers the nature of sexuality and ideas about the role of sexual difference in the constitution of the bodily subject. The social significance of the connection between gender and such distinctions as culture/nature, reason/passion and public/private is examined in the light of feminist critiques. Also raises questions about philosophy and feminism with respect to issues of argument, advocacy and style.

PHIL2519
Greek Philosophy: Issues In Ethics and Epistemology
Staff Contact: S Cohen, M Michael
UOC6 HPW3 S2
Prerequisite/s: Upper Level status in Philosophy
Note/s: Excluded PHIL2507
Covers themes in Plato and Aristotle which have had a continuing influence in Western philosophy. Discussion centres on concepts of virtue and knowledge in relation to ideals of wisdom and contemplation.

PHIL2519
Introduction to Chinese Philosophy
Staff Contact: K Lai
UOC6 HPW3 S2
Prerequisite/s: Upper Level status in Philosophy
Note/s: Excluded PHIL2520
Confucianism and Taoism are the two most influential philosophies originating from China. Examines the two traditions, set against a backdrop of other schools of thought such as Mohism, Legalism and Chinese Buddhism. This course involves close readings of the relevant primary texts. Students will be taught to read these texts. No previous knowledge of Chinese culture or language is assumed.

PHIL2520
Aspects of Chinese Thought
Staff Contact: K Lai
UOC6 HPW3 S2
Prerequisite/s: Upper Level status in Philosophy
Note/s: Excluded PHIL2519
There are many significant concepts underlying contemporary Chinese thought which have their origin in the classical Chinese schools of thought from pre-Confucian times. This course critically examines some of these concepts, such as the Confucian jen (humanity) and li (rules of propriety); and the Taoist tao and wu-wei (non-action).

PHIL2606
Aesthetics
Staff Contact: R Diprose
UOC6 HPW3
Prerequisite/s: Upper Level status in Philosophy
Note/s: Not offered in 2000
Emphasis is placed on the visual arts, although the course also deals with literature and film. Topics include realism and representation; the dialects of tradition and innovation; the idea of aesthetic experience; the sexuality of art and the observer.

PHIL2608
Experiencing the Spectacle: From Plato to Virtual Reality
Staff Contact: R Diprose
UOC6 HPW3 S2
Prerequisite/s: Upper Level status in Philosophy or Media & Communications
Note/s: Excluded PHIL2606
Explores philosophical accounts of what is involved in a person's experience of a spectacle (e.g. a painting, a piece of theatre, television or virtual reality). Some philosophers (e.g. Plato) devalue the experience as irrational and different to rational contemplation of an object of knowledge. Others (e.g. Kant) claim the experience can be objective and universal, where what I experience is (potentially) the same as everyone else, against the common view that the person views the spectacle from a distance and remains unaltered by the experience, Nietzsche, Heidegger and Merleau-Ponty in different ways argue that the spectacle is necessary for creatively opening the person and their world to other possibilities. Emphasis will be on how these thinkers understand the relation between the person and the spectacle with consideration of the implications of their views for understanding the impact of visually based media in our lives.

PHIL2706
Seminar A
Staff Contact: Consult School
UOC6 HPW3
Note/s: Not offered 2000
The seminar is offered occasionally to suit particular student and staff needs and interests. Admission by permission, based on a student's performance in Upper Level courses. Topics vary and are influenced by student requests. Students are invited to approach any member of staff about the possibility of particular seminar topics.
PHIL2707
Seminar B
Staff Contact: Consult School
UOC6  HPW3
Note/s: Not offered 2000
The seminar is offered occasionally to suit particular student and staff needs and interests. Admission by permission, based on a student’s performance in Upper Level courses. Topics vary and are influenced by student requests. Students are invited to approach any member of staff about the possibility of particular seminar topics.

PHIL2708
Reading Option
Staff Contact: Consult School
UOC6  HPW3  S1 or S2
Students wishing to do work in an area not covered by an existing course or seminar may apply to the School to take a reading option. Not more than one such course may be counted towards a degree. Approval of a program for a reading option depends on its suitability and on the availability of a member of staff to undertake supervision.

PHIL3106
Pre-Honours Seminar
Staff Contact: P Cam, R Diprose
UOC6  HPW3  S2
Prerequisite/s: 30 units of credit in Philosophy with overall standard of Credit or higher
A course for students who are considering proceeding to Honours in Philosophy; designed to form skills in philosophical research and writing through seminar discussion of readings illustrating a range of philosophical approaches, styles and techniques.

Philosophy Level IV (Honours)

PHIL4000
Philosophy Honours (Research) F
Staff Contact: R Diprose, M Michael
UOC48  S1S2
Prerequisite/s: 54 units of credit in Philosophy courses including PHIL3106, PHIL2228, PHIL2229 with a grade average of at least 70 per cent and at least one distinction
The Honours year consists of a one year-length seminar, one session-length seminar, and writing a research thesis under supervision.

PHIL4050
Philosophy Honours (Research) P/T
Staff Contact: R Diprose, M Michael
UOC24  S1S2
Prerequisite/s: 54 units of credit in Philosophy courses including PHIL3106, PHIL2228, PHIL2229 with a grade average of at least 70 per cent and at least one distinction

PHIL4500
Combined Philosophy Honours (Research) F
Staff Contact: R Diprose, M Michael
UOC24  S1S2
Prerequisite/s: 48 units of credit in Philosophy including PHIL3016, PHIL2228 and PHIL2229 with a grade average of at least 70 per cent and at least one distinction
Note/s: Students contemplating Honours are urged to seek advice from the School on their program early in their course

PHIL4550
Combined Philosophy Honours (Research) P/T
Staff Contact: R Diprose, M Michael
UOC12  S1S2
Prerequisite/s: 24 units of credit in Philosophy including PHIL3016, PHIL2228 and PHIL2229
Note/s: Students contemplating Honours are urged to seek advice from the School on their program early in their course

Physics

Physics Level I Courses
Notes: Where mathematics courses are specified as prerequisites or as corequisites, the higher levels of such subjects are acceptable and preferable.

PHYS1000
Physics Thinking
Staff Contact: First Year Director
UOC3  HPW3  S2
Prerequisite/s: Assumed knowledge: HSC Physics 65-100
Techniques in scientific thinking and experimentation: seeing similarities, using diverse knowledge and techniques, having good ideas; estimation in theory and experiment. The subject will mainly be taught in small groups organised to solve experimental and theoretical problems, some of them quite difficult. The problems may have fundamental as well as applied character, but the emphasis of the course is on universal principles, including conservation, symmetries, scaling and dimensional analysis, behaviour near equilibrium.

PHYS1111
Fundamentals of Physics
Staff Contact: First Year Director
UOC6  HPW6  S1 or S2
Corequisite/s: Recommended: MATH1011 or MATH1131 or MATH1132
Note/s: Introductory level subject for students of all disciplines.
The methods of physics, describing motion, the dynamics of a particle, conservation of energy, kinetic theory of gases, properties of liquids, vibrations and waves, electricity and conduction in solids, magnetism and electromagnetic induction, alternating current, atomic nature of matter, X-rays, the nucleus and radioactivity, geometrical optics, optical instruments, wave optics.

PHYS1112
Physics 1A
Staff Contact: First Year Director
UOC6  HPW6  S1 or S2
Prerequisite/s: Assumed knowledge: HSC Physics 65-100
Corequisite/s: MATH1131 or MATH1141

PHYS1131
Higher Physics 1A
Staff Contact: First Year Director
UOC6  HPW6  S1 or S2
Prerequisite/s: Assumed knowledge: HSC Physics 65-100
Corequisite/s: MATH1131 or MATH1141
Vectors, kinematics, particle dynamics, work and energy, the conservation of energy, conservation of linear momentum, rotational kinematics and dynamics, simple harmonic motion, gravitational. Electrostatics, magnetostatics in vacuum, ferromagnetism, electromagnetic induction.

PHYS1149
Physics 1A (Aviation)
Staff Contact: First Year Director
UOC6  HPW6  S1
Corequisite/s: MATH1011 or MATH1079 or MATH1131 or MATH1132
The methods of Physics, describing motion, the dynamics of particle, conservation of energy, kinetic theory of gases, properties of liquids, vibrations and waves, electricity and conduction in solids, ions and ionic conduction, magnetism and electro magnetic induction, alternating current.
PHYS1199
Physics 1 (Optometry)
Staff Contact: First Year Director
UOC6 HPW6 S1
Prerequisite/s: Assumed knowledge: HSC Physics 65-100
Note/s: Restricted to course 3950
Vectors, linear mechanics, Newton's Law of Motion, Rotational mechanics, electric forces, fields and potential. Magnetic forces and fields. Ampere's Law, Faraday's Law, Electric circuit theory, AC, DC and transient circuits. Fluid mechanics; Bernoulli's equation; viscosity; Stoke's Law. Nuclear Physics; radioactivity, half-life, nuclear forces, binding energies, fission and fusion.

PHYS1201
Life Science Physics
Staff Contact: First Year Director
UOC6 HPW6 S2
Prerequisite/s: PHYS1111 or HSC Physics 65-100
Corequisite/s: MATH1011 or MATH1031
This course examines selected topics in Physical Science, with emphasis on underlying broad classical and quantum principles which have direct relevance to rapidly developing fields of Molecular Biology, Biotechnology and other life science fields which are becoming increasingly reliant upon knowledge and techniques of Physical Science. This course extends the elementary physics presented in the Fundamentals of Physics course providing a more mathematical treatment but tailored to emphasize material with direct relevance to Life Sciences fields.

PHYS1221
Physics 1B
Staff Contact: First Year Director
UOC6 HPW6 S2
Prerequisite/s: Assumed knowledge: PHYS1121
Corequisite/s: MATH1231 or MATH1241
Note/s: Session 2 or Summer Session
Waves in elastic media; application of wave theories to optical and acoustical phenomena such as interference, diffraction and polarisation. Properties of matter: solids, liquids, gases. Fluids and thermal physics. Inductance and electric circuit transients. Alternating current circuit theory.

PHYS1229
Concepts in Engineering Physics
Staff Contact: First Year Director
UOC6 HPW6 S2
Prerequisite/s: PHYS1111
Corequisite/s: MATH1021 or MATH1031 or MATH1131
This course will examine selected topics from classical and quantum physics which are of relevance to the various Engineering disciplines. The course extends the level beyond PHYS1111 Fundamentals of Physics presenting a more mathematical treatment and including physics applications in various Engineering areas to emphasise the essential way in which Physics underpins many of the advances which have been made in modern Engineering and technology.

PHYS1231
Higher Physics 1B
Staff Contact: First Year Director
UOC6 HPW6 S2
Prerequisite/s: Assumed knowledge: PHYS1131
Corequisite/s: MATH1231 or MATH1241
Note/s: Session 2 or Summer Session

Elective Syllabus for PHYS1231
Higher Physics 1B (Special)
Staff Contact: First Year Director
UOC6 HPW6 S2
Prerequisite/s: PHYS1131
Note/s: Those students enrolled in a physics plan in the Science program, and who have achieved a satisfactory performance in Session 1, may elect to take the following option for Session 2. (This option is not repeated in Summer Session).

QUANTUM PHYSICS
Waves in elastic media; sound waves; early quantum physics; the laser, operation and applications, interference, diffraction and polarisation.

AC CIRCUIT THEORY
Addition of alternating quantities; series circuits, impedance, power, resonance, parallel circuits; ideal transformer.

SOLAR SYSTEM ASTROPHYSICS
Celestial dynamics: orbits; shape and rotation of planets, planetary rings; energy generation in sun; thermal physics; planetary atmospheres.

RELATIVITY
Galilean relativity, Michelson-Morley experiment, the postulates of special relativity, consequences of Einstein's postulates, the Lorentz transformation, measuring the space-time coordinates of an event, the transformation of velocities, consequences of the Lorentz transformation, relativistic momentum and energy.

PHYS1249
Physics 1B (Aviation)
Staff Contact: First Year Director
UOC3 HPW6 S2
Prerequisite/s: Assumed knowledge: PHYS1149 Physics 1A
(Special)
Corequisite/s: MATH23 or MATH1241
Syllabus as per PHYS1229, but more limited scope, for weeks 1 - 7 only.

PHYS1601
Computer Applications In Experimental Science 1
Staff Contact: First Year Director
UOC6 HPW6 S1 or S2
Corequisite/s: PHYS1111 or PHYS1121 or PHYS1131, MATH1131 or MATH1141 or MATH1031
This course will examine selected topics from classical and quantum physics which are of relevance to the various Engineering disciplines. The course extends the level beyond PHYS1111 Fundamentals of Physics presenting a more mathematical treatment and including physics applications in various Engineering areas to emphasise the essential way in which Physics underpins many of the advances which have been made in modern Engineering and technology.

Physics Level II Subjects
Note: Where mathematics subjects are specified as prerequisites or as corequisites, the higher levels of such subjects are acceptable and preferable. Students are also advised that other subjects may be acceptable equivalent prerequisites or corequisites to those listed, eg PHYS2029 of course 3640 may be acceptable in place of PHYS2021. Enquiry should be made to the Executive Assistant.

PHYS2000
Responsibility and Ethics in Science
Staff Contact: Prof R F Howe, Chemistry
UOC3 HPW2 S2
Note/s: Not offered in 2000
Professional and ethical action and social responsibility in science. Case studies of the process of scientific discovery, ethics and fraud in science, science in industry, science and the military, science and religion, science and the media, intellectual property and patent law.
PHYS2100
Mechanics
Staff Contact: Executive Assistant
UOC3 HPW2 S1
Prerequisite/s: PHYS1002, MATH1231 or MATH1241
Corequisite/s: MATH2011 or MATH2110
Note/s: Excluded: PHYS2001

Simple, damped and forced harmonic oscillations, central force problems, systems of particles, Lagrange's equations, coupled oscillations, waves.

PHYS2020
Computational Physics
Staff Contact: Executive Assistant
UOC3 HPW2 S1
Prerequisite/s: PHYS1002 or PHYS1022, MATH1021 or MATH1231 or MATH1241
Note/s: Excluded: PHYS2001

Use of computers to solve problems in Physics. Application to mechanics, chaos, quantum and thermal physics, data analysis.

PHYS2030
Laboratory
Staff Contact: Executive Assistant
UOC3 HPW3 S1
Prerequisite/s: PHYS1002 or PHYS1022, MATH1021 or MATH1231 or MATH1241
Note/s: Excluded: PHYS2031

Experimental investigations in a range of areas: x-ray diffraction, work function, semiconductor bandgap, Hall effect, carrier lifetimes, nuclear magnetic resonance, magnetic properties.

PHYS2040
Quantum Physics
Staff Contact: Executive Assistant
UOC3 HPW2 S1
Prerequisite/s: PHYS1002, MATH1231 or MATH1241
Note/s: Excluded: PHYS2041


PHYS2050
Electromagnetism
Staff Contact: Executive Assistant
UOC3 HPW2 S2
Prerequisite/s: PHYS1002, MATH1231 or MATH1241
Corequisite/s: MATH2011 or MATH2110
Note/s: Excluded: PHYS2051

Static and time-dependent electric and magnetic fields. Electric and magnetic potentials. Electromagnetic waves. Materials in electric and magnetic fields.

PHYS2060
Thermal Physics
Staff Contact: Executive Assistant
UOC3 HPW2 S2
Prerequisite/s: PHYS1002 or PHYS1022, MATH1031 or MATH1231 or MATH1241
Note/s: Excluded: PHYS2061

Laws of thermodynamics, kinetic theory, microscopic processes, entropy, solid-state defects, Helmholtz and Gibbs functions, Maxwell's relations, phase diagrams, chemical and electrochemical potentials.

PHYS2160
Astronomy
Staff Contact: Executive Assistant
UOC3 HPW2 S2
Prerequisite/s: PHYS1002 or PHYS1022

Galaxies, the distance scale, large scale structure of the universe, galaxy evolution, the very early universe.

PHYS2170
The Search for Life Elsewhere in the Universe
Staff Contact: Executive Assistant
UOC3 HPW2 S2
Note/s: Excluded: GEN54014

A scientific examination of the question "Are we alone". The material will include discussions on the origin and survival of life, current hi-tech searches for radio signals from extra-terrestrials, discoveries of new planetary systems, possible types of life-forms, Einstein's relativity, space-travel, and much more. A team of researchers will present the lectures, which will be supported by special tutorials which will look in detail at quantitative aspects of the subject.

PHYS2310
Nuclear Science and Technology
Staff Contact: Executive Assistant
UOC3 HPW2 S2
Prerequisite/s: PHYS1002 or PHYS1022, MATH1021 or MATH1231 or MATH1241
Note/s: Excluded: PHYS2021, GEN54009

Structure of atom and nucleus, historical review, binding energy, mass defect, liquid drop model, semi-empirical mass formula. Radioactive decay, fission, nuclear reactors, natural (background) radiation, nuclear accidents, fusion and cosmology. Impact of radiation on living organisms, nuclear medicine.

PHYS2410
Biophysics 1
Staff Contact: Executive Assistant
UOC3 HPW2 S2
Prerequisite/s: PHYS1002 or PHYS1022


PHYS2500
Methods in Mathematical Physics
Staff Contact: School Office
UOC3 HPW2
Prerequisite/s: PHYS1002, MATH1231 or MATH1241.
Corequisite/s: MATH2011, MATH2120, MATH2510
Note/s: Not offered in 2000

PHYS2520
Einstein's Relativity and Spacetime
Staff Contact: Executive Assistant
UOC3 HPW2
Prerequisite/s: PHYS1002, MATH1231 or MATH1241.
Corequisite/s: MATH2011, MATH2120, MATH2510
Note/s: Not offered in 2000

PHYS2601
Computer Applications in Experimental Science 2
Staff Contact: Executive Assistant
UOC6 HPW5 S2
Prerequisite/s: PHYS1601

Technical aspects of computer hardware, peripherals and systems. Bus logic devices; simple interface design; use of a general purpose interface for communication, data collection and control. Speed and capacity limitations of conventional peripherals; techniques to improve performance.

PHYS2630
Electronics
Staff Contact: Executive Assistant
UOC3 HPW3 S2
Prerequisite/s: PHYS1002 or PHYS1022
Note/s: Exclusions: PHYS2920, PHYS2301

Electronic bench experiments and tutorials on diodes, transistors, operational amplifiers, power supplies and digital electronics.
PHYS2810
Atmospheric Physics
Staff Contact: Executive Assistant
UOC3 HPW2 S1
Prerequisite/s: PHYS1002 or PHYS1022 or PHYS1899, MATH1021 or MATH1231 or MATH1079 or MATH1031
Note/s: Excluded: PHYS2819
Atmospheric composition, thermodynamics of dry and moist air, stability, cloud physics, atmospheric electricity, radiation laws, solar and terrestrial radiation, applications, ozone hole, atmospheric energy transport, 1D and 3D climate models, applications, global warming.

PHYS2850
Environmental Acoustics
Staff Contact: Executive Assistant
UOC3 HPW2.5 S1
Prerequisite/s: PHYS1002 or PHYS1022 or PHYS1899

PHYS3010
Higher Quantum Mechanics
Staff Contact: Executive Assistant
UOC3 HPW2 S1
Prerequisite/s: PHYS2021 or PHYS2040
Corequisite/s: MATH2120
Note/s: Excluded: PHYS3210. Not available in courses 3970, 3400, 3930 and 4075 without a mark of 65 or greater in PHYS2021 or PHYS2040
Fundamental principles and matrix formulation, spherically symmetric systems, angular momentum theory, perturbation theory and semiclassical radiation theory, variational methods, identical particles.

PHYS3020
Statistical Physics
Staff Contact: Executive Assistant
UOC3 HPW2 S1
Prerequisite/s: PHYS2060 or PHYS2011
Corequisite/s: PHYS2060 or PHYS2011
Note/s: Exclusions: PHYS3210

PHYS3030
Higher Electromagnetism
Staff Contact: Executive Assistant
UOC3 HPW2 S1
Prerequisite/s: PHYS2011 or PHYS2050, MATH2111, MATH2120, MATH2250
Corequisite/s: PHYS2060 or PHYS2011
Note/s: Excluded: PHYS3230. Not available in courses 3970, 3400, 3930 and 4075 without a mark of 65 or greater in PHYS2011 or PHYS2050
Electromagnetic fields; Maxwell's equations, Poynting theorem, electromagnetic potentials. Plane and spherical waves. Reflection and transmission, fields in dispersive media, models and applications, emission of radiation from accelerated charges, covariant formulation of electromagnetism.

PHYS3040
Experimental Physics A1
Staff Contact: Executive Assistant
UOC3 HPW4 S1
Note/s: Some experiments assume knowledge of PHYS2030, PHYS2040 or PHYS2050
A selection of experimental investigations in areas including: chaotic motion, high temperature superconductivity, semiconductors, electron and tunneling microscopy, X-ray and electron diffraction, laser physics and holography, optical fibre technology. Fourier optics and transform spectroscopy, measurement techniques and resonance imaging, electromagnetic waves and waveguides, nuclear counting techniques and neutron activation, vacuum techniques. Formal scientific report writing.

PHYS3050
Nuclear Physics
Staff Contact: Executive Assistant
UOC3 HPW2 S2
Prerequisite/s: PHYS3010, or PHYS3210 with a mark of 65 or greater
Nuclear shell model; theory of beta decay; the deuteron, nucleon-nucleon scattering; theories of nuclear reactions, resonances; mesons and strange particles, elementary particle properties and interactions; symmetries and quark models; strong and weak interactions.

PHYS3060
Advanced Optics
Staff Contact: Executive Assistant
UOC3 HPW2 S2
Prerequisite/s: PHYS1002
Corequisite/s: MATH2120
Review of geometrical optics, including ray tracing, aberrations and optical instruments: physical optics, including Fresnel and Fraunhofer diffraction, transfer functions, coherence, auto and cross correlation; applications of optics, including fibre optics, lasers and holography.

PHYS3070
Experimental Physics A2
Staff Contact: Executive Assistant
UOC3 HPW4 S2
Note/s: Some experiments assume knowledge of PHYS2030, PHYS2040 or PHYS2050
As for PHYS3040.

PHYS3080
Solid State Physics
Staff Contact: Executive Assistant
UOC3 HPW2 S1
Prerequisite/s: PHYS2021 or PHYS2040
Corequisite/s: PHYS3010 or PHYS3210, PHYS3020
Note/s: Exclusions: PHYS3021
Free electron model of metals, Bloch states and energy bands, reciprocal space and the Fermi surface, electron dynamics, Landau levels. Crystal structure, Brillouin zones, elementary diffraction theory, bonding, cohesive processes, impurity states, impurity conductivity. Lattice vibration, monatomic and diatomic chain, acoustic and optic phonons, Einstein and Debye models, dielectric effects.

PHYS3110
Experimental Physics B1
Staff Contact: Executive Assistant
UOC3 HPW4 S1
Prerequisite/s: PHYS2030, PHYS2040 or PHYS2050
Selected experiments and projects. Advanced experimental techniques and open ended projects in the areas covered in PHYS3040 Experimental Physica A together with projects involving electron and nuclear magnetic resonances, low temperature physics and super-conductivity. Fourier optics, holography.

PHYS3120
Experimental Physics B2
Staff Contact: Executive Assistant
UOC3 HPW4 S2
As for PHYS3110 Experimental Physics B1.
PHYS3160
Astrophysics
Staff Contact: Executive Assistant
UOC3 HPW2 S2
Prerequisite/s: PHYS2021 or PHYS2040

PHYS3210
Applied Quantum Mechanics
Staff Contact: Executive Assistant
UOC3 HPW2 S1
Prerequisite/s: PHYS2021 or PHYS2040
Corequisite/s: MATH2120
Note/s: Not available to Advanced Science students in programs 0100, 0121 and 0161. Excluded: PHYS3010
Principles of wave mechanics and its applications including harmonic oscillator, spherically symmetric systems, angular momentum, perturbation theory and semi classical radiation theory. Identical particles and the theory of atoms, solid state devices and quantum wells.

PHYS3230
Applied Electromagnetism
Staff Contact: Executive Assistant
UOC3 HPW2 S1
Prerequisite/s: PHYS2021 or PHYS2050, MATH2011, MATH2120
Corequisite/s: PHYS3080 or PHYS3021
Note/s: Not available to Advanced Science students in programs 0100, 0121 and 0161. Excluded: PHYS3030
Review of Maxwell's equations in integral and differential form, boundary conditions, applications to plane electromagnetic waves in vacuum and material media, dispersion, reflection and transmission, dipoles and antennas.

PHYS3310
Physics of Solid State Devices
Staff Contact: Executive Assistant
UOC3 HPW2 S2
Corequisite/s: PHYS3080 or PHYS3021
Review of electronic structure in semiconductors; p-n junctions; bipolar and field effect transistors including formation, characteristics and electrical breakdown. Optical devices including light emitting diodes and junction lasers. Integrated circuit structures.

PHYS3320
Topics in Condensed Matter Physics
Staff Contact: Executive Assistant
UOC3 HPW2
Corequisite/s: PHYS3080 or PHYS3021
Note/s: Not offered in 2000

PHYS3410
Biophysics 2
Staff Contact: Executive Assistant
UOC3 HPW2 S2
Prerequisite/s: PHYS2011 or PHYS2060, PHYS2410

PHYS3510
Advanced Mechanics, Fields and Chaos
Staff Contact: Executive Assistant
UOC3 HPW2 S1
Prerequisite/s: PHYS2001 or PHYS2010, MATH2011
Lagrange's equations and applications, variational principles, dissipative systems, Hamiltonian formulation, canonical transformations, Poisson brackets, Hamilton-Jacobi equation, continuous systems and fields, stability and chaos.

PHYS3550
General Relativity
Staff Contact: Executive Assistant
UOC3 HPW2 S2
Prerequisite/s: PHYS1002, MATH2011
Relativistic kinematics and dynamics, tensors and tensor operations, Christoffel symbols, formulation of general relativity, curvature of space, geodesics, gravitational field equations, Schwarzschild solution, tests of the theory, astrophysical and cosmological implications.

PHYS3610
Computational Physics
Staff Contact: Executive Assistant
UOC3 HPW2 S2
Prerequisite/s: PHYS2001 or PHYS2020, MATH2120
Use of computers in solving physical problems, including matrix eigenvalue problems and quantum energy levels, boundary value problems (heat conduction, fluid flow and electrostatics) and Monte Carlo techniques.

PHYS3630
Electronics
Staff Contact: Executive Assistant
UOC3 HPW2 S1
Prerequisite/s: PHYS2031 or PHYS2630

PHYS3710
Lasers and Applications
Staff Contact: Executive Assistant
UOC3 HPW2 S1
Note/s: Offered in odd-numbered years only
Interaction between light and matter, fundamental properties of laser amplifiers and oscillators, giant pulse generation, mode locking and Q switching, specific laser systems including gas lasers and semiconductor lasers, applications of lasers.

PHYS3720
Optoelectronics
Staff Contact: Executive Assistant
UOC3 HPW2 S1
Note/s: Offered in even-numbered years only
Introduction to non-linear optics, fibre optics, second harmonic generation, parametric amplification, phase matching, modulation of light, types of optical detectors including thermal detectors, photomultipliers and semiconductor detectors.

PHYS3760
Laser and Optoelectronics Laboratory
Staff Contact: Executive Assistant
UOC3 HPW4 S2
Techniques employed in laser technology and components used in laser applications. Construction, operation and characterisation of several types of lasers. Applications of lasers such as holography, acousto-optics, fibre optics, optical spectroscopy, safety aspects of lasers.

Physics Level IV

PHYS4103
Physics 4 (Honours)
Staff Contact: Dr M Ashley
UOC48
Prerequisite/s: Completion of programs 0100, or 0121, including Level III subjects totalling 42 UOC, or 0161
Note/s: For the combined Physics/Geology honours see entry under Board of Studies in Science and Mathematics. Admission to the honours program is at the invitation of the Head of School and normally requires at least a credit average in Year 3.
Honours programs consist of advanced lecture subjects and project work. Students normally undertake two separate projects during the year, in different research areas. All students take subjects in quantum mechanics, statistical mechanics, solid state physics and electromagnetism and the standard model. Additional subjects are chosen from topics such as astronomy, molecular physics, condensed matter physics and quantum field theory.

**PHYS4411**  
**Medical Physics**  
**Staff Contact:** A/Prof J Wolfe  
**UOC6 HPW2**  
**Prerequisite/s:** PHYS2021 or PHYS2040  


**PHYS4413**  
**Medical Physics Projects**  
**Staff Contact:** A/Prof J Wolfe  
**UOC18 HPW9**  
**Note/s:** Restricted to Course 3973 Medical Physics  

These projects for final year Medical Physics students will be in areas such as Radiotherapy, Nuclear Medicine, Medical Imaging or Biophysics. Generally carried out in a hospital environment under the supervision of a practising medical physicist but may be carried out in the university or elsewhere, if suitable facilities available. Students required to submit a written thesis and present a seminar describing their project work.

**Servicing Subjects**

These are mainly subjects taught within courses offered by other faculties. For further information regarding the following subjects see the relevant Faculty Handbooks.

**PHYS1250**  
**Physics 1 (Building)**  
**Staff Contact:** First Year Director  
**UOC3 HPW3 S2**  

Energy transfer: concepts of temperature and heat; calorimetry; gas laws; phase changes and humidity; heat transmission; refrigeration. Electrostatics and electromagnetism; electric and magnetic fields; DC circuits. Properties of matter: atomic bond types and their relation to elasticity, plasticity and fracture; pressure in stationary and moving fluids.

**PHYS1259**  
**Physics 1 (Industrial Design)**  
**Staff Contact:** First Year Director  
**UOC4 HPW4 S2**  

Energy transfer: concepts of temperature and heat; calorimetry; gas laws; phase changes and humidity; heat transmission; refrigeration. Electrostatics and electromagnetism; electric and magnetic fields; DC circuits; electromagnetic induction. Sound: wave properties; absorption of sound. Properties of matter: atomic bond types and their relation to elasticity, plasticity and fracture; pressure in stationary and moving fluids.

**PHYS2920**  
**Measurement Electronics (Mining Engineering and Industrial Chemistry)**  
**Staff Contact:** Executive Assistant  
**UOC3 HPW3 S2**  
**Prerequisite/s:** PHYS1022 or PHYS1002 or PHYS1169  
**Note/s:** Exclusions: PHYS2031, PHYS2630  

The application of electronics to measurement. Includes principles of circuit theory; amplifiers, their specification and application, transducers; electronic instrumentation; industrial data acquisition.

**PHYS2969**  
**Physics of Measurement (Geomatic Engineering)**  
**Staff Contact:** Executive Assistant  
**UOC3 HPW3 S1**  
**Prerequisite/s:** PHYS1998 or PHYS1189  


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**Physiology and Pharmacology**

**Physiology and Pharmacology Level II**

**PHPH2101**  
**Physiology 1A**  
**Staff Contact:** Dr G Simonetta  
**UOC6 HPW6 S1**  
**Prerequisite/s:** BIOS1101 and BIOS1201; CHEM1021 or CHEM1041; MATH1031 and MATH1041 or MATH1231 or MATH1241 or MATH1021  
**Corequisite/s:** (BIOC2101 and BIOC2201) or (BIOC2181 and BIOC2291)  
**Note/s:** Students intending to major in Physiology and/or Pharmacology should note Level III Physiology prerequisites. Prerequisites may be waived at the discretion of the Head of School

Introduces fundamental physiological principles, from basic cellular function in terms of chemical and physical principles to the operation and interaction of body systems. The areas of physiology covered in this unit are excitable tissues, the cardiovascular system, blood and neuroscience. The unit includes a substantial series of practical class experiments on these different areas of physiology. This subject is taken by students enrolled in any of the Physiology programs.

**PHPH2201**  
**Physiology 1B**  
**Staff Contact:** Dr G Simonetta  
**UOC6 HPW6 S2**  
**Prerequisite/s:** PHPH2101, BIOS1101 and BIOS1201; CHEM1021 or CHEM1041; MATH1031 and MATH1041 or MATH1231 or MATH1241 or MATH1021  
**Corequisite/s:** (BIOC2101 and BIOC2201) or (BIOC2181 and BIOC2291)  
**Note/s:** Students intending to major in Physiology and/or Pharmacology should note Level III Physiology prerequisites. Prerequisites may be waived at the discretion of the Head of School.

The areas of physiology covered in this unit build on the fundamentals introduced in PHPH2101 Physiology 1A. The topics covered include reproduction, the respiratory system, the gastrointestinal system, kidney and body fluids and the endocrine system. This unit includes a substantial series of practical class experiments on these different areas of physiology. This subject is taken by students enrolled in any of the Physiology programs.

**PHPH2121**  
**Principles of Physiology A**  
**Staff Contact:** Dr G Simonetta  
**UOC6 HPW6 S1**  
**Note/s:** Restricted to students enrolled in BOptom degree course.  

Provides an introduction to fundamental physiological principles for students in the BOptom degree course. The areas of physiology covered in this unit are excitable tissues, the cardiovascular system, blood and neuroscience, and includes a series of practical class experiments on these different areas of physiology.
The areas of physiology covered in this unit build on the fundamental physiological principles introduced in PHPH2121 Principles of Physiology A. This unit includes a series of practical class experiments on these different areas of physiology.

**Physiology and Pharmacology Level III**

**PHPH3121 Membrane and Cellular Physiology**

**PHPH3521 Membrane and Cellular Physiology (Adv)**

**PHPH3131 Neurophysiology**

**PHPH3531 Neurophysiology (Adv.)**

Brain mechanisms in sensation and perception are analyzed in detail for vision, hearing and touch, and for the position sense arising from muscles, joints and the vestibular apparatus. The sensorimotor mechanisms responsible for the control of fine movement and postural regulation are also studied at different levels of the nervous system, from the sensory and motor nerves within muscles through to the highest levels of cerebral cortical function. Segments are also included on the neural control of cardiorespiratory function; transmitters and neuromodulators; neural mechanisms in certain higher functions, eg language and memory; nervous system plasticity; computer applications in neuroscience. Experimental work introduces the student to electrophysiological and other neuroscience research techniques, and in seminar-discussion groups to a critical evaluation of neuroscience research literature.

The Neurophysiology (Advanced) course will involve an assessable research affiliation program based upon discussion and evaluation of a research project, and submission of a research report.

**PHPH3151 Introductory Pharmacology and Toxicology**

**PHPH3551 Introductory Pharmacology and Toxicology (Adv.)**

Includes a study of the fundamentals of drug action, such as dose-response methods, receptor binding, drug absorption, distribution and metabolism. Further material on drug analysis and adverse effects of drugs will be presented. Segments dealing with aspects of chemical toxicology and the requirements of government agencies for the registration and evaluation of toxic chemicals will be covered.

Advanced Science students will be affiliated with a research group within the School involving attendance at group meetings, seminars and the presentation of a report based on literature within the subject area.

**PHPH3251 Clinical and Experimental Pharmacology**

**PHPH3651 Clinical and Experimental Pharmacology (Adv.)**

The subject deals with the pharmacology of drug classes, with emphasis on mode of drug action. Effects of drugs on the major organs, including the cardiovascular system, kidney, endocrine systems, and the central nervous system, will be covered. Students will be introduced to recent innovations in drug development and emerging therapeutic strategies based on advances in understanding cellular physiology and drug action. The practicals will cover basic pharmacological methods from both clinical and experimental standpoints.

Advanced Science groups will be affiliated with a research group within the School involving attendance at group meetings, seminars and the presentation of a report based on literature within the subject area.

**PHPH3211 Cardiorespiratory and Exercise Physiology**

**PHPH3511 Cardiorespiratory and Exercise-Physiology (Adv.)**

An advanced course which emphasises the influence of exercise on the function and control of the cardiovascular system; gas exchange in the lung and blood gas carriage in the respiratory system and work capacity, preventive medicine and laboratory testing in exercise physiology. Extensive practical components involve mammalian preparations and human subjects.

Advanced Science students will do a project which has planning (wks. 1, 2, 4), execution (wks.6,7,8,9) and presentation (wks. 14).

**PHPH3221 Endocrine, Reproductive and Developmental Physiology**

**PHPH3621 Endocrine, Reproductive and Developmental Physiology (Adv.)**

There are three major components to this subject, which consists of lectures, practical classes, tutorial and case studies. The first component of the course is a study of neuroendocrinology, molecular and systematic endocrinology, and of the endocrinology of exercise
Physiology and Pharmacology Level IV

PHPH4218
Physiology 4 Honours - FullTime
Staff Contact: A/Prof J Morley
UOC48
Note/s: Completion of program 7300 including 7 level III units, 4 of which must be Physiology.

The Honours Year provides an introduction to research. Students undertake a research project with supervision which is written up as a thesis and presented as a seminar. Students are also required to participate in departmental seminars, and to submit an essay.

PHPH4258
Pharmacology 4 Honours - Full Time
Staff Contact: A/Prof J Morley
UOC48
Note/s: Completion of program 7301 including 7 level III units.

The Honours Year provides an introduction to research. Students undertake a research project with supervision which is written up as a thesis and presented as a seminar. Students are also required to participate in departmental seminars, and to submit an essay.

Psychology

Psychology Level I

PSYC1001
Psychology 1A
Staff Contact: Dr R Richardson
UOC6 HPW5 WKS14 S1
Note/s: Excluded GENB4001

This course introduces the content and methods of psychology as a basic science, with emphasis on the social bases of behaviour. After an initial review of the historical foundations for the scientific study of human behaviour, several specific topics related to the social aspects of human behaviour are discussed. Specific topics covered in this course include: development, measurement of personality, theories of consciousness, and social influences on behaviour. In addition, training in the methods of psychological inquiry and basic procedures of data analysis is also provided.

PSYC1011
Psychology 1B
Staff Contact: Dr R Richardson
UOC6 HPW5 WKS14 S2
Note/s: Excluded GENB4002

This course introduces the content and methods of psychology as a basic science, with emphasis on the biological bases of behaviour. Specific topics covered in this course include: perception, learning, memory, motivation, emotion, and abnormal behaviour. After describing the basic phenomena within an area, the goal will be to explore the neural bases of these behaviours. In addition, training in the methods of psychological inquiry and basic procedures of data analysis is also provided.

PSYC1021
Introduction to Psychological Applications
Staff Contact: School Office
UOC6 HPW4 WKS14 S2
Note/s: Restricted to Program 3432 (Bachelor of Psychology)

The approach of psychology to issues arising in the management of human affairs and to the remediation of human problems. Topics include psychology as a scientific discipline, an overview of areas such as clinical psychology, neuropsychology and developmental disabilities in which psychological knowledge is applied to help individuals to change or to function optimally, and specific areas of public concern where psychology has a major contribution to make such as education, selection, training in industry, traffic and aircraft safety, and the law. The practical component will focus on the professional and social responsibilities of psychologists.

Psychology Level II

PSYC2001
Research Methods 2
Staff Contact: Dr M Gleitman
UOC6 HPW4 WKS14 S1
Prerequisite/s: PSYC1001 and PSYC1011
Notes: PSYC1001 may be taken as a corequisite

General introduction to the analysis of data by means of inferential statistics (t, f and chi square). Issues in the use of statistics (power, robustness). General features of research methodology. Laboratory and statistical traditions affecting design and control procedures. The implications of the use of inferential statistics for research methodology generally. Ethics of research and interpretation of data.

PSYC2061
Social and Developmental Psychology
Staff Contact: Prof J Forgas
UOC6 HPW4 WKS14 S1
Prerequisite/s: PSYC1001 and PSYC1011

Two strands: 1. Social - The basic principles of research and theory in social psychology, with a special emphasis on understanding how people relate to each other. Issues such as the nature of human sociability, the perception and interpretation of social behaviour, ambiguities of interpretation of interpersonal behaviour, verbal and nonverbal communication processes, impression formation and impression management and related topics will be covered. 2. Developmental - The age at which certain abilities or dispositions develop or are learned, and the processes by which developmental changes occur. Issues such as nature and nurture, continuity vs discontinuity, nomothetic vs ideographic approaches and the methods and ethics of developmental research will be covered from various perspectives - psychodynamic, biological/ethological, environmental/learning, and cognitive - developmental.

PSYC2071
Perception and Cognition
Staff Contact: Prof B Gillam
UOC6 HPW4 WKS14 S2
Prerequisite/s: PSYC1001 and PSYC1011

Introduces the fundamental principles underlying human perception and cognition such as sensory coding, perceptual organisation, perception of spatial layout, perceptual learning, object recognition, attention, memory storage and retrieval, problem solving and decision making. The practical program will provide an introduction to the use of psychophysical methods, experimental approaches to the study of cognitive processes, and the application of findings in society.

PSYC2081
Learning and Physiological Psychology
Staff Contact: Prof G Paxinos
UOC6 HPW4 WKS14 S1
Prerequisite/s: PSYC1001 and PSYC1011
Note/s: PSYC1001 may be taken as a corequisite

An examination of brain and behaviour relationships with emphasis on learning, memory and motivation. Topics may include habituation, sensitisation, classical/ operant conditioning, basic motivations, hunger, sex aggression, neuropsychology of amnesia and normal memory.
Psychology Level III

PSYC3001
Research Methods 3A
Staff Contact: Dr K Bird
UOC6 HPW4 WKS14 S1
Prerequisite/s: PSYC2001

Analysis of variance for single factor and multifactor designs. MANOVA model analyses of repeated measures data. Simultaneous inference procedures for contrasts defined on parameters of ANOVA and MANOVA models. General principles of experimental design. Analysing experimental data with the PSY program.

PSYC3011
Research Methods 3B
Staff Contact: Dr K Bird
UOC6 HPW4 WKS14 S2
Prerequisite/s: PSYC3001

Multiple regression and its application to prediction, analysis of designed experiments and construction of structural models. Principal components analysis and factor analysis. Data analysis using SPSS.

PSYC3051
Physiological Psychology
Staff Contact: Prof G Paxinos
UOC6 HPW4 WKS14 S2
Prerequisite/s: PSYC2001 and PSYC2081

The neural control of behaviour with special emphasis on cerebral localisation of function in humans. Clinical conditions will be considered to the extent they illuminate mechanisms and theory of brain function, and the professional issues raised by different theories will be canvassed.

PSYC3121
Social Psychology
Staff Contact: Prof J Forgas
UOC6 HPW4 WKS14 S2
Prerequisite/s: PSYC2001 and PSYC2061

A review of the history, principles and methods, and ethics of social psychology at an advanced level. Substantive research areas such as the nature of affiliation and attraction, interpersonal relationships, the study of beliefs, values and attitudes, persuasion and processes of attitude change, social influence processes, and group behaviour, among others, will be covered.

PSYC3141
Behaviour in Organisations
Staff Contact: Dr A Williamson
UOC6 HPW4 WKS14 S2
Prerequisite/s: PSYC2001 and PSYC2061

The application of general psychological theories and principles to contemporary management problems. It will acquaint students with research in employee motivation, satisfaction, selection, training, evaluation, and teamwork as well as other topics in industrial and organisational psychology, including the role of the professional in organisations and in dealing with other professionals.
characteristics between individuals and groups, and the theories or explanations that account for them, is what is involved in a psychology of individual differences.

PSYC3281
Interpersonal Behaviour
Staff Contact: Prof J Forgas
UOC6 HPW4 WKS14
Prerequisite/s: PSYC2001 and PSYC2061
Note/s: Not offered in 2000
A critical, evaluative perspective, dealing with selected topic areas of contemporary research on social behaviour, such as the development of social understanding, emotional development, the role of affect in social behaviour, social cognition, social interaction processes, and group dynamics. The range of topics will reflect the changing emphasis in contemporary research on interpersonal behaviour.

PSYC3301
Psychology and Law
Staff Contact: Dr K Williams
UOC6 HPW4 WKS14 S1
Prerequisite/s: PSYC2001 and PSYC2061
An examination of various aspects of the judicial process from a psychological perspective in terms of their impact upon the trial participants and society. The focus will be upon contributions of social psychology, although other areas of experimental psychology will be drawn from as well. Topics will include eyewitness memory, judges instructions, lie-detection, trial tactics, reactions to insanity defenses and jury decision making.

PSYC3311
The Psychology of Language
Staff Contact: A/Prof M Taft
UOC6 HPW4 WKS14 S1
Prerequisite/s: PSYC2001 and PSYC2071
One of the features that distinguishes humans from other animals is their use of a sophisticated symbolic system for communication - namely, language. This course will examine how humans cognitively represent their language system in order to successfully produce and comprehend spoken and written words. All levels of language will be considered ranging from the smallest sounds up to full discourse within context. Evidence obtained from language dysfunctions and from investigations of language development will also be considered.

PSYC3321
Cognitive Development
Staff Contact: School Office
UOC6 HPW4 WKS14 S2
Prerequisite/s: PSYC2001 and either PSYC2061 or PSYC2071
The study of cognitive development is concerned with changes in the way that information is encoded, transformed, and responded to as a function of age. The scope of this course ranges from the perceptual and motor abilities of young infants, to the memory functioning of elderly people. Several different perspectives leading to an understanding of cognitive development through the life span will be examined, including the Piagetian approach, age-related changes in information processing, and the acquisition of concepts and beliefs within specific knowledge domains. The applied relevance of developmental findings will also be considered.

PSYC3331
Health Psychology
Staff Contact: A/Prof G Huon
UOC6 HPW4 WKS14
Prerequisite/s: PSYC2001 and either PSYC2061 or PSYC201
Note/s: Excluded PSYC3536. Not offered in 2000
This course aims to introduce students to some of the major theoretical and empirical work in Health Psychology. Its primary focus will be on the promotion and maintenance of health-related behaviour and the prevention of illness. The course will begin with a brief overview of core material in the discipline of psychology with an emphasis on personality, social and developmental psychology. The application of that knowledge will then cover health promotion strategies and methods (for example, improving diet-related behaviour and attitudes, initiating and maintaining exercise programs), and disease prevention skills and behaviours (for example, coronary heart disease, cancer, and smoking related problems).

PSYC3516
Psychology for Optometry
Staff Contact: Dr M Rohan
UOC3 HPW2 WKS14 S1
Note/s: Restricted to Program 3950 (Bachelor of Optometry). Excluded PSYC2116 and PSYC3506
An introduction to various aspects of psychology of relevance to optometrical practice. Includes development of psychological theories, human development, social psychology, psychopathology, perceptual learning and human neuropsychology.

PSYC3526
Workplace Psychology
Staff Contact: Dr J Bright
UOC3 HPW2 WKS14 S2
Note/s: Excluded GENB4005. Restricted to students enrolled in Safety Science majors
An examination of the aims, methods and ethics of industrial and organisational psychology. Topics will include personnel selection, training, job analysis and design, and the relation between job satisfaction and job performance.

Psychology Level IV

PSYC4053
Psychology 4A
Staff Contact: Dr S McDonald
UOC24 WKS14 S1
Prerequisite/s: Completion of Stages 1-3 of programs 3432, 3970 (Psychology Honours), 3978 (Psychology with Computer Science) or 3990 (Psychology and Neuroscience plans)
A supervised research thesis and course work to be determined in consultation with the Head of School.

PSYC4063
Psychology 4B
Staff Contact: Dr S McDonald
UOC24 WKS14 S2
Prerequisite/s: PSYC4053
A supervised research thesis and course work to be determined in consultation with the Head of School.

Servicing Courses

These are courses taught within the Bachelor of Science (Health and Sports) degree. See the Faculty of Medicine Handbook for full details.

PSYC2126
Sports Psychology
Staff Contact: Dr M Rohan
UOC6 HPW4 WKS14
Prerequisite/s: PSYC1001 and PSYC101
Note/s: Restricted to Program 3850 (Bachelor of Science - Health and Sports Science). Not offered in 2000
This course focuses on intrapsychic and interpersonal processes relevant to the training and practice of sports. Theories in areas such as self-perception, self-evaluation, attentional control, attribution, social comparison, group cohesiveness, leadership, and conflict management will be described and applied to the sporting context. Physiological consequences of psychological processes, and their implications for preparation and performance will be discussed. Practical classes will include consideration of issues and methods involved in assessment of relevant personality and individual differences.
This course aims to introduce students to some of the major theoretical and empirical work in Health Psychology. Its primary focus will be on the promotion and maintenance of health-related behaviour and the prevention of illness. The application of that knowledge will then cover health promotion strategies and methods (for example, improving diet-related behaviour and attitudes, initiating and maintaining exercise programs), and disease prevention skills and behaviours (for example, coronary heart disease, cancer, and smoking related problems).

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### Safety Science

**SESC1560 Risk Management 1**  
*Staff Contact: Prof J Cross*  
UOC3 HPW4 WKS14 S2  
This course gives an overview of risk and the risk management process. The course briefly considers what is risk, why people take risks and the cost of risk. It then considers the steps of the risk management process as defined by Australian standards on risk management. The steps are defining the system, risk identification, risk analysis and assessment risk control implementation and auditing. The class will apply each step of the process to case studies relating primarily to aviation issues.

**SESC2090 Safety, Health and Environment**  
*Staff Contact: A/Prof C Winder*  
UOC3 HPW2 WKS14 S2  
This course introduces students to the different subdisciplines in SHE. Areas include Occupational Hygiene, Epidemiology, Ergonomics, Occupational Medicine, Rehabilitation, Safety Engineering, Toxicology and OHS Nursing.

**SESC2100 Workplace Hazards**  
*Staff Contact: Dr T Green*  
UOC3 HPW2 WKS14 S2  
This course aims to make students aware of major workplace safety issues by discussing physical, chemical, biological, psychological and biomechanical hazards. Issues covered include noise, whole body vibration, ionising and non ionising radiation, electrical hazards, hazardous substances, dangerous goods, dust, fumes and ventilation, infectious diseases and stress.

**SESC2500 Occupational Health and Safety**  
*Staff Contact: A/Prof C Winder*  
UOC3 HPW2 WKS14 S1  
*Note/s: Exclusions: SESC6610*  
The legal system and OHS Law; workers compensation law, legal responsibilities for safety, safety committees and safety management systems. Introduction to OHS risk management and the hierarchy of controls, case studies, user centred design and human factors in OHS.

**SESC2560 Risk Management 2**  
*Staff Contact: Dr T Green*  
UOC6 HPW2 WKS14 S2  
This course looks into safety issues in aviation, identifies problems which could lead to emergency situations then considers the planning required for different types of emergency. The course covers writing safety and emergency procedures, emergency plans, setting up an emergency control centre, running emergency exercises and the links with state emergency planning system. General safety issues such as human factors in aviation safety and emergency planning, OHS and major hazard legislation.

**SESC3020 Occupational Health and Safety Law 1**  
*Staff Contact: Prof A Brooks*  
UOC3 HPW2 WKS7 S2  
This course covers concepts of law; the judicial and court systems; common law and equity; the common law of employment, occupational health and safety.

**SESC3091 Safety, Health and Environment Practice**  
*Staff Contact: Dr B Markovic*  
UOC6 HPW3 WKS14 S2  
*Assumed Knowledge: SESC2100*  
A workplace assessment based course, where students are required to report on the safety, health or environmental issues of management following visits to a number of diverse industrial sites.

**SESC3200 Hazard and Risk Assessment**  
*Staff Contact: Prof J Cross*  
UOC3 HPW2 WKS14 S2  
*Note/s: Excluded SESC6610*  
This course takes a risk management approach to safety and demonstrates how safety risk management integrates into other areas of business risk. The concept of safety risk management and requirements for safety risk management in regulations are introduced over the first 4 units. These principles are then illustrated by considering how the risks of particular industrial hazards are assessed and controlled. The topics, which use different methods of risk assessment, include manual handling, machine guarding, fire and explosion, pressure vessels, confined spaces and construction safety issues. In each module the hierarchy of controls is applied in the discussion of risk control strategies. The course concludes with a discussion of accident investigation, prevention and recording and emergency planning.

**SESC3310 Social Issues in Science and Technology**  
*Staff Contact: Dr B Markovic*  
UOC3 HPW2 WKS14 S1  
This course is an objective 5 course which covers social issues arising from future scientific and technological developments and the role that the professional engineer or scientist can play in influencing future directions. The course is taught by a combination of group activities, case studies, projects and seminars. This course will cover four major topic areas, which are: professional ethics, environmental related issues, safety and liability and controls of future technology.

**SESC3541 Assessment of the Workplace Environment**  
*Staff Contact: Dr K Kothiyal*  
UOC6 HPW4 WKS14 S2  
*Assumed Knowledge: SESC2100*  
This course is designed to give students an opportunity to learn and apply methods and techniques used to assess the workplace and the environment. The course is based on measurements in the working and external environment. Topics are selected from measurement and evaluation of noise, lighting, vibration, ventilation, air quality, thermal environment, radiation, chemical hazards, slip resistance etc. Assessments will be carried out on sites in and around UNSW.
SESC3620
Occupational Diseases and Injuries
Staff Contact: A/Prof C Winder
UOC3 HPW3 WK57 S1
Assumed Knowledge: ANAT2151
This course deals with the ways in which work can affect the health of workers. Covers occupational diseases and injuries of skin, respiratory system, nervous system, reproductive system, the musculoskeletal system and occupational cancer.

SESC4010
Research Methods
Staff Contact: Ms D Gardner
UOC3 HPW2 WK57 S1
This course is the preparation for the fourth year project in safety science. It covers issues in research methodology, includes literature searching, problem formulation, null and alternative hypotheses, qualitative and quantitative research designs, statistical inference and the analysis of quantitative data, and a research report. Students will be expected to be able to recognise and avoid common methodological problems in research.

SESC4030
Occupational Health and Safety Law 2
Staff Contact: Prof A Brooks
UOC3 HPW2 WK57 S2
This course extends concepts of law introduced in SESC3020, and covers other workplace legislation and procedures, such as workers compensation and rehabilitation legislation; cases and actions under common law.

SESC4140
Radiation Protection
Staff Contact: Dr R Rosen
UOC3 HPW2 WK57 S1
Principles and practices of radiation protection for both ionising and non-ionising radiation. Radiation physics, detection and measurement; background radiation; biological effects of radiation; dose limits; technical controls for radioactive sources and radiation apparatus. Codes of safe practice; radiological monitoring and personal dosimetry; storage, transport and disposal of sources; environmental impact; administrative controls; emergency procedures; control of non-ionising radiation.

SESC4211
Risk Management
Staff Contact: Prof J Cross
UOC6 HPW3 WK514 S1
This course gives an overview of Risk Management following the format of the Australian Standard in Risk Management (AS4360). Tools and techniques applicable to each step of the risk management process are discussed using examples applicable to the class. The same risk management process is applied to manage a wide range of business issues including health and safety, the environment, finance and project management. This course is therefore relevant as part of a wide variety of programs and students from any program are accepted. The student selects examples for exercises to suit the industry and role in which they work (or intend to work). At the end of the course, students should be able to use risk management tools applicable to their specific interest and have an awareness of tools used in other industries and applications.

SESC4310
Management of Safety, Health and the Environment
Staff Contact: Ms D Gardner
UOC3 HPW2 WK514 S1
Prerequisite(s): PSYC3526 or PSYC3141 or equivalent
This course covers basic issues for managing health, safety and the environment in organisations. Topics include management and management theory, the behaviour of workers, the behaviour of managers, safety culture, systems for managing health, safety and the environment.

SESC4410
Ergonomics 2
Staff Contact: Dr A McIntosh
UOC3 HPW3 WK57 S1 or S2
Assumed Knowledge: SESC2090, SESC2100, SESC2500
Covers displays & controls, design of human-machine-environment systems, job design and work organisation, design of workplaces, the physical environment and an introduction to product design.

SESC4820
Chemical Safety and Toxicology
Staff Contact: A/Prof C Winder
UOC3 HPW3 WK57 S1
Assumed Knowledge: SESC2100
This course provides an outline of the toxicological, occupational hygiene and environmental aspects of chemical hazards and exposures. Metals, solvents, toxic and irritant gases, pesticides, carcinogens, hazardous wastes and dioxins are used as case studies.

SESC4850
Management of Dangerous Materials
Staff Contact: A/Prof Chris Winder
UOC3 HPW3 WK57 S1 or S2
Chemicals legislation, regulatory assessment of chemicals, the dangerous goods system, the hazardous substances regulation and systems for hazardous wastes.

SESC4924
Project
Staff Contact: Program Coordinator
UOC24 S1 or S2 or S3
Stage 4 undergraduate project comprising 24 units of credit (50% of Year 4 load, with the other 50% made up from Stage 4 courses). This course provides an introduction to the research process. Students will undertake a research project with supervision which is written up as a research project report.

SESC6610
Work and Safety
Staff Contact: Dr Boban Markovic
UOC3 HPW2 WK514 S1 and S2
Note/s: Also offered off-campus via web mode. May not be taken as part of 48 UOC Masters program.
This is an introductory course that covers the fundamental safety science principles. It is aimed at giving future managers the skills needed to identify and deal with safety issues in the workplace. The course concentrates on identification of workplace hazards, their associated risks to health and how they can be controlled.

Science Communications
SCOM1011
Science, Technology and Society
Staff Contact: A/Prof D Miller, School of Science and Technology Studies
UOC6 HPW3 WK514 S1
This course provides a topical introduction to a number of key issues in science communication: the need to identify and communicate the 'truth'; the need to simplify in order to be understood by public and professional but non-scientific audiences; the need to deal with incomprehensible viewpoints; whether to allow ideas about the potential impact of what is communicated to influence the act of communication. After an initial sequence of lectures the course will be taught as a seminar involving examination of topical examples of communication issues and dilemmas.

SCOM1021
Introduction to Science Communication
Staff Contact: Dr J Franklin, School of Mathematics
UOC6 HPW3 WK514 S2
A course which introduces students to methods of reporting the general characteristics of science. The course surveys employment
in science communication and introduces the range of skills required of practitioners in the area. It provides practical skills in research, organising, writing and presenting scientific and quantitative information to a non-specific audience with clarity and accuracy. Techniques for the display of quantitative information are introduced. Students gain experience in talking and writing about science and help in achieving the skills required through presentation of science reports for group criticism. There will be consideration of the need to present information to non-scientific audiences and to consider the likely impact of what is communicated. Case studies will illustrate the differing requirements of communicating controversial and non-controversial issues.

Science and Technology Studies

The School of Science and Technology Studies (STS) offers courses in two streams: History and Philosophy of Science and Technology; and Science, Technology, and Society. The courses in the two streams are designated by different course codes (HPST and SCTS). However, any combination of HPST or SCTS courses is permissible, subject to the relevant prerequisites. Entrance to most Level II/III courses is possible without having studied Level I HPST or SCTS courses.

Science and Technology Studies Level I

Students undertaking courses in Science and Technology Studies supplement class contact hours by study in the Library. Only two Level I subjects may be counted towards course 3970.

HPST1107

Cosmos and Culture: Revolutions of Science

Staff Contact: A Corones

UOC6 HPW3 S1

Note/s: Excluded HPST1002, HPST1106

Introduction to the history and philosophy of science and technology. Examines the origins of science in antiquity, and the scientific revolutions of the seventeenth and eighteenth centuries. Covers the history of both physical and life sciences, including technology and medicine, and places special emphasis on change in worldview and cosmologies, and in conceptions and practices of science. Topics: archaeoastronomy; Greek natural philosophy; Aristotle's cosmology; mathematical, physical, and life sciences in Late Antiquity; Ptolemaic astronomy; Vesalius and Renaissance anatomy; the Copernican Revolution; Harvey's new 'biology'; telescope and microscope; the infinite universe; natural history and classification; the chemical revolution.

HPST1108

Science Good, Bad, and Bogus

Staff Contact: P Slezak

UOC6 HPW3 S2

Note/s: Excluded HPST1003

What is science? What are its distinctive characteristics as a form of inquiry? Why are astrology, 'creationism' or parapsychology widely considered to be pseudosciences? A critical consideration of such inquiries raises central questions concerning the nature of science, involving issues such as the nature of observation and evidence, theories and laws, explanation and prediction, etc. Issues to be considered include the 'Galileo Affair', 'science vs. religion' and relativism. These are placed in an historical context from the Ancient Greeks to twentieth century philosophers. Also considered are the nature of scientific revolutions and 'postmodern' approaches to science.

SCTS1106

Science, Technology, and Society

Staff Contact: S Healy/D Miller

UOC6 HPW3 S1

Note/s: Excluded SCTS1001

Examines the relations of science and technology with societies in the modern world. The status and authority of science. Can science tell us what we ought to do? Critiques of science. Is technology applied science? What is the relation between technology and social change? The political uses of expertise. Experts and the rest of us. Issues of participation. These topics will be explored theoretically and by reference to case studies including: modern genetics and its use in agriculture and medicine; information technology; computers and cyberspace; energy technologies, nuclear and solar; technologies of everyday life.

HPST2107

The 'Darwinian Revolution' and the Order of Nature 1790-1890

Staff Contact: D Miller

UOC6 HPW3 S1

Prerequisite/s: Completion of Arts courses carrying at least 36 units of credit or Level I Science courses totalling at least 24 units of credit

Note/s: Excluded HPST2001

Focuses on theories in the practice of science, and examines not only the structure of theories but also their life cycle from conception to crematorium: How are theories generated? How do they guide, and translate into scientific practice? What are the dynamics of theoretical change? Under what conditions are theories discarded? Along the way, many of the classical problems of the philosophy of science get an airing: What are scientific laws? Can theories be proved true or falsified? Is there a logic of theory generation? Do theories describe the world?

HPST2108

Cheating Death: A History of Medicine

Staff Contact: S Hardy

UOC6 HPW3 S1

Prerequisite/s: Completion of Arts courses carrying at least 36 units of credit or Level I Science courses totalling at least 24 units of credit

Note/s: Excluded GENS5522, GENT0902, HPST2003, HPST2128.

Development of theory and practice in Western medicine from Hippocratic times to the 20th century. Material covered in four sections: (1) 'bedside' medicine from antiquity to the French Revolution; (2) 'hospital' medicine in the early 19th century; (3) 'laboratory' medicine in the late 19th century; and (4) 'technological' medicine in the 20th century, emphasising the social role of modern medicine.
HPST2109

Computers, Brains, and Minds
Staff Contact: P. Slezak
UOC6 HPW3 S2
Prerequisite/s: Completion of Arts courses carrying at least 36 units of credit or Level I Science courses totalling at least 24 units of credit
Note/s: Excluded GEN5525, HPST2004

Introduction to contemporary discussions of the mind, thought, intelligence and consciousness. Focuses on the issues which arise in connection with the so-called 'cognitive sciences'- the disciplines which include such fields as neuroscience, psychology, linguistics, the philosophy of mind, and 'artificial intelligence'. Can computers think? Is the brain a machine?

HPST2111

The Scientific Revolution
Staff Contact: J. Schuster
UOC6 HPW3 S1
Prerequisite/s: Completion of Arts courses carrying at least 36 units of credit or Level I Science courses totalling at least 24 units of credit

Examines fundamental issues and techniques in the history and philosophy of science. Deals with the origins of modern European science, as exemplified in the work of Copernicus, Galileo, Newton and others. The social, religious, political and economic factors shaping the emergence and content of the new science are analysed. Emphasis is placed on critical historical thinking and use of tools from the sociology of scientific knowledge.

HPST2118

Defining Science: A History
Staff Contact: A. Corones
UOC6 HPW3 S2
Prerequisite/s: Completion of Arts courses carrying at least 36 units of credit or Level I Science courses totalling at least 24 units of credit
Note/s: Excluded HPST2011. Not recommended for students without some background in philosophy or HPST.

Examines the history of attempts to define and direct the scientific enterprise, from Plato and Aristotle in antiquity to the twentieth century. Questions about what scientific knowledge is, or should be, and how we should go about acquiring it, provide a focal point of discussion. The diversity of answers to these questions provide insight into not only the importance of methodological issues in the history of science, but also of the normative nature of foundational theories of science. Provides an overview of the history of the philosophy and methodology of science.

HPST2118

Body, Mind, Soul: The History and Philosophy of Psychology
Staff Contact: P. Slezak
UOC6 HPW3 S1
Prerequisite/s: Completion of Arts courses carrying at least 36 units of credit or Level I Science courses totalling at least 24 units of credit
Note/s: Excluded HPST2013

Development of ideas concerning the nature of mind and its relation to the body. Topics: Plato’s doctrine of the immortality of the soul; Descartes’ division of mind and body; the classical dispute between rationalism and empiricism over innate ideas; the behaviourism of Watson and Skinner; the Freudian Revolution; the rise of experimental psychology from Wundt and Fechner to Chomsky and the ‘Cognitive Revolution’; minds as machines and the question of whether computers can think.

HPST2119

Philosophy of the Social Sciences: Issues and Topics
Staff Contact: P. Slezak
UOC6 HPW3 S1
Prerequisite/s: Completion of Arts courses carrying at least 36 units of credit or Level I Science courses totalling at least 24 units of credit
Note/s: Not offered in 2000. Excluded HPST2014

Can human behaviour be understood and explained scientifically? Are social behaviour and meaningful action to be explained by causal laws, as in the natural sciences, or are there special methods which are uniquely appropriate to human behaviour? Examines the long-standing controversy about the radically contrasting ways to understand human beings and their social existence. The course examines this debate through considering laws, explanations, causes, and theories in the natural sciences, in contrast with the empathic or intuitive understanding of the meaningfulness of human actions.

HPST2126

God, Life, the Universe and Everything: Science and Meaning
Staff Contact: P. Slezak
UOC6 HPW3 S1
Prerequisite/s: Completion of Arts courses carrying at least 36 units of credit or Level I Science courses totalling at least 24 units of credit

‘Ultimate’ questions about God, the meaning of life and the point of it all, have traditionally been the business of religion. Can science provide an answer to these questions, or is there always a realm of understanding which is beyond scientific knowledge? This course examines philosophical issues in epistemology, metaphysics and philosophy of science. Topics will include arguments for the existence of God and the underlying questions of evidence and explanation in science.

HPST2127

Discrediting Science? - Postmodernism and Legitimation
Staff Contact: A. Corones
UOC6 HPW3 S2
Prerequisite/s: Completion of Arts courses carrying at least 36 units of credit or Level I Science courses totalling at least 24 units of credit

Examines the perception that postmodernism discredits science. Discussion is focussed on postmodernist ‘incredulity towards metanarratives’, and the way in which this provokes the crisis of legitimation. Topics and debates covered include constructivism, relativism, realism and anti-realism, the naturalistic turn in epistemology, rationality, hermeneutics and the politics of knowledge.

HPST2128

Medicine and Empire: The Australian Experience
Staff Contact: S. Hardy
UOC6 HPW3 S2
Prerequisite/s: Completion of Arts courses carrying at least 36 units of credit or Level I Science courses totalling at least 24 units of credit
Note/s: Excluded GEN5522, GENT0902, HPST2003, HPST2108, HPST3119

Examines how the European version of medicine evolved in and was adapted to the Australian environment from 1788 to the mid-twentieth century - how the landscape, climate and social, political and economic structures affected the way medical care and medical personnel were viewed. Consideration is also given to the development of medicine on the North American continent, noting similarities and differences between the situation there and in Australia.

HPST2136

Agriculture and Civilisation In Historical Perspective
Staff Contact: D. Miller
UOC6 HPW3 S1
Prerequisite/s: Completion of Arts courses carrying at least 36 units of credit or Level I Science courses totalling at least 24 units of credit

This course looks at some of the wide variety of ways civilisations have developed an agriculture to sustain them, and how a people's way of embedding itself in the ecosystem can inform its culture. Also considers in some detail the ways in which the agriculture of Western civilisation has been transformed in the tiny span of time (evolutionarily and ecologically speaking) since the scientific revolution and the industrial revolution that followed it. An understanding of how our relations with nature came to their current state provides essential background for approaching ecological crises of the present and future.
HPST2137
Life Science in the 20th Century: The Molecular Revolution
Staff Contact: N Rasmussen
UOC6 HPW3 S2
Prerequisite/s: Completion of Arts courses carrying at least 36 units of credit or Level I Science courses totalling at least 24 units of credit
Note/s: Not offered in 2000
Explores the rise of the experimental biology disciplines, from the embryology, genetics, bacteriology and physiology of the early 20th century through the 'molecular revolution' of the period around the Second World War and the new sciences it spawned. These include sciences such as cell biology, immunology and above all molecular genetics - the science of the genetic code and the linchpin of current biotechnology.

HPST3106
The Discovery of Time
Staff Contact: D Miller
UOC6 HPW3 S1
Prerequisite/s: Completion of Arts courses carrying at least 36 units of credit or Level I Science courses totalling at least 24 units of credit
Note/s: Not offered in 2000. Excluded HPST3001
The puzzle of the nature of time is examined through the history of the conception and perception of time, from the world of primal cultures to that of the bizarre universe of twentieth-century physicists. Major strands include: time in primal and ancient cultures; philosophy of time; time in iconography and architecture; the theology of time; time measurement; the invention of the mechanical clock and its cultural and cognitive consequences; absolute and relative time; the extension of the time scale; the arrow of time and time displacement; time and the writing of history; biological and psychological time; time and literature.

HPST3108
Deity and Mother Earth
Staff Contact: Y Luxford
UOC6 HPW3 S2
Prerequisite/s: Completion of Arts courses carrying at least 36 units of credit or Level I Science courses totalling at least 24 units of credit
Note/s: Excluded HPST3003
Conceptions of deity in relation to changing notions of sexuality and generation, and the place of human beings in relation to their environment. Topics: the Earth Mother; keng-shui; symbolism of city, temple, and dwelling; mythology and generation in ancient and primal cultures including the Australian Aborigines; Medieval and Renaissance world views; the mythology of the machine; exploitation, conservation and stewardship; the cultus of the Virgin Mary; place making; theories of biological generation; Deity, Nature and environmentalism; the Gaia hypothesis; typology of religions.

HPST3111
Experiment, Discovery, Method: New Perspectives on Science
Staff Contact: J Schuster
UOC6 HPW3 S2
Prerequisite/s: Completion of Arts courses carrying at least 36 units of credit or Level I Science courses totalling at least 24 units of credit
Scientists do experiments, make discoveries and employ scientific method. This is the traditional picture. But recent insights from the history and sociology of scientific knowledge suggest that more complex processes are involved. This course deals with: the theoretical shaping of experimental practice; scientists' negotiation of discoveries; the rhetorical and political use of ideas of scientific method in such negotiations.

HPST3118
Reading Option In History and Philosophy of Science
Staff Contact: D Miller
UOC6 HPW3 S1 or S2
Prerequisite/s: Completion of Arts courses carrying at least 36 units of credit or Level I Science courses totalling at least 24 units of credit
Note/s: Permission for enrolment in the reading option must be obtained from Head of School
Students wishing to work in an area not covered by an existing course may apply to the School to take a reading option. Not more than one such course may be counted towards a degree. Approval of a program for a reading option will depend on its suitability, and the availability of a staff member to undertake supervision.

HPST3119
Researching Medical History In Australia
Staff Contact: S Hardy
UOC6 HPW3 S2
Prerequisite/s: HPST2108 or HPST2003
Note/s: Excluded HPST2128
This research-oriented course is intended for students who have completed HPST2108 'History of Medicine' and who wish to undertake further study in this area, with a particular focus on Australia. Background information will be provided in lectures, and students will engage in original research. Weekly seminars will address the techniques and resources available for researching the history of medicine in Australia.

HPST3126
Thinking Technology Through: Philosophies of Technology
Staff Contact: A Corones
UOC6 HPW3 S2
Prerequisite/s: Completion of Arts courses carrying at least 36 units of credit or Level I Science courses totalling at least 24 units of credit
Note/s: Not offered in 2000
What is Technology? How does it shape our form of life? Can we do anything about it? What should we be doing about it? These issues are approached through the philosophy of technology. Issues considered include technology and the life-world, technological determinism, technology and values, and the relations between philosophy of technology and philosophy of science.

SCTS2107
How Science Works: The Sociology of Science and Technology
Staff Contact: D Miller
UOC6 HPW3 S2
Prerequisite/s: Completion of Arts courses carrying at least 36 units of credit or Level I Science courses totalling at least 24 units of credit
Note/s: Excluded SCTS2002
Examines contrasting accounts of how science works as a system of knowledge production, as a social system, and as a basis for manipulating the world through technology. Is science insulated from social and technological processes or integrated with them? Included among the approaches to this question are: Mertonian normative sociology; sociology of scientific knowledge; Latourian actor-network theory; symbolic interactionism and pragmatist sociology of science. Provides background to understanding debates about issues such as: the objectivity of scientific knowledge; the relationship between science and technology; the role of science in dealing with environmental problems; the communication of scientific knowledge to wider business, government and community constituencies and their understanding of it.

SCTS2108
Information Technology, Politics and the Media
Staff Contact: J Merson
UOC6 HPW3 S1
Prerequisite/s: Completion of Arts courses carrying at least 36 units of credit or Level I Science courses totalling at least 24 units of credit
Note/s: Excluded SCTS2003
Examines the global expansion of Information Technology and its social and economic impacts. It looks at the role of internet, intranet and satellite broadcasting systems in breaking down traditional barriers of time and space. Examples discussed include: the spread of global media services; international telemedicine; education and training accessed globally; international consumer banking and
finance; and manufacturing processes controlled globally on-line. It also explores the political implications of these changes, and the efforts of communities in both developed and underdeveloped countries to take advantage of this information 'superhighway' without being culturally annihilated in the process.

**SCTS2109**
The Challenge of the New Biotechnologies
*Staff Contact: N Rasmussen*
UOC6 HPW3 S2
**Prerequisite/s:** Completion of Arts courses carrying at least 36 units of credit or Level I Science courses totalling at least 24 units of credit

**Note/s:** Not offered in 2000. Excluded SCTS2004

Examines the new medical and agricultural technologies, stemming from the molecular biology revolution, in social context. Topics covered may include xenotransplantation, the Human Genome Project, new reproductive biotechnologies for humans, the genetic manipulation of food crops and animals for altered product qualities, and the impact of biotechnology on agricultural sustainability.

**SCTS2118**
Technology, Environment, Politics
*Staff Contact: P Brown*
UOC6 HPW3 S1
**Prerequisite/s:** Completion of Arts courses carrying at least 36 units of credit or Level I Science courses totalling at least 24 units of credit

Provides a theoretical and historical background for understanding the 'social crisis of the environment'. Environmental crisis is often blamed on 'Western Industrialised Society'. This needs careful definition as do other terms such as 'liberal democratic', 'Northern', 'modern' and 'capitalist'. Major ideas and important historical developments of Western Society are investigated, by considering key themes in relation to present day environmental politics. Topics include: pre-industrial social and political developments in Europe; the ideas of the Enlightenment; the Industrial Revolution; images of nature in the development of modernity; positivism, natural science and the emergence of social science; progress and ecological impacts of industrialisation; technocracy and totalitarianism in the Twentieth Century; critical theory and the critique of science and technology since World War Two; globalisation and postmodernity; the lifeworld, risk, trust and participatory decision making.

**SCTS2119**
Science, Technology and Everyday Life
*Staff Contact: D Miller*
UOC6 HPW3 S1
**Prerequisite/s:** Completion of Arts courses carrying at least 36 units of credit or Level I Science courses totalling at least 24 units of credit

Examines and analyses the place of science and technology in everyday existence in Australia, Britain and the United States over the last two hundred years as a way of addressing the 'public understanding' of science and technology. The history of infrastructural and domestic technologies (water, sewerage, heating and cooling, transport, communications). Contemporary community efforts to mobilise scientific and technical knowledge in the pursuit of infrastructural, environmental and health objectives.

**SCTS2120**
Science and Technology in the Movies
*Staff Contact: G Bindon*
UOC6 HPW3 S1
**Prerequisite/s:** Completion of Arts courses carrying at least 36 units of credit or Level I Science courses totalling at least 24 units of credit

Since the inception of the communication medium of moving pictures, the impacts of science and technology on society and the environment have been prevalent sources of themes and images for movie-makers. Involves viewing a variety of films and critically examining how they have represented the interactions of science, technology, society and the environment including such aspects as: the portrayal of scientists and engineers; the nexus of knowledge and power; the conflicts between the scientific/modern project and alternate world views; utopias and dystopias; 'popularisation' of science; 'scientistic' vs. 'scientific' content; pro-science and anti-science views, and the role of science fiction in the formulation of scientific futures. These portrayals will be considered in light of the parallel development of the scholarly study of science, technology and society, and the extent to which the popular media reflect academic analyses.

**SCTS2121**
Knowledge and Power
*Staff Contact: G Bindon*
UOC6 HPW3 S1
**Prerequisite/s:** Completion of Arts courses carrying at least 36 units of credit or Level I Science courses totalling at least 24 units of credit

**Note/s:** Excluded SCTS2106

How does knowledge, particularly scientific and technical knowledge, interact with the exercise of power? Examines the history of the idea of a special relationship between the possession of both knowledge and power. Through case studies of contemporary scientific, technological and environmental policy issues, and the use of workshops, students will simulate the processes by which power is exercised and knowledge is used. They will acquire some of the skills associated with the practical deployment of knowledge within organisations, particularly those associated with the role of policy advisers. Students will gain a basic understanding of Australian and international science and technology policies. Some examples of recent case study workshops include the new Lucas Heights Reactor, a consensus conference on genetic engineering, and the Microsoft monopoly debate.

**SCTS2122**
Evolution, Innovation, Communications and the Future
*Staff Contact: G Bindon*
UOC6 HPW3 S2

**Note/s:** Excluded SCTS2116

One thing that dramatically distinguishes humans is that we are able to change the conditions of our own existence. We achieve this by changing what we do and whom we do it with, and by making things that previously didn’t exist. Focuses on a developing convergence of thinking about evolution, communications, economics, and technological innovation/change. Considers ways of explaining how we create physical and cultural extensions of our bodies and our brains, and how these have evolved, and continue to evolve. We live in an era of unprecedented transformation. As we move rapidly into a ‘post-industrial’/‘post-modern’ world, this course provides an opportunity to consider the nature, origins, and consequences of the changes we shall be experiencing.

**SCTS3106**
Technology, Sustainable Development, and the Third World
*Staff Contact: J Merson*
UOC6 HPW3 S1
**Prerequisite/s:** Completion of Arts courses carrying at least 36 units of credit or Level I Science courses totalling at least 24 units of credit

**Note/s:** Excluded COMD2050, SCTS3001

This course is about sustainable development along with the technological and social changes that are involved in achieving it, both at a national and global level. It is divided into three parts: (1) the historical causes of the present global environmental and economic crisis; (2) possible solutions to problems of food production, environmental degradation, industrialisation, energy use, and population growth; (3) ideas for a New World Economic Order and the economic and technological changes required to bridge the ever increasing gap between rich and poor nations.

**SCTS3107**
Women and Science
*Staff Contact: D Miller*
UOC6 HPW3 S2
**Prerequisite/s:** Completion of Arts courses carrying at least 36 units of credit or Level I Science courses totalling at least 24 units of credit

**Note/s:** Not offered in 2000. Excluded SCTS3002
A series of seminars on: the constraints and opportunities facing women scientists, including some eminent Australians; the philosophical issues and implications for social policy raised by women's participation in science.

**SCOTS3109**  
Society, Technological Hazards, and Environmental Management  
Staff Contact: D Miller  
UOC6 HPW3 S1  
Prerequisite/s: Completion of Arts courses carrying at least 36 units of credit or Level I Science courses totalling at least 24 units of credit  
Note/s: Not offered in 2000. Excluded SCTS3004  
Concerns over risk associated with technological and environmental hazards. The present anxieties over social control and the relations between ethics and politics. Institutional and global aspects of environmental management in relation to hazards such as toxic wastes, genetic engineering, ozone hole; international negotiation.

**SCOTS3115**  
Politics of the Atmosphere  
Staff Contact: S Healy  
UOC6 HPW3 S1  
Prerequisite/s: Completion of Arts courses carrying at least 36 units of credit or Level I Science courses totalling at least 24 units of credit  
Examines the ozone and greenhouse issues in the broader sustainability debate. The regulation of the atmospheric commons is crucial in attempts to balance industrial development and ecological sustainability and a key rationale for curtailing modern industrial lifestyles. Considers the pivotal role of scientific knowledge in these issues, the technological politics central to them, and the prominent role of economic instruments in proposed solutions. The evolution of the ozone issue and its regulation via the Montreal Protocol provides a basis for the study of the more complex and challenging greenhouse problem. The local/global relationship is examined through a case study of urban air quality and transport in Sydney.

**SCOTS3119**  
Reading Option in Science and Technology Studies  
Staff Contact: D Miller  
UOC6 HPW3 S1 or S2  
Prerequisite/s: Completion of Arts courses carrying at least 36 units of credit or Level I Science courses  
Note/s: Permission for enrolment in the reading option must be obtained from Head of School  
Students wishing to work in an area not covered by an existing course may apply to the School to take a reading option. Not more than one such course may be counted towards a degree. Approval of a program for a reading option will depend on its suitability and the availability of a staff member to undertake supervision.

**SCOTS3126**  
Society and Environmental Process: Botany Bay  
Staff Contact: S Healy  
UOC6 HPW3 S2  
Prerequisite/s: SCTS2118 and at least two other upper level courses listed in the Environmental Studies Program  
Note/s: Excluded SCTS3013, SCTS3020  
Interprets the concept of the social construction of the environment in the specific context of Botany Bay and its region. Environmental issues are identified and examined in the light of historical, sociological, economic and political developments in the regional, national and global levels. Prospects and processes for intervention. In addition to other work, each student completes a substantial research report.

**SCOTS3127**  
Communicating Science: Theory and Practice  
Staff Contact: D Miller/J Merson/VG Bindon  
UOC6 HPW3 S2  
Prerequisite/s: Completion of Arts courses carrying at least 36 units of credit or Level I Science courses totalling at least 24 units of credit  
Communicating science is crucial in modern societies. Scientists need to communicate not only among themselves but with representatives of business, unions, government, the media and environmental and community interest groups. Examines how different ideas about the nature of science affect our understanding of how science is communicated. Topics include: the history of science communication; new communications technologies and science; popularisation; distortion; the communication of uncertainty and risk. Also considers the role of communicators and policy advisors and guides students towards the latest on-line tools required to access, evaluate and use current information about science, technology and their social and environmental impacts. The class will simulate issues of communication and the roles of science communicators and produce appropriate outputs, such as journalistic articles, press releases, and presentations to be published through an on-line journal.

**SCOTS4106/SCTS4156**  
Science and Technology Studies Level IV Honours Program  
Staff Contact: D Miller  
UOC48  
Prerequisite/s: At least 54 units of credit, with an average of Credit or better, in courses offered by the School  
In the Honours Program, candidates are required to present a thesis to complete coursework as approved by the Head of School.

**Textile Technology**

**TEXT4003**  
Project  
Staff Contact: Prof R Postle  
Corequisite/s: TEXT4013  
Note/s: Restricted to courses 3170, 3175 and 3177  
Students are required to carry out a research project and to submit a thesis describing their investigations. It is usual for students to be allocated projects in areas related to the particular course option they are studying.

**TEXT4013**  
Seminar  
Staff Contact: Prof M Pailthorpe  
Corequisite/s: TEXT4003  
Note/s: Restricted to courses 3170, 3175 and 3177  
Students prepare and present a seminar before an audience consisting of staff of the Department, final year students, Graduate Diploma students, and any other interested undergraduate or postgraduate students, on a subject of topical and specific interest in the field of textile science, technology or management, and subsequently submit the seminar in writing.

**TEXT4101**  
Textile Structures 2  
Staff Contact: Prof R Postle  
Prerequisite/s: TEXT1101/TEXT1301  
Note/s: Restricted to courses 3170, 3175 and 3177  
TEXT4202
Textile Quality Control
Staff Contact: Prof M Pailthorpe
Prerequisite/s: TEXT2201
Note/s: Restricted to courses 3170, 3175 and 3177

TEXT4501
Finishing Technology B
Staff Contact: Prof M Pailthorpe
Prerequisite/s: TEXT1101/TEXT1301
Note/s: Restricted to courses 3170, 3175 and 3177
Wet and dry fabric finishing. The application of special finishes including flame retardant finishes, crease resistant and antistatic finishes, etc. Fabric setting Dimensional stability and its measurement. The drying of textile materials. Recent developments in finishing technology.

TEXT4601
Field Trip
Staff Contact: Dr J Curiskis
Prerequisite/s: Completion of all Years 1, 2 and 3 TEXT subjects
Note/s: Restricted to courses 3170, 3175 and 3177
A five day field trip, normally undertaken during Session 1, designed to give wide exposure to the natural fibre and man-made fibre processing industries in New South Wales and Victoria. Students will incur some personal expenses in connection with this subject, which is a compulsory part of the course.

TEXT4701
Textile Industry Studies
Staff Contact: Dr J Curiskis
Prerequisite/s: TEXT3901
Note/s: Restricted to course 3177
Econometrics of the textile and clothing industries. Models of production, import and export and consumption of textiles and clothing in Australia, and comparison with world data. Case studies in textile and clothing manufacture operations. Environmental considerations in relation to pollution from the textile industry. Waste water treatment methods.

TEXT4901
Textile Design 3
Staff Contact: Dr J Curiskis
Prerequisite/s: TEXT3901
Note/s: Restricted to course 3177
Appreciation of the role of computers in textile design. Computer Aided Design (CAD) applications in fibre blending, yarn manufacture, woven and knitted fabric manufacture, dyeing technology, printing technology, embroidery, etc. Computer Aided Manufacture (CAM) systems for various sectors of the textile industry. Commercial aspects of CAD/CAM systems including performance requirements and coatings.
Faculty of Life Sciences

Dean: Professor MJ Sleigh
The Schools of the Faculty of Life Sciences offer facilities for students to proceed to the award of a Graduate Diploma in Biochemistry and Molecular Genetics (5345), Biotechnology (5015), Food Technology (5020), Biological Science (5350), Microbiology and Immunology (5355) and Psychology (5330).

The award of a Masters degree by course work is offered in Psychology (8251 and 8253 and 8254). Course work Masters programs are also available in Biotechnology (8042), Biopharmaceuticals (8043), Food Science and Technology (8032) and Marine Science (8265).

Programs leading to degrees of Masters by research and PhD are available in all Schools of the Faculty. A combined PhD/Masters course work is offered in Psychology (1402 and 1403). Graduates are advised to contact the relevant Head of School to obtain advice on entry requirements.

Faculty of Science and Technology

Dean: Professor CE Sutherland
The Schools of the Faculty of Science and Technology offer programs leading to the Award of the degrees of Doctor of Philosophy, Master of Science and (through the School of Materials Science and Engineering) Master of Engineering.

The following formal courses leading to graduate awards are also offered:
- School of Chemistry: Graduate Diploma in Food and Drug Analysis, Master of Chemistry in Food and Drug Chemistry
- School of Geography: Graduate Diploma in Remote Sensing, Master of Applied Science in Geography
- School of Geology: Master of Applied Science in Geology (including programs in Geological Data Processing, Groundwater Studies and Engineering and Environmental Geology)
- School of Materials Science and Engineering: Graduate Diploma in Textile Technology, Master of Applied Science in Corrosion Engineering, Master of Applied Science in Engineering Materials
- School of Mathematics: Graduate Diploma in Physical Oceanography, Graduate Diploma in Statistics, Master of Mathematics, Master of Statistics
- School of Optometry: Master of Optometry
- School of Physics: Graduate Diploma in Physics, Graduate Diploma in Physics Research Techniques
- Centre for Advanced Numerical Computation in Engineering and Science: Graduate Diploma in Computational Science, Master of Computational Science.

Graduates are advised to consult the Head of Department before making formal application for registration in any of the above courses.

Students completing undergraduate science degrees which include an appropriate mix of subjects may qualify for admission to higher degree programs in Faculties other than Life Sciences and Science and Technology.

Enrolment Procedures

All students re-enrolling in 2000 or enrolling in graduate courses should contact the Postgraduate Section for enrolment details.
Facilities are available in each of the Schools for research leading to the award of the degrees of Master of Science, Doctor of Philosophy and Graduate Diploma. The Department of Biotechnology (within the School of Applied Bioscience) offers a Graduate Diploma in Biotechnology and a Masters degree course in Biotechnology by formal study. The Department of Food Science and Technology (within the School of Applied Bioscience) offers a Graduate Diploma in Food Technology and Master of Science degrees in Food Technology, Food Microbiology, Food Engineering and Food Science and Nutrition by formal study. The School of Psychology offers Master of Psychology (Clinical), Master of Psychology (Forensic), Master of Psychology (Organisational), combined PhD/Master of Psychology (Clinical), combined PhD/Master of Psychology (Forensic), and combined PhD/Master of Psychology (Organisational) degree courses. A Master of Marine Science program is also available.

**Higher Degree Qualifying Program**

Students without a BSc Honours degree wishing to register as higher degree candidates must usually complete a qualifying program, admission to which is course to the approval of the Faculty Higher Degree Committee.

Applicants must normally have a degree or diploma in an appropriate field of study from an approved university or institution, and in the case of a diploma, appropriate professional experience.

Undergraduates of this University may be admitted to the full-time or part-time Honours undergraduate course. Other applicants may be admitted to a full-time, part-time or external qualifying program. The duration of the qualifying program is a minimum of one year for full-time and two years for part-time or external students.

**Content of Qualifying Program**

The qualifying program consists of the whole of the usual program for the final Honours year of the undergraduate course, the following being the prescribed Level IV courses:

- **BIOC4318** Biochemistry Honours (Full-time)
- **BIOC4618** Biochemistry Honours (Part-time)
- **BIOS4517** Biological Science Honours (Full-time)
- **BIOS4527** Biological Science Honours (Part-time)
- **BIOT4073** Biotechnology Honours (Full-time)
- **BIOT4083** Biotechnology Honours (Part-time)
- **BSSM4103** Genetics Honours (Full-time)
- **BSSM4109** Genetics Honours (Part-time)
- **MICR4013** Microbiology and Immunology Honours (Full-time)
- **MICR4023** Microbiology and Immunology Honours (Part-time)
- **PSYC4053** Psychology 4A
- **PSYC4063** Psychology 4B

The qualifying program is graded in the usual way, and in appropriate cases the results are expressed as a grading equivalent to Honours.

Students undertaking a qualifying program in the Department of Food Science and Technology will enrol in Course 6138 Postgraduate Qualifying in Food Science and Technology and undertake such courses as approved by the Head of Department.

**Alternative Qualifying Program**

Applicants who cannot attend the University regularly for the above programs may be admitted as external qualifying students to a program similar to a standard Honours year. The following are the alternative qualifying courses:

- **BIOC6308** Biochemistry
- **BIOS9917** Biological Science
- **MICR6043** Microbiology
- **PSYC6000** Psychology

The results in alternative qualifying courses are graded Pass or Fail only.

**Fees**

Candidates enrolled in the Alternative Qualifying Program are exempt from student service fees.
Graduate Diplomas

The Graduate Diploma is designed as a one year full-time period of study and research in all Schools except Applied Bioscience. It is intended primarily as an advanced training program for graduates from overseas universities who wish to obtain specialised training in particular areas of life sciences. The expectation is that for suitably qualified students, the program would allow entrance to a higher degree program (MSc or PhD) provided supervision and facilities were available. The program is also available to graduates of Australian universities who have not done an Honours program and who wish to pursue graduate study in a discipline other than that in which they obtained their first degree.

At the successful conclusion of the program the students would be provided with a Diploma Certificate showing their Higher Degree Qualifying status by the University and a statement of their proficiency from the relevant School.

Entrance for students for whom English is the second language would be dependent on achieving an adequate standard of written and spoken English.

The academic year for the University of New South Wales consists of two sessions, commencing in late February – early March and mid-July, respectively. It is preferred that new students arrive 2-3 weeks prior to the beginning of the Session, so that they can be oriented prior to the commencement of formal teaching.

The Graduate Diplomas in Biotechnology and Food Technology are coursework programs that offer retraining for graduates of other disciplines.

Brief descriptions of the courses currently offered within the Schools of the Faculty of Life Sciences follow.

School of Applied Bioscience

Comprises the Departments of Biotechnology and Food Science and Technology.

Department of Biotechnology

5015
Biotechnology Graduate Diploma Program
Full-time or Part-time

Graduate Diploma
GradDip

Staff Contact: Prof P Rogers

The graduate diploma program provides the opportunity for graduates with no previous tuition in biotechnology to undertake training in this discipline.

A degree in a science-based course is required for admission. If the degree course has not included a biology component, the candidate is required to undertake some basic biology training as a prerequisite or corequisite.

Under normal circumstances, students whose previous training has included a substantial component of biotechnology are not admitted to the course.

The program comprises study of undergraduate and graduate formal courses, plus extensive laboratory training in biotechnology.

The diploma is awarded after one year's full-time study, or two years part time study. The program includes the listed obligatory courses plus sufficient of the listed elective courses to meet the units of credit required. The electives include courses necessary for students without previous tuition in biochemistry and or microbiology, as well as alternatives for those with previous tuition in these disciplines.

The choice of electives in each individual case is course to approval by the Head of School.

Note: This program is course to University approval.

5015
Graduate Diploma in Biotechnology

Compulsory courses

<table>
<thead>
<tr>
<th>Course</th>
<th>UOC</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOT5013</td>
<td>Practical Biotechnology</td>
</tr>
</tbody>
</table>

Elective courses

<table>
<thead>
<tr>
<th>Course</th>
<th>UOC</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOT7051</td>
<td>Applied Genetics</td>
</tr>
<tr>
<td>BIOT7061</td>
<td>Peptide and Protein Technology</td>
</tr>
<tr>
<td>BIOT7071</td>
<td>Biochemical Engineering</td>
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<tr>
<td>BIOT7081</td>
<td>Environmental Biotechnology</td>
</tr>
<tr>
<td>BIOT7091</td>
<td>Applied Cellular Physiology</td>
</tr>
<tr>
<td>BIOT7110</td>
<td>Bioengineering Principles</td>
</tr>
</tbody>
</table>

Combinations of Compulsory and Elective courses to be 36 units of credit.

Department of Food Science and Technology

5020
Food Technology Graduate Diploma Program
Full time or Part time

Graduate Diploma
GradDip

The Graduate Diploma program is designed to provide professional training at an advanced level for graduates in Science, Science and Technology or Engineering who have not had previous training in Food Technology.

Requirements are a first degree and, in some cases, the successful completion of assignments or examinations as directed by the Head of Department.

The program is a blend of formal lectures and laboratory work. The Graduate Diploma is awarded on the successful completion of one year of full time study (at least 36 units of credit) or two years of part time study (at least 18 units of credit per year). It involves the following program:

Compulsory courses

<table>
<thead>
<tr>
<th>Course</th>
<th>UOC</th>
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</thead>
<tbody>
<tr>
<td>FOOD1577</td>
<td>Food Processing Principles</td>
</tr>
<tr>
<td>FOOD1587</td>
<td>Food Processing Laboratory</td>
</tr>
<tr>
<td>FOOD2627</td>
<td>Food Microbiology</td>
</tr>
<tr>
<td>FOOD2637</td>
<td>Quality Assurance and Control</td>
</tr>
<tr>
<td>FOOD1597</td>
<td>Food Processing and Packaging</td>
</tr>
</tbody>
</table>

Students who have previously studied compulsory courses or their equivalent at an acceptable level may be granted an exemption by the Head of Department but the equivalent number of units of credit must be completed by taking other approved courses.

Elective courses

The elective courses making up the remainder of the units of credit, may be selected from those offered by the School of Applied Bioscience, or from those offered by other Schools in the University course to approval by the Head of Department. Only graduate courses will count towards units of credit.
School of Biochemistry and Molecular Genetics

5345
Biochemistry Graduate Diploma Program
Graduate Diploma (by Research)
GradDip
Full-time – UOC 48
Part-time – UOC 24
Staff Contact: Dr D Lee

The program is tailored according to the background and requirements of the individual student. In most cases it would include advanced formal undergraduate training, including lectures in general and medical biochemistry, training in the use of modern biochemical techniques, eg scintillation counting, gas liquid chromatography (GLC), high performance liquid chromatography (HPLC), molecular biology, spectrophotometry, nuclear magnetic resonance (NMR) spectroscopy, and animal and plant cell culture. The student would also carry out a research project (or projects) in the laboratory of an academic member of staff and write a report on the project.

The School of Biochemistry and Molecular Genetics has a wide range of interests and can offer research projects in most areas of biochemistry. Specialised areas of research are molecular biology, marine biochemistry, parasite biochemistry and plant biochemistry.

School of Microbiology and Immunology

5355
Microbiology and Immunology Graduate Diploma Program
Full-time

Graduate Diploma
GradDip
UOC 48
Staff Contact: School Office

The structure of the program would be decided after discussions with students, taking into account their particular background, interest and career goals. Usually students would attend one or more of the advanced third year courses in either microbial genetics, microbial physiology, environmental microbiology, immunology, medical bacteriology or virology. The rest of the year would be spent carrying out a research project supervised by a member of academic staff.

The School of Microbiology and Immunology has a number of research teams working on a range of well funded projects in microbiology, molecular biology and immunology. Specialised areas of research include microbial ecology, molecular genetics, environmental microbiology, marine microbiology; the pathogenesis of intestinal and gastroduodenal infection, Tcells, cytokines, the allergic reaction.

School of Biological Science

5350
Biological Science Graduate Diploma Program
Full-time

Graduate Diploma
GradDip
Full-time – UOC 48
Part-time – UOC 24
Staff Contact: School Office

The program is designed to meet the needs and objectives of individual students building on that students’ competence and experience. It includes a formal coursework component and a research project which is carried out under the supervision of a member of the academic staff. Students receive advanced formal training to provide them with background information relevant to their research project.

The School has a wide range of interests, and training and research are offered in both plant and animal sciences. Areas of biology in which facilities and appropriate supervision are available include: ecology, taxonomy, environmental physiology, marine and fisheries biology, genetics and evolution, mycology, ultrastructure, comparative physiology, mammalian studies.

School of Psychology

5330
Psychology Graduate Diploma Program
Full-time

Graduate Diploma
GradDip
UOC 48
Staff Contact: Dr J Cranney

This one year program is adapted to suit the needs and objectives of each student, taking into account the areas of psychology in which they have already demonstrated competence. The expectation is that students who achieve an appropriate standard in the program are then admitted to a higher degree program, provided suitable supervision and facilities are available.

The program comprises formal teaching in an approved set of courses drawn from the following areas: research methods and statistics, perception, learning, cognitive psychology, psycholinguistics, social psychology, clinical psychology, developmental psychology, personality, physiological psychology, abnormal psychology, and applied psychology. Both lectures and practical work will be given.

Students normally also carry out a research project under the supervision of a member of the academic staff of the School. Active research programs exist in most areas including abnormal and clinical psychology, behavioural neuroscience, cognitive science, cognition and perception, data analysis and psychometrics, industrial and organisational psychometrics, and social, personality and developmental psychology. Particular attention within each of these programs is paid to the interrelationship between scientific theory and the practical application of psychological knowledge.
Masters Degrees

Department of Biotechnology

Master of Science Coursework Degree Programs

The Department of Biotechnology offers three formal coursework masters programs, the Master of Science in Biotechnology 8048, the Master of Science in Biopharmaceuticals 8049.1000, and the Master of Science in Bio-pharmaceuticals by distance education 8049.2000.

CRC for Biopharmaceuticals

_University Contact: Professor PP Gray_

The Cooperative Research Centre for Biopharmaceutical Research was incorporated in 1992. The partners in the Centre include UNSW's Department of Biotechnology, School of Physiology and Pharmacology, and Biomedical Mass Spectrophotometry Unit; the Garvan Institute of Medical Research, St Vincent's Hospital, Sydney; the Biomolecular Research Institute and Peptech Limited.

The primary aim of the Biopharmaceutical Research CRC is to provide a coordinated research base to aid the development of the Australian biopharmaceutical industry. To achieve this goal, the Centre functions as a national centre for both the development of new internationally competitive biopharmaceutical products, and the education of researchers in the combination of biopharmaceutical research techniques and their integration with the industrial goals necessary to develop products for the world market. The partners of the Cooperative Research Centre have all the necessary expertise for the discovery, design and development of novel biopharmaceutical products resulting from the recent rapid advances in the fields of genetic engineering and biotechnology.

The CRC provides a fertile environment for postgraduate study, as students can see the results of their research being developed into useful products.

CRC for Food Industry Innovation

_Director: Professor NW Dunn_

The Centre was established in 1993 and involves the Schools of Applied Bioscience, Biochemistry and Molecular Genetics and Microbiology and Immunology in the Faculty of Life Sciences, CSIRO, and three industry partners to provide a coordinated research and educational base to generate development of improved and novel natural food ingredients, principally through the use of microorganisms.

The five partners in the CRC have the combined expertise in research and commercialisation to market the first ingredients within four years. The ingredients that the Centre aims to develop include starter cultures, anti-microbial agents, antioxidants, fat substitutes, texture modifiers, colours, flavours, probiotics and biocontrol agents.

Currently there are eight research programs which focus on different areas which may generate commercial products. Research areas include molecular genetics, cellular physiology, biochemistry and kinetics of food approved and other potentially useful microorganisms. Microbial processes will be developed and optimised through to 100 litre pilot-scale capacity and these studies will include ingredient recovery and formulation. Expertise exists for evaluation of ingredients in food formulation and nutritional evaluation.

Undergraduate and postgraduate (formal MSc and PhD) programs provide training relevant to the total area. Research programs contribute to the generic resource of the CRC and provide students with a direct opportunity to interact with national and international food/biotechnology companies.

8048 Master of Science in Biotechnology by coursework

_MSc Program_

The course includes advanced treatments of all areas of biotechnology. It is open to graduates with a four-year degree in biotechnology or a related discipline, or who have, in the opinion of the Higher Degree Committee, acquired equivalent qualifications or experience. Intending students are referred to Conditions for the Award of Graduate Degrees set out later in this handbook.

The program consists of lectures, tutorials, practical sessions, case history studies and a supervised project.

The minimum period of registration before the award of the degree is two sessions for full-time students and four sessions for part-time students.

8048 Master of Science in Biotechnology

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>UOC</th>
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<tbody>
<tr>
<td>BIOT7051</td>
<td>Applied Genetics</td>
<td>6</td>
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<tr>
<td>BIOT7061</td>
<td>Peptide and Protein Technology</td>
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<td>BIOT7071</td>
<td>Biochemical Engineering</td>
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<tr>
<td>BIOT7091</td>
<td>Applied Cellular Physiology</td>
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<tr>
<td>BIOT7110</td>
<td>Bioengineering Principles</td>
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</tr>
<tr>
<td>BIOT7123</td>
<td>Biotechnology Project Minor</td>
<td>12</td>
</tr>
</tbody>
</table>

**TOTAL** 48

Students may be able to replace one of the above courses (6 units of credit) with an equivalent size course in another Department or School.

**Elective components**

Elective courses, may be selected from those offered by the School of Applied Bioscience, or from those offered by other Schools in the University course to approval. Additional courses available by distance mode include:

**Note:** This program is course to University approval

Each individual program would comprise:

1. A major strand of related material comprising approximately 75% of the total program, including a project comprising not less than 15% nor more than 50% of the program.
2. A minor strand of broader based material comprising up to 25% of the total program.
3. At least 60% of the non-project component must be taken in the Department of Biotechnology unless otherwise approved by the Head of School. The remainder, course to approval and availability, may be undertaken elsewhere in the University.
8049.1000 Master of Science in Biopharmaceuticals by coursework

MSc

This is an interdisciplinary program designed for graduates with backgrounds in either pharmacology or biotechnology who wish to obtain advanced training in both areas in order to gain expertise necessary for the development and use of the new generation of biopharmaceuticals which have been developed by, or result from, the application of molecular biology. It is open to graduates with a four year degree in a related discipline or who have, in the opinion of the Higher Degree Committee, acquired equivalent qualifications or experience. Prior study of biochemistry is required for the program. The program consists of lectures, tutorials, practical sessions, case history studies and a supervised project. The minimum period of registration before the award of the degree is two sessions for full-time students and four sessions for part-time students. The program is also offered through distance education. Choice of courses is dependent on the background of the student.

Principles of Pharmacology (PHPH5461) must be taken by students who have not completed an approved Pharmacology course, while Principles of Biotechnology (BIOT7040) must be taken by students who have not completed an approved Biotechnology course. All students must pass Advanced Pharmacology (PHPH5471) and Advanced Biotechnology (BIOT7030) and Biotechnology Principles (BIOT7040) and/or Pharmacology Principles (PHPH5461) whichever is applicable. Program details are as follows:

8049.1000 Master of Science in Biopharmaceuticals

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>UOC</th>
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</thead>
<tbody>
<tr>
<td>PHPH5461</td>
<td>Pharmacology Principles</td>
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<tr>
<td>OR</td>
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<td></td>
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<tr>
<td>BIOT7040</td>
<td>Biotechnology Principles</td>
<td>12</td>
</tr>
<tr>
<td>PHPH5471</td>
<td>Advanced Pharmacology</td>
<td>12</td>
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<tr>
<td>BIOT7030</td>
<td>Advanced Biotechnology</td>
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<tr>
<td>BIOT7060</td>
<td>Biotechnology Project</td>
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<tr>
<td>OR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHPH5491</td>
<td>Pharmacology Project</td>
<td>12</td>
</tr>
</tbody>
</table>

TOTAL 48

Pharmacology Principles (PHPH5461) must be taken by students who have not completed an approved Pharmacology course, while Biotechnology Principles (BIOT7040) must be taken by students who have not completed an approved Biotechnology course program.

All students must pass Advanced Pharmacology (PHPH5471) and Advanced Biotechnology (BIOT7030).

Elective Components

Each individual program would comprise: (i) a major strand of related material comprising approximately 75% of the total program including a project comprising not less that 15% of the program (ii) a minor strand of broader based material comprising up to 25% of the total program.

Note: This program is course to University approval

8049.2000 Master of Science in Biopharmaceuticals by coursework

Distance Education

The CRC for Biopharmaceutical Research has developed this strongly interdisciplinary Master of Science in Biopharmaceuticals program. The program teaches the scientific basis underscoring the development of recombinant biopharmaceuticals, combined with aspects of clinical trials, regulatory considerations, patent issues, and licensing. The program content is incorporated in 8 distance education modules comprised of written text and video/audio tapes containing program material, demonstrations and self-testing exercises. Access to the Course Co-ordinators will be by phone, fax, electronic mail and teleconferencing facilities.

The Master's Program can be completed in a minimum of 2 years. The minimum time option would entail the completion of two modules per session. These are offered concurrently. A maximum time for completion has been set at 8 years.

Modules consist of printed notes containing course material, readings, assessment questions and exercises. Some modules also include audio and video taped material so access to audio equipment is essential.

The Master's Program calls for the completion of 8 modules, which is equivalent to 48 units of credit (exemptions may be allowed in exceptional circumstances). There will be two tutorials per session per module. These will be conducted via a multiple telephone link and will be structured and interactive.

Each module will be assessed separately at module completion and a certificate awarded. The assessment of modules will be flexible and will be based on two pieces of submitted work. This may be in the form of written assignments or as a timed, faxed examination.

Students' module choices are from the following:

8049.2000 Master of Science in Biopharmaceuticals

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>UOC</th>
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</thead>
<tbody>
<tr>
<td>PHPH5501</td>
<td>Basic Principles of Drug Action</td>
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<tr>
<td>PHPH5511</td>
<td>Selected Topics in Pharmacology</td>
<td>6</td>
</tr>
<tr>
<td>PHPH5521</td>
<td>Techniques for Drug Development</td>
<td>6</td>
</tr>
<tr>
<td>PHPH5531</td>
<td>Discovery and Development of New Medicines</td>
<td>6</td>
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<tr>
<td>BIOT7070</td>
<td>Production of Recombinant Products</td>
<td>6</td>
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<tr>
<td>BIOT7080</td>
<td>Principles of Fermentation and Downstream</td>
<td>6</td>
</tr>
<tr>
<td>BIOT7090</td>
<td>Monoclonal Antibody Technology</td>
<td>6</td>
</tr>
<tr>
<td>BIOT7120</td>
<td>Regulatory Considerations, Patent Issues</td>
<td>6</td>
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<td>OR</td>
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<td>TOTAL</td>
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<td>48</td>
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</tbody>
</table>

Note: This program is course to University approval

Module 1 UOC 6

Basic Principles of Drug Actions

PHPH5501 Basic Principles of Drug Actions

This module covers general principles of pharmaco-dynamics and pharmokinetics. Pharmacodynamics (what the drug does to the body) considers drug-receptor interactions, the basis of dose-response curves, reversible and irreversible antagonists, partial agonists and related topics. Events following the drug-receptor interaction, which include stimulation of second messenger systems and the pharmacology of ion channels, are described. The principles governing pharmacokinetics (what the body does to the drug) and their clinical importance are discussed in some detail. There are several simple graphical and problem solving exercises to be completed to aid in your understanding of this material.

Module 2 UOC 6

PHPH5511 Selected Topics in Pharmacology

For this module the topics were chosen to enable students to gain knowledge of the receptors in the human body with which drugs commonly interact to produce their main clinical effects, or their side-effects/toxicological actions. The module begins with an introduction to the autonomic nervous system, then works through autonomic receptors, receptors for histamine and serotonin, then to the newer areas of peptide receptors and cytokines, the latter areas being those for which drugs are now being developed. With this background, plus some reading material on receptors for drugs affecting the central nervous system, it is felt that students will be able to read and understand the pharmacology of most drugs in clinical use. A video which covers many autonomic drug effects on the cardiovascular system, plus questions based around this film, are included.
Module 3 UOC 6
PHPH5521 Techniques for Drug Development
This module extends the concepts raised and discussed in the Basic Pharmacokinetics section of Module 1. More advanced pharmacokinetic problems, such as compartmentation, kinetics of effects and problem solving are included. The technique of measuring receptor binding is shown in some detail on video, with explanation of how the technique is set up, and how and why it is much used in new drug development. Also included in this module is a section on techniques used in the assay of drugs. The determination of molecular structure, and quantification of drugs in the body are vital areas of drug development, and indeed pharmacokinetics depends upon such quantitation.

Module 4 UOC 6
PHPH5531 Discovery and Development of New Medicines
This module gives an overview of most aspects of the development of new drugs. There is a very short historical introduction and examples of the discovery and development of drugs from natural products (plants) plus some examples of drugs developed using synthetic programs (chemical modifications). There is an example of a Natural Products program with examples of broad based screens and follow up testing in animals (Phase 0) followed by a section on the necessary toxicological testing in animals (also Phase 0) before a drug can be tested in humans. Phase 1-4 of clinical trials are then discussed, followed by the Pharmaceutical Company's and the Clinical Investigator's viewpoints of drug development. Regulatory issues and some ethical problems are briefly considered.

Module 5 UOC 6
BIOT7070 Production of Recombinant Products
In this module, the topics deal with some basic recombinant DNA techniques and then heterologous protein expression in prokaryotes and eukaryotes are discussed in greater details. For prokaryotes, Escherichia coli is the model species chosen and for eukaryotes, the cell systems of yeast and mammalian cells are described. The advantages and disadvantages of the various expression cell systems are outlined. The vectors used for cloning of the protein genes are also described and illustrated. Cloning of genes into the vectors, production and subsequent characterisation of the recombinant protein are also described. These examples are actual biopharmaceutical products currently produced by the biotechnology industry and students are referred to published journal papers throughout the modules.

Module 6 UOC 6
BIOT7080 Principles of Fermentation and Downstream Processing
The units in this module were selected to give the students a good understanding of the fundamental principles associated with biopharmaceuticals manufacture. The module begins by discussing basic fermentation principles for the large-scale culture of bacterial and mammalian cells to produce recombinant protein biopharmaceuticals. This is followed by a thorough study of the main unit operations associated with product recovery, commonly referred to as downstream processes. The principles of Good Manufacturing Practice are discussed in the third unit, which is relevant to all aspects of drug manufacturing, including fermentation and product recovery operations. This unit is thus designed to put regulatory principles into the context of biopharmaceutical manufacture. The last unit covers modern methods of product characterisation, which forms a critical component of the regulatory procedure.

Module 7 UOC 6
BIOT7090 Monoclonal Antibody Technology
This module is made up of 4 units covering techniques for the production of monoclonal antibodies and discussing their therapeutic applications. Unit 1 is designed as an introduction to immunology, emphasising the areas of immunology relevant to antibody production. In addition the structure of antibody molecules is studied in detail. Unit 2 describes the processes in the production of hybridomas, the specialised cells which produce monoclonal antibodies. This unit includes information on immunisation protocols, methods of cell fusion and selection, and the production of human monoclonal antibodies by EBV-transformed B cells. Unit 3 is associated with the more recent developments in antibody engineering techniques. The phage display system, and genetic manipulations for the production of humanised antibodies and antibody fragments are described in details. Unit 4 covers the applications of monoclonal antibodies both for in vivo diagnostics and for therapy. Also, some of the more recent innovations such as the production of recombinant immunoconjugates are described.

Module 8 UOC 6
BIOT7120 Regulatory Considerations, Patent Issues and Licensing
The first unit of this module looks at the code of Good Manufacturing Practice (GMP) for the production of recombinant biopharmaceuticals and the establishment of Standard Operating Procedures (SOPs) for a production process. This is especially relevant as many of the M.App.Sc. (Biopharmaceuticals) graduates will take up positions in industry. The international biopharmaceutical industry is a vigorous, rapidly growing industry. Compared to the pharmaceutical industry it is still at a fairly early stage of development and undergoing some interesting changes. The second unit provides an understanding of the nature of the biopharmaceutical industry at this stage of its evolution. It includes the concept of licensing as an important factor in its development as well as an appreciation of the basics of licensing activity. The final unit introduces the student to the concept of intellectual property as it relates to biopharmaceuticals and provides some guidelines on its management. Intellectual property is the collection of statute and common law principles giving ownership of inventions, trade secrets, trade marks, designs and copyright in literary and artistic works to their creators. The creation and protection of intellectual property is the basis on which development and commercialisation of biopharmaceuticals is built and as such is of vital concern to the industry. This unit will provide a detailed consideration of patents and trade secrets and touch briefly on the course of trade mark registrations, industrial design registrations and copyright. Special issues relating to patents and trade secrets in biopharmaceuticals will also be examined.

Department of Food Science and Technology

8032
Master of Science by Coursework Degree Programs

The MSc coursework degree programs provide a comprehensive study of theoretical and applied aspects of the science, technology and engineering of foods. The programs are elective in nature providing an opportunity for graduates to apply their basic skills in areas relevant to those fields of Science and Technology in which the Department has developed special expertise. Intending candidates are invited to contact the Head of Department for advice and recommendation.

Graduate programs are available for Master of Science by Coursework degrees in the following areas:

<table>
<thead>
<tr>
<th>Program</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food Technology Program</td>
<td>8032.1000</td>
</tr>
<tr>
<td>Food Microbiology Program</td>
<td>8032.2000</td>
</tr>
<tr>
<td>Food Engineering Program</td>
<td>8032.3000</td>
</tr>
<tr>
<td>Food Science and Nutrition Program</td>
<td>8032.4000</td>
</tr>
</tbody>
</table>

Entry qualifications
A four-year Bachelor degree, honours degree or equivalent (e.g. three-year degree plus relevant employment experience) is the minimum requirement for admission to the programs.

Study programs
Students are required to complete a program of study totalling at least 48 units of credit made up of compulsory courses, a compulsory project and elective courses. Students who have
previously studied compulsory courses or their equivalent may be granted an exemption by the Head of Department but the equivalent number of units of credit must be completed by taking other approved courses. The degree will comprise one year of full-time study (normally two sessions of at least 24 units of credit each), or two years of part-time study (normally four sessions of at least 12 units of credit each), and would comprise:

1. A major strand of related material comprising approximately 75% of the total program, including a project comprising not less than 12.5% nor more than 25% of the program.
2. A minor strand of broader based material comprising up to 25% of the total program.
3. Undergraduate material may be included in one or both strands but will not be included in units of credit.
4. At least 60% of the non-project component must be taken in the School of Applied Bioscience unless otherwise approved by the Head of Department. The remainder, course to approval and availability, may be undertaken elsewhere in the University. Full details of all courses are listed under Disciplines of the University in the Calendar.

### 8033.1000
Food Technology

**Master of Science by Coursework in Food Technology**

MSc

The MSc by Coursework program in Food Technology is designed for graduates in Science, Applied Science, Biochemistry, Microbiology or Biotechnology or related disciplines, who seek specialised knowledge of the science and technology of foods. The program provides advanced training in various aspects of food science and technology that can be tailored to the background of the candidate.

<table>
<thead>
<tr>
<th>Compulsory courses</th>
<th>UOC*</th>
</tr>
</thead>
<tbody>
<tr>
<td>FOOD1577 Food Processing Principles</td>
<td>6</td>
</tr>
<tr>
<td>FOOD1587 Food Processing Laboratory</td>
<td>6</td>
</tr>
<tr>
<td>FOOD1597 Food Processing and Packaging</td>
<td>6</td>
</tr>
<tr>
<td>FOOD1677 Product Design and Development</td>
<td>6</td>
</tr>
<tr>
<td>Either FOOD5117 Minor Project</td>
<td>6</td>
</tr>
<tr>
<td>OR FOOD5127 Research Project</td>
<td>12</td>
</tr>
<tr>
<td>Total</td>
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</table>

<table>
<thead>
<tr>
<th>Elective courses</th>
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<tbody>
<tr>
<td>FOOD2627 Food Microbiology</td>
<td>6</td>
</tr>
<tr>
<td>FOOD2637 Quality Assurance and Control</td>
<td>6</td>
</tr>
<tr>
<td>FOOD2647 Food Safety</td>
<td>6</td>
</tr>
</tbody>
</table>
| or other courses as approved by the Head of Department to a total of 48 units of credit. *Units of credit may be concentrated in one session

### 8033.2000
Food Microbiology

**Master of Science by Coursework in Food Microbiology**

MSc

The MSc by Coursework program in Food Microbiology is designed for graduates in Food Science, Food Technology, Microbiology, Biochemistry, Biotechnology or related disciplines, who seek specialised knowledge of microorganisms associated with foods. The program provides advanced training in all aspects of food microbiology as well as some fundamental aspects of food science and technology.

A four year Bachelor degree, honours degree or equivalent (eg three year degree plus sufficient relevant industry experience) involving some basic training in microbiology and biochemistry is the minimum requirement for admission to the course.

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<td>FOOD2627 Food Microbiology</td>
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<tr>
<td>FOOD2637 Quality Assurance and Control</td>
<td>6</td>
</tr>
<tr>
<td>FOOD2657 Analytical Microbiology</td>
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<td>FOOD2667 Advanced Food Microbiology</td>
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<tr>
<td>EITHER FOOD5117 Minor Project</td>
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</tr>
<tr>
<td>OR FOOD5127 Research Project</td>
<td>12</td>
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</tbody>
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<table>
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<th>Elective courses</th>
<th>UOC*</th>
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</thead>
<tbody>
<tr>
<td>FOOD2647 Food Safety</td>
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</tr>
<tr>
<td>FOOD1557 Food Preservation</td>
<td>6</td>
</tr>
</tbody>
</table>
| or other courses as approved by the Head of Department to a total of 48 units of credit. *Units of credit may be concentrated in one session

### 8033.3000
Food Engineering

**Master of Science by Coursework in Food Engineering**

MSc

The MSc by Coursework in Food Engineering is designed for graduates in Engineering or related disciplines, who have an interest in the processing of biological resources for human consumption. The formal components of the course provide professional training at an advanced level in food engineering and food science. The studies in food engineering are designed to strengthen and broaden the engineering background of candidates and emphasise the use of fundamental principles in solving problems associated with food processing. Problem solving skills in engineering are developed further in a research project devoted to an area of food engineering.

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<td>6</td>
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<tr>
<td>FOOD1597 Food Processing and Packaging</td>
<td>6</td>
</tr>
<tr>
<td>FOOD4617 Advanced Food Engineering</td>
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</tr>
<tr>
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</tr>
<tr>
<td>OR FOOD5127 Research Project</td>
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<table>
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<tr>
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<tbody>
<tr>
<td>FOOD2637 Quality Assurance and Control</td>
<td>6</td>
</tr>
<tr>
<td>FOOD2647 Food Safety</td>
<td>6</td>
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</tbody>
</table>
or other courses as approved by the Head of Department to a total of 48 units of credit

*Units of credit may be concentrated in one session

8033.4000 Food Science and Nutrition

Master of Science by Coursework in Food Science and Nutrition MSc

The MSc by Coursework in Food Science and Nutrition is designed for graduates in Science, Food Science and Food Technology with principal interests in chemistry, biochemistry, physiology and human nutrition. The program is comprised of a core component (including a project) and an elective component that allows for reasonable flexibility and a choice of courses in human nutrition and food science and technology based on the candidate's background.

Compulsory courses

<table>
<thead>
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<th>Course Code</th>
<th>Course Title</th>
<th>UOC</th>
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<tr>
<td>FOOD1697</td>
<td>Advanced Food Chemistry</td>
<td>6</td>
</tr>
<tr>
<td>FOOD3567</td>
<td>Nutrition</td>
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</tr>
<tr>
<td>FOOD3777</td>
<td>Advanced and Applied Nutrition</td>
<td>6</td>
</tr>
<tr>
<td>EITHER</td>
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<td></td>
</tr>
<tr>
<td>FOOD5117</td>
<td>Minor Project</td>
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<tr>
<td>FOOD5127</td>
<td>Research Project</td>
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Elective courses

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<tr>
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<th>Course Title</th>
<th>UOC</th>
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</thead>
<tbody>
<tr>
<td>CMED9500</td>
<td>Epidemiology for Public Health</td>
<td>6</td>
</tr>
<tr>
<td>CMED9610</td>
<td>Food and Nutrition Policy Studies</td>
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<tr>
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<td>Food Safety</td>
<td>6</td>
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<tr>
<td>HEAL9371</td>
<td>Research and Evaluation Methods</td>
<td>6</td>
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</tbody>
</table>

or other courses as approved by the Head of Department to a total of 48 units of credit.

*Units of credit may be concentrated in one session

Centre for Marine and Coastal Studies

Presiding Member of Management Committee:
Professor JH Middleton

Director: Vacant

8265 Master of Marine Science Degree Course (MMarSc)

UOC 48

The Master of Marine Science is a course work degree to be completed in one year of full time study. It is intended primarily as an advanced training program for graduates from overseas universities who require specialised training in marine science but do not wish to undertake a research degree. Graduates, especially from overseas universities, who do not meet the requirements for entry to the MSc (Research) degree.

Australian Science graduates who wish to update their qualifications or obtain a qualification in an area which is different from that of their initial award.

School of Psychology

Head of School: Associate Professor SM Andrews

Senior Administrative Officer: Mr T Clulow

The School offers programs leading to the award of the combined degrees of PhD/Master of Psychology (Clinical), PhD/Master of Psychology (Forensic), and PhD/Master of Psychology (Organisational), and the degrees of Master of Psychology (Clinical), Master of Psychology (Forensic) and Master of Psychology (Organisational).

1404 Combined Doctor of Philosophy/Master of Psychology (Clinical) Degree Program

Full-time

Doctor of Philosophy/Master of Psychology (Clinical) PhD/MPsychol(Clin)

The combined Doctor of Philosophy/Master of Psychology (Clinical) degree program has an emphasis on research training in clinical fields. The combined degree program requires a minimum of four full-time years to complete, and offers advanced training in research skills that are particularly relevant to clinical areas. It is accredited as fifth and sixth years of study leading to full membership of the Australian Psychological Society and to its College of Clinical Psychologists, and registration as a psychologist in New South Wales.

The normal entrance requirements are (1) completion of an honours Class 1 degree in Psychology from the University of New South Wales or a qualification deemed equivalent, and (2) the availability of adequate supervision and research infrastructure. As the number of places is limited, entry into the combined program is competitive. Referees reports will be sought for applicants who are shortlisted and an interview may be required. Students may apply for advanced standing, credit transfer or exemption of coursework components. The minimum period of registration before the award of the degree is eight sessions.

The combined program consists of two components which are compulsory: (1) a research project (PhD), and (2) a coursework component (MPsychol(Clin)). The research project should be original, and lead to a significant contribution to our knowledge of the nature of psychological processes, particularly in the field of
clinical psychology. The program structure requires students to work on their research project during the entire candidature until submission, and the same research-related requirements as for the regular PhD degree (Program code 1400) will apply for the first two years of this program. University regulations and guidelines for good practice in postgraduate research supervision will apply to this program.

Students will concurrently undertake a compulsory coursework component, which is set out below. There are twelve courses and students will normally complete these by taking three courses in each of the four years. In the first year only one course may be taken in Session 1. The coursework program focuses on training in the assessment and treatment of people with a range of psychological disorders, disabilities and/or special needs, advanced interviewing and counselling skills for dealing with such clients, and familiarity with statutory and common law provisions and procedures and government policies and programs relevant to different forensic settings.

<table>
<thead>
<tr>
<th>Course Code</th>
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<tr>
<td>PSYC7000</td>
<td>Research and Evaluation Methods</td>
</tr>
<tr>
<td>PSYC7001</td>
<td>Psychological Assessment 1</td>
</tr>
<tr>
<td>PSYC7204</td>
<td>Child Clinical Psychology</td>
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<td>PSYC7210</td>
<td>Human Neuropsychology</td>
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<td>Experimental Clinical Psychology 1</td>
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<tr>
<td>PSYC7220</td>
<td>Psychology of Health and Illness</td>
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<tr>
<td>PSYC7221</td>
<td>Experimental Clinical Psychology 2</td>
</tr>
<tr>
<td>PSYC7222</td>
<td>Experimental Clinical Psychology 3</td>
</tr>
<tr>
<td>PSYC7223</td>
<td>Professional &amp; Ethical Practice (Clinical) 1</td>
</tr>
<tr>
<td>PSYC7224</td>
<td>Professional &amp; Ethical Practice (Clinical) 2</td>
</tr>
<tr>
<td>PSYC7225</td>
<td>Professional &amp; Ethical Practice (Clinical) 3</td>
</tr>
<tr>
<td>PSYC7226</td>
<td>Professional &amp; Ethical Practice (Clinical) 4</td>
</tr>
</tbody>
</table>

1405
Combined Doctor of Philosophy/Master of Psychology (Forensic) Degree Program

Full-time
Doctor of Philosophy/Master of Psychology (Forensic)
PhD/MPsychol(For)

The combined Doctor of Philosophy/Master of Psychology (Forensic) degree program has an emphasis on research training in forensic fields. The combined degree program requires a minimum of four full-time years to complete, and offers advanced training in research skills that are particularly relevant to forensic areas. It is accredited as fifth and sixth years of study leading to full membership of the Australian Psychological Society and to its College of Organisational Psychologists, and registration as a psychologist in New South Wales.

The normal entrance requirements are (1) completion of an honours Class 1 degree in Psychology from the University of New South Wales or a qualification deemed equivalent, and (2) the availability of adequate supervision and research infrastructure. As the number of places is limited, entry into the combined program is competitive. Referees reports will be sought for applicants who are shortlisted and an interview may be required. Students may apply for advanced standing, credit transfer or exemption of coursework components. The minimum period of registration before the award of the degrees is eight sessions.

The combined program consists of two components which are compulsory: (1) a research project (PhD), and (2) a coursework component (MPsychol(For)). The research project should be original, and lead to a significant contribution to our knowledge of the nature of forensic psychological processes, particularly in the field of forensic psychology. The program structure requires students to work on their research project during the entire candidature until submission, and the same research-related requirements as for the regular PhD degree (Program 1400) will apply for the first two years of this program. University regulations and guidelines for good practice in postgraduate research supervision will apply to this program.

Students will concurrently undertake a compulsory coursework component, which is set out below. There are twelve courses and students will normally complete these by taking three courses in each of the four years. In the first year only one course may be taken in Session 1. The coursework program focuses on training in the assessment of people with a range of psychological disorders, disabilities and/or special needs, advanced interviewing and counselling skills for dealing with such clients, and familiarity with statutory and common law provisions and procedures and government policies and programs relevant to different forensic settings.

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<td>Research and Evaluation Methods</td>
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<tr>
<td>PSYC7001</td>
<td>Psychological Assessment 1</td>
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<tr>
<td>PSYC7002</td>
<td>Psychological Assessment 2</td>
</tr>
<tr>
<td>PSYC7100</td>
<td>Psychology of Human Resources 1</td>
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<tr>
<td>PSYC7101</td>
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<tr>
<td>PSYC7102</td>
<td>Psychological Principles of Training</td>
</tr>
<tr>
<td>PSYC7115</td>
<td>Vocational Interviewing and Counselling</td>
</tr>
</tbody>
</table>
Master of Psychology (Clinical) Degree Program

Full-time or Part-time

Master of Psychology (Clinical)

MPsychol(Clin)

This program provides graduate training for psychologists who intend to work as clinicians in hospitals, community health and other settings where they might be engaged in health promotion and the diagnosis, assessment or treatment of people with a range of psychological problems or disabilities. It is accredited as fifth and sixth years of study leading to full membership of the Australian Psychological Society and to its College of Clinical Psychologists, and registration as a psychologist in New South Wales.

The normal entrance requirement is completion of an honours Class 1 or Class 2 degree in Psychology from the University of New South Wales or a qualification considered equivalent.

Selection is based on academic qualifications for the program. As the number of places is limited, entry into the program is competitive. Referees reports will be sought for applicants who are shortlisted and an interview may be required.

Applicants who do not satisfy these entrance requirements may in exceptional circumstances be admitted, depending upon their knowledge, experience, occupation and the nature of their undergraduate training. Students applying under these provisions will usually be required to complete a qualifying program before they are admitted.

The minimum period of registration before the award of the degree is four sessions for full-time students and six sessions for part-time students. Students with advanced standing may have the minimum period reduced by up to one half of the program i.e. a reduction of one session if a student has completed a PhD in an approved area of Psychology and one session if a student has completed part of the course work program.

The program consists of three components, all of which are compulsory: 1. course work (weekly lectures and seminars with associated written forms of assessment), 2. professional practice (completion of a minimum of 1000 hours of supervised clinical practice within the School Clinic and in field clinical settings, weekly Clinical meetings and Skills Training Workshops), and 3. a research thesis. The three components total 96 units of credit (48 in each stage).

Stage 1

<table>
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<tr>
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Stage 2

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<td>PSYC7227</td>
<td>Research Thesis (Clinical) 1*</td>
</tr>
<tr>
<td>PSYC7228</td>
<td>Research Thesis (Clinical) 2*</td>
</tr>
</tbody>
</table>

*PSYC7227 and PSYC7228 together contribute 25 per cent to the overall grading for the degree.

Notes: Part-time students normally are expected to take half the full-time program in any one session.

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Master of Psychology Degree Program
Full-time or Part-time
Master of Psychology (Organisational)
MPsychol(Org)

This program provides graduate training for psychologists who intend to work in industry, commerce, consulting practice, service organisations, trade unions, or the public service. The program focuses on the theories, practice, and research in industrial and organisational psychology and in human factors. It is accredited as fifth and sixth years of study leading to full membership of the Australian Psychological Society and to its College of Organisational Psychologists, and registration as a psychologist in New South Wales.

The normal entrance requirement is completion of an honours Class 1 or Class 2 degree in Psychology from the University of New South Wales or a qualification considered equivalent.

Selection is based on academic qualifications for the program. As the number of places is limited, entry into the program is competitive. Referees reports will be sought for applicants who are shortlisted and an interview may be required.

Applicants who do not satisfy these entrance requirements may in exceptional circumstances be admitted, depending upon their knowledge, experience, occupation and the nature of their undergraduate training. Students applying under these provisions will usually be required to complete a qualifying program before they are admitted.

The minimum period of registration before the award of the degree is four sessions for full-time students and six sessions for part-time students. Students with advanced standing may have the minimum period reduced by up to one half of the program if a student has completed a PhD in an approved area of Psychology and one session if a student has completed part of the course work program.

The program consists of three components, all of which are compulsory: 1. course work (weekly lectures and seminars with associated written forms of assessment), 2. professional practice (completion of a minimum of 1,000 hours of supervised organisational practice in organisational field settings, weekly Organisational meetings and Career Development Workshops), and 3. a research thesis. The three components total 96 units of credit (48 in each stage).

**Stage 1**
- PSYC7000  Research and Evaluation Methods
- PSYC7001  Psychological Assessment 1
- PSYC7100  Psychology of Human Resources 1
- PSYC7101  Psychology of Human Resources 2
- PSYC7102  Psychological Principles of Training
- PSYC7115  Vocational Interviewing and Counselling
- PSYC7122  Professional and Ethical Practice (Organisational) 1
- PSYC7122  Professional and Ethical Practice (Organisational) 2

**Stage 2**
- PSYC7002  Psychological Assessment 2
- PSYC7117  Advanced Topics in Organisational Psychology
- PSYC7124  Professional and Ethical Practice (Organisational) 3
- PSYC7125  Professional and Ethical Practice (Organisational) 4
- PSYC7126  Research Thesis (Organisational) 1*
- PSYC7127  Research Thesis (Organisational) 2*

*PSYC7126 and PSYC7127 together contribute 25 per cent to the overall grading for the degree.

**Notes:** Part-time students normally are expected to take half the full-time program in any one session.
The Schools of the Faculty of Science and Technology offer research programs leading to the award of the degrees of Doctor of Philosophy, Master of Science and (through the School of Materials Science and Engineering) Master of Engineering.

The following formal coursework programs leading to graduate awards are also offered:

- School of Chemistry: GradCert in Chemical Analysis and Laboratory Management, GradDip in Chemical Analysis and Laboratory Management, MScTech in Chemical Analysis and Laboratory Management.
- School of Geography: GradDip in Remote Sensing, MScTech in Remote Sensing, MScTech in Geographic Information Systems and MScTech in Environmental Management.
- School of Geology: MScTech in Geology (including programs in Geological Data Processing, Groundwater Studies and Engineering and Environmental Geology).
- School of Materials Science and Engineering: GradDip in Textile Technology, MScTech in Corrosion Engineering, MScTech in Engineering Materials.
- School of Mathematics: GradDip in Physical Oceanography, GradDip in Statistics, MScTech in Mathematics, Master of Statistics.
- School of Optometry: Master of Optometry.
- School of Physics: GradDip in Physics, GradDip in Physics Research Techniques, MScTech in Medical Physics.
- Department of Aviation: GradCert in Aviation Management; GradDip in Aviation Management, GradDip in Flying, MScTech in Aviation.
- Centre for Advanced Numerical Computation in Engineering and Science: Graduate Diploma in Computational Science, Master of Science and Technology in Computation.
- In addition the Faculty of Science and Technology has two faculty-wide programs that are administered by the School of Safety Science. These are the GradDip in Environmental Studies, and the Master of Environmental Studies.

Graduates are advised to consult the Head of Department before making formal application for registration in any of the above programs or programs.

For admission to registration for all degrees of Master (except Master of Statistics), candidates must have completed one of the following:

1. An approved degree of Bachelor with Honours;
2. An approved three-year program leading to the award of the degree of Bachelor plus an approved qualifying program. Suitable professional and or research experience may be accepted in lieu of the qualifying program;
3. An approved four-year program leading to the award of the degree of Bachelor.

Applicants for registration for the degree of Master of Statistics shall have been admitted to the degree of Bachelor with major studies in the field of statistics in the University of New South Wales or other approved university.

For admission to the Graduate Diploma and Graduate Certificate candidates must have completed one of the following:

1. An approved Degree of Bachelor, or
2. Evidence of other academic and professional attainments as approved by the Higher Degree Committee of the Faculty.

The conditions governing these higher degrees are set out later in this handbook.

In many cases the Faculty offers articulated programs whereby a student who performs satisfactorily in a Graduate Certificate or Graduate Diploma may be permitted to upgrade to a Masters program in the same discipline. For further details students should consult their Director of Postgraduate Studies.

There are also multi-faculty programs in which Science and Technology is a major participant. These include the Master of Environmental Management (described below), Master of Technology Management and Master of Business and Technology (see Faculty of Engineering Handbook).
Graduate Certificates

School of Chemistry

Head of School: Professor RF Howe
Director of Graduate Studies: Prof DB Hibbert (contactable via Chemistry Academic Office)

7345.3001 Graduate Certificate in Chemical Analysis and Laboratory Management

This program offers training in advanced chemical analysis techniques and associated management issues. It allows students to select from a series of courses covering all aspects of modern chemical analysis, safety and occupational health issues, and people management. The program will normally be completed within one year on a part-time basis. It is particularly suited to new graduates or laboratory chemists and managers who wish to upgrade their qualifications in and knowledge of chemical analysis and related topics. This is the first stage in a fully articulated program of Graduate Certificate, Graduate Diploma and Master of Science and Technology in Chemical Analysis and Laboratory Management.

Entry Qualifications: BSc degree with a major in Chemistry or equivalent qualification

Course Requirements: Candidates are required to complete a total of 24 units of credit selected from the following offerings with at least 6 units of credit being selected from the analysis courses and at least 6 units of credit from the management courses:

**Analysis Courses**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>UOC</th>
<th>Sess.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM7112</td>
<td>Analysis of biological and organic materials</td>
<td>6</td>
<td>3 2</td>
</tr>
<tr>
<td>CHEM7113</td>
<td>Elemental analysis</td>
<td>6</td>
<td>3 2</td>
</tr>
<tr>
<td>CHEM7114</td>
<td>Chromatography</td>
<td>6</td>
<td>3 2</td>
</tr>
<tr>
<td>CHEM7115</td>
<td>Treatment of analytical data</td>
<td>6</td>
<td>3 1</td>
</tr>
<tr>
<td>CHEM7116</td>
<td>Chromatography-mass spectrometry</td>
<td>6</td>
<td>3 1</td>
</tr>
<tr>
<td>CHEM7117</td>
<td>Molecular analysis</td>
<td>6</td>
<td>3 2</td>
</tr>
<tr>
<td>CHEM7118</td>
<td>Surface analysis</td>
<td>6</td>
<td>3 1</td>
</tr>
</tbody>
</table>

**Management Courses**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>UOC</th>
<th>Sess.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM7111</td>
<td>Quality assurance and laboratory practice</td>
<td>6</td>
<td>3 2</td>
</tr>
<tr>
<td>SESC9020</td>
<td>Occupational health and safety law 1</td>
<td>3</td>
<td>1 1</td>
</tr>
<tr>
<td>SESC9030</td>
<td>Occupational health and safety law 2</td>
<td>3</td>
<td>1 1</td>
</tr>
<tr>
<td>SESC9820</td>
<td>Chemical safety and toxicology</td>
<td>3</td>
<td>1.5 1 or 2</td>
</tr>
<tr>
<td>SESC9850</td>
<td>Management of dangerous materials</td>
<td>3</td>
<td>1.5 1 or 2</td>
</tr>
<tr>
<td>IROB2721</td>
<td>Managing people</td>
<td>6</td>
<td>3.5 1</td>
</tr>
</tbody>
</table>

School of Safety Science

7345.8510 Graduate Certificate in Industrial Safety

Students enrolled in the Graduate Certificate in Industrial Safety must complete a program totaling 18 Units of credit. The program is normally completed by six months of full-time study or one year of part-time study. This program may also be taken in attendance mode or off-campus learning mode, however the range of electives available in off-campus mode is more restricted than available in attendance mode. It is the first stage in an articulated program of Graduate Certificate and Masters (of Science and Technology) programs in industrial safety.

Students undertake 9 UOC of compulsory courses, and 9 UOC of electives. The electives may be taken from any School in the Faculties of Science and Technology or Engineering, subject to the agreement of the Head of School and the Head of the School of Safety Science. This enables students to extend their specialist knowledge in their own discipline, to undertake additional general management subjects or to focus on subjects relating to occupational safety and health.

**Core courses – 9 Units of Credit**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>UOC</th>
</tr>
</thead>
<tbody>
<tr>
<td>SESC9100</td>
<td>Physical Hazards</td>
<td>3</td>
</tr>
<tr>
<td>SESC9200</td>
<td>Hazard and Risk Assessment</td>
<td>3</td>
</tr>
<tr>
<td>SESC9300</td>
<td>Effective Behaviour in Organisations</td>
<td>3</td>
</tr>
</tbody>
</table>

Exemption but not Advanced Standing may be awarded to students who can establish that they have equivalent knowledge in these courses. Where necessary other, approved postgraduate courses may be substituted.

**Elective courses**

Students are required to complete elective courses (up to 9 UOC) taken from the electives offered by the School. Other graduate courses offered by other Schools may be taken subject to the approval of both the School concerned and the Industrial Safety Course Coordinator. Not all elective courses are offered every year and not all are offered in off-campus delivery.

7345.8520 Graduate Certificate in Risk Management

The Graduate Certificate in Risk Management provides students with the opportunity to study risk management related courses to meet specific vocational needs or individual interests. A student must complete, SESC9211 Risk Management, the prerequisite statistics course and any two other 6 UOC courses related to risk management. In addition students are required to satisfy any prerequisites in their program of studies including a statistics prerequisite for SESC9211. Preliminary courses from the Masters program may not be taken as elective courses. Students may be proscribed from taking courses that would duplicate prior studies.

7345.8540 Graduate Certificate in Ergonomics

The Graduate Certificate in Ergonomics is intended to provide professionals from other disciplines with an awareness of the principles of ergonomics sufficient for them to be able to identify ergonomics problems in human-technology-environment systems and to be able to recommend a user-centred, systems approach to their assessment and control. It is the first stage in a fully articulated program of Graduate Certificate, Graduate Diploma and Masters (of Science & Technology) programs in ergonomics.

**Preliminary courses**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>UOC</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANAT6151</td>
<td>Introductory Functional Anatomy</td>
<td>3</td>
</tr>
<tr>
<td>SESC6110</td>
<td>Physical Principles of Safety</td>
<td>3</td>
</tr>
</tbody>
</table>

Advanced Standing may be awarded to students who can establish that they have equivalent knowledge in these courses.
### Core courses

- **SESC9010** Research Methods 3
- **SESC9100** Physical Hazards 3
- **SESC9200** Hazard and Risk Assessment 3
- **SESC9300** Effective Behaviour in Organisations 3
- **SESC9411** Principles of Ergonomics 6

Exemption but not necessarily Advanced Standing may be awarded to students who can establish that they have equivalent knowledge in these courses. Where necessary other approved postgraduate courses may be substituted.

1 If students have no statistics in their background they will have to do **SESC6010** Descriptive Statistics in addition to the above load.

### 7345.8560 Graduate Certificate in Safety Science

The Graduate Certificate in Safety Science is a graduate program of six months full time (or equivalent) study for students working in health and safety to become safety practitioners. It is the first stage in a fully articulated program of Graduate Certificate, Graduate Diploma and Master of Science and Technology programs in occupational health and safety or Master of Safety Science. The Graduate Certificate in Safety Science is available in attendance and off campus study modes.

#### Preliminary courses

Up to a maximum of 6 UOC, depending on student background.

- **UOC**
  - **ANAT6151** Functional Anatomy 3
  - **SESC6010** Descriptive Statistics 3
  - **SESC6110** Physical Principles of Safety 1 3
  - **SESC6800** Fundamentals of Toxicology 3

Advanced Standing may be awarded to students who can establish that they have equivalent knowledge in these courses.

#### Core courses

A minimum of 12 UOC, depending on student background and the need for preliminary courses.

- **UOC**
  - **SESC6120** Physical Principles of Safety 2 3
  - **SESC9100** Physical Hazards 1 3
  - **SESC9200** Hazard and Risk Assessment 3
  - **SESC9300** Effective Behaviour in Organisations 3
  - **SESC9400** Ergonomics 1 3
  - **SESC9920** Occupational Health and Safety Law 1 3
  - **SESC9600** Introduction to Occupational Health 3
  - **SESC9810** Introduction to Toxicology 3

Exemption but not necessarily Advanced Standing may be awarded to students who can establish that they have equivalent knowledge in these courses. Where necessary other, approved postgraduate courses may be substituted.

### Elective Courses

Students can also select up to 6 UOC of elective courses from the list of electives or core courses presented for the MScTech (OHS) program.

No advanced standing will be granted for the Graduate Certificate. Where students have previously studied material equivalent to one of the core courses, exemption may be granted and an additional elective selected.

1 Requires preliminary course or equivalent knowledge as assumed knowledge.

### 7345.9001 Graduate Certificate in Aviation Management

The Graduate Certificate in Aviation Management is designed for students who do not have tertiary qualifications but do have at least four years of relevant experience or two years experience and two years advanced training (eg holder of an ATPL). Three courses will be completed to a total of 18 units of credit (UOC). If a credit average is attained, students may apply for a transfer to the Graduate Diploma of Aviation Management. The Graduate Certificate is offered through distance education and designed with industry input for professionals and managers working in aviation related environments.

#### Available Courses

**Session 1**

- **AVIA5001** Law and Regulations in Aviation 6
- **AVIA5003** Aviation and Security 6
- **AVIA5007** Airport Operations Management 6
- **AVIA5009** Airline Corporate Management 6

**Session 2**

- **AVIA5004** Aviation Safety and Accident Prevention 6
- **AVIA5005** Airline Operational Management 6
- **AVIA5006** Airport Planning 6
- **AVIA5018** Aviation Human Factors 6
Graduate Diplomas

Faculty of Science and Technology

Graduate Diploma in Environmental Sciences

GradDip
The Graduate Diploma in Environmental Sciences is a graduate program of one year full time (or equivalent) study for students to study the nature of environmental problems, the methodology of evaluation and environmental management. The program is administered by the School of Safety Science.

Entry qualifications
A three year honours degree or equivalent, in a field relevant to environmental studies, or a four year degree in another field. Under exceptional circumstances, and at the discretion of the head of school, applicants with extensive experience in the environmental field, or with other professional or academic attainments, may also enrol in the Graduate Diploma program.

Program requirements
Students enrolled on the Graduate Diploma in Environmental Sciences are required to complete a program totalling 36 units of credit made up of compulsory Core Courses (18 UOC) and Elective Courses (18 UOC). The structure of the program allows students to pursue specialised interests through the electives, or to develop new areas of expertise. Students may upgrade to the Master of Science and Technology in Environmental Sciences (a new study plan being introduced from 2000, subject to Faculty approval) upon completion of satisfactory progress. In such cases, students will be required to complete 60 UOC.

Core and elective courses are the same as those listed under the entry for the Master of Environmental Studies (8045) coursework only option. Except in unusual circumstances, the Graduate Diploma in Environmental Sciences is the first stage in an articulated program of Graduate Diploma and Masters programs in Environmental Science. The Graduate Diploma in Environmental Sciences is available in attendance study mode only.

Core courses
SESC9711 Environmental Planning and Assessment 6
SESC9721 Environment and Medicine 6
SESC9731 Environment and Law 6

Elective courses
To a maximum of 36 UOC. See list under Master of Environmental Studies

School of Chemistry

Head of School: Professor RF Howe
Director of Graduate Studies: Prof DB Hibbert (contactable via Chemistry Academic Office)

Graduate Diploma in Chemical Analysis and Laboratory Management

This program offers training in advanced chemical analysis techniques and associated management issues. It allows students to select from a series of modules covering all aspects of modern chemical analysis, safety and occupational health issues, and people management. The program will normally be completed within one year on a full time basis, or over two years part time. It is particularly suited to new graduates or laboratory chemists and managers who wish to upgrade their qualifications in and knowledge of chemical analysis and related topics. This is the second stage in a fully articulated program of Graduate Certificate, Graduate Diploma and Master of Science and Technology in Chemical Analysis and Laboratory Management.

Entry Qualifications
BSc degree with a major in Chemistry or equivalent qualification

Course Requirements
Candidates are required to complete a total of 36 units of credit selected from the following offerings with at least 6 units of credit being selected from the analysis courses and at least 6 units of credit from the management courses:

Analysis Courses

CHEM7112 Analysis of biological and organic materials 6 3 2
CHEM7113 Elemental analysis 6 3 2
CHEM7114 Chromatography 6 3 2
CHEM7115 Treatment of analytical data 6 3 1
CHEM7116 Chromatography-mass spectrometry 6 3 1
CHEM7117 Molecular analysis 6 3 2
CHEM7119 Surface analysis 6 3 1

Management Courses

CHEM7111 Quality assurance and laboratory practice 6 3 2
SESC9020 Occupational health and safety law 1 3 1 1
SESC9030 Occupational health and safety law 2 3 1 1
SESC9820 Chemical safety and toxicology 3 1.5 1 or 2
SESC9850 Management of dangerous materials 3 1.5 1 or 2
IROB2721 Managing people 6 3.5 1
School of Geography

5522.4003
Remote Sensing

Graduate Diploma
GradDip

The graduate diploma program in Remote Sensing is offered in both the Faculty of Science and Technology and the Faculty of Engineering. Entry into either faculty depends on the background of the applicant and the orientation of the proposed program.

Entry qualifications
Three-year degree from an approved university and or qualifications deemed appropriate by the relevant faculty.

Program requirements
Candidates are required to complete a program totalling a minimum of 36 units of credit made up of 4 compulsory courses (24 units of credit) and 2 elective courses (12 units of credit). Compulsory courses not offered in a particular year may be substituted by an approved equivalent course.

The program will normally comprise one year of full-time study or two years part-time study.

Compulsory courses
- GEOG9021 Image Analysis in Remote Sensing 6
- GEOG9002 Remote Sensing Applications 6
- GMAT9600 Principles of Remote Sensing 6
- GMAT9606 Microwave Remote Sensing 6

Elective courses
- From the following (or as approved by the relevant Faculty):
  - CVEN9861 Environmental and Engineering Geophysics 6
  - CVEN9875 Hydrological Processes 6
  - GEOG9013 Directed Problems in Remote Sensing 6
  - GEOG9014 Computer Mapping and Data Display 6
  - GEOG9016 Principles of Geographic Information Systems 6
  - GEOL0110 Remote Sensing in Applied Geology 6
  - GEOL9060 Environmental Geology 6
  - GMAT9211 Introduction to Geodesy 6
  - GMAT9532 Data Acquisition and Terrain Modelling 6
  - GMAT9604 Land Information Systems 6

School of Mathematics

5522
Statistics Graduate Diploma Program
Full-time or Part-time

Graduate Diploma in Statistics
GradDipStats

Staff Contact: Prof W Dunsmuir
This graduate diploma is intended for Statistics graduates wishing to further develop their knowledge and skills in Statistical science. In particular, it provides an opportunity for advanced training in topics relevant to Medical Statistics and Financial Mathematics.

Intending students are referred to the conditions for the award of graduate diplomas set out elsewhere in the handbook. Basic entry qualifications for this program are a degree in Statistics or Econometrics or a degree in Commerce with a major in Business Statistics or an approved equivalent. The program consists of eight courses from the MStats program (excluding MATH5925 and MATH 5935). At most two courses may be selected from those offered by other Departments or Schools within the University.

The program may be taken over one year full-time or on a part-time basis. The total number of units of credit is 48, six for each course.

5528.6003
Physical Oceanography Graduate Diploma Program
Full-time or Part-time

Graduate Diploma by Research in Physical Oceanography
GradDip

Staff Contact: Dr John Middleton
This graduate diploma is intended to train graduates in the physical sciences or engineering in the basic techniques of physical oceanography particularly in preparation for study at postgraduate level.

It is intended to develop student skills in planning and execution of oceanographic experiments, in the theory of oceanographic fluid mechanics, the applications and limitations of oceanographic equipment and of commonly used data analysis techniques.

Recent rapid developments in marine science coupled with the relative scarcity of persons able to take up support positions demonstrate the need for skilled persons who will be able to assist oceanographic research with minimum training. This program is aimed at providing such skilled graduates.

Intending students are referred to the conditions for the award of graduate diplomas set out elsewhere in this handbook. Basic entry qualifications for this program are a degree in Engineering or in Science with major studies in mathematics or physics.

The program, requiring 48 units of credit for completion, consists of a major project OCEA5115 worth 24 units of credit of the total accreditation for the program, the remaining 24 being comprised as indicated below.

1. Compulsory Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>UOC</th>
</tr>
</thead>
<tbody>
<tr>
<td>OCEA5115</td>
<td>Experimental Project</td>
<td>24</td>
</tr>
<tr>
<td>OCEA5125</td>
<td>Geophysical Fluid Dynamics</td>
<td>6</td>
</tr>
<tr>
<td>OCEA5145</td>
<td>Applied Data Analysis</td>
<td>6</td>
</tr>
</tbody>
</table>

2. Elective Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>UOC</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOG9021</td>
<td>Image Analysis in Remote Sensing</td>
<td>6</td>
</tr>
<tr>
<td>GMAT9606</td>
<td>Microwave Remote Sensing</td>
<td>6</td>
</tr>
<tr>
<td>CVEN9835</td>
<td>Coastal Engineering 1</td>
<td>6</td>
</tr>
<tr>
<td>CVEN9836</td>
<td>Coastal Engineering 2</td>
<td>6</td>
</tr>
<tr>
<td>CVEN9863</td>
<td>Estuarine Hydraulics</td>
<td>6</td>
</tr>
<tr>
<td>GEOG9012</td>
<td>Remote Sensing Applications</td>
<td>6</td>
</tr>
<tr>
<td>OCEA565</td>
<td>Theoretical Project</td>
<td>12</td>
</tr>
<tr>
<td>MATH5285</td>
<td>Ocean Modelling</td>
<td>6</td>
</tr>
</tbody>
</table>

or appropriate courses within mathematics, physics or engineering chosen on the basis of individual background.

The program may be taken over one year full-time or two years part time.
School of Physics

5520
Physics Graduate Diploma Program
Full-time or Part-time

Graduate Diploma in Physics
GradDipPhys

Staff Contact: Associate Professor RJ Stening

The Graduate Diploma in Physics offers an advanced training program for graduates from overseas universities who wish to obtain specialised training in physics. The program is also available to graduates from Australian universities who have not done an Honours program and who wish to pursue postgraduate study in physics. Students qualified to enrol in the Honours program would be expected to do so rather than to enrol in the GradDipPhys. For suitably qualified students the expectation is that the program would allow entrance to a higher degree program provided suitable supervision and facilities were available.

The GradDipPhys will be offered with program work and research project requirement similar to Physics Level IV, with substitutions if required to be approved by the School Postgraduate Coordinator. The program involves two sessions full-time study or four sessions part-time study comprising a total of 24 UOC, plus a single research project over the period of study or two different research projects, one in each half of the period of study (total units of credit 24). All students normally take programs in quantum mechanics, statistical mechanics and solid state physics. Other lecture programs and the research projects are offered in general areas of physics including astrophysics, biophysics, condensed matter physics and theoretical physics.

5516
Physics Research Techniques Graduate Diploma
Program
Full-time or Part-time

Graduate Diploma in Physics
GradDipPhysResTech

Staff Contact: Associate Professor RJ Stening

The Graduate Diploma in Physics Research Techniques offers an advanced training program for graduates who wish to obtain specialised training in research techniques in physics. The program involves two sessions full-time study or four sessions part-time study and consists of courses at Level III/IV totalling 30 UOC and a research project (18 UOC). The choice of courses is very flexible. Most courses selected should be from the School of Physics but courses from other Schools may be included. Students wishing to proceed to a research degree will consult with their potential supervisor on their choice of courses.

School of Safety Science

5522.8765
Graduate Diploma in Occupational Medicine

The Graduate Diploma in Occupational Medicine is a graduate program of one year full time (or equivalent) study for medical graduates intending to become occupational physicians. It is the second stage in an articulated program of Graduate Certificate in Occupational Rehabilitation, Graduate Diploma and Masters of Science and Technology programs in Occupational Medicine. The Graduate Diploma in Occupational Medicine is available in attendance and off campus study modes. This program is suitable for occupational physician trainees of the Australasian Faculty of Occupational Medicine of the Royal Australasian College of Physicians.

Core subjects – 18 Units of Credit
SESC9600 Introduction to Occupational Health 3
SESC9631 Occupational Medicine 6
SESC9640 Occupational Epidemiology 3
SESC9651 Occupational Rehabilitation 6

Exemption but not necessarily Advanced Standing may be awarded to students who can establish that they have equivalent knowledge in these courses. Where necessary other, approved postgraduate courses may be substituted.

Elective courses – to a maximum of 36 UOC.

5522.8720
Graduate Diploma in Risk Management

Grad Dip Risk Management

The Graduate Diploma of Risk Management provides a general introduction to risk management as it is applied across all disciplines. Courses for the program are offered by the Faculties of Science and Technology, Engineering, Commerce.

Candidates are required to complete 48 units of credit for the degree. Students may be exempted the preliminary course where these topics have been studied during previous studies.

Preliminary courses
ECON5103 Business Economics 6
ECON5203 Statistics for Business 6
SESC6010 Descriptive Statistics 3
SESC9010 Research Methods 3

Core courses
SESC9351 Risk Management 6
SESC9352 Risk Analysis 6
FINS5513 Security Valuation and Portfolio Selection 6
FINS5531 Risk and Insurance 6

Elective courses
Students may select 2 elective courses from any Faculty providing they can demonstrate to the program authority the relevance of the course to risk management. A list of possible electives is given with the description of the Master of Risk Management.
Graduate Diploma in Ergonomics

GradDip

The Graduate Diploma in Ergonomics is intended for students wishing to become professional ergonomists. It provides students with the competencies to identify ergonomics hazards in human-technology-environment systems, to assess their associated risks and to use a user-centred, systems approach to develop controls for the hazards. It is the second stage in a fully articulated program of Graduate Certificate, Graduate Diploma and Masters (of Science & Technology) programs in ergonomics.

Preliminary courses1

ANAT6151 Functional Anatomy 3
SESC6110 Physical Principles of Safety 1 3

Advanced Standing may be awarded to students who can establish that they have equivalent knowledge in these courses.

Core courses

SESC9010 Research Methods 3
SESC9100 Physical Hazards 3
SESC9200 Hazard and Risk Assessment 3
SESC9300 Effective Behaviour in Organisations 3
SESC9411 Principles of Ergonomics 6
SESC9421 Applied Ergonomics 6
SESC9431 Physical Ergonomics 6
SESC9441 Ergonomics & New Technology 6
SESC9541 Assessment of the Workplace Environment 6

Exemption but not necessarily Advanced Standing may be awarded to students who can establish that they have equivalent knowledge in these courses. Where necessary other approved courses may be substituted.

1 If students have no statistics in their background they will have to do SES6010 - Descriptive Statistics in addition to the above load.

Graduate Diploma in Safety Science

GradDip

The Graduate Diploma in Safety Science is a graduate program of one year full time (or equivalent) study for students with a health and safety background intending to become safety professionals. It is the second stage in a fully articulated program of Graduate Certificate, Graduate Diploma and Master of Science and Technology programs in occupational health and in Master of Safety Science. The Graduate Diploma in Safety Science is available in attendance and off campus study modes.

Preliminary courses

Up to a maximum of 12 UOC, depending on student background.

ANAT6151 Functional Anatomy 3
SESC6010 Descriptive Statistics 3
SESC6110 Physical Principles of Safety 1 3
SESC6800 Fundamentals of Toxicology 3

Advanced Standing may be awarded to students who can establish that they have equivalent knowledge in these courses.

Core courses

Core courses, totalling 27 units of credit, represent the central theme of safety science and are compulsory.

SESC6120 Physical Principles of Safety 2 3
SESC9010 Research Methods 3
SESC9100 Physical Hazards 3
SESC9200 Hazard and Risk Assessment 3
SESC9300 Effective Behaviour in Organisations 3
SESC9400 Ergonomics 1 3

Elective courses

Students are required to select up to 9 UOC of elective courses from the list of electives or core courses presented for the MScTech (OHS) program.

1 Requires preliminary course or equivalent knowledge as assumed knowledge.

Department of Aviation

Graduate Diploma in Aviation Management

The Graduate Diploma in Aviation Management is designed for students who have an approved diploma from a recognised tertiary institution as well as two years of relevant professional experience. Six courses will be completed to a total of 36 units of credit (UOC). A credit average must be achieved to continue on to the Masters level. The Graduate Diploma is offered through distance education and designed with industry input for professionals and managers working in aviation related environments.

Available Courses

Session 1 Aviation Core Courses

AVIA5001 Law and Regulations in Aviation 6
AVIA5003 Aviation and Security 6
AVIA5007 Airport Operations Management 6
AVIA5009 Airline Corporate Management 6

Session 2 Aviation Core Courses

AVIA5004 Aviation Safety and Accident Prevention 6
AVIA5005 Airline Operational Management 6
AVIA5006 Airport Planning 6
AVIA5018 Aviation Human Factors 6

Graduate Diploma in Flying

The Graduate Diploma in Flying is a program designed for students with a Bachelors degree from a recognised institution or equivalent qualifications as determined by UNSW and with an ambition towards an aviation career as a pilot. Taken over 3 to 4 semesters part-time, the program has both yearly and mid-yearly starts with a combination of academic subjects offered by distance mode and an intensive flight training practicum. Students are required to complete a total of 36 units of credit (UOC) consisting of a minimum of 18 UOC from the flying practicum and a minimum of 12 UOC from the academic selection.

Flying Practicum Components

AVIA5010 Private pilot practical and theory 12
AVIA5011 Night Rating, Commercial pilot, 12
Multi Engine Endorsement
AVIA5012 Instrument Rating and Theory 6
AVIA5013 Grade Three Instructor Rating 6
AVIA5014 Airline Transport Theory 6
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVIA5001</td>
<td>Aviation law and Regulations</td>
<td>6</td>
</tr>
<tr>
<td>AVIA5003</td>
<td>Aviation Security</td>
<td>6</td>
</tr>
<tr>
<td>AVIA5004</td>
<td>Flight Safety and Accident Investigation</td>
<td>6</td>
</tr>
<tr>
<td>AVIA5005</td>
<td>Airline Operations Management</td>
<td>6</td>
</tr>
<tr>
<td>AVIA5006</td>
<td>Airport Planning</td>
<td>6</td>
</tr>
<tr>
<td>AVIA5007</td>
<td>Airport Operations Management</td>
<td>6</td>
</tr>
<tr>
<td>AVIA5009</td>
<td>Airline Corporate Management</td>
<td>6</td>
</tr>
<tr>
<td>AVIA5018</td>
<td>Aviation Human Factors</td>
<td>6</td>
</tr>
<tr>
<td>ANCE8001</td>
<td>Computational Mathematics</td>
<td>6</td>
</tr>
<tr>
<td>MATH5315</td>
<td>High Performance Numerical Computing</td>
<td>6</td>
</tr>
<tr>
<td>ANCE8003</td>
<td>Project (Masters degree only)</td>
<td>12</td>
</tr>
<tr>
<td>ANCE8101</td>
<td>Data Analysis and Visualization</td>
<td>6</td>
</tr>
<tr>
<td>ANCE8102</td>
<td>Mesh Generation</td>
<td>6</td>
</tr>
<tr>
<td>ANCE8103</td>
<td>Fundamental Applied Computation</td>
<td>6</td>
</tr>
<tr>
<td>ANCE8104</td>
<td>Advanced Computational Algorithms</td>
<td>6</td>
</tr>
<tr>
<td>ANCE8207</td>
<td>Advanced Computational Science</td>
<td>6</td>
</tr>
</tbody>
</table>

Centre for Advanced Numerical Computation in Engineering and Science

Director: Professor CAJ Fletcher

The Centre for Advanced Numerical Computation in Engineering and Science is a joint initiative of the Faculties of Engineering and Science to provide a focus for the very active UNSW community of computational engineers and scientists exploiting state-of-the-art workstation clusters, vector and parallel supercomputers. The Centre contributes to graduate training through coursework and research programs, carries out both fundamental and applied research through developing and using computer codes, provides short programs for industry-based engineers and scientists and organises conferences and workshops on the latest computational techniques. The Centre has three areas of special emphasis: a) Industrial Computational Fluids and Heat Transfer, b) Environmental Modelling, c) Finite Element Structural Analysis.

1. Core Courses (6 units)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANCE8001</td>
<td>Computational Mathematics</td>
<td>6</td>
</tr>
<tr>
<td>MATH5315</td>
<td>High Performance Numerical Computing</td>
<td>6</td>
</tr>
<tr>
<td>ANCE8003</td>
<td>Project (Masters degree only)</td>
<td>12</td>
</tr>
</tbody>
</table>

2. Generic Computational Courses (6 units)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANCE8101</td>
<td>Data Analysis and Visualization</td>
<td>6</td>
</tr>
<tr>
<td>ANCE8102</td>
<td>Mesh Generation</td>
<td>6</td>
</tr>
<tr>
<td>ANCE8103</td>
<td>Fundamental Applied Computation</td>
<td>6</td>
</tr>
<tr>
<td>ANCE8104</td>
<td>Advanced Computational Algorithms</td>
<td>6</td>
</tr>
<tr>
<td>ANCE8207</td>
<td>Advanced Computational Science</td>
<td>6</td>
</tr>
</tbody>
</table>

5522

Graduate Diploma in Computation

Staff Contact: Dr Y Shao

The graduate diploma will provide thorough training in modern computational techniques in the discipline-specific areas: A) Environmental Modelling; B) Computational Chemistry; C) Computational Physics, through coursework.

Admission to the Graduate Diploma program requires the student to have at least a pass degree in Science, Engineering or other mathematically-based discipline. The Graduate Diploma program can be completed in one year of full-time study.

Students are required to complete, satisfactorily, 36 units of credit, as follows:

I) The two core courses (ANCE8001, MATH5315, above)

II) One generic computational course (above)

III) Two discipline-specific courses offered by the Centre or the Faculty of Science.

IV) One elective course offered by the Centre or the Faculties of Science and Engineering.

Candidates may apply to upgrade to the Masters program after completing not less than 18 units. Entry will be competitive and based on the student's record. Transfer of units is based on the particular circumstances of the case. One unit equals one hour per week of classes for a 14 week session.
Masters Degrees

Faculty of Science and Technology

8045
Master of Environmental Studies

MEnvStudies

Entry qualifications

The entry qualification for the Master of Environmental Studies is a four year honours degree or equivalent in a field relevant to environmental studies. Applicants may also be admitted if they have a three year degree plus another qualification at an acceptable level, or have other professional or academic attainments. In the past, the program has attracted students from a wide variety of backgrounds, including those with first degrees in geography, biological sciences, geology, ecology, civil engineering, chemistry, physics, law, health administration, agriculture, social science and archaeology.

The program is administered by the School of Safety Science.

Program requirements

Students enrolled on the Master of Environmental Studies Program are required to complete a program totalling 48 Units, but have the choice of two options:

- coursework only;
- coursework and project.

The coursework only option is made up of compulsory Core Courses (18 units) and Elective Courses (30 units). The coursework and project option is made up of Core courses (18 units), Project courses (15 units) and Elective courses (15 units). The structure of the program options allows students to pursue specialised interests through the electives and the project, or to develop new areas of expertise.

Some courses have prerequisites or assumed knowledge which are determined to be necessary for suitable progress through the program. Students should seek advice from course co-ordinators if they are in doubt as to whether they are qualified to take a course.

Coursework only option

<table>
<thead>
<tr>
<th>Core courses</th>
<th>UOC</th>
</tr>
</thead>
<tbody>
<tr>
<td>SESC9711 Environmental Planning and Assessment</td>
<td>6</td>
</tr>
<tr>
<td>SESC9721 Environment and Medicine</td>
<td>6</td>
</tr>
<tr>
<td>SESC9731 Environment and Law</td>
<td>6</td>
</tr>
</tbody>
</table>

OR

Project and Coursework option

<table>
<thead>
<tr>
<th>Course</th>
<th>UOC</th>
</tr>
</thead>
<tbody>
<tr>
<td>SESC9711 Environmental Planning and Assessment</td>
<td>6</td>
</tr>
<tr>
<td>SESC9721 Environment and Medicine</td>
<td>6</td>
</tr>
<tr>
<td>SESC9731 Environment and Law</td>
<td>6</td>
</tr>
<tr>
<td>SESC9900 Project Methods</td>
<td>3</td>
</tr>
<tr>
<td>SESC9912 Project</td>
<td>12</td>
</tr>
</tbody>
</table>

Project courses

Students undertaking the coursework and project option must undertake an investigative project of 12 units (SESC9912). Students taking the project must also take the course SESC9900 Project Methods. A second course (SESC9010 Research Methods is also highly recommended). This project is expected to be complete within one University session (that is, six months). Students will require an academic supervisor for the duration of the project. Projects normally require collection and analysis of data, leading to the preparation of a report of about 8-10,000 words. The project can be based on studies carried out at the student's place of work, or at some other suitable location.

The objective of the Project is for the student to demonstrate skills in project design, data acquisition and analysis, critical synthesis, and presentation of findings.

Elective courses

There is a very wide range of courses offered by Schools across the entire University which are suitable for inclusion in the M Env Studies program.

Students may choose to take electives that:
- reinforce their own areas of expertise; or
- extend their knowledge and skills into new areas.

By carefully combining the choice of courses, it is possible to create programs which are tailored to the needs of individual students.

Students may choose elective courses from all graduate programs available in the Faculty of Science and Technology, provided that they meet or can satisfy any necessary prerequisites to enrol. These programs include: Earth Sciences, Planning and Assessment, Pollution, Ecology, Remote Sensing, Water Management, Conservation and Land Management, Urban and Social Environments and Safety Science.

Other courses may be taken on the approval of the Program Coordinator.

The Master of Environmental Studies will not be available from Session 1, 2001 and will be replaced by a MScTech in Environmental Sciences subject to Faculty approval.

School of Chemistry

Head of School: Professor RF Howe
Director of Graduate Studies: Prof DB Hibbert (contactable via Chemistry Academic Office)

8720.3001
Master of Science and Technology in Chemical Analysis and Laboratory Management

This program offers training in advanced chemical analysis techniques and associated management issues. It allows students to select from a series of modules covering all aspects of modern chemical analysis, safety and occupational health issues, and people management. The program will normally be completed within one year on a full time basis, or over two years part time. It is particularly suited to new graduates or laboratory chemists and managers who wish to upgrade their qualifications in and knowledge of chemical analysis and related topics.
Entry Qualifications

A four-year BSc degree with a major in Chemistry or equivalent qualification or a three-year BSc degree with at least one year of relevant experience in a laboratory based career or a three-year BSc degree and completion of the units of credit required by the Graduate Diploma in Chemical Analysis and Laboratory Management with a 1 at least a credit (65%) average mark and no failures.

Course Requirements

Candidates are required to complete a total of 48 units of credit from the following offerings with at least 6 units of credit selected from the management courses and at least 6 units of credit from the analysis courses:

**Analysis Courses**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>UOCHPW Sess.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM7112</td>
<td>Analysis of biological and organic materials</td>
<td>6 3 2</td>
</tr>
<tr>
<td>CHEM7113</td>
<td>Elemental analysis</td>
<td>6 3 2</td>
</tr>
<tr>
<td>CHEM7114</td>
<td>Chromatography</td>
<td>6 3 2</td>
</tr>
<tr>
<td>CHEM7115</td>
<td>Treatment of analytical data</td>
<td>6 3 1</td>
</tr>
<tr>
<td>CHEM7116</td>
<td>Chromatography-mass spectrometry</td>
<td>6 3 1</td>
</tr>
<tr>
<td>CHEM7117</td>
<td>Molecular analysis</td>
<td>6 3 2</td>
</tr>
<tr>
<td>CHEM7118</td>
<td>Surface analysis</td>
<td>6 3 1</td>
</tr>
</tbody>
</table>

**Management Courses**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>UOCHPW Sess.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM7111</td>
<td>Quality assurance and laboratory practice</td>
<td>6 3 2</td>
</tr>
<tr>
<td>SESC9020</td>
<td>Occupational health and safety law 1</td>
<td>3 1 1</td>
</tr>
<tr>
<td>SESC9030</td>
<td>Occupational health and safety law 2</td>
<td>3 1 1</td>
</tr>
<tr>
<td>SESC9820</td>
<td>Chemical safety and toxicology</td>
<td>3 1.5 1 or 2</td>
</tr>
<tr>
<td>SESC9850</td>
<td>Management of dangerous materials</td>
<td>3 1.5 1 or 2</td>
</tr>
<tr>
<td>IROB2721</td>
<td>Managing people</td>
<td>6 3.5 1</td>
</tr>
</tbody>
</table>

Program requirements

Candidates are required to complete a program totalling a minimum of 48 units of credit made up of 3 compulsory courses, 3 elective courses and a project. The degree will normally comprise one year of full-time study or two years of part-time study.

**Compulsory Courses**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>UOCHPW Sess.</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOG9016</td>
<td>Principles of Geographic Information Systems</td>
<td>6</td>
</tr>
<tr>
<td>GEOG9017</td>
<td>Advanced Geographic Information Systems</td>
<td>6</td>
</tr>
<tr>
<td>GEOG9530</td>
<td>Project</td>
<td>12</td>
</tr>
<tr>
<td>GEOG9020</td>
<td>Applications and Management of GIS</td>
<td>6</td>
</tr>
<tr>
<td>GMTA9064</td>
<td>Land Information Systems</td>
<td>6</td>
</tr>
</tbody>
</table>

**Elective courses**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>UOCHPW Sess.</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP9311</td>
<td>Introduction to Data Base Systems</td>
<td>6</td>
</tr>
<tr>
<td>GEOG9012</td>
<td>Remote Sensing Applications</td>
<td>6</td>
</tr>
<tr>
<td>GEOG9014</td>
<td>Computer Mapping and Data Display</td>
<td>6</td>
</tr>
<tr>
<td>GEOG9018</td>
<td>Transportation Applications of Geographic Information Systems</td>
<td>6</td>
</tr>
<tr>
<td>GEOG9019</td>
<td>Special Topic</td>
<td>6</td>
</tr>
<tr>
<td>GEOG9021</td>
<td>Image Analysis in Remote Sensing</td>
<td>6</td>
</tr>
<tr>
<td>GMTA9532</td>
<td>Data Acquisition and Terrain Modeling</td>
<td>6</td>
</tr>
<tr>
<td>GMTA9600</td>
<td>Principles of Remote Sensing</td>
<td>6</td>
</tr>
<tr>
<td>GEOL1110</td>
<td>Geographical Information Systems in Applied Geology</td>
<td>6</td>
</tr>
</tbody>
</table>

Note: Other courses may be substituted for those listed with permission of the Program Coordinator to suit the specific needs of individual students.

*Students wishing to include both of those courses should take one as an elective.

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**8720.4003**

**Remote Sensing**

Master of Science and Technology

**MScTech**

The masters degree program in Remote Sensing is offered in both the Faculty of Science and Technology and the Faculty of Engineering. Entry into either Faculty depends on the background of the applicant and the orientation of the proposed program.

**Entry qualifications.** Four-year degree of appropriate standard in engineering, geography, geology, geomatic engineering, or in a relevant environmental science.

**Program requirements.** Candidates are required to complete a program totalling 48 units of credit, made up of 3 compulsory courses, 3 electives, and a project. Compulsory courses not offered in a particular year may be substituted by an equivalent course, approved by the appropriate Program Coordinator. The degree will normally comprise one year of full-time study or two years of part-time study.

**Compulsory Courses**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>UOCHPW Sess.</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOG9012</td>
<td>Remote Sensing Applications</td>
<td>6</td>
</tr>
<tr>
<td>GEOG9021</td>
<td>Image Analysis in Remote Sensing</td>
<td>6</td>
</tr>
<tr>
<td>GMTA9600</td>
<td>Principles of Remote Sensing</td>
<td>6</td>
</tr>
<tr>
<td>GEOG9530</td>
<td>Project</td>
<td>12</td>
</tr>
<tr>
<td>or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GEOL0114</td>
<td>Project</td>
<td>12</td>
</tr>
</tbody>
</table>

**Elective courses**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>UOCHPW Sess.</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOG9011</td>
<td>Environmental Impact Assessment</td>
<td>6</td>
</tr>
<tr>
<td>GEOG9013</td>
<td>Directed Problems in Remote Sensing</td>
<td>6</td>
</tr>
<tr>
<td>GEOG9014</td>
<td>Computer Mapping and Data Display</td>
<td>6</td>
</tr>
<tr>
<td>GEOG9016</td>
<td>Principles of Geographical Information Systems</td>
<td>6</td>
</tr>
<tr>
<td>GEOG9017</td>
<td>Advanced Geographical Information Systems</td>
<td>6</td>
</tr>
<tr>
<td>GEOG9019</td>
<td>Special Topic</td>
<td>6</td>
</tr>
<tr>
<td>GEOG9020</td>
<td>Applications and Management of GIS</td>
<td>6</td>
</tr>
<tr>
<td>GEOL0110</td>
<td>Geological Remote Sensing*</td>
<td>6</td>
</tr>
<tr>
<td>GEOL0310</td>
<td>Image Processing of Spatial Data Sets</td>
<td>6</td>
</tr>
</tbody>
</table>

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**School of Geography**

**Head of School:** Associate Professor I Burnley

**Director of Graduate Studies:** Associate Professor MD Fox

A number of coursework Masters degrees and Graduate Diplomas are available through the School of Geography. In addition the School welcomes enquiries from graduates who are interested in research leading to the award of the degrees of Doctor of Philosophy 1080 or Master of Science 2040.

**Graduate Program in Geographic Information Systems**

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**8720.4001**

**Geographic Information Systems**

**Master of Science and Technology**

**MScTech**

The Masters degree program in Geographic Information Systems is offered in both Geography and Geology within the Faculty. Entry into either discipline depends on the background of the applicant and the orientation of the proposed program.

**Entry qualifications**

Four-year Honours degree of appropriate standard in Geography, Geology, Geomatic Engineering, or a relevant environmental science.
GEOL0360 Remote Sensing Applications in Geoscience 6
GMAT9532 Data Acquisitions and Terrain Modelling 6
GMAT9606 Microwave Remote Sensing 6

*Students who take GEOL0110 are precluded from taking GEOL0310 and GEOL0360.

Note: Other courses may be substituted for those listed with permission of the Program Coordinator to suit the specific needs of individual students.

Graduate Programs in Environmental Studies

Institute of Environmental Studies

8619 Master of Environmental Management MEM

5499 Graduate Diploma

7339 Graduate Certificate

The environmental expertise of 7 faculties at UNSW has been brought together to provide these practical and flexible programs in environmental management, designed for people from a wide range of disciplinary backgrounds, professional experience and environmental knowledge. They provide a solid foundation in the frameworks and tools for environmental management and an understanding of the key disciplinary approaches, whilst also enabling students to tailor-make a program to suit their special needs, by drawing on more than 100 relevant elective courses at UNSW.

These new University-wide programs (starting in Session 1, 2000) are coordinated by the Institute of Environmental Studies.

Entry qualifications

An appropriate degree of Bachelor from UNSW or a qualification considered equivalent from another University or tertiary institution. Performance in the undergraduate degree and/or relevant experience will be taken into account in granting admission. An applicant may be granted admission to the GradCert on the basis of evidence of other academic or professional attainments, including relevant experience.

Program requirements

Programs may be taken part-time or full-time.

8619 MEM

72 units of credit; 3 sessions full-time or 6 part-time. The 72 units of credit is made up of core courses (18 units of credit), fundamental knowledge courses (generally 24 units of credit), electives (generally 30 units of credit). A project (18 units of credit) may be substituted for some of the elective requirement.

Core courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>UOC</th>
</tr>
</thead>
<tbody>
<tr>
<td>IEST5001</td>
<td>Frameworks for Environmental Management</td>
<td>6</td>
</tr>
<tr>
<td>IEST5002</td>
<td>Tools for Environmental Management</td>
<td>6</td>
</tr>
<tr>
<td>IEST5003</td>
<td>Addressing Environmental Issues</td>
<td></td>
</tr>
</tbody>
</table>

Fundamental knowledge courses

Each 6 units of credit

Each titled "Fundamental Knowledge in Environmental Management:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOSxxxx</td>
<td>Ecology</td>
</tr>
<tr>
<td>ECON5125</td>
<td>Economics</td>
</tr>
<tr>
<td>CVEN9985</td>
<td>Engineering</td>
</tr>
<tr>
<td>LAWS3439</td>
<td>Law</td>
</tr>
<tr>
<td>CHEM7300</td>
<td>Physical Science</td>
</tr>
<tr>
<td>SCTS4317</td>
<td>Social Science</td>
</tr>
</tbody>
</table>

Students will take fundamental knowledge courses (generally four) in the areas outside their own disciplinary background.

Electives

Chosen from across the University to meet specific needs. Students may enhance their specific skills or broaden their area of expertise and understanding.

GradDip

48 units of credit; two sessions full-time or four part-time; comprising:

- IEST5001 & IEST5002 12
- Four (generally) fundamental knowledge courses 24
- Electives 12

GradCert

24 units of credit; one session full-time or two part-time; comprising:

- IEST5001 6
- Two fundamental knowledge courses 12
- Either
  - IEST5002
  - One further fundamental knowledge course
  - One Elective 6

8045 Environmental Studies

Master of Environmental Studies MEnvStudies

This is an interdisciplinary program designed to study the nature of environmental problems and the methodology of evaluation. Emphasis is placed on the development of relevant skills in environmental analysis, management and planning. See entry under School of Safety Science

8720.4002 Environmental Management

Master of Science and Technology MScTech

The Masters degree program in environmental management provides an opportunity to focus on the management of key natural resources, particularly soils, rivers, and vegetation. Emphasis is also placed on the application of information technology for planning and decision making.

Entry qualifications

Four year degree of appropriate standard in geography, environmental science, engineering, or in a relevant science.
Program requirements
Candidates are required to complete a program of study totalling 48 units of credit made up of 3 compulsory courses (18 units of credit), a project (12 units of credit), and 3 elective courses (18 units of credit). Compulsory courses not available in a particular year may be substituted by an equivalent course, approved by the Program Coordinator. The degree will normally comprise one year of full-time study or two years of part-time study.

Compulsory courses
- GEOG9011 Environmental Impact Assessment 6
- GEOG9022 Vegetation Management 6
- GEOG9024 Soil Degradation and Conservation** 6
- GEOG9530 Project 12

Elective courses*
- GEOG9012 Remote Sensing Applications 6
- GEOG9016 Principles of Geographic Information Systems 6
- GEOG9017 Advanced Geographic Information Systems 6
- GEOG9019 Special Topic 6
- GMT9600 Principles of Remote Sensing 6
- SAFE9273 Environment and Law 8

*Alternative courses may be substituted with the permission of the Program Coordinator.
** May not be offered in 2000.

School of Geology
Head of School: Associate Professor CR Ward
Director of Graduate Studies: Dr AC Dunlop
A coursework Masters degree with several areas of specialisations is available through the School of Geology. In addition, the Department offers the research degrees of Doctor of Philosophy PhD in Applied Geology 1000 and Master of Science MSc in Applied Geology 2000.

8720
Applied Geology

Master of Science and Technology
MScTech
The Master of Science and Technology program in Applied Geology is designed to give advanced training in developing specialisations within the geological profession. Programs are structured specifically for candidates from industry to take on a part-time basis. Specialist programs are currently offered in the fields of Groundwater Studies and Geological Data Processing.

8720.1002
Groundwater Studies
This program is coordinated through the UNSW Groundwater Centre. Candidates are required to complete 48 units of credit, made up of core courses, elective courses and a project. The degree may be taken internally on a full-time (normally 2 sessions) or a part-time (normally 4 sessions) basis. The Program Director, Dr J Jankowski.

Core courses
- GEOL9111 Groundwater Environments 3
- GEOL9053 Hydrogeochemistry 3
- GEOL9054 Analysis and Interpretation of Hydrochemical Data 3
- GEOL9055 Hydrogeochemical Modelling 3
- GEOL9112 Investigation and Management of Salinity 3
- GEOL9252 Groundwater Quality and Protection 3
- CVEN7807 Groundwater Hydrology 3
- CVEN7808 Investigation of Groundwater Resources 3
- CVEN7809 Geophysical Techniques in Groundwater Studies 3
- CVEN7823 Applied Groundwater Modelling 3
- CVEN7830 Physical Aspects of Contaminated Ground Water 3
- CVEN7831 Chemical and Biological Aspects Of Contaminated Ground Water 3

Project
GEOL9124 Groundwater Project 12

Elective courses
- GEOL0110 Geological Remote Sensing 6
- GEOL1110 Geographic Information Systems in Applied Geology 6
- CVEN7800 Urban Hydrology & Storm Water 3
- CVEN7805 Coastal Zone Management 3
- CVEN7806 Catchment and Water Quality Management 3
- CVEN7810 Electrical Methods in Groundwater Investigation 3
- CVEN7817 Water in Mining Engineering 3
- CVEN7819 Hydrological Processes 3
- CVEN7824 Risk Analysis in Water Engineering 3
- CVEN7825 Aquatic Chemistry for Engineering 3

8720.1003
Geological Data Processing
This program is intended for industry-based geologists who wish to enhance their skills in the computer processing of geological data. It is delivered as a series of separate academic courses, each consisting of an intensive short course with additional assignment material. An industry-based project is also included in the program. The short courses are scheduled to allow the degree to be completed on a part-time basis over two years.

The program allows an emphasis to be placed on data processing in mineral exploration, exploration geochemistry, ore reserve estimation, image processing and remote sensing, exploration geophysics or fossil fuel deposits. Optional courses are also available to provide complementary training in topics such as environmental management and project evaluation.

Candidates are required to complete a program of 48 units of credit including a 12 UOC project. Intending students should discuss their choice of courses with the Program Director, Dr DR Cohen.

Elective courses (each 6 units of credit)
- GEOL0310 Image Processing of Spatial Data Sets
- GEOL0320 Geostatistical Ore Reserve Estimation
- GEOL0330 Conceptual Models for Exploration Geology
- GEOL0340 Geochemical Exploration Techniques
- GEOL0350 Exploration Geochemical Data Processing
- GEOL0360 Remote Sensing Applications in Geoscience
- GEOL0370 Fundamentals of Exploration Geophysics
- GEOL0380 Electrical Methods in Geophysical Exploration
- GEOL0390 Data Processing for Fossil Fuel Resources
- GEOL1110 Geographical Information Systems in Applied Geology
- GEOL9060 Environmental Geology
School of Materials Science and Engineering

Head of School: Prof DJ Young

Postgraduate Coordinator: Prof CC Sorrell

The School welcomes enquiries from graduates in Science, Engineering, Technology, and related disciplines who are interested in undertaking research leading to the award of the degree of:

- Doctor of Philosophy, Materials Science and Engineering (1045)
- Master of Science, Materials Science and Engineering (2055)
- Master of Engineering, Materials Science and Engineering (2175)

Programs involving formal coursework and a research component leading to the award of Master of Science and Technology in Engineering Materials (Program 8702.5001) or in Corrosion Engineering (Program 8702.5002) also are available.

Information concerning scholarships, fellowships, and grants-in-aid is available from the Postgraduate Coordinator. Graduates are advised to consult him before making a formal application for admission.

8720.5002
Corrosion Engineering

Master of Science and Technology
MScTech

This program will not be offered in 2000.

School of Mathematics

Head of School: Professor Gl Gaudry

Director of Graduate Studies: Dr PJ Blennerhassett

The School offers graduate programs leading to the award of the degrees of Master of Science and Technology in Mathematics and Master of Statistics (MStats).

8720.6001
Master of Mathematics Degree Program
Full-time or Part-time

Master of Science and Technology in Mathematics
MScTech in Math

The Master of Science and Technology in Mathematics degree program is intended for suitably qualified graduates in applied mathematics, pure mathematics or statistics, but others may be admitted after completing a qualifying program. The program may be completed in one year of full-time or two years of part-time study. The program may be taken as a preliminary step towards the award of a PhD in mathematics. It also provides advanced training for persons specialising in the teaching of mathematics in tertiary institutions. In addition an appropriate program may provide training for those employed or seeking employment in the area of industrial mathematics.

The program consists of seven approved lecture courses, the duration of each being two hours per week for one session, each worth 6 units of credit. With the approval of the Head of the School of Mathematics a student may substitute for one or more of these lecture courses a reading course supervised by a member of staff. Again with this approval a student may substitute for at most three of these courses graduate courses offered in a relevant discipline outside the School of Mathematics. Students are also required to undertake a project supervised by a staff member. The project consists of either a critical review of the literature in a specific field of
mathematics, or a short research project. The project is worth 6 units of credit. Each candidate's proposed program of study requires the approval of the Head of the School of Mathematics.

The conditions for the award of the degree are set out elsewhere in this handbook.

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8750
Master of Statistics Degree Program
Full-time or Part-time

Master of Statistics
MStats

The Master of Statistics Program covers a wide range of statistical theory and practice and provides advanced training for practising statisticians. The program may be completed in three sessions of full-time or three years of part-time study, and it is available to graduates with a pass degree in statistics or an honours degree in a related field (commonly mathematics) with supporting studies in statistics. Honours graduates in statistics may be exempted from up to 30 units of credit. The conditions for the award of the degree are set out elsewhere in this handbook.

The academic requirement for the degree is 72 units of credit. Unless otherwise noted, all courses listed below are 6 units of credit each, while courses offered by other schools may vary in value.

Each candidate's program of study must be approved by the Head of the School.

Compulsory Courses (offered every year)
- MATH5835 Stochastic Processes
- MATH5905 Statistical Inference
- MATH5925 Project (12 units of credit)
- MATH5935 Statistical Consulting

Elective Courses (offered every second year)
- MATH5806 Applied Regression Analysis
- MATH5815 Experimental Design 1
- MATH5816 Mathematics of Security Markets 2 (Prerequisite: MATH5965)
- MATH5825 Experimental Design 2 (Prerequisite: MATH5815)
- MATH5826 Statistical Methods in Epidemiology
- MATH5845 Time Series
- MATH5855 Multivariate Analysis 1
- MATH5865 Multivariate Analysis 2
- MATH5875 Sample Survey Design
- MATH5885 Sequential Analysis
- MATH5895 Nonparametric Methods
- MATH5915 Medical Statistics
- MATH5945 Categorical Data Analysis
- MATH5955 Statistical Quality Control
- MATH5965 Mathematics of Security Markets 1
- MATH5975 Economic Quality Control Models (Prerequisite: MATH5955)
- MATH5985 Industrial Designs (Prerequisite: MATH5815)

Up to 24 units of credit may be taken in graduate courses offered by other Departments or Schools within the University, course to the approval of the Head of School.

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School of Optometry

Head of School: Associate Professor SJ Dain

The program consists of any 4 courses selected from the 14 electives offered. The courses are generally independent and any 4 of them are suitable for a student seeking advanced professional training. However, before undertaking an overseas placement in OPTM8001 Advanced Clinical Optometry, students are required to have taken OPTM8009 Ocular Therapy. The program may be completed in one year of full-time study, or (to meet the needs of practising optometrists) in two or more years of part-time study. The program provides advanced training in clinical and theoretical aspects of optometry, with opportunities for specialisation in fields such as contact lenses, occupational optometry, and behavioural optometry. Conditions for admission and for the award of the degree of Master of Optometry are set out in this handbook.

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8760
Master of Optometry Degree Program
Full-time or Part-time

Master of Optometry
MOptom

Four elective graduate courses chosen from the list below
- OPTM8001 Advanced Clinical Optometry
- OPTM8002 Advanced Physiological Optics (Not offered in 2000)
- OPTM8003 Behavioural Optometry
- OPTM8004 Advanced Contact Lens Studies
- OPTM8005 Advanced Contact Lens Practice (Not offered in 2000)
- OPTM8006 Occupational Optometry (Not offered in 2000)
- OPTM8007 Clinical Photography (Not offered in 2000)
- OPTM8008 Project
- OPTM8009 Ocular Therapy
- OPTM8010 Public Health Optometry (Not offered in 2000)
- OPTM8011 Advanced Studies in Ocular Disease
- OPTM8012 Visual Neuroscience (Not offered in 2000)
- OPTM8014 Human Visual Development (0.5 units course) (Not offered in 2000)
- OPTM8020 Rehabilitation of the Partially Sighted (0.5 units course)

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School of Safety Science

8720.8910
Master of Science and Technology in Industrial Safety

MScTech

This program is designed as a specialism program which builds on a previous four year bachelor's degree in engineering or a related discipline. It is suitable for people who manage safety as part of their line management role and wish to extend their learning in their base discipline in addition to gaining a grounding in Safety. It is also suitable for people looking for a specialist program building on a first degree in safety. In addition to the core there is a wide choice of elective courses to suit students from widely varying backgrounds. No preliminary courses are required for this program as the specialist area chosen must be based on the discipline of the student's first degree.

Core courses
- SESC9010 Research Methods
- SESC9000 Physical Hazards
- SESC9200 Hazard and Risk Assessment
- SESC9300 Effective Behaviour in Organisations
- SESC9211 Risk management

Exemption but not necessarily Advanced Standing may be awarded to students who can establish that they have equivalent knowledge in these courses. Where necessary other, approved postgraduate courses may be substituted.
Project courses

SESC9900  Project Methods  
SESC9912  Project  

Elective courses

Elective courses may be taken from any School in the Faculties of Science and Technology or Engineering, course to the agreement of the Head of School and the Head of the School of Safety Science. This enables students to extend their specialist knowledge in their own discipline, to undertake additional general management courses or to focus on courses relating to occupational safety and health.

8720.8920  
Master of Science and Technology in Risk Management

MScTech

The Master of Science and Technology in Risk Management provides a general introduction to risk management principles as they are applied across all disciplines, then allows students to specialise in one or more areas. Courses for the program are offered by the Faculties of Science and Technology, Engineering, Commerce and the AGSM. Students may select either a financial or a technical focus.

Candidates are required to complete 72 units of credit for the degree. Students may receive advanced standing in the preliminary courses on the basis of prior studies providing they can demonstrate the prerequisite knowledge for the core courses. Advanced standing is not given for core and elective courses.

Preliminary Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>UOC</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON5103</td>
<td>Business Economics</td>
<td>6</td>
</tr>
<tr>
<td>SESC9300</td>
<td>Effective Behaviour in Organisations</td>
<td>3</td>
</tr>
<tr>
<td>SESC9020</td>
<td>The Legal System and Risk</td>
<td>3</td>
</tr>
<tr>
<td>and either</td>
<td>Statistics for Business</td>
<td>6</td>
</tr>
<tr>
<td>or SESC6010</td>
<td>Descriptive Statistics</td>
<td>3</td>
</tr>
<tr>
<td>and SESC9010</td>
<td>Research Methods</td>
<td>3</td>
</tr>
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</table>

Core Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>UOC</th>
</tr>
</thead>
<tbody>
<tr>
<td>SESC9211</td>
<td>Risk Management</td>
<td>6</td>
</tr>
<tr>
<td>SESC9231</td>
<td>Risk Analysis</td>
<td>6</td>
</tr>
<tr>
<td>FIN5513</td>
<td>Security Valuation and Portfolio Selection</td>
<td>6</td>
</tr>
<tr>
<td>FIN5531</td>
<td>Risk and Insurance</td>
<td>6</td>
</tr>
<tr>
<td>SESC9900</td>
<td>Special Report</td>
<td>6</td>
</tr>
</tbody>
</table>

Elective Courses

Students may select elective courses from any faculty providing they can demonstrate to the program authority the relevance of the course to risk management. A list of possible electives is shown below.

Note: some courses may have prerequisites or assumed knowledge

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>UOC</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCT5901</td>
<td>Accounting a User Perspective</td>
<td>6</td>
</tr>
<tr>
<td>ACCT5908</td>
<td>Auditing</td>
<td>6</td>
</tr>
<tr>
<td>ACCT5917</td>
<td>Strategic Management Systems and Processes</td>
<td>6</td>
</tr>
<tr>
<td>ACCT5996</td>
<td>Management Accounting Control Systems</td>
<td>6</td>
</tr>
<tr>
<td>BLDG7406</td>
<td>Real Estate Investment Analysis</td>
<td>6</td>
</tr>
<tr>
<td>CIVL7907</td>
<td>Engineering Economics and Financial Management</td>
<td>6</td>
</tr>
<tr>
<td>CIVL9702</td>
<td>Project Planning and Control</td>
<td>6</td>
</tr>
<tr>
<td>CIVL9703</td>
<td>Quality and Quality Systems</td>
<td>6</td>
</tr>
<tr>
<td>CIVL9707</td>
<td>Contracts Management</td>
<td>6</td>
</tr>
<tr>
<td>CIVL9711</td>
<td>Management of Professional Services</td>
<td>6</td>
</tr>
<tr>
<td>CIVL9714</td>
<td>Resource Management</td>
<td>6</td>
</tr>
<tr>
<td>CIVL9718</td>
<td>Strategic Management in Engineering</td>
<td>6</td>
</tr>
<tr>
<td>CIVL9720</td>
<td>Problem Solving and Decision Making</td>
<td>6</td>
</tr>
<tr>
<td>CIVL9881</td>
<td>Hazardous Waste Management</td>
<td>6</td>
</tr>
<tr>
<td>CIVL9888</td>
<td>Environmental Management</td>
<td>6</td>
</tr>
<tr>
<td>CIVL9889</td>
<td>Environmental Economics and Law</td>
<td>6</td>
</tr>
<tr>
<td>COMP9514</td>
<td>Advanced Decision Theory</td>
<td>6</td>
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<tr>
<td>CON5003</td>
<td>Project Quality Management</td>
<td>6</td>
</tr>
<tr>
<td>CON5009</td>
<td>Construction Planning and Control</td>
<td>6</td>
</tr>
<tr>
<td>CON5010</td>
<td>Contracts Management and Law</td>
<td>6</td>
</tr>
<tr>
<td>FIN5511</td>
<td>Corporate Finance</td>
<td>6</td>
</tr>
<tr>
<td>FIN5512</td>
<td>Financial Markets and Institutions</td>
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</tr>
<tr>
<td>FIN5513</td>
<td>Security Valuation and Portfolio Selection</td>
<td>6</td>
</tr>
<tr>
<td>FIN5517</td>
<td>Applied Portfolio Management and Modelling</td>
<td>6</td>
</tr>
<tr>
<td>FIN5535</td>
<td>Derivatives and Risk Management Techniques</td>
<td>6</td>
</tr>
<tr>
<td>FIN5541</td>
<td>Advanced Investment and Funds Management</td>
<td>6</td>
</tr>
<tr>
<td>FIN5542</td>
<td>Applied Funds Management</td>
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<tr>
<td>FIN5551</td>
<td>International Insurance</td>
<td>6</td>
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<tr>
<td>REST0001</td>
<td>Real Estate Investment Analysis</td>
<td>6</td>
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<tr>
<td>SESC9300</td>
<td>Effective Behaviour in Organisations</td>
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<tr>
<td>SESC9320</td>
<td>Effective Management</td>
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<tr>
<td>SESC9330</td>
<td>Technology Management</td>
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<tr>
<td>SESC9221</td>
<td>Major Hazards Management</td>
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<tr>
<td>SESC9020</td>
<td>Occupational Health &amp; Safety Law 1</td>
<td>3</td>
</tr>
<tr>
<td>SESC9030</td>
<td>Occupational Health &amp; Safety Law 2</td>
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</tr>
<tr>
<td>SESC9411</td>
<td>Principles of Ergonomics</td>
<td>6</td>
</tr>
<tr>
<td>SESC9711</td>
<td>Environmental Planning and Assessment</td>
<td>6</td>
</tr>
<tr>
<td>SESC9020</td>
<td>Hazard and Risk Assessment</td>
<td>6</td>
</tr>
<tr>
<td>SESC9310</td>
<td>Issues in Safety Management</td>
<td>3</td>
</tr>
<tr>
<td>SESC9810</td>
<td>Introduction to Toxicology</td>
<td>3</td>
</tr>
<tr>
<td>SESC9820</td>
<td>Chemical Safety and Toxicology</td>
<td>3</td>
</tr>
<tr>
<td>SESC9850</td>
<td>Management of Dangerous Materials</td>
<td>3</td>
</tr>
</tbody>
</table>

Courses from the AGSM may also be taken by agreement

8720.8940  
Master of Science and Technology in Ergonomics

MScTech

The Master of Science & Technology in Ergonomics is a graduate program of one and a half years full-time (or equivalent) study intended for students wishing to become professional ergonomists. It provides students with the competencies to identify ergonomics hazards in human-technology-environment systems, to assess their associated risks and to use a user-centred, systems approach to develop controls for the hazards. In addition it provides students with the competencies to plan and conduct an ergonomics research or design project in a scientific manner and to disseminate the results. It is the third stage in a fully articulated program of Graduate Certificate, Graduate Diploma and Masters (of Science & Technology) programs in ergonomics.

Preliminary courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>UOC</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANAT6151</td>
<td>Introductory Functional Anatomy</td>
<td>3</td>
</tr>
<tr>
<td>SESC6110</td>
<td>Physical Principles of Safety 1</td>
<td>3</td>
</tr>
</tbody>
</table>

Advanced Standing may be awarded to students who can establish that they have equivalent knowledge in these courses.

Core courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>UOC</th>
</tr>
</thead>
<tbody>
<tr>
<td>SESC9010</td>
<td>Research Methods</td>
<td>3</td>
</tr>
<tr>
<td>SESC9100</td>
<td>Physical Hazards</td>
<td>3</td>
</tr>
<tr>
<td>SESC9200</td>
<td>Hazard and Risk Assessment</td>
<td>3</td>
</tr>
<tr>
<td>SESC9300</td>
<td>Effective Behaviour in Organisations</td>
<td>3</td>
</tr>
<tr>
<td>SESC9411</td>
<td>Principles of Ergonomics</td>
<td>6</td>
</tr>
<tr>
<td>SESC9421</td>
<td>Applied Ergonomics</td>
<td>6</td>
</tr>
<tr>
<td>SESC9431</td>
<td>Physical Ergonomics</td>
<td>6</td>
</tr>
<tr>
<td>SESC9441</td>
<td>Ergonomics &amp; New Technology</td>
<td>6</td>
</tr>
<tr>
<td>SESC9541</td>
<td>Assessment of the Workplace Environment</td>
<td>6</td>
</tr>
<tr>
<td>SESC9900</td>
<td>Project Methods</td>
<td>3</td>
</tr>
<tr>
<td>SESC9912</td>
<td>Project</td>
<td>12</td>
</tr>
</tbody>
</table>

Exemption but not necessarily Advanced Standing may be awarded to students who can establish that they have equivalent knowledge in these courses. Where necessary other approved postgraduate courses may be substituted.
Electives
Courses selected from those offered by the School of Safety Science in its other programs, eg, Master of Safety Science, Master of Science & Technology in OHS and Industrial Safety. Students may take courses available from other Schools within the University under the approval of both the relevant program coordinator and the Ergonomics Program coordinator.  

1 If students have no statistics in their background they will have to do SESC6010 - Descriptive Statistics in addition to the above load.

8720.8960
Master of Science and Technology in Occupational Health and Safety

MScTech
The Master of Science and Technology in Occupational Health and Safety is a graduate program of one and a half years full time (or equivalent) study for students with a health and safety background intending to become occupational health and safety professionals. It is the third stage in a fully articulated program of Graduate Certificate, Graduate Diploma and Master of Science and Technology programs in occupational health and safety or Master of Safety Science. The Master of Science and Technology in Occupational Health and Safety is available in attendance and off campus study modes.

Preliminary courses
Up to a maximum of 15 UOC, depending on student background.
ANAT6151 Functional Anatomy 3
SESC6010 Descriptive Statistics 3
SESC6110 Physical Principles of Safety 1 3
SESC6800 Fundamentals of Toxicology 3

Core courses
SESC6120 Physical Principles of Safety 2 3
SESC9010 Research Methods 3
SESC9100 Physical Hazards 3
SESC9200 Hazard and Risk Assessment 3
SESC9300 Effective Behaviour in Organisations 3
SESC9400 Ergonomics 1 3
SESC9020 Occupational Health and Safety Law 1 3
SESC9600 Introduction to Occupational Health 3
SESC9810 Introduction to Toxicology 3

Exemption but not necessarily Advanced Standing may be awarded to students who can establish that they have equivalent knowledge in these courses. Where necessary other, approved postgraduate courses may be substituted.

Elective courses
Up to a maximum of 72 UOC.

1 Requires preliminary course or equivalent knowledge as assumed knowledge.

8720.8965
Master of Science and Technology in Occupational Medicine

MScTech
The Master of Science and Technology in Occupational Medicine is a graduate program of one year full time (or equivalent) study for medical graduates intending to become occupational physicians. It is the third stage in an articulated program of Graduate Certificate in Occupational Rehabilitation, Graduate Certificate, Graduate Diploma and Masters of Science and Technology programs in occupational medicine. The Masters of Science and Technology in Occupational Medicine is available in attendance and off campus study modes. This program is suitable for occupational physician trainees of the Australasian Faculty of Occupational Medicine of the Royal Australasian College of Physicians.

Core courses – 33 Units of Credit

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>UOC</th>
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</thead>
<tbody>
<tr>
<td>SESC9600</td>
<td>Introduction to Occupational Health</td>
<td>3</td>
</tr>
<tr>
<td>SESC9631</td>
<td>Occupational Medicine</td>
<td>6</td>
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<tr>
<td>SESC9640</td>
<td>Occupational Epidemiology</td>
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<tr>
<td>SESC9651</td>
<td>Occupational Rehabilitation</td>
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<tr>
<td>SESC9900</td>
<td>Project Methods</td>
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<tr>
<td>SESC9912</td>
<td>Project</td>
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</tbody>
</table>

Exemption but not necessarily Advanced Standing may be awarded to students who can establish that they have equivalent knowledge in these courses. Where necessary other, approved postgraduate courses may be substituted.

Elective courses – to a maximum of 42 UOC

8671
Master of Safety Science

MSafetySc
The Master of Safety Science is a graduate program of two years full time (or equivalent) study for students wanting a broad based understanding of safety engineering, occupational health, risk management and ergonomics. The Master of Safety Science is available in attendance study mode only.

Preliminary courses
Up to a maximum of 15 UOC, depending on student background.
ANAT6151 Functional Anatomy 3
SESC6010 Descriptive Statistics 3
SESC6110 Physical Principles of Safety 1 3
SESC6800 Fundamentals of Toxicology 3

Advanced Standing may be awarded to students who can establish that they have equivalent knowledge in these courses.

Core courses
SESC6120 Physical Principles of Safety 2 3
SESC9010 Research Methods 3
SESC9100 Physical Hazards 3
SESC9200 Hazard and Risk Assessment 3
SESC9300 Effective Behaviour in Organisations 3
SESC9400 Ergonomics 1 3
SESC9020 Occupational Health and Safety Law 1 3
SESC9600 Introduction to Occupational Health 3
SESC9810 Introduction to Toxicology 3

Exemption but not necessarily Advanced Standing may be awarded to students who can establish that they have equivalent knowledge in these courses. Where necessary other, approved postgraduate courses may be substituted.

Elective courses
Up to a maximum of 72 UOC.

1 Requires preliminary course or equivalent knowledge as assumed knowledge.
Department of Aviation

8720.9001
Master of Science and Technology (Aviation)

MScTech (Aviation)

The Master of Science and Technology (Aviation) is a program designed for students that have a degree or equivalent qualification from a recognised university and relevant industry experience. Students are required to gain a total of 48 units of credit (UOC) from the courses within the MScTech (Aviation) program in order to complete the Masters degree. At least 6 courses (36 UOC) must be AVIA5000 courses and a research project is compulsory. The MScTech(Av) is offered through distance education and designed with industry input for professionals and managers working in aviation related environments.

Available Courses

Session 1 Aviation Core Courses
AVIA5001 Law and Regulations in Aviation 6
AVIA5003 Aviation and Security 6
AVIA5007 Airport Operations Management 6
AVIA5009 Airline Corporate Management 6

Session 2 Aviation Core Courses
AVIA5004 Aviation Safety and Accident Prevention 6
AVIA5005 Airline Operational Management 6
AVIA5006 Airport Planning 6
AVIA5018 Aviation Human Factors 6

Other
AVIA5020 Aviation Research Project 6

Centre for Advanced Numerical Computation in Engineering and Science

8720.2001
Master of Science and Technology (Computation)

Staff Contact: Dr Y Shao

The MComputationSc degree will provide thorough training in modern computational techniques in the discipline-specific areas: A) Environmental Modelling; B) Computational Chemistry; C) Computational Physics, through coursework and a focused project in your major field.

Admission to the Masters program requires the equivalent of a 4-year degree in Science, Engineering or other mathematically-based discipline at a satisfactory level. Candidates must have adequate higher-level language (preferably Fortran) programming skills. The Masters program can be completed in one year of full-time study.

Students are required to complete, satisfactorily, 48 units, as follows:
I) The two core courses (ANCE8001, MATH5315, see Grad Dip)
II) One generic computational course (see Grad Dip)
III) Two discipline-specific courses offered by the Centre or the Faculty of Science and Technology or the Faculty of Engineering.
IV) One elective course offered by the Centre or the Faculty of Science and Technology or the Faculty of Engineering.
V) A project supervised by academic members of the Centre and/or the Faculty of Science and Technology.
Postgraduate Study

Descriptions of all subjects are presented in alphanumeric order within organisational units. For academic advice regarding a particular subject consult with the contact for the subject as listed. A guide to abbreviations and prefixes is included in the chapter ‘Handbook Guide’, appearing earlier in this book.

Aviation

AVIA5001
Law and Regulations In Aviation
Staff Contact: Mr Ron Bartsch
UOC6
This subject provides an overview of the regulatory structure of civil aviation in Australia. It focuses on the legal system within which this regulatory system operates and the powers, responsibilities and scope of various aviation regulatory authorities. In particular the subject will concentrate on providing a practical insight into the legal implications associated with the various aviation positions such as the pilot in command.

AVIA5003
Aviation and Security
Staff Contact: Mr Ron Armstrong
UOC6
Aviation security needs to be understood by all those involved in the operational requirements of civil aviation. Past disasters have provided appalling lessons that any departure from strict, internationally accepted procedures creates an "opportunity" for those intent on acts of unlawful interference. The subject Aviation and Security deals with the broad issue of security appreciation for professionals and managers, a perspective of the human and organisational dimensions of aviation security, an explicit understanding of responsibilities, the mechanism for implementation and the ability to determine and report on security events. This subject is designed for a wide cross section of professionals in the aviation, transport and affiliated industries.

AVIA5004
Aviation Safety and Accident Prevention
Staff Contact: Mr Ron Bartsch
UOC6
Safety an Accident prevention is an issue in almost every walk of life, none more so than within the aviation industry. The objective of this subject is to provide those working in aviation and associated industries with a broad and detailed understanding of the commercial aviation safety system and strategies developed to make that system safer. While the subject specifically relates to commercial air service operations in Australia, it also recognises the vital importance of global co-operation and the role of specific international organisations. It also focuses on the investigation and prevention of accidents, and the roles of the Bureau of Air Safety Investigation and the Aviation Regulatory authorities.

AVIA5005
Airline Operational Management
Staff Contact: Mr Rodger Robertson
UOC6
Airline Operational Management includes the operational and day to day aspects of airline management such as operational control, aircraft maintenance outsourcing, crew planning and scheduling, airport management, catering, reservations management, delay and punctuality control, marketing and emergency planning. The subject covers these aspects of the day to day management and the relationship between these functions and those of the corporate areas in AVIA5009. These matters drive the major airline cost areas.

AVIA5006
Airport Planning
Staff Contact: Mr Rod Sullivan
UOC6
Airport Planning includes the following: town planning aspects, access, obstacles, growth, longer term issues of noise and other environmental issues, longer term political issues and ownership issues as airports become privatised. Also included are topics covering the process of privatisation and investment evaluation, community benefits, airport master plans, forecasting aircraft movements and passenger and freight flows, terminal planning issues, runway and taxiway planning.

AVIA5007
Airport Operations Management
Staff Contact: Mr Rod Sullivan
UOC6
This subject covers day to day operational issues such as managing airport business opportunities, aircraft parking control, relationship with other industry bodies and general administrative tasks at airports such as roads, signs, flight information, electricity and water.

AVIA5008
Air Traffic Management
Staff Contact: Mr John Guselli
UOC6
This subject includes the following aspects: definition and quantification of risk, primacy and management of Air Traffic System safety, development of efficient procedures, Air Traffic System -requirements, management of traffic priorities, environmental management, financial imperatives, aviation industry liaison and public liaison.

AVIA5009
Airline Corporate Management
Staff Contact: Mr Rodger Robertson
UOC6
Airline Corporate Management includes organisational structures, business planning and budgeting, financial analysis, supply and
AVIA5018
Aviation Human Factors
Staff Contact: Dr Graham Braithwaite
UOC6
Aviation Human Factors is a fast developing subject area that influences all aspects of the aviation environment from ramp to maintenance line and from airport to flight deck and has particular relevance for all involved in management. This subject provides and in-depth introduction to the subject in the context of organisational efficiency, and management of error and safety. Basic principles of physical and cognitive human performance are covered along with a detailed analysis of error, situational awareness, ergonomics and the evaluation of human factors. Specific aviation coverage includes Crew Resource Management (CRM), human factors in aircraft operations, air traffic control, maintenance and management.

AVIA5020
Research Project
Staff Contact: Mr Rodger Robertson
UOC6
This subject requires the student, under guidance, to research an issue in aviation management and produce a written report. The subject of the project will be agreed between the research supervisor and the student.

AVIA500
Flight Training PIMIL
Staff Contact: Capt Greg Clynick
UOC12
Conducted in two full time blocks of 6 and 12 weeks, this practicum covers the theory and practical aspects required for the issue of a Civil Aviation Safety Authority (CASA) Private Pilots Licence (PPL) qualification. Study areas include Pre Command theory, Basic Aeronautical knowledge, PPL Theory, Introduction and PPL flight training.

AVIA5011
Flight Training CPL
Staff Contact: Capt Greg Clynick
UOC12
Prerequisites: AVIA5010 or equivalent
Conducted in a single full time block of 20 weeks, this practicum covers the theory and practical aspects required for the issue of a Civil Aviation Safety Authority (CASA) Commercial Pilots Licence (CPL), Night rating (NVFR) and multi engine type endorsement.

AVIA5012
Flight Training CIR
Staff Contact: Capt Greg Clynick
UOC6
Prerequisites: AVIA5011 or equivalent
Conducted in a single full time block of 9 weeks, this practicum covers the theory and practical aspects required for the issue of a Civil Aviation Authority (CASA) Multi Engine Command Instrument Rating (CIR).

AVIA5013
Flight Training QF1
Staff Contact: Capt Greg Clynick
UOC6
Prerequisites: AVIA5011 and AVIA5012 or equivalent
Conducted in a single full time block of 9 weeks, this practicum covers the theory and practical aspects required for the issue of a Civil Aviation Authority (CASA) Grade III Instructor Rating (Fixed Wing).

AVIA5014
Flight Training ATPiL
Staff Contact: Mr Len Sales
UOC6
Prerequisites: AVIA5011 and AVIA5012 or equivalent
This subject addresses the theory requirements for the issue of an Australian Airline Transport Pilot's Licence (ATPL). Conducted on a full time basis over 8 weeks, the subject culminates in the sitting of CASA conducted exams.

Biochemistry

BIOC5308
Alternative Higher Degree Qualifying Program
Staff Contact: Dr V Murray
UOC48
Similar in content and standard to BIOC4318 Biochemistry Honours but designed specifically for students who cannot regularly attend the University.

Biological Science

BIOS0001
Biological Science Research - Full-time
Staff Contact: Head of School
UOC48 S1 S2
Note/s: MSc or PhD or Grad Diploma by research.

BIOS0002
Biological Science Research - Part-time
Staff Contact: A/Prof R McMurtrie
UOC24 S1 S2
Note/s: MSc or PhD or Grad Diploma by research.

BIOS0006
Biological Science Special Program
Staff Contact: Head of School
UOC6 S1 or S2
Note/s: Individually designed project courses generally available only to overseas students.

BIOS0007
Biological Science Special Program
Staff Contact: Head of School
UOC12 S1 or S2
Note/s: Individually designed project courses generally available only to overseas students.

BIOS0008
Biological Science Special Program
Staff Contact: Head of School
UOC18 S1 or S2
Note/s: Individually designed project courses generally available only to overseas students.

BIOS0009
Biological Science Special Program
Staff Contact: Head of School
UOC24 S1 or S2
Note/s: Individually designed project courses generally available only to overseas students.

BIOS3014
Biological Studies In Arid Lands Management
Staff Contact: Dr D Croft
UOC6 S2
Prerequisite/s: Assumed knowledge: Bachelor's Degree in Biology or Geography or Land Management.
Note/s: This course is available only to graduate students.
Techniques in ecological studies of animal communities. Adaptations to an arid environment, environmental and social determinants. Behaviour, diet and condition of native and feral animals. Competition between native and introduced herbivores. Strategies in the management of arid zone wildlife. Concurrent studies in relevant units in the School of Biological Science are prescribed to cover aspects of vegetation description and plant environment interactions.

**BIOS9917**

**Alternative Higher Degree Qualifying Full-time**

**Staff Contact:** UOC24 WK5 S1 S2

**Prerequisite/s:** BSc in Biological Science or equivalent

**Note/s:** Similar in content and standard to BIOS4018 Biological Science Honours but designed specifically for students who cannot regularly attend the University.

**BIOS9919**

**Alternative Higher Degree Qualifying Program Part-time**

**Staff Contact:** A/Prof C Quinn

**UOC48 WK5 S1 S2**

**Prerequisite/s:** BSc in Biological Science or equivalent.

**Note/s:** Similar in content and standard to BIOS4018 Biological Science Honours but designed specifically for students who cannot regularly attend the University.

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**Biomedical Engineering**

**BIOM9012**

**Biomedical Statistics**

**Staff Contact:** Dr R Odell

**UOC3 HPW3 WK5 S1 S2**


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**Biotechnology**

**BIOT7040**

**Biotechnology Principles**

**Staff Contact:** Dr S Mahler

**UOC12 HPW5 WK5 S1 S2**

This course is designed to provide students who have not previously studied biotechnology with sufficient training in the field to complete the MSc (Biopharmaceuticals). Aspects of the application of gene cloning techniques for the production of recombinant proteins from a range of host cells, growth, product formation and recovery of microbial products, bioreactor design and operation, monoclonal antibody and gene probe technology will be covered.

**BIOT7050**

**Biopharmaceuticals Project**

**Staff Contact:** Dr S Mahler

**UOC12 HPW8 WK5 S1 S2**

An experimental or technical investigation or design project in the general field of biotechnology.

**BIOT7051**

**Applied Genetics**

**Staff Contact:** Dr D Glenn

**UOC6 HPW5 WK5 S1 S2**

Isolation of commercially useful microorganisms. Mutagenesis and the isolation of mutants of the following types: auxotrophs; catabolic mutants; feedback inhibition and repression resistance; constitutive; catabolite repression resistance; resistance to antimicrobial agents and to viruses; extended enzyme substrate specificity; altered enzyme properties; changes in promoter and attenuator activity. Techniques of genetic exchange: transformation; conjugation; transduction; cell fusion; sexual and paracsexual cycles. The use of these techniques in strain construction. Recombinant-DNA technology: plasmid and virus technology; cloning vectors for use in microorganisms, plant and animal cells. Strain construction using rec-DNA techniques. Properties of expression, excretion and genetic stability of constructs.

**BIOT7061**

**Peptide and Protein Technology**

**Staff Contact:** Dr F Foong

**UOC6 HPW5 WK5 S1 S2**

Industrial scale production of enzymes, peptide hormones, antibodies including monoclonal antibodies, vaccines; regulation of synthesis by environmental control and genetic manipulation; recovery and down-stream processing techniques; immobilization by entrapment and binding. Applications of proteins in medical therapy and diagnosis and as analytical tools including ELISA and affinity chromatography: applications of enzymes in the food and beverage industries.

**BIOT7071**

**Biochemical Engineering**

**Staff Contact:** Prof P Rogers

**UOC6 HPW5 WK5 S1 S2**

Design of bioreactors; range of biocatalysts from free enzymes to immobilized cells; heat and mass transfer, scale-up, economic feasibility studies as applied to bioprocesses; design of equipment and facilities for sterile operation and to meet rec-DNA guidelines; downstream processing, design and operation; instrumentation and control; use of computer-linked systems; mathematical simulation. Detailed examples of bioprocesses including: amino acid production, single cell protein and liquid fuels, secondary metabolite production, growth and product formation of animal and plant tissue cultures. Patent and commercial aspects of bioprocesses.

**BIOT7081**

**Environmental Biotechnology**

**Staff Contact:** Dr J Foster

**UOC6 HPW5 WK5 S1 S2**

Environmental Biotechnology examines the way microbes decompose chemically complex materials. Applications include the use of bacteria and fungi to detoxify wastes, converting them to usable substances. Prevention of biodeterioration of valuable materials is also an important area of study. Lectures cover...
biodegradation of minerals, metals, cellulosics, aromatics, hydrocarbons and waste-water treatment. Students present research reviews and conduct experimental projects.

BIOT7091
Applied Cell Culture
Staff Contact: Dr P Foong
UOC6 HPW5 WKS14 S2
Elemental and molecular composition of cells; formulation of growth media; stoichiometry of growth processes and product formation; metabolic regulation; stringent response; mechanisms of metabolite uptake and product release; maintenance energy; thermodynamics of cellular growth and activities. Effect of mutation on cellular physiology; recombinant-DNA products. Fermentation processes: inoculum preparation, physiology of selected processes.

BIOT7110
Biotechnology Principles
Staff Contact: A/Prof P Doran
UOC6 HPW3 WKS14 S1
A subject designed to provide an introductory course for students in the MapSc Biotech program who have not previously undertaken any biotechnology studies. Steady state and differential balances as a basis for quantification of complex real systems. Concepts in rate processes and kinetic analysis with application to biological systems. Experimental determination of rate data. Correlation of simple lumped rate processes and simultaneous distributed processes and the concepts involved in dimensionless numbers. Laminar and turbulent flow. The structure of homogeneous and boundary layer turbulence flow in pipes and channels. Mixing theory. Process vessel reactor models. Fluid viscosity, Newtonian and non-Newtonian fluids, convective and molecular transport processes. Heat and mass transport, film coefficients. Film, boundary layer, penetration and surface renewal theories. Quantification of complex systems. Empirical and mechanistic models in biological systems.

BIOT7123
Biotechnology Project
Staff Contact: Prof P Rogers
UOC12 HPW4 WKS28 S3
A small experimental or design project, or an extensive literature review and analysis of a selected topic in biotechnology.

BIOT7210
Food Biotechnology (Principles)
Staff Contact: Professor P Rogers
UOC6 S1 or S2
Note/s: Not offered in 2000
The subject covers the basic principles in food biotechnology including techniques of genetic manipulation of microorganisms, principles of cell culture, bioreactor design, operation and control for the food industry, the use of bacteria in the production of new and novel foods, the use of yeast and fungi in foods, and the principles involved in developing probiotics and functional foods. Examples are taken from the food industry where the principles of food microbiology and bioprocess engineering are both essential to an understanding of food process and product innovation.

BIOT7220
Food Biotechnology (Applications)
Staff Contact: Professor P Rogers
UOC6 S1 or S2
Note/s: Not offered in 2000
The subject reviews a range of applications in the food industry where food biotechnology principles are involved. These include: the applications of the principles of biocatalysis in food production and the extension of shelf life, the application of enzymes in food production, the use of molecular diagnostic and analytical procedures for food monitoring, new technologies in the treatment and utilization of food processing wastes, the applications of both plant biotechnology and animal biotechnology for enhanced food production and the new developments and implications of transgenic plants and animals.

BIOT7230
Food Biotechnology (Management)
Staff Contact: Professor P Rogers
UOC6 S1 or S2
The subject is designed to develop management skills related to biotechnology-based innovations in the food industry. It provides an overview and analysis of the Australian and international food industry as well as covering the principles of economic feasibility analysis for new opportunities and strategies for effective R&D, marketing and commercialization to exploit these opportunities. Intellectual property and patenting, regulatory aspects (novel foods, applications of gene technology in foods) are also covered as well as a comparative study of food standards in Australia and internationally. A series of case studies on new food biotechnology products and processes is designed to integrate the various concepts developed in the course. Each individual course would comprise: 1. A major strand of related material comprising approximately 75% of the total program, including a project comprising not less than 15% nor more than 50% of the program. 2. A minor strand of broader based material comprising up to 25% of the total program. 3. At least 60% of the non-project component must be taken in the Department of Biotechnology unless otherwise approved by the Head of School. The remainder, subject to approval and availability, may be undertaken elsewhere in the University.

BIOT8010
Graduate Seminars
Staff Contact: Department Office
UOC3 HPW2 WKS28 S3

Chemistry

CHEM7112
Analysis of Biological and Organic Materials
Staff Contact: Dr J Gooding
UOC6 HPW3
Analysis of biological and organic species in complex matrices (e.g., biological, food, soil, wastewater etc.). Emphasis will be on: (i) bioassays and new methods requiring minimal sample preparation; enzyme and immunoassays, assay formats, transduction and design, biosensors including DNA and surface plasmon resonance devices; (ii) conventional instrumental techniques for analysis of biological and organic molecules with emphasis on sample preparation including sampling, extraction, derivatisation and clean-up.

CHEM7113
Elemental Analysis
Staff Contact: Dr G Moran
UOC6 HPW3

CHEM7114
Chromatography
Staff Contact: A/Prof P Southwell-Keeley
UOC6 HPW3
Principles of chromatographic separation; gas, liquid and thin layer chromatography. Gas chromatography: columns, instrumentation and applications. HPLC: overview of techniques; normal and reverse phase, size exclusion; ion exchange and ion-pair techniques; instrumentation, derivatisation and method selection. Latest chromatographic software and data handling methods. Applications in the food, pharmaceutical, biological and health fields.
CHEM7115  
Treatment of Analytical Data  
Staff Contact: Prof B Hibbert  
UOC6  HPW3  
Basic definitions, Errors and Uncertainty, Confidence Limits, Hypothesis Testing, Outlier tests, T-tests, F-tests, ANOVA. Calibration, Experimental Design and Optimisation, Multivariate analysis.

CHEM7116  
Chromatography/Mass-Spectrometry  
Staff Contact: A/Prof M Guilhaus  
UOC6  HPW3  
Principles of mass spectrometry especially when combined with gas chromatography and liquid chromatography. Method source and analyser options for environmental, forensic, clinical, pharmaceutical, food, natural product, petroleum, polymer and biological analysis. Sampling and clean-up for chromatography-mass spectrometry. Interpretation of spectra; use of databases. Fast separations and MS/MS. Quantitative methods; isotope dilution; isotope ratio MS. Management and maintenance of equipment; costing analyses and planning equipment replacements.

CHEM7117  
Molecular Analysis  
Staff Contact: Prof R Howe  
UOC6  HPW3  
Spectroscopic methods for the molecular analysis of materials. FTIR and Raman spectroscopy and microscopy: methods for macroscopic and microscopic analysis based on the vibrational spectrum as a fingerprint. NMR spectroscopy as an analytical technique, NMR of liquids and solids. NMR for analysis of foods. UV, visible and near infrared spectroscopy as analytical methods. X-ray absorption spectroscopy.

CHEM7118  
Surface Analysis of Materials  
Staff Contact: Prof R.Lamb  
UOC6  HPW3  
Surface characterisation for "wet" and "dry" (vacuum) analysis. Ion, electron and photon probes for surface characterisation. Spectroscopic techniques for qualitative and quantitative analysis of polymer, mineral and electronic sample surfaces. Ultra high-vacuum analytical instruments: principles, operation and maintenance. Complementary techniques for chemical and structural analysis of surfaces, e.g. photoemission and surface X-ray absorption. Secondary ion mass spectrometry for molecular analysis of surfaces of complex surfaces.

CHEM7111  
Quality Assurance and Laboratory Practice  
Staff Contact: Professor B Hibbert  
UOC6  HPW3  
International bodies and regulations; Statistical and QA tools; uncertainty and traceability, method validation, accreditation; interlaboratory trials and proficiency testing; GLP Guide 25 and ISO 9000 etc.: Laboratory Information Management Systems.

IROB2721  
Managing People  
UOC6  HPW3.6  
This subject focuses on managing in a rapidly changing environment. Topics include: leadership, decision-making and innovation; power, legitimacy, and the socialisation process; the structure and design of organisations, organisation and domination, the evolution of ethical awareness; intergroup conflict and conflict resolution; skills of managing - communication, negotiation, coaching and objectives setting; organisational culture and transformation.

Computational Science

ANCE8001  
Computational Mathematics  
Staff Contact: Mathematics  
HPW3  
Discretization, linear algebra, ODE and PDE solvers, appropriate for contemporary computational engineering and scientific applications.

ANCE8002  
Supercomputing Techniques  
Staff Contact: Mathematics  
HPW3  
For understanding and efficiently using vector and parallel supercomputers for contemporary computational engineering and scientific applications.

ANCE8003  
Project (MComputationalSc Degree)  
Staff Contact: Mathematics  
Case study experience to give the student practice in applying the techniques learnt in specific subjects towards solving or computationally analyzing practical problems.

ANCE8101  
Data Analysis and Visualization  
Staff Contact: Mathematics  
HPW3  
Statistical data analysis, error assessment, spectral analysis and data filtering, recent development in data analysis techniques, data storage, organisation of technical data and data formats, graphic analysis of real data sets, graphic packages for data visualisation.

ANCE8102  
Mesh Generation  
Staff Contact: Mathematics  
HPW3  
Algebraic and PDE grid generation techniques for structured and unstructured grids. Exposure to techniques used in commercial packages, such as PATRAN. Relationship to pre-processing. Relationship to solution accuracy and error control.

ANCE8103  
Fundamental Applied Computation  
Staff Contact: Mathematics  
HPW3  
Basic computational skills for candidates with limited previous training, structured to provide an appropriate foundation for the core subjects. This subject is equivalent to the FACES program (self-contained computer-based learning modules for industry-based engineers and scientists).

ANCE8104  
Advanced Computational Algorithms  
Staff Contact: Mathematics  
HPW3  
This is a specialized advanced subject to cover: i) special algorithms for vector supercomputing; ii) special algorithms for parallel supercomputing; iii) special computational algorithms taught by visitors or UNSW staff.

ANCE8207  
Advanced Computational Science  
Staff Contact: Mathematics  
HPW3  
Special topics taught by visitors or UNSW staff.
Food Science and Technology

Not all subjects are necessarily offered in any one year.

**FOOD1517**
Chemistry, Biochemistry and Physics of Foods
*Staff Contact: Prof KA Buckle*
UOC6 HPW6 WKS14 S1


**FOOD1537**
Food Preservation
*Staff Contact: Prof KA Buckle*
UOC6 HPW6 WKS14 S1

Not all subjects are necessarily offered in any one year.

ANS8208
Physics and Modelling of the Atmospheric Boundary Layer
*Staff Contact: Mathematics HPW3*

Theory of boundary layer flows; numerical modelling of turbulence and flow over complex terrain; boundary layer parameterisation; dispersion of pollutants and particulates.

ANC9105
Computational Techniques for Fluid Dynamics
*Staff Contact: Professor CAJ Fletcher UOC6 HPW3*

Notes: Please note: Attendance at a 5 day full-time course, 14-18 July 2000 is required.

General and specific computational techniques for fluid flow behaviour occurring in industrial, geophysical and chemical processes etc.

**FOOD1597**
Food Processing and Packaging
*Staff Contact: Dr RH Driscoll, Dr JE Paton*
UOC6 HPW6 WKS14 S2

Prerequisite/s: FOOD1577, FOOD1587

This course is presented as an integrated lecture-laboratory program that covers production principles of a number of primary food commodities including dairy, marine and meat products, fruit and vegetables, sugars and cereal products. The laboratory component demonstrates the effect of processing on aspects of food such as functionality and quality. In addition, aspects of plant design such as factory layout, hygiene design and operation, cleaning in-place and application and comparison of HACCP and HAZOP, and an introduction to new technologies such as high pressure processing and ohmic heating, are covered. This course also provides fundamental principles of packaging including properties of packaging materials, and selection and evaluation of packaging materials and systems.

**FOOD1667**
Postharvest Storage of Foods
*Staff Contact: Dr JE Paton*
UOC6 HPW6 WKS14 S1

Prerequisite/s: FOOD1597 or equivalent

Pre-harvest considerations, post-harvest physiology and biochemistry, post-harvest factors affecting quality, methods of storage and handling, marketing strategies for selected food commodities.

**FOOD1677**
Product Design and Development
*Staff Contact: A/P Prof M Wootton*
UOC6 HPW6 WKS14 S2

Consumer, commercial and national needs for new products, types of new products, the steps in the product development process; development team, idea generation; market research; its role, specific tasks, techniques, and limitations. Roles of advertising and supermarkets in new product success. Product lifecycles, reasons for new product failure and preventative strategies. Ingredient and additive properties and contributions to foods, effects of processing on their properties and functionality. Optimisation of quality and acceptability of foods by manipulation of formulations. Packaging and processing for food acceptability; sensory properties, storage stability and nutritional properties of foods. Impact of new technology. Sensory analysis: basic sensory analysis techniques, expert vs. consumer panels, interpretation and implementation of sensory testing data, sensory rankings from different target markets.
POSTGRADUATE STUDY

FOOD1747
Special Topics in Food Science and Technology
Staff Contact: Prof KA Buckle
UOC6 HPW6 WKS14 S1 or S2
An individually supervised program of investigation in specialised aspects of food science and technology not otherwise offered. Embraces a literature review, laboratory work and/or industrial liaison as may be appropriate. Available only to appropriately qualified students.

FOOD1757
Special Topics in Food Science and Technology
Staff Contact: Prof KA Buckle
UOC3 HPW3 WKS14 S1 or S2
An investigation similar to but shorter than that outlined in FOOD1747.

FOOD1767
Reading Assignment
Staff Contact: Prof KA Buckle
UOC3 HPW3 WKS14 S1 or S2
A reading assignment in an area supporting candidates major disciplines or commodity interests. Presentation of a seminar may be required.

FOOD2627
Food Microbiology
Staff Contact: Prof GH Fleet
UOC6 HPW6 WKS14 S1
Prerequisite/s: MICR2201 or equivalent
This is a lecture-laboratory course that introduces the basic concepts of food microbiology, covering the ecology, biochemistry, isolation, enumeration and identification of bacteria, yeasts, fungi and viruses associated with foods and beverages. Food spoilage: specific food microorganism associations; taxonomy and biochemistry of major spoilage species; chemical and physical changes to food properties; spoilage of specific commodities. Foodborne microbial disease: foods as vectors of disease and food poisoning; statistics and epidemiology; ecology and taxonomy of food-borne pathogenic microorganisms; control and prevention by hygiene, microbiological standards and legislation. Food fermentation: microbial ecology and biochemistry of fermentations; fermentations of alcoholic beverages, bakery products, dairy products, meats, vegetables, cocoa beans, soy sauce; production of food ingredients and processing aids by fermentation. Microbiological examination of foods: sample preparation and sampling plans; sub-lethal injury; standard methods for determination of total plate counts, indicator organisms, food-borne pathogenic species, principal spoilage species. Microbiological quality assurance: specifications and standards; decision criteria; hazard analysis and critical control point (HACCP) concept; cleaning and sanitation.

FOOD2637
Quality Assurance and Control
Staff Contact: Dr JM Cox
UOC6 HPW4 WKS14 S2
Prerequisite/s: FOOD2627
This course aims to provide students with a knowledge base and application of concepts in quality assurance (QA) and quality control (QC) in the context of the food industry. What are quality, QA, QC? Organisation-wide quality management, quality costs, Total Quality Management and ISO9000-based Quality Management Systems. Tools in quality management, brainstorming and other qualitative tools, benchmarking. Production-level QA and QC, HACCP, risk analysis and management, statistical quality/process control, microbiological criteria, sampling and sampling plans, cleaning and sanitation. QA in the laboratory, accreditation, metrology, proficiency testing, QA of microbiological media. Regulatory aspects of QA/ QC. Auditing quality. Staff training.

FOOD2647
Food Safety
Staff Contact: Prof GH Fleet, Prof KA Buckle
UOC6 HPW6 WKS14 S2
This course presents a package of information and exercises designed to demonstrate (i) the public health risk associated with the production and consumption of foods and (ii) the strategies adopted by industry, government and consumers to manage and control these risks. Topics covered include: chemical risks - natural, additives and residues; microbiological risks - bacteria, fungi, viruses, algae, parasites, prions; nutrition - diet and health; genetically modified foods - concepts and specific safety issues; management of food safety by industry - TQM, HACCP, ISO; management of food safety by government - food law, national and international regulation and issues; legal and insurance issues; consumer concerns - education, social, moral and ethical issues; safety in the workplace.

FOOD2657
Analytical Microbiology
Staff Contact: Dr JM Cox
UOC6 HPW6 WKS14 S2
The aim of this course is to provide students with an understanding of the underlying principles of and practical exposure to modern and rapid methods for microbiological analysis, with specific reference to foods. The course begins with a history of the development of methods of analysis and criteria for the evaluation of methods. Methods considered include improved and advanced cultural methods, automated biochemical identification systems, ATP and lux bioluminescence, methods for assessing hygiene, ice nucleation, impedance technology, immunoassay, electrophoretic and chromatographic techniques for strain characterisation and identification, nucleic acid probes, PCR and genchepol technology.

FOOD2667
Advanced Food Microbiology
Staff Contact: Prof GH Fleet
UOC6 HPW6 WKS14 S2
Prerequisite/s: FOOD2627
This course consists of a series of lectures, discussion groups and visits to local food companies that take food microbiology from its basic concepts to advanced consideration of current issues on food spoilage, foodborne microbial disease, food and beverage fermentations and the use of microorganisms as processing aids and sources of food ingredients and additives. With a focus on commodity groups, it considers industry structure, food properties and processing operations that impact on the growth, survival and biochemical activity of microorganisms as they relate to spoilage, safety and desirable fermentations. Commodities considered include dairy products, fruit and vegetables, meat products (red, poultry, seafoods) and alcoholic beverages. Advanced concepts of microbial taxonomy, biochemistry, physiology, detection and enumeration are covered as well as the use of microorganisms as sources of colours, flavours, polysaccharides, vitamins, amino acids and as probiotic and biocontrol agents.

FOOD3567
Nutrition
Staff Contact: Dr J Arcot
UOC6 HPW6 WKS14 S2
Prerequisite/s: BIOC2101/2181
This course consists of a series of lectures and practical exercises that provide students with the knowledge about the occurrence of nutrients in foods and their role in human physiology, health and disease. Structure, properties and sources of nutrients. Role of nutrients in human structure and function. Introduction to food groups, tables of food composition, food labels, dietary recommendations. Food guides. Nutrition in health and disease. Nutritional needs of vulnerable groups: infants, pregnant and lactating women, the aged. Dietary intolerance, disorders related to the affluent diet including coronary heart disease, dental caries, diabetes, hypertension and cancer. Problems of undernutrition including protein, energy, mineral and vitamin deficiencies. Physiological and nutritional aspects of dietary fibre, alcohol. Assessment of nutritional status using dietary and anthropometric techniques. Practical exercises on anthropometric techniques and measurement of nutrient intake using computer systems on individual and group bases.
FOOD3577
Advanced and Applied Nutrition
Staff Contact: Dr J Arcot
UOC6 HPW6 WKS14 S2
Prerequisite/s: FOOD3567 or equivalent

This course consists of lecture and discussion classes that build on the basic concepts of nutrition with respect to the food supply, giving advanced treatment of the following topics. Food and nutrition policy; structure of the population. Food supplies, food consumption, nutritional epidemiology. Population dietary references. Food programs such as food fortification, supplementary feeding schemes, nutritional rehabilitation, nutrition education, dietary and nutrition interventions (ORT, family planning, infection control, growth monitoring). Principles, practice and evaluation of applied nutrition programs. Advanced assessment methods in nutrition: nutrient bioavailability studies, nitrogen balance tests, vitamin load tests, sodium and potassium excretion, creatinine excretion, fitness assessment, biochemical assessment, design and evaluation of nutritional epidemiology studies; food intake studies.

FOOD4617
Advanced Food Engineering
Staff Contact: Dr RH Driscoll, Prof KA Buckle
UOC6 HPW6 WKS14 S1
Prerequisite/s: FOOD3577, FOOD1587

This course consists of lectures and discussion groups covering advanced aspects of modern food processing and preservation. This includes food bulk and thermal properties, rheological properties and models of heat transfer (analytical, graphical and numerical methods, computer packages, microwave, infrared, and radio frequency irradiation), process modelling and control, dehydration, evaporation and distillation, membrane processes.

FOOD5117
Minor Project
Staff Contact: Prof KA Buckle
UOC6 HPW6 WKS14 S2

The aim of this course is to provide students with an opportunity to undertake independent study of a particular aspect of food science and technology through critical evaluation of literature or the performance of limited laboratory work. Students will be expected to present the results of their investigation in a thesis-style report and in a research seminar. Students will select a project in consultation with the course authority within the program of study in which they are enrolled.

FOOD5127
Research Project
Staff Contact: Prof KA Buckle
UOC12 HPW12 WKS14 S2

The aim of this course is to provide students with an opportunity to undertake independent study of a particular aspect of food science and technology through performance of laboratory-based research work. Students will be expected to present the results of their investigation in a thesis-style report and in a research seminar. Students will select a project in consultation with the course authority within the program of study in which they are enrolled.

Geography

GEOG9011
Environmental Impact Assessment
Staff Contact: Mr J Sammut
UOC6 HPW4 WKS14

Environmental planning legislation and decision making processes in Australia with special reference to NSW. The content and structure of Environmental Impact Statements and the stages in the granting of development consent. Approaches to EIA with reference to the assessment of impacts on the natural, social and economic environments. Case studies exemplifying procedures, techniques, methods, and issues. Trends in EIA in Australia and selected other countries.

GEOG9012
Remote Sensing Applications
Staff Contact: School Office
UOC6 HPW3 WKS14

Using a diverse range of case studies, this course demonstrates broad remote sensing applications in forestry, agriculture, natural resource management, wildlife conservation, environmental change, pedology, oceanography, geology, meteorology, and politics. Specific applications relate to the assessment of tropical and sub-tropical land cover change, ecosystem dynamics and biogeochemical cycles, vegetation biophysical properties, wetlands management and monitoring, fire, pollution, urban studies and cold region hydrology. Computer-based laboratories allow the students to explore a range of optical, thermal and radar data appropriate to particular applications, and provide exposure to practical image processing and interpretation techniques including classification, change detection, formulation of indices and derivation of empirical relationships. Practical experience with IDL ENVI and Erdas Imagine is provided.

GEOG9013
Directed Problems In Remote Sensing
Staff Contact: School Office
UOC6 HPW3 WKS14

A detailed investigation of a particular aspect of remote sensing technology or an area of applications relevant to candidates interests and background. This course requires prior approval of the supervisor.

GEOG9014
Computer Mapping and Data Display
Staff Contact: School Office
UOC6 HPW4 WKS14

Introduction to automated cartography and thematic mapping; theoretical and practical problems in displaying and mapping data by computer; review and application of selected computer mapping packages. Mapinfo is used for cartographic manipulation and output.

GEOG9015
Population, Health and Environment
Staff Contact: A/Prof J Burnley
UOC6 HPW4 WKS14

Relationship between environmental factors and disease morbidity and mortality is examined by consideration of the epidemiological transition in different countries, and the spatial and occupational-specific variation in disease incidence in Australia. Methodology for standardising, testing for significance and data quality.

GEOG9016
Principles of Geographic Information Systems
Staff Contact: School Office
UOC6 HPW3 WKS14

Study of selected geographic information systems; problems of data capture and display, data storage and manipulation, system design and development; cartographic displays and computer mapping. INFO is used for database management, and ARCINFO and MAP for spatial data manipulation and display.

GEOG9017
Advanced Geographical Information Systems
Staff Contact: School Office
UOC6 HPW3 WKS14
Prerequisite/s: GEOG9420 or GEOG9016

Advanced topics and concepts in GIS research and development. Focus is primarily on vector-based systems. Topics include data models, structures and capture; vector editing and algorithms; errors and data accuracy. Practical exercises based on ARCINFO; INFO is used for data base management.

GEOG9018
Transportation Applications of Geographical Information Systems
Staff Contact: Dr B Parolin
UOC6 HPW3 WKS14
Prerequisite/s: GEOG9420 or GEOG9016
This subject provides an overview and hands-on experience in the design, use, and interpretation of Transport Information Systems (GIS-Ts). Topics covered include transportation layers, transportation related referencing systems, data structures, network structures, urban transportation planning models, logit and other spatial models. At the end of the subject, the student will have a sound working knowledge of transportation GIS and an ability to work directly with real problems in government and private sectors.

GEOG9019
Special Topic
Staff Contact: A/Prof MD Fox
UOC6 HPW3 WKS14
Selected topics may be pursued in the forum of individually supervised readings and assignments linked to studies in postgraduate programs offered through the School of Geography. This course requires prior approval of the supervisor.

GEOG9020
Application and Management of Geographical Information Systems
Staff Contact: School Office
UOC6 HPW3 WKS14
The process and issues involved in an organisation acquiring, implementing and managing a GIS will be considered using real examples. Applications using GIS in the management of natural resources (forest, park, soil etc), human activities at the local, national and global scale will be critically reviewed. The course will involve field visits.

GEOG9021
Image Analysis of Remote Sensing
Staff Contact: School Office
UOC6 HPW3 WKS14
This course, which is largely laboratory based, provides an in-depth understanding of image processing, analysis and interpretation. Topics include human vision and colour, the construction, display, enhancement and filtering of images, geometric, radiometric and atmospheric correction, supervised and unsupervised classification, principal components analysis, and spatial modeling. The course also demonstrates the theory of hyperspectral and radar remote sensing through lectures and practical computer based processing. The course provides training in both remote sensing and GIS software, including ERDAS, ENVI, ArcView and Arc/Info.

GEOG9022
Vegetation Management
Staff Contact: A/Prof M Fox
UOC6 HPW3 WKS14
Note/s: Fieldwork forms a compulsory part of this subject and students will incur personal costs.
The subject provides a background in theory and practice in vegetation management, particularly under Australian conditions. It covers the description and measurement of vegetation, vegetation dynamics, vegetation response to perturbation and human impacts, theories, and modelling of vegetation change. A third of the subject is devoted to management strategies of selected vegetation types.

GEOG9024
Soil Degradation and Conservation
Staff Contact: A/Prof M Melville,
UOC6 HPW3 WKS14
Note/s: Fieldwork forms a compulsory part of this subject and students will incur personal costs.
Identification, assessment and analysis of the main processes of soil degradation, including the role of climate, vegetation, geomorphology and pedology in controlling the processes. Discussions of appropriate management strategies for reducing degradation and for reclaiming degraded landscapes. Topics include: surface wash, gully erosion, wind erosion, soil acidification, soil structure decline, salinisation, accumulation of toxins and residuals.

GEOG9025
Spatial Data Processing and Integration
Staff Contact: School Office
UOC6 HPW3 WKS14
Note/s: Not offered in 1998.
Geographical information systems and remote sensing have many similarities, including geometric rectification, incorporation of reference data into the analysis of GIS and remotely sensed data, accuracy assessment, the form and structure of the data, visual analysis of spatial data and digital processing methods (Boolean overlay, decision support systems, affine transformations and expert systems). These topics will be considered and applied in the laboratory using remotely sensed and GIS data. INFO is used for database management and ARCINFO, ERDAS and MapInfo to demonstrate the practical application of the topics.

GEOG9530
Project
Staff Contact: A/Prof MD Fox
UOC12 WKSI4
An investigation of a problem in environmental management, remote sensing or geographical information systems which may involve an identifiable research component. Such an investigation should be related to the research interests of particular Schools within the Faculty of Science and Technology.

Geology

GEOL0004
Special Program Applied Geology
Staff Contact: Dr AC Dunlop
UOC48
Note/s: For programs 8720.1002 and 8720.1003.

GEOL0005
Research Thesis Applied Geology Full-time
Staff Contact: Dr AC Dunlop
UOC48
Note/s: For programs 1000 and 2000.

GEOL0006
Research Thesis Applied Geology Part-time
Staff Contact: Dr AC Dunlop
UOC24
Note/s: For programs 1000 and 2000

GEOL0110
Geological Remote Sensing
Staff Contact: A/Prof GR Taylor
UOC6 HPW3
The physics of various remote sensing techniques; interpretation of conventional aerial photography in exploration; Infrared remote sensing techniques; side looking airborne radar; theory and applications of Landsat Imagery; enhancement techniques for satellite imagery; interpretation of Landsat photographic products and application to several case history areas. Integration of remote sensing information with the overall data base as applied to exploration.

GEOL0114
Project In Geological Remote Sensing
Staff Contact: A/Prof GR Taylor
UOC12
Note/s: Restricted to program 8720.4003.

GEOL0304
Data Processing Project
Staff Contact: Dr DR Cohen
UOC12
A project equivalent to 6HPW study for one session which requires the student to carry out detailed processing and analysis of a comprehensive data set for a geological project that may relate to the student's field of employment.
GEOL0310 Image Processing of Spatial Data Sets
Staff Contact: A/Prof GR Taylor
UOC6
Data sources and formats, remotely sensed, geophysical, geochemical and topographic. Image display systems; data pre-processing, image rectification, spatial filtering and enhancement techniques. Statistical analysis, classification and image display as a tool for data integration.

GEOL0320 Geostatistical Ore Reserve Estimation
Staff Contact: Dr DR Cohen
UOC6
When to apply geostatistics; brief review of univariate statistics; bivariate statistics and correlation; exploratory data analysis; measures of spatial correlation: the variogram, the covariance; variogram calculation and how to obtain a good variogram; random function models and stationarity; desirable properties of estimators; estimation of variance; dispersion variance and uses; optimal weighted average estimator, ordinary kriging; recoverable reserve estimation, problems and solutions; application examples, coal, copper, gold; blast hole kriging for ore/waste selection; geotechnics and the environment.

GEOL0330 Conceptual Models for Exploration Geology
Staff Contact: Dr AC Dunlop
UOC6
The development and use of ore deposit models as a guide for exploration. Examples drawn from the major categories of deposit such as epithermal gold, greenstone associated gold, vein-type uranium, porphyry copper, volcanogenic massive sulphides, carbonate and shale-hosted lead-zinc and ultramafic hosted nickel sulphides. Exploration strategies and tactics; risk analysis and prospect evaluation.

GEOL0340 Geochemical Exploration Techniques
Staff Contact: Dr DR Cohen/Dr AC Dunlop
UOC6

GEOL0350 Mine Geology and Grade Control
Staff Contact: Dr AC Dunlop
UOC6
Sampling theory and sampling techniques relevant to various styles of ore bodies, mining methods and scales of mining; statistical and geostatistical techniques for verifying and analysing sample analytical data; reserves modelling; grade interpolation; fundamental grade control problems; case histories; computer modelling demonstrations; practical exercises.

GEOL0355 Environmental Assessment
Staff Contact: Dr DR Cohen
UOC6
This course is an introduction to methods for assessing existing and potential contamination of industrial sites and mining operations. The course includes elements such as the policy and legal framework of environmental assessments; sources of information on a range of chemical contaminants and recommended exposure limits; the role of the assessor (or auditor). Selected environmental assessment case studies will be considered.

GEOL0360 Remote Sensing Applications in Geoscience
Staff Contact: A/Prof GR Taylor
UOC6
The physics of various remote sensing techniques. Consideration of various sources of imagery; Landsat, TM, SPOT, aircraft scanners etc. Spectral properties of rocks, soils and vegetation. Geological applications of visible, infrared, thermal and multi-parameter microwave imagery in resource exploration, tectonic studies, geological hazard recognition and environmental monitoring. Mapping and data integration methodologies.

GEOL0370 Fundamentals of Exploration Geophysics
Staff Contact: Mr D Palmer
UOC6
An introduction to the theory and application of geophysical methods to engineering, environmental, and groundwater studies. The methods covered include gravity, magnetic seismic refraction, shallow seismic reflection, DC electrical resistivity, electromagnetic, transient electromagnetic, radar, and geophysical well logging. Each method is described in terms of the fundamental physical principles, data acquisition and field techniques, data processing and presentation, and quantitative interpretation.

GEOL0380 Electrical Methods in Geophysical Exploration
Staff Contact: Mr D Palmer
UOC6
The relationships between geology and electrical geophysical properties; basic theory of resistivity, induced polarisation and electromagnetic methods. Evaluation of applications, survey design, instrumentation, data acquisition, interpretation and productivity. Computer methods of interpretation are emphasised by the extensive use of hands-on microcomputer tutorials. An introduction to recent advances in electrical geophysics: inversion, multi-electrode array resistivity, spectral induced polarisation, transient electromagnetics and ground probing radar.

GEOL0390 Data Processing for Fossil Fuel Resources
Staff Contact: A/Prof CR Ward
UOC6
Sedimentary basin analysis with special emphasis on the geology of coal deposits; coal deposit evaluation, data acquisition, computer processing, analysis and display.
GEOL9011 Groundwater Environments
Staff Contact: Dr J Jankowski
UOC3
Study of the detailed occurrence and the environmental problems associated with groundwater in aquifer systems of importance to Australia. Environments will include karst hydrogeology and hydrogeochemical processes in karst terrains, natural saline groundwaters, deep sedimentary basins, groundwater-surface water interaction, fractured rock, alluvial plains, and unconsolidated sediments.

GEOL 9053 Hydrogeochemistry
Staff Contact: Dr J Jankowski
UOC3

GEOL 9054 Analysis and Interpretation of Hydrochemical Data
Staff Contact: Dr J Jankowski
UOC3

GEOL 9055 Hydrogeochemical Modelling
Staff Contact: Dr J Jankowski
UOC3

GEOL9060 Environmental Geology
Staff Contact: Dr DR Cohen
UOC6
Geology and urban planning; geological input to Environmental Impact Statements; soil and rock construction materials; ground subsidence due to mining and ground-water pumping; geological hazards; land degradation and problem soils; engineering geomorphology.

GEOL9070 Engineering Geophysics
Staff Contact: Mr D Palmer
UOC6
Notes: Short field tutorials are included as part of this subject. Students will incur personal costs.

An introduction to the theory and application of geophysical methods to engineering, environmental, and groundwater studies. The methods covered include gravity, magnetic seismic refraction, shallow seismic reflection, DC electrical resistivity, electromagnetic, transient electromagnetic, radar, and geophysical well logging. Each method is described in terms of the fundamental physical principles, data acquisition and field techniques, data-processing and presentation, quantitative interpretation, and case histories.

GEOL 9112 Investigation and Management of Salinity
Staff Contact: Dr J Jankowski
UOC3
Fresh water - saline water interaction in coastal aquifers. Occurrence and salinity mechanisms of naturally occurring saline groundwaters. Saline lakes and playa brines. Dryland salinity mechanisms; occurrence and management. Irrigation induced salinity; mechanisms and management. Case studies.

GEOL9124 Groundwater Project
Staff Contact: Dr J Jankowski
UOC12
A project equivalent to 10HPW study for one session which will require the student to carry out a detailed investigation relating to groundwater or hydrogeology. The study may relate to the student's field of employment.

GEOL9151 Petroleum Geology
Staff Contact: A/Prof CR Ward
UOC6 S1 S2
Notes: External mode only
Petroleum generation, including kerogenic types and maturation, entrapment and degradation processes; sedimentology of petroleum-bearing sequences; features of sedimentary rocks, with special reference to reservoir materials; primary and secondary porosity; introduction to clay minerals; structural and stratigraphic traps, including diapirs and fractured rock reservoirs; coal-bed methane, oil shale and other non-conventional petroleum sources; geological settings of Australia's petroleum basins; exploration and evaluation of petroleum deposits, including an introduction to geophysical techniques.

GEOL9151 Petroleum Geophysics
Staff Contact: Mr D Palmer
UOC6 S1 S2
Notes: External mode only
Principles and applications of gravity, magnetic, seismic refraction and reflection methods; nature and properties of seismic waves; acquisition of seismic data in land and marine environments; fundamentals of signal processing; processing of seismic reflection data; three-dimensional and four-dimensional (time-lapse) seismic methods; inversion of seismic traces; amplitude variation with offset (AVO); vertical seismic profiling (VSP): integration of geology and geophysics in petroleum exploration and development programs.

GEOL9252 Groundwater Quality and Protection
Staff Contact: Dr J Jankowski
UOC3

Institute for Environmental Studies

IEST5001 Frameworks for Environmental Management
Staff Contact: A/Prof R Harding
UOC6 HPW3 S1 S2
This course provides an introduction to the MEM program. Participants will gain an appreciation of the complex and transdisciplinary nature of environmental management issues and of the inherent challenges in multi-disciplinary group approaches to environmental management issues. The emphasis is on exploring conceptual and practical frameworks for environmental management. Starting from the premise...
of sustainability as a current broadly-endorsed framework for environmental management, the following are explored: the development of the concepts of sustainable development and sustainability; problems in practically interpreting and implementing sustainability; disciplinary perspectives on the concepts (eg from philosophy, planning, health sciences etc); the "principles" of sustainable development and experience in their application; responses to the "sustainability framework" at different levels of governance, by different sectors, by corporations, by professional organisations; critiques of sustainability as a framework for environmental management; alternative models.

IEST5002
Tools for Environmental Management
Staff Contact: A/Prof R Harding
UOC6 HPW3 S2
Provides an introduction to the wide range of "tools" used in environmental management and for environmental decision-making. These include: environmental impact assessment, social impact assessment, public participation, policy formulation, risk management, environmental management systems, life cycle assessment, materials flux analysis, State of the Environment reporting/accounting, auditing, modelling. Links will be drawn between the "tools" course and material covered in 'Frameworks for environmental management and the fundamental knowledge' courses. This course will provide an introduction to a number of specialist courses that may be taken as electives (in for example environmental impact assessment).

IEST5003
Addressing Environmental Issues
Staff Contact: A/Prof R Harding
UOC6 HPW3 S1 (2001)
Notes: To be taken in final session of program
Brings participants in the MEM together in the final stage of their program to focus on analysis and problem solving in multidisciplinary teams. Will further illustrate the nature of, and need for, a transdisciplinary approach to addressing environmental problems. Group work will draw on current or recent key environmental issues and will be supported by high level seminars addressed by guest speakers from both within UNSW and externally.

Marine Science

MSCI5001
Environmental Monitoring and Assessment
Staff Contact: A/Prof A Albani
UOC6 HPW4 WKS14
This course is designed to give each student an understanding of the various techniques used in monitoring a coastal environment. It includes the applications and limitations of oceanographic instrumentation and application of physical, geological, chemical and biological methods in the field. Bathymetric, sedimentological and ecological surveys are part of a number of field activities designed to train students to carry out a detailed assessment of a coastal area.

MSCI5002
Management of Marine Resources
Staff Contact: Director, Centre for Marine and Coastal Studies
UOC5 HPW4 WKS7
This course basic concepts relating to marine resources, environmental issues, property rights and how different property rights affect the exploitation of marine resources, questions of marine resources, how natural systems interact with economic systems, with policies and regulations that may improve economic performance in a very uncertain environment, with adjustment to economic policies on regional and community criteria, with sustainable and non-sustainable models of resource use in genera and the management of fisheries in particular and with problems of resource use in developing countries.

MSCI5003
Experimental Design and Analysis
Staff Contact: Director, Centre for Marine and Coastal Studies
UOC6 HPW4 WKS7
Applications of statistics to marine science data. Probability, estimation statistics and tests of hypotheses. Experimental design, ANOVA, linear and multiple regression, multivariate analysis, non-parametric methods. Emphasis is placed on the applications of computer software packages.

MSCI5004
Oceanographic Processes
Staff Contact: Director, Centre for Marine and Coastal Studies
UOC6 HPW4 WKS14
The physical, biological and geological processes of the marine environment; the dynamics of ocean currents including surface waves, geostrophy, tides, upwelling, basin scale gyres, El Nino: biological processes including primary formation of particulate matter, secondary production, biological cycles; geological processes.

MSCI5005
Topics in Marine Science
Staff Contact: Director, Centre for Marine and Coastal Studies
UOC12 HPW8 WKS28
Students choose topics from those listed below to make up the required contact hours per week. The topics chosen must be approved by the course co-ordinator: marine biology, aquaculture, zooplankton, marine botany, fisheries, coastal ecology, marine pollution, environmental microbiology, fluid dynamics, estuarine hydraulics, dispersion processes, instrumentation, coastal engineering, remote sensing, atmosphere-ocean dynamics, marine geology, coastal environmental assessment, aquatic chemistry, computers in chemistry, spectroscopic analysis, environmental chemistry, modern developments in chemical synthesis.

MSCI5006
Graduate Seminars in Marine Science
Staff Contact: Director, Centre for Marine and Coastal Studies
UOC6 HPW2 WKS28
A series of seminars of particular relevance to the practice of marine science. Includes both specialist topics in the disciplines that contribute to the marine sciences and detailed study and evaluation of case studies and contemporary issues in marine science.

MSCI5007
Marine Science Project
Staff Contact: Director, Centre for Marine and Coastal Studies
UOC12 HPW8 WKS28
A study of an aspect of marine science and submission of a project report. The project may be either experimental or theoretical in approach.

MSCI5008
Special Topic
Staff Contact: Director, Centre for Marine and Coastal Studies
UOC6 HPW4 WKS28
A special reading program and seminar course to cover perceived areas of special need. This subject is designed to meet the particular needs of individual students.

Materials Science and Engineering

MATS1092
Materials and Design 1
Staff Contact: A/Prof A Crosby
UOC3 HPW2 WKS14
An appreciation of the relationships between the properties of materials, component design, manufacturing and product performance. Materials selection as an integral part of successful design. Long-term potential for materials improvement and substitution.
MATS6005
Corrosion Project
Staff Contact: School Office
UOC12 HPW6 WKS28
A substantial project on some aspect of corrosion science or technology.

MATS6495
Corrosion Materials
Staff Contact: Prof DJ Young
UOC6 HPW3 WKS28
Properties and efficient selection of materials for corrosion resistance. Applications in manufacturing, mining and process industries, in transportation equipment and in structures. Materials selection for service in particular environments.

MATS6535
Industrial Coatings for Corrosion Protection
Staff Contact: Prof DJ Young
UOC6 HPW3 WKS28
Special topics on heavy-duty organic, inorganic and metallic coatings used in atmospheric, marine and industrial environments.

MATS6545
Corrosion Technology
Staff Contact: Prof DJ Young
UOC6 HPW3 WKS28
Environmental fracture; corrosion in specific environments; corrosion of specific equipment types; principles of materials selection and design; surface preparation and maintenance coatings; polymeric materials and linings, inhibitors and electrochemical tests methods; cathodic protection.

MATS6605
Professional Communication and Presentation
Staff Contact: Prof CC Sorrell
UOC6 HPW2 S1 S2
Corequisite/s: MATS6695
Presentation skills: public speaking, presentation techniques, visual aids, and library usage. MATS6695 Materials Project: guidelines for project preparation and two oral presentations. Job search skills: curriculum vitae, cover letters, and interviews.

MATS6615
Materials Design
Staff Contact: A/Prof AG Crosky
UOC6 HPW4 S1 or S2
Selected topics in ceramics, composites, metals, and/or polymers involving the inter-relationships between materials properties, design, production, and performance. Materials selection, specifications, and standards.

MATS6625
Materials Processing
Staff Contact: Dr V Sahajwalla
UOC6 HPW4 S1 or S2
Selected topics in ceramics, composites, metals, and/or polymers involving the processing of raw materials to their finished condition as precursors, stock shapes, or specific components. Mass and energy balances, engineering calculations, and unit operations.

MATS6635
Materials Properties and Behaviour
Staff Contact: Dr MJ Hoffman
UOC6 HPW4 S1 or S2
Selected topics in ceramics, composites, metals, and/or polymers involving the principal properties of materials: physical, chemical, thermal, mechanical, thermo-mechanical, electrical, magnetic, and optical.

MATS6645
Materials Characterisation
Staff Contact: A/Prof PR Munroe
UOC6 HPW4 S1 or S2
Selected topics in ceramics, composites, metals, and/or polymers involving the structural, microstructural, and chemical analyses of materials: X-ray diffraction (XRD), scanning electron microscopy (SEM), transmission electron microscopy (TEM), energy dispersive spectroscopy (EDS), electron probe microanalysis (EPMA), atomic force microscopy (AFM), and optical microscopy.

MATS6655
Advanced Materials Characterisation
Staff Contact: A/Prof AG Crosky
UOC6 HPW4 S1 or S2
Selected topics in ceramics, composites, metals, and/or polymers involving the structural, microstructural, and chemical analyses of materials: secondary ion mass spectroscopy (SIMS), X-ray photoelectron spectroscopy (XPS), Auger electron spectroscopy (AES), and laser Raman microscopy.

MATS6655
Materials Applications and Performance
Staff Contact: Dr P Krauklis
UOC6 HPW4 S1 or S2
Selected topics in ceramics, composites, metals, and/or polymers involving the inter-relationships between the structure and microstructure of materials, their resultant properties, expected and actual performance, and current and potential applications.

MATS6675
Materials Modelling
Staff Contact: Dr MJ Hoffman
UOC6 HPW4 S1 or S2
Selected topics in ceramics, composites, metals, and/or polymers involving numerical and analytical techniques, such as finite element modelling (FEM), applied to materials and processes in terms of design and performance, particularly thermal and mechanical stress analyses. Software packages and design of computer programs.

MATS6685
Management
UOC6 HPW4 S1 or S2
Selected topics in management involving basic economic principles, cost-benefit analyses, basic accounting, legal and contractual issues, products and services liability, human resources, industrial relations and conflict, leadership, decision-making, operations and project management, quality assurance and management, organisational design and development, market research and strategy, marketing and sales.

MATS6695
Materials Project
UOC12 HPW8 S1 or S2
Corequisite/s: MATS6605
A project report on ceramics, composites, metals, and/or polymers in the form of a thesis, including literature review, experimental, theoretical, or design investigation; and discussion of the results. Serves as the basis for the oral presentations in MATS6605 Professional Communication and Presentation.

Undergraduate Servicing Courses

MATS9421
Materials for Mining Engineers
Staff Contact: Dr P Krauklis
UOC4 HPW4 WKS14 S1 or S2
Systems of ordinary differential equations - general one-step methods for nonlinear differential equations covering global techniques and singularity analysis, and functional and complex analytic methods for nonlinear partial differential equations will be discussed.

MATS9650
Pyrometallurgical Processes
Staff Contact: A/Prof O Ostrovski
UOC3 HPW2 WKS14 S2
Principles and developments of pyrometallurgical processes and a review of the unit operations, roasting, sintering, smelting and refining for the treatment of ferrous and non-ferrous minerals.

MATS9712
Materials and Techniques in Design Craft 1
Staff Contact: Prof CC Sorrell
UOC4 HPW3 WKS14 S1
An introduction to the science and technology of materials, emphasizing relationships between structure, composition and properties. Introduction to processing of metallic, ceramic and fibrous materials. Materials recognition and design possibilities are discussed.

MATS9722
Materials and Techniques in Design Craft 2B
Staff Contact: Prof CC Sorrell
UOC4 HPW3 WKS14 S2
Metals: Casting, working, and surface finishing of metals and alloys; soldering, brazing, and welding. Gemstones: survey of gem materials (crystalline, massive, organic) and identification methods. Enamels: practical considerations and skills.

MATS9732
Materials and Techniques in Design Craft 2C
Staff Contact: Prof CC Sorrell
UOC4 HPW3 WKS14 S2

Mathematics
Mathematics graduate subjects are not offered every year. Contact the School of Mathematics Office to see which subjects are offered in any particular year.

MATHS105
Numerical Analysis of Differential Equations
Staff Contact: School of Mathematics Office
UOC6

MATHS110
Advanced Numerical Analysis
Staff Contact: School of Mathematics Office
UOC6
Development and analysis of numerical methods for the computational solution of mathematical problems.

MATHS115
Topics in Numerical Analysis
Staff Contact: School of Mathematics Office
UOC6
A selection of topics from: finite element methods, boundary element methods, approximation theory, integral equations and iterative techniques for matrix problems.

MATHS130
Advanced Mathematical Methods
Staff Contact: School of Mathematics Office
UOC6
Fundamental methods for solution of problems in applied mathematics, physics and engineering.

MATHS155
Discrete Optimization
Staff Contact: School of Mathematics Office
UOC6
Analysis, solution and application of optimization problems where the variables change discretely. Topics selected from: integer programming, network flows, scheduling problems, complexity theory, matroid theory, polyhedral combinations, and other areas of operations research.

MATHS165
Continuous Optimization
Staff Contact: School of Mathematics Office
UOC6
Analysis, solution and application of optimization problems where the variables change continuously. Topics selected from: nonlinear programming, convex optimization, nonsmooth analysis and optimization, variational inequalities and complementarity problems, infinite dimensional optimization, stochastic optimization, and numerical optimization.

MATHS170
Advanced Optimization
Staff Contact: School of Mathematics Office
UOC6
Development, analysis and application of methods for optimization problems.

MATHS175
Topics in Optimization and Optimal Control
Staff Contact: School of Mathematics Office
UOC6
Special topics in the analysis, solution and application of optimization and optimal control problems.

MATHS185
Topics in Modern Applied Mathematics A
Staff Contact: School of Mathematics Office
UOC6
A selection of topics from optimization, optimal control and numerical analysis not offered in other graduate courses.

MATHS205
Nonlinear Analysis
Staff Contact: School of Mathematics Office
UOC6
The mathematical theory of nonlinear differential equations, whose behaviours may range from coherence to chaos. Major topics include soliton theory covering integrable partial differential equations and their method of solution using the inverse scattering method, asymptotic methods for nonlinear differential equations covering global techniques and singularity analysis, and functional and complex analytic methods of proving qualitative results for equations of physical interest.
MATH5215
Topics in Dynamics
Staff Contact: School of Mathematics Office
UOC6
A selection of topics from: bifurcation theory, Hamiltonian systems, perturbation methods, the theory of solitons and chaotic systems.

MATH5245
Topics in Fluid Mechanics
Staff Contact: School of Mathematics Office
UOC6
A selection of topics from: boundary layer theory, turbulent flows, stability theory, waves, viscous flows and computational techniques.

MATH5250
Advanced Fluid Dynamics
Staff Contact: School of Mathematics Office
UOC6
The mathematical modelling and theory of problems arising in the flow of fluids.

MATH5255
Waves
Staff Contact: School of Mathematics Office
UOC6
Hyperbolic waves, the first-order wave equation, Burgers equation, hyperbolic systems, gas dynamics and the wave equation. Dispersive waves, linear dispersive waves, wave patterns, linear and nonlinear theories of water waves, modulated waves including the weakly nonlinear theory, stability and wave resonances.

MATH5265
Atmosphere-Ocean Dynamics
Staff Contact: School of Mathematics Office
UOC6
The dynamics of large scale atmospheric and ocean circulation. Key concepts include geostrophy, potential vorticity, available potential energy and Ekman boundary layers and transport. Quasi-geostrophic models, eddies in the atmosphere and oceans and their role in the transport of heat and momentum and energy exchange. Windforced models for ocean gyres and the atmospheric circulation forced by meridional heating (including Hadley Cells). Additional topics may include tropical circulation and El Nino, air-sea exchange, climate change and the Greenhouse effect.

MATH5275
Topics in Modern Applied Mathematics B
Staff Contact: School of Mathematics Office
UOC6
A selection of topics from dynamics, fluid mechanics and oceanography not offered in other graduate courses.

MATH5285
Ocean Modelling
Staff Contact: School of Mathematics Office
UOC6
Analytical and numerical modelling of ocean dynamics, and their interpretation. The course examines aspects of modelling of oceanic circulation using analytical and numerical modelling techniques. Theoretical analyses of the primitive equations will be used to identify individual physical processes such as surface Ekman layers, stratified flow over topography and wind-forced coastal currents under idealised conditions. A general numerical ocean model will be used to illustrate these results by comparison with the idealised analytical work, and by extension to more complex cases. Theoretical and practical aspects of model implementation will be considered including numerical stability, open boundary conditions, surface and convective mixed layer algorithms, as well as interpretation in the light of observations.

MATH5295
Atmospheric Modelling
Staff Contact: School of Mathematics Office
UOC6
Atmospheric dynamics and their simulation using numerical models. This course combines atmospheric dynamics and numerical modelling. It covers the following topics: derivation and interpretation of the equations governing the motion of the earth's atmosphere from the surface to just above the stratopause, the important types of wave motions supported by the governing equations, the use of scaling analysis to develop several distinct kinds of atmospheric models and the application of a range of numerical techniques to solving the equations governing these models. The last section will form the major part of the course, and will examine the various numerical algorithms in terms of accuracy, stability, consistency and efficiency. The choice of lateral boundary conditions also will be discussed in detail. During the course, computer laboratory sessions will be held and course participants will put together a working numerical model of their choice, from one of those introduced in the course. This model will be realistic in the sense that it will produce 24 hour predictions of the state of the atmosphere using real (observed) data as initial and boundary conditions.

MATH5305
Computational Techniques
Staff Contact: School of Mathematics Office
UOC6
Topics covered are chosen from the following: stability of timestepping schemes, iterative methods for elliptic equations, including multigrid techniques, special treatment of nonlinear terms and outflow/radiation conditions. The emphasis is on finite differences, and the course involves a computer project.

MATH5315
Topics in Mathematical Computing
Staff Contact: School of Mathematics Office
UOC6
The design and implementation of accurate and efficient numerical methods, typically as programs in Fortran or C. Topics could include the use of advanced computer architectures such as vector and parallel processors.

Pure Mathematics

MATH5405
Automata and Formal Languages
Staff Contact: School of Mathematics Office
UOC6
Topics from: finite automata and regular languages, pushdown automata and contextfree languages, Turing machines and phase structure languages, computational complexity, LL(k) and LR(k) grammars.

MATH5415
Information and Coding
Staff Contact: School of Mathematics Office
UOC6
Topics from: error detecting and correcting codes, information and entropy, coding ergodic Markov processes, Shannon's Source Coding and Channel Coding theorems, perfect codes, Hamming codes, algebraic (B.C.H. and quadratic residue) codes, associated combinatorial structures, ciphers.

MATH5425
Fuzzy Logic and Neural Nets
Staff Contact: School of Mathematics Office
UOC6
Topics from: how fuzzy logic handles imprecise and vague concepts, fuzzy control theory, artificial neural nets and their learning algorithms, approximation by neural nets, supervised and unsupervised networks.

MATH5435
Appraisal Algebraic Computation
Staff Contact: School of Mathematics Office
UOC6
Introduction to Maple. Programming in Maple, with applications to include construction and analysis of computational algorithms. Manipulation of perturbation and Taylor series approximations to partial differential equations, manipulation of Taylor series approximations in the error analysis of discretised ordinary and partial differential equations.
MATH5505
Topics in Algebra
Staff Contact: School of Mathematics Office
UOC6

MATH5515
Topics in Analysis
Staff Contact: School of Mathematics Office
UOC6

MATH5525
Topics in Geometry
Staff Contact: School of Mathematics Office
UOC6

MATH5535
Topics in Number Theory
Staff Contact: School of Mathematics Office
UOC6

MATH5605
Operator Theory
Staff Contact: School of Mathematics Office
UOC6
Topics from: invariant subspaces, integral equations and Fredholm
theory, functional calculus, decomposition theorems, Hankel and
Toeplitz operators, operators on $L^p$ spaces, Ergodic theory, semigroups.

MATH5615
Banach and Operator Algebras
Staff Contact: School of Mathematics Office
UOC6
Topics from: commutative Banach algebras and Gelfand theory,
spectral theory of operators on Hilbert space, introduction to $C^*$
and von Neumann algebras, relationship to group representations
and ergodic theory.

MATH5625
Distributions and Partial Differential Equations
Staff Contact: School of Mathematics Office
UOC6
Topics from: derivatives, convolutions and Fourier transforms of
distributions, weak solutions of differential equations, existence and
uniqueness for the Cauchy problem, Holmgren's Theorem, elliptic
boundary-value problems via the Schauder approach.

MATH5635
Dynamical Systems
Staff Contact: School of Mathematics Office
UOC6
Topics from: automorphisms of measure spaces, recurrence,
ergodicity, entropy, conjugacy and orbit equivalence, topological
dynamics with applications to number theory, fractals and chaos.

MATH5645
Number Theory
Staff Contact: School of Mathematics Office
UOC6
Topics from: elementary number theory, prime numbers, number
theoretic functions, Dirichlet series, prime number theorem,
continued fractions, diophantine approximation, quadratic reciprocity,
algebraic number theory, class number theorem.

MATH5655
Homological Algebra
Staff Contact: School of Mathematics Office
UOC6
Topics from: concept of a category, additive and abelian categories,
representable functors, exact sequences, homology, derived
functors, Ext and Tor, relations with algebraic topology, derived
categories, homological dimension.

MATH5685
Algebraic Topology
Staff Contact: School of Mathematics Office
UOC6
Topics from: functors and natural transformations, homotopy of
maps, homotopy groups, covering spaces, simplicial and singular
homology and cohomology, homological algebra.

MATH5675
Set Theory and Topology
Staff Contact: School of Mathematics Office
UOC6
Topics from: set theory, axiom of choice, ordinals and cardinals,
topological spaces, compactness, quotient topologies.

MATH5685
Complex Analysis
Staff Contact: School of Mathematics Office
UOC6
Topics in advanced complex function theory chosen from the
following: conformal mappings, analytic continuation, entire and
meromorphic functions, elliptic functions, asymptotic methods,
integral formulae, harmonic functions, Riemann surfaces.

MATH5695
Stochastic Differential Equations
Staff Contact: School of Mathematics Office
UOC6
Topics from: Brownian motion, Itô calculus, Malliavin calculus,
Girsanov's theorem, Clark's theorem, the Harrison-Pliska model of
option pricing.

MATH5705
Commutative Harmonic Analysis
Staff Contact: School of Mathematics Office
UOC6
Topics from: Fourier series and integrals for $T^n$ and $R^n$, locally
compact abelian groups, Pontrjagin duality, Pancharev Theory.

MATH5715
Non-Commutative Harmonic Analysis
Staff Contact: School of Mathematics Office
UOC6
Topics from: locally compact groups, Haar measure, homogeneous
spaces, convolution algebras, representations, irreducibility, induced
representations, Mackey theory; compact groups, Peter-Weyl theory,
nilpotent groups, Kirillov theory.

MATH5725
Lie Groups and Algebras
Staff Contact: School of Mathematics Office
UOC6
Topics from: revision of manifolds and linear algebra, topological
groups, Haar measure, Lie groups, Lie algebras, substructures,
classification of semi-simple complex Lie algebras, highest weight
representations.

MATH5735
Advanced Algebra
Staff Contact: School of Mathematics Office
UOC6
Topics from: rings, commutative rings, factorization theory, modules,
associative and Lie algebras, Wedderburn theory, category theory.

MATH5745
Group Theory
Staff Contact: School of Mathematics Office
UOC6
Topics from: abelian, nilpotent and solvable groups, further
representation theory, Euclidean reflection groups, Chevalley groups,
group homology and cohomology, group extensions.
MATH5755
Mathematical Foundations of Quantum Mechanics
Staff Contact: School of Mathematics Office
UOC6
Topics from: origin and interpretation of Schrödinger's equation, unbounded operators on Hilbert space, spectral theory, functional calculus and time evolution, the role of symmetry groups, irreducible and induced.

MATH5765
Algebraic Geometry
Staff Contact: School of Mathematics Office
UOC6
Topics from: algebraic curves, cohomology, Riemann-Roch theorem, elliptic curves, Jacobians, classical projective geometry, quadrics, cubic surfaces, Grassmannians, Schubert calculus, commutative algebra, modules, homological concepts, dimension.

MATH5775
Calculus on Manifolds
Staff Contact: School of Mathematics Office
UOC6
Topics from: manifolds, vector fields, flows, introduction to Morse theory, differential forms, Stokes theorem, de Rham cohomology.

Statistics

MATH5806
Applied Regression Analysis
Staff Contact: School of Mathematics Office
UOC6

MATH5815
Experimental Design 1
Staff Contact: School of Mathematics Office
UOC6
Modified designs for fixed effects models. Incomplete and balanced incomplete block designs. Confounding and fractional replication. Randomization theory.

MATH5816
Mathematics of Security Markets 2
Staff Contact: School of Mathematics Office
UOC6
Prerequisite/s: MATH5806
More advanced applications of stochastic calculus to security markets.

MATH5825
Experimental Design 2
Staff Contact: School of Mathematics Office
UOC6
Prerequisite/s: MATH5815
Extensive treatment of random and mixed models. Combinatorial structure of designs, crossover and lattice designs, response surfaces.

MATH5826
Statistical Methods in Epidemiology
Staff Contact: School of Mathematics Office
UOC6
Measures and models of disease association, relative risks and odds ratios, attributable risk, interactions, Mantel-Haenszel formulae, confounding, logistic regression, survival analysis.
MATH5925
Project
Staff Contact: School of Mathematics Office
UOC12
A thorough study of a set of statistical papers or some workplace problem of the student's choice.

MATH5935
Statistical Consultancy
Staff Contact: School of Mathematics Office
UOC6
This is a practical course which introduces students to the general framework of statistical consulting and gives students experience in solving statistical problems arising in practice.

MATH5945
Categorical Data Analysis
Staff Contact: School of Mathematics Office
UOC6

MATH5955
Statistical Quality Control
Staff Contact: School of Mathematics Office
UOC6

MATH5965
Mathematics of Security Markets 1
Staff Contact: School of Mathematics Office
UOC6

MATH5975
Economic Quality Control Models
Staff Contact: School of Mathematics Office
UOC6
Prerequisite/s: MATH5955
Economic design of acceptance sampling plans. Economic design of process control charts. Quality evaluation. Tolerance design and tolerancing. Taguchi's online quality control. Online process parameter design, process improvement methods and preventive maintenance.

MATH5985
Industrial Designs
Staff Contact: School of Mathematics Office
UOC6
Prerequisite/s: MATH5815

CMED9500
Epidemiology
Staff Contact: A/Prof J Kaldor
UOC6 HPW3 WKS14 S1 S2
This subject provides students with an understanding of the role of epidemiology as the quantitative science underpinning much of public health practice. Students will learn the basic methodological tools of epidemiology, such as statistics to measure disease frequency, skills to critically review literature and interpret epidemiological studies, and their application in a variety of research and public health contexts. Skills for measuring frequency of disease and testing for evidence of association between risk factors and disease in this subject will build on statistics learnt in CMED9502 Statistics for Public Health. This subject will cover topics pertaining to study design, basic statistical tests and interpretation of results. Application of these topics in areas such as questionnaire design, conducting and managing studies, problems relating to research grants will be covered in CMED9513 Applied Epidemiology.

CMED9610
Food and Nutrition Policy Studies
Staff Contact: Ms L Bloomfield and Ms P Craig
UOC4 HPW2 WKS14 S2
The relationship between population, health and the food and nutrition system, i.e. the production, distribution and consumption of food. Discussion of development of intersectoral policies and strategies addressing specific segments of the food and nutrition system to improve the health of vulnerable populations in developed and developing countries. Students will work through a case study and demonstrate their understanding by preparing, presenting and defending a proposed food policy for a specified population or community group.

Microbiology and Immunology

MICR6043
Alternative Higher Degree Qualifying Program
Staff Contact: Prof A Lee
UOC48
Similar in standard to MICR4013 Microbiology Honours, but designed for students who cannot regularly attend the University.

Oceanography

Administered by the School of Mathematics. Please contact Dr John Middleton.

OCEA5115
Experimental Project In Physical Oceanography
UOC24
A report of an experimental project, including recording, preparation, analysis and interpretation of field or laboratory data.

OCEA5125
Geophysical Fluid Dynamics
UOC6
Aspects of the physical features of the oceans. Includes ocean waves rotational and gravitational, tides, large scale wind driven ocean circulation, coastal dynamics, thermohaline circulations and mixing processes.

OCEA5145
Applied Time Series Analysis
UOC6
Classification of random processes, sampling for discrete analysis, Fourier analysis, spectra, filtering. Crossspectra, estimation and hypothesis testing, confidence limits, application to experiment planning. Emphasis on computer analysis of actual data.
OCEA5155
Theoretical Project in Physical Oceanography
UOC12
A theoretical project aimed at developing the prediction of oceanographical phenomena, tailored to meet individual student background but taken only by those students with a strong theoretical background.

Optometry
Initial contact for these courses should be directly with the School of Optometry. All courses are full year course.

OPTM8001
Advanced Clinical Optometry
Staff Contact: Mr D Pye
UOC12 S3
Clinical work on selected patients with special emphasis on advanced techniques and new developments. Optometric examination procedures including: gonioscopy, slit lamp funduscopy, binocular indirect ophthalmoscopy and scleral depression; ultrasonography; corneal topography; ocular photography; computerised visual field analysis; visual functions; low vision; optometric co-management; evaluation of binocular functions; geriatric and paediatric optometry; the clinical application of electrophysiological techniques. Assessments of new instruments, methods and treatments. This subject is offered as either a domestic option at the University of New South Wales, or as an overseas option at either the Philadelphia College of Optometry or the LV Prasad Eye Institute, Hyderabad, India. The overseas option involves a 4 week period at PCO; travel and accommodation costs are to be met by the candidate.

OPTM8002
Physiological Optics
Staff Contact: School Office
UOC12 S3
Note/s: Subject not offered in 2000.

OPTM8003
Behavioural Optometry
Staff Contact: Ms R Paynter
UOC12 S3
An integrated subject, in which binocular vision and pleorhptics are studied from theoretical and clinical viewpoints. Clinical experience is provided by selected patients. Includes: the nature and control of eye movements and role in maintaining the perception of a stable visual world. Binocular and monocular subjective visual directions. The neurophysiological substrate of binocular vision and its phenomena. Stereopsis and its measurement. Accommodation, convergence, and oculo-motor imbalance. Laboratory and clinical methods of measuring eye position and visual directions. The astologies, measurements and treatment of strabismus, anomalous correspondence, eccentric fixation, amblyopia.

OPTM8004
Advanced Contact Lens Studies
Staff Contact: Dr H Swarbrick
UOC12 S3
Recent advances in anterior ocular physiology; ocular biochemistry; influences on corneal hydration; recent research on the tear film. Practice-based contact lens research; introducing and accessing the contact lens literature; basic experimental design and statistics; clinical photography; presenting research. Contact lenses and vision correction; presbyopia; orthokeratology and myopia control; post-surgery contact lens fitting. Specialty contact lens applications; keratoconus; haptic lenses; cosmetic contact lenses and prosthetics; contact lenses for children. Advanced contact lens instrumentation; corneal topographical analysis; pachymetry; specialised research instrumentation; measuring oxygen transmission and uptake. Contact lens-related inflammation and infection; ocular microbiology, antimicrobial agents and chemotherapy; ocular immune mechanisms, hypersensitivity and inflammation. Revitalising rigid lenses; understanding and optimising RGP lens design; fitting the toric cornea; fitting the Asian eye with RGP’s; RGP parameter measurement and modification; RGP material properties; long-term effects of RGP lens wear. Future challenges for contact lens practice; contact lenses in Asia; contact lens education worldwide; refractive surgery and its impact on contact lens practice; regulations in the contact lens industry.

OPTM8005
Advanced Contact Lens Practice
Staff Contact: School Office
UOC12 S3
Note/s: Subject not offered in 2000.

OPTM8006
Occupational Optometry
Staff Contact: School Office
UOC12 S3
Note/s: Subject not offered in 2000.

OPTM8007
Clinical Photography
Staff Contact: School Office
UOC12 S3
Note/s: Subject not offered in 2000.
Introduction to clinical photography, cameras and lens systems, colour films, black-and-white films and filters, apparatus and accessories. Patient preparation and lighting. Copying, slide making, macrophotography. Computer hardware and software available for slide production for lecture presentation. Dark room techniques, anterior eye photography, and fundus photography with hydric and non-mydriatic equipment. Image analysis and its application to fundus interpretation, photo-refraction and corneal modelling systems and including medical imaging techniques such as CAT scans, NMl and PET. Video equipment, ophthalmic applications, editing and production of videotapes. The subject matter will comprise of subject matter at a higher level than in the undergraduate course. Emphasis will be placed upon the development of practical skills and the application of the attained information to patient management.

OPTM8020
Rehabilitation of the Partially Sighted
Staff Contact: Dr P Herse
UOC6 S1 or S2
This subject will survey issues involved in the visual rehabilitation of the partially sighted person. Topics covered include epidemiology of visual impairment, pathophysiology of the major ocular disease processes, models of adaptation to loss, assessment of visual impairment, provision of optical and non-optical visual aids, new developments in adaptive technology, professional interactions and referrals and support structures.

Physics
Not all graduate subjects are necessarily offered in any one year. Initial contact should be made with A/Prof RJ Stening.

PHYS7159
Acoustic Theory
Staff Contact: A/Prof J Wolfe
UOC3 HPW2
Sources of acoustic radiation; simple, dipole, quadrupole, plane, impulsive source, random source, aerodynamic sources. Free field propagation in fluids, interference and diffraction, absorption, shock waves. Boundary effects: reflection and transmission at fluid/fluid and fluid/solid interfaces, fluid waveguides, solid waveguides. Reception and analysis; transducers. Fourier analysis, statistical methods, impulse measurement.

PHYS9583
Advanced Theoretical Physics
Staff Contact: A/Prof RJ Stening
UOC3 HPW2
A field theory approach to condensed matter physics. Field theory and critical phenomena, exactly soluble models, low-dimensional quantum spin models. Content may vary from year to year.

PHYS9583
Advanced Astrophysics
Staff Contact: A/Prof RJ Stening
UOC3 HPW2
Radio astronomy and interferometry; the structure of the galaxy; optical and infrared astronomy - instrumentation and data reduction; the extragalactic distance scale. Content may vary from year to year.

Psychology

PSYC6000
Alternative Higher Degree Qualifying Program
Staff Contact: Dr J Cranney
UOC48 WKS28 S3
Refer to the School of Psychology for details.

PSYC7000
Research and Evaluation Methods
Staff Contact: Dr K Bird
UOC6 HPW2 WKS14 S2
An examination of threats to the validity of casual inferences from randomised experiments, quasi-experiments and passive
observational studies, with particular reference to field studies and program evaluations. Statistical power analysis, the analysis of data from nonequivalent control group designs, interrupted time series analysis, and structural modelling.

**PSYC7001**
*Psychological Assessment 1*
*Staff Contact: Dr S McDonald*
UOC6 HPW2 WKS14 S1
A theoretical basis, background information and practical skills in methods of assessment typically used in clinical forensic, and organisational psychology. Theory and research on interviewing, introduction to DSM IV-R, assessment interviewing, assessment of intellectual functioning, test access and use and computerised testing, neuropsychological and organicity assessment, personality assessment and its use, assessment and goal attainment scaling, and ethical, legal and professional issues.

**PSYC7002**
*Psychological Assessment 2*
*Staff Contact: Dr K Bird*
UOC6 HPW2 WKS14 S1

**PSYC7100**
*Psychology of Human Resources 1*
*Staff Contact: Dr A Adams*
UOC6 HPW2 WKS14 S1
General framework for understanding organisational settings and how social structures and procedures affect work motivation, job satisfaction, performance and health. Emphasis placed on the particular contribution which psychologists can make to such areas as job analysis and design, selection, and performance appraisal, interpersonal and intergroup relations, the socio-technical analysis of production systems, social influence, leadership style, job enrichment, and communication patterns.

**PSYC7102**
*Psychological Principles of Training*
*Staff Contact: Prof E J Kehoe*
UOC6 HPW2 WKS14 S2
Relevant principles from learning theory and cognitive psychology applied to training in industry and retraining for new technology. Training for adaptability and transfer; the important role of automaticity and attitudes in training. Development of work related cognitive, motor and social skills, and the use of computerised packages. Research on the effectiveness of different methods of training.

**PSYC7115**
*Vocational Interviewing and Counselling*
*Staff Contact: A/Prof G Huon*
UOC6 HPW2 WKS14 S1
The theory and practice of vocational interviewing and counselling, and approaches to career decision making and work adjustment throughout life. The role of occupational information and psychological tests, and the impact of work, leisure, retirement and unemployment on these areas will be considered. The specific problems of minority groups in these areas will be highlighted.

**PSYC7117**
*Advanced Topics in Organisational Psychology*
*Staff Contact: Dr A Williamson*
UOC6 HPW2 WKS14 S2
Advanced treatment of established and emerging areas in organisational psychology.

**PSYC7122**
*Professional and Ethical Practice (Organisational) 1*
*Staff Contact: Dr A Adams*
UOC6 WKS14 SI
Attendance at professional practice meetings (including reviews of professional ethical issues) and career development workshops (including a thorough understanding of ethical principles and practices within professional settings) and the completion of placements to a total of 250 hours.

**PSYC7123**
*Professional and Ethical Practice (Organisational) 2*
*Staff Contact: Dr K Bird*
UOC6 WKS14 S2
Attendance at professional practice meetings (including reviews of professional ethical issues) and career development workshops (including a thorough understanding of ethical principles and practices within professional settings) and the completion of placements to a total of 250 hours.

**PSYC7124**
*Professional and Ethical Practice (Organisational) 3*
*Staff Contact: Dr A Adams*
UOC6 WKS14 S1
Prerequisite/s: PSYC7122 and PSYC7123
Attendance at professional practice meetings (including reviews of professional ethical issues) and career development workshops (including a thorough understanding of ethical principles and practices within professional settings) and the completion of placements to a total of 250 hours.

**PSYC7125**
*Professional and Ethical Practice (Organisational) 4*
*Staff Contact: Dr J Bright*
UOC6 WKS14 S2
Prerequisite/s: PSYC7122 and PSYC7123
Attendance at professional practice meetings (including reviews of professional ethical issues) and career development workshops (including a thorough understanding of ethical principles and practices within professional settings) and the completion of placements to a total of 250 hours.

**PSYC7126**
*Research Thesis (Organisational) 1*
*Staff Contact: Prof E J Kehoe*
UOC12 WKS14 S1 or S2
Research thesis involving an investigation into some aspect of organisational psychology.

**PSYC7127**
*Research Thesis (Organisational) 2*
*Staff Contact: Prof E J Kehoe*
UOC12 WKS14 S1 or S2
Prerequisite/s: PSYC7126
Research thesis involving an investigation into some aspect of organisational psychology.

**PSYC7204**
*Child Clinical Psychology*
*Staff Contact: Dr K Salmon*
UOC6 HPW2 WKS14 S1
Description, assessment and treatment of child and adolescent psychopathology. Role of constitutional and environmental factors
in behavioural and emotional dysfunction. Theoretical bases of behavioural, cognitive, and family treatment approaches. Integrated cognitive behavioural management programs.

**PSYC7210**

**Human Neuropsychology**

*Staff Contact: Dr S McDonald*

UC06 HPW3 WKS14 S2

Neural bases of human behaviour, with particular emphasis on clinical applications. Issues in assessment and rehabilitation, functional analysis of each cerebral lobe, and particular disorders such as the dementias and aphasias.

**PSYC7212**

**Experimental Clinical Psychology 1**

*Staff Contact: A/Prof R Bryant and Dr J Henry*

UC06 HPW4 WKS14 S1

An introduction to clinical practice and covers the major anxiety and mood disorders. This course reviews the major models and research strategies for understanding psychopathology and clinical interventions. Specific psychological disorders are analysed in detail to illustrate the interplay of biological, cognitive, and behavioural models of psychological dysfunction. Each disorder is also described in terms of practical assessment and treatment procedures.

**PSYC7220**

**Psychology of Health and Illness**

*Staff Contact: A/Prof R Bryant*

UC06 HPW2 WKS14 S2

Applications of psychological principles, derived from human and animal research, to human health, including health promotion, risk factor reduction, and the psychological assessment and management of medical illnesses, with a special focus on chronic illnesses.

**PSYC7221**

**Experimental Clinical Psychology 2**

*Staff Contact: A/Prof R Bryant and Dr J Henry*

UC06 HPW4 WKS14 S2

A continuation of the problem-oriented approach begun in PSYC7212 and deals with a range of psychological problems, including schizophrenia, personality disorders, eating disorders, psychopharmacology, and other clinical dysfunctions. This course continues the integration of theoretical models of each disorder with applied descriptions of assessment and treatment procedures.

**PSYC7222**

**Experimental Clinical Psychology 3**

*Staff Contact: A/Prof R Bryant and Dr J Henry*

UC06 HPW2 WKS14 S1

The assessment and management of a range of disorders including schizophrenia, post-traumatic stress disorders, and dissociative disorders.

**PSYC7223**

**Professional and Ethical Practice (Clinical) 1**

*Staff Contact: A/Prof R Bryant and Dr J Henry*

UC06 WKS14 S1

This course focuses on practical training of clinical skills and thorough understanding of ethical principles and practices within professional settings. Attendance at 4 one-day workshops and once-weekly meetings is required. Skills training includes interviewing families, group processes, professional supervision, and report writing. Weekly meetings will also deal with the conduct of professional psychologists, with a strong focus on the maintenance of ethical practices.

**PSYC7225**

**Professional and Ethical Practice (Clinical) 3**

*Staff Contact: A/Prof R Bryant and Dr J Henry*

UC06 WKS14 S1

*Prerequisite/s: PSYC7223 and PSYC7224*

Across PSYC7225 and PSYC7226 students must complete three field placements, totalling 800 hours. These will normally comprise one adult mental health setting, one child setting, and one specialised setting. In addition, students will complete supervised clinical work in the Psychology Clinic. Students will also attend once-weekly meetings that will continue reviews of professional and ethical issues.

**PSYC7226**

**Professional and Ethical Practice (Clinical) 4**

*Staff Contact: A/Prof R Bryant and Dr J Henry*

UC06 WKS14 S2

*Prerequisite/s: PSYC7223 and PSYC7224*

*Note/s: See under PSYC7225*

In addition to field placements students will also attend once-weekly meetings that will continue reviews of professional and ethical issues.

**PSYC7227**

**Research Thesis (Clinical) 1**

*Staff Contact: A/Prof R Bryant*

UC06 WKS14 S1 or S2

Research thesis involving an investigation into some aspect of clinical psychology.

**PSYC7228**

**Research Thesis (Clinical) 2**

*Staff Contact: A/Prof R Bryant*

UC06 WKS14 S1 or S2

*Prerequisite/s: PSYC7227*

Research thesis involving an investigation into some aspect of clinical psychology.

**PSYC7400**

**An Overview of Forensic Psychology**

*Staff Contact: A/Prof R Bryant*

UC06 HPW2 WKS14 S1

Forensic psychology is the application of psychological concepts, skills and methods within the legal system. This course seeks to provide an introduction to a number of important forensic issues, with a particular emphasis on matters which affect children, adolescents, and families. Among the topics to be addressed will be risk factors for juvenile offending, the abuse of children and people with developmental disabilities, children as witnesses, the effect of divorce on children, and youth suicide. Cultural factors relevant to the consideration of these forensic questions will also be discussed.

**PSYC7401**

**Intervention in Forensic Psychology**

*Staff Contact: Dr K Saimon*

UC06 HPW2 WKS14 S2

An examination of the approaches to intervention employed by psychologists in various forensic settings. It will focus specifically on the theory and practice of interviewing and counselling forensic clients. Areas to be covered will include: the assessment, treatment and prevention of child maltreatment; interviewing child witnesses; specific issues in interventions with crime victims; dealing with spousal violence; counselling and mediation in the Family Court; the prevention of juvenile offending; and the interventions involving violent offenders.
PSYC7402
Applications of Forensic Psychology
Staff Contact: Dr A Williamson
UOC6 HPW2 WKS14 S1

The relationship between work and the legal system. It includes issues relating to work and work organisation, such as equal employment opportunity, unfair dismissal, stress in the workplace, and issues relating to workers compensation such as the assessment of the effects of harmful workplace exposures on performance, the effects of work injury on worker performance and the effects of the compensation system itself. It also includes issues relating to testimony in social and experimental psychology and allied fields. Topics may include eyewitness identification, jury selection, lie detection, use of hypnosis, trial advocacy tactics, individual and jury decision making, laypersons perceptions of insanity, judges instructions, the effects of the media, to name a few.

PSYC7403
Experimental Psychology and Law
Staff Contact: Dr K Williams
UOC6 HPW2 WKS14 S2

Examination of contributions to the application of forensic psychology in different settings that come from theory and research in social and experimental psychology and allied fields. Topics may include eyewitness identification, jury selection, lie detection, use of hypnosis, trial advocacy tactics, individual and jury decision making, laypersons perceptions of insanity, judges instructions, the effects of the media, to name a few.

PSYC7409
Professional and Ethical Practice (Forensic) 1
Staff Contact: A/Prof R Bryant
UOC6 WKS14 S1

This course provides an introduction to skills training in a variety of tasks undertaken by forensic psychologists. It focuses on practical training of forensic skills and a thorough understanding of ethical principles and practices within professional settings. Attendance at 4 one-day workshops and once-monthly meetings is required. Skills training includes interviewing, cognitive techniques, providing expert testimony, and interviewing children. There will be a strong focus on the code of professional conduct, and ethical issues that arise in the context of working with individuals, cultural groups, organisations, other professionals and the public at large.

PSYC7410
Professional and Ethical Practice (Forensic) 2
Staff Contact: Dr K Williams
UOC6 WKS14 S2

This course continues with the training of psychological skills and ethical practices required in the professional context. Attendance at 4 one-day workshops and once-monthly meetings is required. Skills training includes interviewing families, group and jury processes, professional supervision, and mediation counselling. Weekly meetings will also deal with the conduct of professional psychologists, with a strong focus on the maintenance of ethical practices.

PSYC7411
Professional and Ethical Practice (Forensic) 3
Staff Contact: Dr K Williams
UOC6 WKS14 S1
Prerequisite/s: PSYC7409 and PSYC7410

Across PSYC7411 and PSYC7412 students must complete three field placements, totalling 800 hours. These will normally comprise placements of approximately 35 days in settings that may include the courts, police, prisons, or other related forensic settings. Students will also attend once-monthly meetings that will continue reviews of professional ethical issues. Assessment will be conducted by audio and videotaped practice, case presentations, and formal reports.

PSYC7412
Professional and Ethical Practice (Forensic) 4
Staff Contact: A/Prof R Bryant
UOC6 WKS14 S2
Prerequisite/s: PSYC7409 and PSYC7410
Note/s: See under PSYC7411

In addition to field placements, students will also attend once-monthly meetings that will continue reviews of professional and ethical issues. Assessment will be conducted by audio and videotaped practice, case presentation, and formal reports.

PSYC7413
Research Thesis (Forensic) 1
Staff Contact: A/Prof R Bryant
UOC12 WKS14 S1 or S2

Research thesis involving an investigation into some aspect of forensic psychology.

PSYC7414
Research Thesis (Forensic) 1
Staff Contact: A/Prof R Bryant
UOC12 WKS14 S1 or S2
Prerequisite/s: PSYC7413

Research thesis involving an investigation into some aspect of forensic psychology.

LAWS9800
Law for Psychologists 1
Staff Contact: Ms P Vines
UOC6 HPW2 S1

This course will provide an introduction to certain aspects of law relevant to forensic psychologists. Topics to be covered will include an overview of the Australian legal system, a range of issues arising in the fields of criminal law and procedure, and the laws of evidence.

LAWS9810
Law for Psychologists 2
Staff Contact: A/Prof S Egger
UOC6 HPW2 S2
Prerequisite: LAWS9800

This course will consider legal issues for forensic psychologists. Topics to be covered will include relevant areas of family law, children and the law, and tort law.

Safety Science

SESC6010
Descriptive Statistics
Staff Contact: School Office
UOC3 HPW3 WKS7 S1

Note/s: May not be taken as part of 48 UOC Masters program

Introduction to the theory of statistics and to statistical techniques for describing data. Topics include measures of central tendency and dispersion, probability and probability distribution, correlation and regression.

SESC6110
Physical Principles of Safety 1
Staff Contact: Prof Jean Cross
UOC3 HPW3 WKS7 S1

Note/s: May not be taken as part of 48 UOC Masters program

This course introduces the principles of statics and dynamics as it applies to safety and ergonomic issues. Topics include materials handling, equilibrium and balance, biomechanics, and linear motion.

SESC6120
Physical Principles of Safety 2
Staff Contact: Prof Jean Cross
UOC3 HPW3 WKS7 S2
Prerequisite/s: Assumed knowledge: SESC6101

Note/s: May not be taken as part of 48 UOC Masters program

This course builds on SESC6110 and aims to give students the confidence and vocabulary to understand an engineers report in safety issues and to understand technical standards and codes of practice. Topics include collisions and impacts, fluids ventilation, rotation, vibration and friction.
SESC610
Work and Safety
Staff Contact: Dr Boban Markovic
UOC3 HPW2 WKS14 S1 and S2
Note/s: Also offered off-campus via web mode. May not be taken as part of 48 UOC Masters program.
This is an introductory course that covers the fundamental safety science principles. It is aimed at giving future managers the skills needed to identify and deal with safety issues in the workplace. The course concentrates on identification of workplace hazards, their associated risks to health and how they can be controlled.

SESC600
Fundamentals of Toxicology
Staff Contact: Assoc Prof Chris Winder
UOC3 HPW3 WKS57 S2
Note/s: Also offered in off-campus mode in either session. May not be taken as part of 48 UOC Masters program.
Introduction to chemical, biochemical, toxicological, and cellular principles.

SESC9010
Research Methods
Staff Contact: Ms Dianne Gardner
UOC3 HPW3 WKS57 S1
Assumed Knowledge: Basic Statistics
Note/s: Also offered in off-campus mode in either session.
This course covers issues in research methodology including research problem formulation, null and alternative hypotheses, qualitative and quantitative research designs, statistical inference and the analysis of quantitative data. Students will be expected to be able to recognise and avoid common methodological problems in research. The course will not provide a detailed coverage of statistical theory but a basic understanding of statistics is required.

SESC9020
Occupational Health and Safety Law 1
Staff Contact: Prof Adrian Brooks
UOC3 HPW2 WKS57 S2
Note/s: Also offered in off-campus mode in either session.
This course covers concepts of law: the judicial and court systems; common law and equity; the common law of employment, occupational health and safety legislation.

SESC9030
Occupational Health and Safety Law 2
Staff Contact: Prof Adrian Brooks
UOC3 HPW2 WKS57 S2
Assumed Knowledge: Core subjects
This course extends concepts of law introduced in SESC9010, and covers other workplace legislation and procedures, such as workers compensation and rehabilitation legislation; cases and actions under common law.

SESC9091
Safety, Health and Environmental Practice
Staff Contact: Dr Boban Markovic
UOC6 HPW6 WKS14 S2
Assumed Knowledge: SESC6120
A workplace assessment based course, where students are required to report on the safety, health or environmental issues following visits to a number of diverse industrial sites.

SESC9100
Physical Hazards
Staff Contact: Dr Tony Green
UOC3 HPW3 WKS57 S2
Assumed Knowledge: Core subjects
Note/s: Also offered in off-campus mode in either session.

SESC9121
Fire and Explosion
Staff Contact: Dr Tony Green
UOC6 S2
Note/s: Short Course Mode.
This course introduces the students to the principles of combustion in fire and explosion processes. The first section deals with the control of industrial fires (liquids and gases). The second section deals with the control of building fires and the third section deals with explosion prevention and control.

SESC9130
Noise Management
Staff Contact: School Office
UOC3 S2
Assumed Knowledge: SESC9100 and SESC9600
Note/s: Short Course Mode

SESC9140
Radiation Protection
Staff Contact: Dr Ronald Rosen
UOC3 HPW2 WKS57 S1
Principles and practices of radiation protection for both ionising and non-ionising radiation. Radiation physics, detection and measurement; background radiation, biological effects of radiation; dose limits; technical controls for radioactive sources and radiating apparatus. Codes of safe practice; radiological monitoring and personal dosimetry; storage, transport and disposal of sources; environmental impact; administrative controls; emergency procedures; control of non-ionising radiation.

SESC9150
Electrical Safety
Staff Contact: Prof Jean Cross
UOC3 S1
Note/s: Off-campus mode only
Regulations and codes of safe practice relating to electricity. Identification assessment and control of electrical hazards including electrocution, electrical fires, static electricity, electrical wiring in hazardous areas, the effect of electric and magnetic fields, safety related systems.

SESC9160
Plant and Construction Safety
Staff Contact: School Office
UOC3 HPW2.5 WKS7 S1
This course examines current issues and problems in ensuring the occupational safety and health of workers in building, construction and manufacturing industry. Topics include OHS Act, legal responsibilities, implications of changes in legislation to building and construction safety, contractual relationship with subcontractors, risk assessment and control strategies, positive performance indicators, safeguarding of plant, systems safety management, audit reviews, hazards in building and construction work, human behaviour and occupational safety and incident investigation. Best practice initiatives in the construction sector.

SESC9170
Traffic Safety
Staff Contact: Dr Andrew McIntosh
Note/s: Not offered in 2000.
This course aims to provide students with an introduction to nature and scope of road safety and provide an understanding of the interdisciplinary and integrated approaches required to implement improvements in roads and traffic safety. Subject areas include identification of road safety problems, strategic planning, road environment safety, ergonomics, signals, signs, lighting, road user safety, knowledge attitudes, compliance and practices, vehicle and equipment safety, road safety schooling education, road safety campaigns and program evaluation.
SESC9200
Hazard and Risk Assessment
Staff Contact: Prof Jean Cross
UOC3 HPW3 WKS7 S2
Note/s: Also offered in off-campus mode in either session
Principles of risk management and systems safety, hazard identification, risk assessment, accident models, accident reporting, auditing. Each topic will be illustrated by practical examples and case studies.

SESC9211
Risk Management
Staff Contact: Prof Jean Cross
UOC6 HPW3 WKS14 S1
This course gives an overview of Risk Management following the format of the Australian Standard in Risk Management (AS4360). Tools and techniques applicable to each step of the risk management process are discussed using examples application to the class. The same risk management process is applied to manage a wide range of business issues including health and safety, the environment, finance and project management. This subject is therefore relevant as part of a wide variety of postgraduate courses and students from any postgraduate course are accepted if numbers permit. The student selects examples for exercises to suit the industry and role in which they work (or intend to work). At the end of the subject, students should be able to use risk management tools applicable to their specific interest and have an awareness of tools used in other industries.

SESC9221
Major Hazards Management
Staff Contact: Dr Tony Green
UOC6 HPW3 WKS14 S1
This course discusses the management of major hazardous facilities. Australian and overseas legislation is discussed, together with the preparation of safety cases, environmental impact statements and emergency planning. Analysis techniques that are required for these assessments will be discussed including how to quantify likelihood and the consequences through the use of modelling. Finally, the requirements for emergency plans are discussed.

SESC9231
Risk Analysis
Staff Contact: Prof Jean Cross
UOC6 HPW3 WKS14 S2
This course introduces methods used to analyse risk in different disciplines. Techniques covered include Fault Tree analysis and quantification, Trend analysis, Monte Carlo and other computer modelling techniques, use of risk analysis software. The methods are applied to examples which include decision making in financial, environmental and safety management. In addition, students undertake a case study selecting areas of risk of their choice.

SESC9300
Effective Behaviour in Organisations
Staff Contact: Ms Dianne Gardner
UOC3 HPW3 WKS7 S1
Note/s: Also offered in off-campus mode in either session
This course examines issues of human behaviour as a major system factor in occupational health and safety. Topics include attitudes and motivation, decision making, leadership and group dynamics, selection, training and communication.

SESC9310
Issues In Safety Management
Staff Contact: Ms Dianne Gardner
UOC3 HPW3 WKS7 S2
This course covers a range of issues in the management of risks in industry. Topics include cost benefit analysis of safety; rehabilitation and workers compensation, enterprise agreements, industrial relations and stress in the workplace.

SESC9320
Effective Management
Staff Contact: Ms Dianne Gardner
UOC3 HPW3 WKS7 S1
This course examines processes required for effective management. Topics include management systems and standards, planning, change management, measuring organisational performance, best practice and benchmarking and the management of conflict.

SESC9330
Technology Management
Staff Contact: Ms Dianne Gardner
UOC3 HPW3 WKS14 S2
This course covers a range of issues in the management of technology. Topics include legal responsibilities of managers, industrial relations, project management, management of contracts and the management of technological change.

SESC9340
Occupational Health and Safety Management Systems
Auditing
Staff Contact: Ms Dianne Gardner
UOC3 X1 or X2
Note/s: Short course mode
This course outlines the requirements of an effective OHS management system, and how such systems may be audited.

SESC9400
Ergonomics 1
Staff Contact: Dr Andrew McIntosh
UOC3 HPW3 WKS7 S1
Assumed Knowledge: SESC9400
This course follows on from SESC9400 Ergonomics 1, and covers displays & controls, design of human-machine-environment systems, job design and work organisation, design of workplaces, the physical environment and an introduction to product design.

SESC9410
Ergonomics 2
Staff Contact: Dr Andrew McIntosh
UOC3 HPW3 WKS7 S1
Assumed Knowledge: SESC9400
This course will focus on the application of ergonomics principles to real world problems and the difficulties involved. It requires a knowledge of the principles of ergonomics and will provide in-depth knowledge and skills in ergonomics research methodology - analysing the exact nature and extent of the problem, and evaluating the outcome of solutions to the problem. Topics include ergonomics
methodologies, analysis techniques, benefit-cost & practical case studies, mock trial, professional ethics, and participatory ergonomics.

SESC9431
Physical Ergonomics
Staff Contact: Dr Kamal Kothiyal
UOCS S2
Assumed Knowledge: SESC9410 or SESC9411 or equivalent

Notes: Off-campus Mode plus a 2-3 day workshop during S2
This course discusses various analytical tools and techniques used by ergonomists to assess or solve practical, physical ergonomics problems. It requires a knowledge of the principles of ergonomics and will provide in-depth knowledge and skills in assessing the physical ergonomics aspects of work systems. Topics include anthropometry, biomechanical models, electromyography, manual handling jobs with multiple tasks and work physiology. Students will gain hands-on experience with relevant equipment and software such as Mannequin, 2D and 3D SSP Programs, Energy Expenditure Program, and the revised NIOSH 1991 equation.

SESC9441
Ergonomics and New Technology
Staff Contact: Mr Roger Hall
UOCS HPW3 WKS14 S1
Assumed Knowledge: SESC9410 or SESC9411 or equivalent

The course will focus on the ergonomics issues related to the design and implementation of new technology. It assumes a knowledge of the principles of ergonomics and in particular it will look at cognitive aspects of human-computer interaction, human error and software design, usability and its assessment, user interface design, evaluation techniques, guidelines and standards, and the introduction of new systems into organisations.

SESC9451
Experimental Biomechanics
Staff Contact: Dr Andrew McIntosh
UOCS HPW3 WKS14 S1
This course commences with lectures on experimental methods, instrumental analysis methods. The student then undertakes a series of experiments by motion analysis, EMG, exercise tests and impact testing.

SESC9460
Biomechanics of Impact Injury
Staff Contact: Dr Andrew McIntosh
UOCS S2
Assumed Knowledge: SESC6110, SESC6120

Notes: Short Course Mode
Impact injury occurs in the workplace, on the sports field, during recreation, and in traffic accidents. The course will cover mechanisms of trauma, research methods, human tolerance to impact and methods for reducing injury. The course will bring together biomechanics, engineering and traumatology.

SESC9471
Industrial Ergonomics
Staff Contact: Dr Kamal Kothiyal
UOCS HPW3 WKS14 S2
Assumed Knowledge: For students with an engineering background

This course discusses the principles of ergonomics and their application to engineering systems. Topics include Introduction to ergonomics, works systems design and evaluation, neuromuscular function, perceptual motor skills, biomechanics of human body movement, work physiology, anthropometry and workplace design, human information processing, human error and design, job design and work organisation, psychophysical measurements, manual materials handling, visual tasks measurements and design, environmental ergonomics, work schedules and sustained human performance (shift work), participatory ergonomics, ergonomics in manufacturing, ergonomics cost/benefits analysis.

SESC9511
Occupational Hygiene
Staff Contact: School Office
UOCS HPW3 WKS14 S1
Assumed Knowledge: SESC9100, SESC9600

This course deals with practical considerations of recognising, evaluating and controlling workplace hazards. Topics include the role of the occupational hygienist; types of workplace hazards such as particulates, gases and vapours, chemicals, noise, radiation, temperature, biohazards; workplace assessment and monitoring; and methods for the control of hazards (such as ventilation and personal protection).

SESC9520
Ventilation
Staff Contact: School Office
Assumed Knowledge: SESC9600, SESC9511
Notes: Not offered in 2000.

SESC9530
Personal Protective Equipment
Staff Contact: Assoc Prof Chris Winder
UOCS S2
Notes: Short Course Mode
This course provides an introduction to personal protective equipment. Protection for head, eyes, hearing, skin, respiration, feet and protection against failing. Relevant standards for personal protection. Personal protection programs.

SESC9541
Assessment of the Workplace Environment
Staff Contact: Dr Kamal Kothiyal
UOCS HPW3 WKS14 S2
Assumed Knowledge: Core subjects

This is an experimental and workplace based course where students will be required to assess ergonomics, physical and chemical hazards encountered in the occupational environment. Students will design and carry out a number of practical measurement programs to assess and report on workplace environmental parameters. Topics include measurement and analysis of noise, lighting, vibration, ventilation, air quality, thermal environment, radiation and magnetic fields, assessment of chemical hazards, and floor slip resistance characteristics.

SESC9600
Introduction to Occupational Health
Staff Contact: Assoc Prof Chris Winder
UOCS HPW3 WKS7 S1
Notes: Also offered in off-campus mode in either session
Introduction to occupational health, including workplace hazards and risks, approaches to workplace safety, occupational health and safety legislation, management of workplace safety, the hierarchy of controls, occupational epidemiology and occupational rehabilitation.

SESC9620
Occupational Diseases and Injuries
Staff Contact: Assoc Prof Chris Winder
UOCS HPW3 WKS7 S1
Assumed Knowledge: ANA^6^5^

This course deals with the ways in which work can affect the health of workers. Covers occupational diseases and injuries of skin, respiratory system, nervous system, reproductive system, the musculoskeletal system and occupational cancer.
SESC9631
Occupational Medicine
Staff Contact: Head of School
UOC6 HPW3 WKS14 S1
Assumed Knowledge: SESC9600
Note/s: Only available to medical practitioners
This course deals with the role of the occupational physician in practice and research. This includes health promotion, health screening, medical surveillance and biological monitoring.

SESC9640
Occupational Epidemiology
Staff Contact: Head of School
UOC3 HPW3 WK57 S2
Assumed Knowledge: SESC9600
This course provides an introduction to epidemiology of the workplace. The course covers concepts of epidemiology, including relative risk, odds ratio, confidence limits, confounding, bias, types of epidemiological studies and their design. Interpretation of the results of epidemiology subjects. A significant feature of the course is the study of case studies in various occupational health and safety areas.

SESC9651
Occupational Rehabilitation
Staff Contact: Dr Andrew McIntosh
UOC6 HPW2.5 WK57 S2
Note/s: Medical or allied health background desirable. This course provides a scientific basis upon which to base rehabilitation. The main focus will be on examining methods in physical rehabilitation. Other issues, for example relating to case management, will be covered briefly. Concepts and practice from areas such as exercise physiology, training/conditioning, biomechanics, medicine, physiotherapy and occupational therapy will be covered in the context of the rehabilitation.

SESC9711
Environmental Planning and Assessment
Staff Contact: Dr Boban Markovic
UOC6 HPW2.5 WK57 S1
This course is a core element for the Graduate Diploma and Masters of Environmental Sciences courses and provides the conceptual framework for understanding interactions between humans, nature, philosophy, law, politics, ethics and decision making and how this is related to environmental planning and assessment.

SESC9721
Environment and Medicine
Staff Contact: Dr John Frith
UOC6 HPW2.5 WK57 S1
Note/s: Also offered in off-campus mode
Aspects of medicine bearing upon physiological consequences of pollutants. Metabolic mechanisms; chemical interactions, synergism and antagonism; photosynthesis and phytotoxicity. Ozone depletion and greenhouse effects. Morbidity and mortality surveys. Studies of particular pollutants and environmental contaminants.

SESC9731
Environment and Law
Staff Contact: School Office
UOC6 HPW3 WK57 S2
Note/s: Short course mode
Resources in law for the preservation of the environment. Types of legislation local government, town planning, environmental and common law; administrative infrastructure, problems and actions. The North American experience. Economic and sociological factors.

SESC9741
Environmental Management Systems
Staff Contact: Dr Boban Markovic
UOC6 S2
Note/s: Short course mode
This course is designed to define the central role of management strategies for environmental issues. It describes the development of different approaches to fulfill the demands of the environment while considering not only the current legislative requirements but also customer requirements, competitive pressure and safety aspects of the firms respectively. A short course. Lecture materials are delivered as a short course.

SESC9810
Introduction to Toxicology
Staff Contact: Assoc Prof Chris Winder
UOC6 HPW3 WK57 S2
Note/s: Also offered in off-campus mode in either session
This course provides an introduction to toxic hazards, including chemicals and biohazards. Effects of exposure to toxic hazards. Legislation and standards for the identification and control of toxic hazards.

SESC9820
Chemical Safety and Toxicology
Staff Contact: Assoc Prof Chris Winder
UOC3 HPW3 WK57 S1
This course provides an outline of the toxicological, occupational hygiene and environmental aspects of chemical hazards and exposures. Metals, solvents, toxic and irritant gases, pesticides, carcinogens, hazardous wastes and dioxins are used as case studies.

SESC9850
Management of Dangerous Materials
Staff Contact: A/Prof Chris Winder
UOC6 HPW3 WK57 S1 or S2
Chemicals legislation, regulatory assessment of chemicals, the dangerous goods system, the hazardous substances regulation and systems for hazardous wastes.

SESC9860
Applied Laboratory Safety
Staff Contact: A/Prof Chris Winder
UOC3 WK57 S2
Note/s: Not offered in 2000
Identification of hazards found in laboratories (chemicals, radiation, biohazards, physical hazards), the ways in which they can be controlled, and development of management systems for laboratory safety.

SESC9871
Toxicological and Environmental Laboratory Science
Staff Contact: Dr Boban Markovic
UOC6 HPW3 WK57 S1 or S2
Assumed Knowledge: SESC9820
A laboratory based course which provides basic requirements of laboratory based research, especially in chemical safety and applied toxicology. The course covers literature review, methodology, experimental design, data collection and analysis, discussion and presentation skills, through undertaking a research project.

SESC9900
Project Methods
Staff Contact: Ms Dianne Gardiner
UOC3 HPW3 WK57 S1
Prerequisite/s: Assumed Knowledge: SESC9010
Note/s: Also offered in off-campus mode in either session
This course covers the development of a research project including the research proposal, research design and data analysis and the writing of the research report. Students will be expected to be able to recognise and avoid common methodological problems in research.

SESC9903
Report
Staff Contact: Course Coordinator
UOC3 S1 or S2
A 3 units of credit report on a topic relevant to the program of study.
SESC9906
Special Report
Staff Contact: Course coordinator
UOC6  S1 or S2
A 6 units of credit report on a topic relevant to the program of study.

SESC9912
Project
Staff Contact: Dr Andrew McIntosh
UOC12  S1 or S2
Assumed Knowledge: SESC9900
A 12 units of credit project relevant to the program of study. Students will be required to undertake an investigative project with supervision and to present a satisfactory report.

SESC9918
Project
Staff Contact: Dr Andrew McIntosh
UOC18  S1 or S2
Assumed Knowledge: SESC9900
An 18 units of credit project relevant to the program of study. Students will be required to undertake an investigative project with supervision and to present a satisfactory report (only for students in 1.5 or 2 year masters programs).

SESC9924
Project
Staff Contact: Dr Andrew McIntosh
UOC24  S1 or S2
Assumed Knowledge: SESC9900
A 24 units of credit project relevant to the program of study. Students will be required to undertake an investigative project with supervision and to present a satisfactory report (only for students in 1.5 or 2 year masters programs in exceptional circumstances).
Conditions for the Award of Degrees

First Degrees

Rules, regulations and conditions for the award of first degrees are set out in the appropriate Faculty Handbooks. For the list of undergraduate programs and degrees offered see Table of Programs by Faculty (Undergraduate Study) in the Calendar.

Higher Degrees

For the list of postgraduate degrees by research and course work, arranged in faculty order, see UNSW Programs (by faculty) in the Calendar. The conditions for the award of postgraduate degrees, diplomas and certificates appear in the relevant Faculty Handbook.

Doctor of Philosophy (PhD)

1. The degree of Doctor of Philosophy may be awarded by the Council on the recommendation of the Higher Degree Committee of the appropriate faculty or board (hereinafter referred to as the Committee) to a candidate who has made an original and significant contribution to knowledge.

Qualifications

2. (1) A candidate for the degree shall have been awarded an appropriate degree of Bachelor with Honours from the University of New South Wales or a qualification considered equivalent from another university or tertiary institution at a level acceptable to the Committee.

(2) In exceptional cases an applicant who submits evidence of such other academic and professional qualifications as may be approved by the Committee may be permitted to enrol for the degree.

(3) If the Committee is not satisfied with the qualifications submitted by an applicant the Committee may require the applicant to undergo such assessment or carry out such work as the Committee may prescribe, before permitting enrolment as a candidate for the degree.

Enrolment

3. (1) An application to enrol as a candidate for the degree shall be lodged with the Registrar at least one month prior to the date at which enrolment is to begin.

(2) In every case before making the offer of a place the Committee shall be satisfied that initial agreement has been reached between the School* and the applicant on the topic area, supervision arrangements, provision of adequate facilities and any coursework to be prescribed and that these are in accordance with the provisions of the guidelines for promoting postgraduate study within the University.

(3) The candidate shall be enrolled either as a full-time or a part-time student.

(4) A full-time candidate will present the thesis for examination no earlier than three years and no later than five years from the date of enrolment and a part-time candidate will present the thesis for examination no earlier than four years and no later than six years from the date of enrolment, except with the approval of the Committee.

(5) The candidate may undertake the research as an internal student i.e. at a campus, teaching hospital, or other research facility with which the University is associated, or as an external student not in attendance at the University except for periods as may be prescribed by the Committee.

(6) An internal candidate will normally carry out the research on a campus or at a teaching or research facility of the University except that the Committee may permit a candidate to spend a period in the field, within another institution or elsewhere away from the University provided that the work can be supervised in a manner satisfactory to the Committee. In such instances the Committee shall be satisfied that the location and period of time away from the University are necessary to the research program.
(7) The research shall be supervised by a supervisor and where possible a co-supervisor who are members of the academic staff of the School or under other appropriate supervision arrangements approved by the Committee. Normally an external candidate within another organisation or institution will have a co-supervisor at that institution.

Progression

4. The progress of the candidate shall be considered by the Committee following report from the School in accordance with the procedures established within the School and previously noted by the Committee.

(i) The research proposal will be reviewed as soon as feasible after enrolment. For a full-time student this will normally be during the first year of study, or immediately following a period of prescribed coursework. This review will focus on the viability of the research proposal.

(ii) Progress in the course will be reviewed within twelve months of the first review. As a result of either review the Committee may cancel enrolment or take such other action as it considers appropriate. Thereafter, the progress of the candidate will be reviewed annually.

Thesis

5. (1) On completing the program of study a candidate shall submit a thesis embodying the results of the investigation.

(2) The candidate shall give in writing to the Registrar two months notice of intention to submit the thesis.

(3) The thesis shall comply with the following requirements:

(a) it must be an original and significant contribution to knowledge of the subject;

(b) the greater proportion of the work described must have been completed subsequent to enrolment for the degree;

(c) it must be written in English except that a candidate in the Faculty of Arts and Social Sciences may be required by the Committee to write a thesis in an appropriate foreign language;

(d) it must reach a satisfactory standard of expression and presentation;

(e) it must consist of an account of the candidate's own research but in special cases work done conjointly with other persons may be accepted provided the Committee is satisfied about the extent of the candidate's part in the joint research.

(4) The candidate may not submit as the main content of the thesis any work or material which has previously been submitted for a university degree or other similar award but may submit any work previously published whether or not such work is related to the thesis.

(5) Four copies of the thesis shall be presented in a form which complies with the requirements of the University for the preparation and submission of theses for higher degrees.

(6) It shall be understood that the University retains the four copies of the thesis submitted for examination and is free to allow the thesis to be consulted or borrowed. Subject to the provisions of the Copyright Act, 1968, the University may issue the thesis in whole or in part, in photostat or microfilm or other copying medium.

Examination

6. (1) There shall be not fewer than three examiners of the thesis, appointed by the Committee, at least two of whom shall be external to the University.

(2) At the conclusion of the examination each examiner shall submit to the Committee a concise report on the thesis and shall recommend to the Committee that one of the following:

(a) The thesis merits the award of the degree.

(b) The thesis merits the award of the degree subject to minor corrections as listed being made to the satisfaction of the head of school.

(c) The thesis requires further work on matters detailed in my report. Should performance in this further work be to the satisfaction of the higher degree Committee, the thesis would merit the award of the degree.

(d) The thesis does not merit the award of the degree in its present form and further work as described in my report is required. The revised thesis should be subject to re-examination.

(e) The thesis does not merit the award of the degree and does not demonstrate that resubmission would be likely to achieve that merit.

(3) If the performance in the further work recommended under (2)(c) above is not to the satisfaction of the Committee, the Committee may permit the candidate to submit the thesis for re-examination as determined by the Committee within a period determined by it but not exceeding eighteen months.

(4) After consideration of the examiners' reports and the results of any further examination of the thesis, the Committee may require the candidate to submit to written or oral examination before recommending whether or not the candidate be awarded the degree. If it is decided that the candidate be not awarded the degree, the Committee shall determine whether or not the candidate be permitted to resubmit the thesis after a further period of study and/or research.

Fees

7. A candidate shall pay such fees as may be determined from time to time by the Council.

"School is used here and elsewhere in these conditions to mean any teaching unit authorised to enrol research students and includes a department where that department is not within a school, a centre given by the Academic Board to enrol students, and an interdisciplinary unit within a faculty and under the control of the Dean of the Faculty. Enrolment is permitted in more than one such teaching unit."
CONDITIONS FOR THE AWARD OF HIGHER DEGREES

1. The combined degrees of Doctor of Philosophy/Master of Psychology (Clinical), Doctor of Philosophy/Master of Psychology (Forensic) and Doctor of Philosophy/Master of Psychology (Organisational) by thesis and formal coursework may be awarded by the Council on the recommendation of the Higher Degree Committee of the Faculty of Life Sciences (hereinafter referred to as the Committee) to a candidate who has made an original and significant contribution to knowledge, and who has satisfactorily completed a program of advanced study.

Qualifications

2. (1) A candidate for the combined degrees shall have been awarded an appropriate degree of Bachelor with Honours Class 1 in Psychology from the University of New South Wales or a qualification considered equivalent from another university or tertiary institution at a level acceptable to the Committee.

(2) In exceptional cases an applicant who submits evidence of such other academic and professional qualifications as may be approved by the Committee may be permitted to enrol for the combined degrees.

(3) If the Committee is not satisfied with the qualifications submitted by an applicant the Committee may require the applicant to undergo such assessment or carry out such work as the Committee may prescribe, before permitting enrolment as a candidate for the combined degrees.

Enrolment

3. (1) An application to enrol as a candidate for the combined degrees shall be made on the prescribed form which shall be lodged with the Registrar at least one month before the commencement of session in which enrolment is to begin.

(2) In every case before making the offer of a place the Committee shall be satisfied that initial agreement has been reached between the School and the applicant on the PhD topic area, supervision arrangements, provision of adequate facilities and coursework and that these are in accordance with the provisions of the guidelines for promoting postgraduate study within the University.

(3) The candidate shall be enrolled as a full-time student only.

(4) The candidate will present the PhD thesis for examination no earlier than three years and no later than five years from the date of enrolment, except with the approval of the Committee.

(5) A candidate for the award of the degree of Doctor of Philosophy as part of a combined program shall not be eligible to be awarded that degree until they have completed the additional requirements applicable to the other degree in such combined program.

(6) The candidate shall undertake the PhD research only as an internal student i.e. at a campus, teaching hospital, or other research facility with which the University is associated.

(7) The candidate will normally carry out the PhD research on a campus or at a teaching or research facility of the University except that the Committee may permit a candidate to spend a period in the field, within another institution or elsewhere away from the University provided that the work can be supervised in a manner satisfactory to the Committee. In such instances the Committee shall be satisfied that the location and period of time away from the University are necessary to the research program.

(8) The PhD research shall be supervised by a supervisor and where possible a co-supervisor who are members of the academic staff of the School or under other appropriate supervision arrangements approved by the Committee.

(9) A candidate for the combined degrees shall be required to undertake such formal courses and pass such assessment as prescribed. The order in which the formal courses are taken must be approved by the School of Psychology.

Progression

4. The progress of the candidate shall be considered by the Committee following report from the School in accordance with the procedures established within the School and previously noted by the Committee.

(i) The research proposal will be reviewed as soon as feasible after enrolment. This will be during the first year of study. This review will focus on the viability of the research proposal.

(ii) Progress in the combined program will be reviewed within twelve months of the first review. As a result of either review the Committee may cancel enrolment or take such other action as it considers appropriate. Thereafter, the progress of the candidate will be reviewed annually.

PhD Thesis

5. (1) On completing the program of study a candidate shall submit a thesis embodying the results of the investigation.

(2) The candidate shall give in writing to the Registrar two months notice of intention to submit the thesis.

(3) The thesis shall comply with the following requirements:

(a) it must be an original and significant contribution to knowledge of the course;

(b) the greater proportion of the work described must have been completed subsequent to enrolment for the degree;
(c) it must be written in English;
(d) it must reach a satisfactory standard of expression and presentation;
(e) it must consist of an account of the candidate's own research but in special cases work done conjointly
with other persons may be accepted provided the Committee is satisfied about the extent of the candidate's
part in the joint research.

(4) The candidate may not submit as the main content of the thesis any work or material which has previously
been submitted for a university degree or other similar award but may submit any work previously published
whether or not such work is related to the thesis.

(5) Four copies of the thesis shall be presented in a form which complies with the requirements of the University
for the preparation and submission of theses for higher degrees.

(6) It shall be understood that the University retains the four copies of the thesis submitted for examination and
is free to allow the thesis to be consulted or borrowed. Course to the provisions of the Copyright Act, 1968, the
University may issue the thesis in whole or in part, in photostat or microfilm or other copying medium.

PhD Examination
6. (1) There shall be not fewer than three examiners of the thesis, appointed by the Committee, at least two of
whom shall be external to the University.

(2) At the conclusion of the examination each examiner shall submit to the Committee a concise report on the
thesis and shall recommend to the Committee that one of the following:
(a) The thesis merits the award of the degree.
(b) The thesis merits the award of the degree course to minor corrections as listed being made to the
satisfaction of the head of school.
(c) The thesis requires further work on matters detailed in my report. Should performance in this further
work be to the satisfaction of the higher degree Committee, the thesis would merit the award of the degree.
(d) The thesis does not merit the award of the degree in its present form and further work as described in
my report is required. The revised thesis should be course to re-examination.
(e) The thesis does not merit the award of the degree and does not demonstrate that resubmission would
be likely to achieve that merit.

(3) If the performance in the further work recommended under (2)(c) above is not to be satisfaction of the
Committee, the Committee may permit the candidate to submit the thesis for re-examination as determined by
the Committee within a period determined by it but not exceeding eighteen months.

(4) After consideration of the examiners' reports and the results of any further examination of the thesis, the
Committee may require the candidate to submit to written or oral examination before recommending whether or
not the candidate be awarded the degree. If it is decided that the candidate be not awarded the degree, the
Committee shall determine whether or not the candidate be permitted to resubmit the thesis after a further
period of study and/or research.

Fees
7. A candidate shall pay such fees as may be determined from time to time by the Council.

Master of Science by coursework (MSc) – Biotechnology/Biopharmaceuticals

1. The degree of Master of Science by formal coursework may be awarded by the Council to a candidate who
has satisfactorily completed a program of advanced study.

Qualifications
2. (1) A candidate of the degree shall have been awarded an appropriate degree of Bachelor of four full-time
years duration (or the part-time equivalent) from the University of New South Wales or a qualification considered
equivalent from another university or tertiary institution at a level acceptable to the Higher Degree Committee
of the Faculty of Life Sciences (hereinafter referred to as the Committee), or
(2) An applicant who submits evidence of such other academic or professional attainments as may be approved
by the Committee may be permitted to enrol for the degree.
(3) If the Committee is not satisfied with the qualifications submitted by an applicant the Committee may require
the applicant to undergo such assessment or carry out such work as the Committee may prescribe, before
permitting enrolment.

Enrolment and Progression
3. (1) An application to enrol as a candidate for the degree shall be made on the prescribed form which shall be
lodged with the Registrar at least two calendar months before the commencement of the session in which
enrolment is to begin.
(2) A candidate for the degree shall be required to undertake such formal courses and pass such assessment
as prescribed.
(3) The progress of a candidate shall be reviewed at least once annually by the Committee and as a result of its
review the Committee may cancel enrolment or take such other action as it considers appropriate.
(4) No candidate shall be awarded the degree until the lapse of two academic sessions from the date of enrolment in the case of a full-time candidate or four sessions in the case of a part-time candidate. The maximum period of a candidate shall be four academic sessions from the date of enrolment for a full-time candidate and six sessions for a part-time candidate. In special cases an extension of this time may be granted by the Committee.

Fees

4. A candidate shall pay such fees as may be determined from time to time by the Council.

Master of Engineering (ME) and Master of Science (MSc)

1. The degree of Master of Engineering or Master of Science by research may be awarded by the Council on the recommendation of the Higher Degree Committee of the appropriate faculty (hereinafter referred to as the Committee) to a candidate who has demonstrated ability to undertake research by the submission of a thesis embodying the results of an original investigation.

Qualifications

2. (1) A candidate for the degree shall have been awarded an appropriate degree of Bachelor from the University of New South Wales or a qualification considered equivalent from another university or tertiary institution at a level acceptable to the Committee.

(2) An applicant who submits evidence of such other academic or professional attainments as may be approved by the Committee may be permitted to enrol for the degree.

(3) When the Committee is not satisfied with the qualifications submitted by an applicant the Committee may require the applicant, before being permitted to enrol, to undergo such examination or carry out such work as the Committee may prescribe.

Enrolment and Progression

3. (1) An application to enrol as a candidate for the degree shall be made on the prescribed form which shall be lodged with the Registrar at least one calendar month before the commencement of the session in which enrolment is to begin.

(2) In every case, before permitting a candidate to enrol, the head of the school in which the candidate intends to enrol shall be satisfied that adequate supervision and facilities are available.

(3) An approved candidate shall be enrolled in one of the following categories.

(a) full-time attendance at the University;

(b) part-time attendance at the University;

(c) external not in regular attendance at the University and using research facilities external to the University.

(4) A candidate shall be required to undertake an original investigation on an approved topic. The candidate may also be required to undergo such examination and perform such other work as may be prescribed by the Committee.

(5) The work shall be carried out under the direction of a supervisor appointed from the full-time members of the University staff.

(6) The progress of a candidate shall be reviewed annually by the Committee following a report by the candidate, the supervisor and the head of the school in which the candidate is enrolled and as a result of such review the Committee may cancel enrolment or take such other action as it considers appropriate.

(7) No candidate shall be granted the degree until the lapse of three academic sessions in the case of a full-time candidate or four academic sessions in the case of a part-time or external candidate from the date of enrolment. In the case of a candidate who has been awarded the degree of Bachelor with Honours or who has had previous research experience the Committee may approve remission of up to one session for a full-time candidate and two sessions for a part-time or external candidate.

(8) A full-time candidate for the degree shall present for examination not later than six academic sessions from the date of enrolment. A part-time or external candidate for the degree shall present for examination not later than ten academic sessions from the date of enrolment. In special cases an extension of these times may be granted by the Committee.

Thesis

4. (1) On completing the program of study a candidate shall submit a thesis embodying the results of the original investigation.

(2) The candidate shall give in writing two months notice of intention to submit the thesis.

(3) The thesis shall present an account of the candidate's own research. In special cases work done conjointly with other persons may be accepted, provided the Committee is satisfied about the extent of the candidate's part in the joint research.

(4) The candidate may also submit any work previously published whether or not such work is related to the thesis.
(5) Three copies of the thesis shall be presented in a form which complies with the requirements of the University for the preparation and submission of higher degree theses.

(6) It shall be understood that the University retains the three copies of the thesis submitted for examination and is free to allow the thesis to be consulted or borrowed. Subject to the provisions of the Copyright Act, 1968, the University may issue the thesis in whole or in part, in photostat or microfilm or other copying medium.

Examination

5. (1) There shall be not fewer than two examiners of the thesis, appointed by the Committee, at least one of whom shall be external to the University unless the Committee is satisfied that this is not practicable.

(2) At the conclusion of the examination each examiner shall submit to the Committee a concise report on the merits of the thesis and shall recommend to the Committee that:

(a) the candidate be awarded the degree without further examination; or

(b) the candidate be awarded the degree without further examination subject to minor corrections as listed being made to the satisfaction of the head of the school; or

(c) the candidate be awarded the degree subject to a further examination on questions posed in the report, performance in this further examination being to the satisfaction of the Committee; or

(d) the candidate be not awarded the degree but be permitted to resubmit the thesis in a revised form after a further period of study and/or research; or

(e) the candidate be not awarded the degree and be not permitted to resubmit the thesis.

(3) If the performance at the further examination recommended under (2)(c) above is not to the satisfaction of the Committee, the Committee may permit the candidate to represent the same thesis and submit to a further oral, practical or written examination within a period specified by it but not exceeding eighteen months.

(4) The Committee shall, after consideration of the examiners' reports and the reports of any oral or written or practical examination, recommend whether or not the candidate may be awarded the degree. If it is decided that the candidate be not awarded the degree the Committee shall determine whether or not the candidate may resubmit the thesis after a further period of study and/or research.

Fees

6. A candidate shall pay such fees as may be determined from time to time by the Council.

Master of Engineering (ME), Master of Science (MSc) and Master of Surveying (MSurv) without supervision

1. The degree of Master of Engineering or Master of Science or Master of Surveying without supervision may be awarded by the Council on the recommendation of the Higher Degree Committee of the appropriate faculty (hereinafter referred to as the Committee) to a candidate who has demonstrated ability to undertake research by the submission of a thesis embodying the results of an original investigation.

Qualifications

2. A candidate for the degree shall have been awarded an appropriate degree of Bachelor from the University of New South Wales with at least three years relevant standing in the case of Honours graduates and four years relevant standing in the case of Pass graduates, and at a level acceptable to the Committee.

Enrolment

3. An application to enrol as a candidate for the degree without supervision shall be made on the prescribed form which shall be lodged with the Registrar not less than six months before the intended date of submission of the thesis. A graduate who intends to apply in this way should, in his or her own interest, seek at an early year the advice of the appropriate head of school with regard to the adequacy of the subject matter and its presentation for the degree. A synopsis of the work should be available.

Thesis

4. (1) A candidate shall submit a thesis embodying the results of the investigation.

(2) The candidate shall give in writing to the Registrar two months notice of intention to submit the thesis.

(3) The thesis shall present an account on the candidate’s own research. In special cases work done conjointly with other persons may be accepted, provided the Committee is satisfied about the extent of the candidate’s part in the joint research.

(4) The candidate may also submit any work previously published whether or not such work is related to the thesis.

(5) Three copies of the thesis shall be presented in a form which complies with the requirements of the University for the preparation and submission of theses for higher degrees.

(6) It shall be understood that the University retains the three copies of the thesis submitted for examination and is free to allow the thesis to be consulted or borrowed. Subject to the provisions of the Copyright Act, 1968, the University may issue the thesis in whole or in part, in photostat or microfilm or other copying medium.
Examination

5. (1) There shall be not fewer than two examiners of the thesis, appointed by the Committee, at least one of whom shall be external to the University unless the Committee is satisfied that this is not practicable.

(2) Before the thesis is submitted to the examiners the head of the school in which the candidate is enrolled shall certify that it is prima facie worthy of examination.

(3) At the conclusion of the examination each examiner shall submit to the Committee a concise report on the thesis and shall recommend to the Committee that:
   (a) the candidate be awarded the degree without further examination; or
   (b) the candidate be awarded the degree without further examination subject to minor corrections as listed being made to the satisfaction of the head of the school; or
   (c) the candidate be awarded the degree subject to a further examination on questions posed in the report, performance in this further examination being to the satisfaction of the Committee; or
   (d) the candidate be not awarded the degree but be permitted to resubmit the thesis in a revised form after a further period of study and/or research; or
   (e) the candidate be not awarded the degree and be not permitted to resubmit the thesis.

(4) If the performance at the further examination recommended under (3)(c) above is not to the satisfaction of the Committee, the Committee may permit the candidate to represent the same thesis and submit to further examination as determined by the Committee within a period specified by it but not exceeding eighteen months.

(5) The Committee shall, after consideration of the examiners' reports and the results of any further examination, recommend whether or not the candidate may be awarded the degree. If it is decided that the candidate be not awarded the degree the Committee shall determine whether or not the candidate may resubmit the thesis after a further period of study and/or research.

Fees

6. A candidate shall pay such fees as may be determined from time to time by the Council.

Master of Science and Technology (MScTech)

1. The degree of Master of Science and Technology by formal coursework may be awarded by the Council to a candidate who has satisfactorily complete a program of advanced study.

Qualifications

2. (1) A candidate for the degree shall:
   (a) have been awarded an appropriate degree of Bachelor of four full-time years duration (or the part-time equivalent) from the University of New South Wales or a qualification considered equivalent from another university or tertiary institution at a level acceptable to the Higher Degree Committee of the Faculty (hereinafter referred to as the Committee), or
   (b)(i) have been awarded an appropriate degree of Bachelor of three full-time years duration (or the part-time equivalent) from the University of New South Wales or a qualification considered equivalent from another university or tertiary institution at a level acceptable to the Committee and
   (ii) have undertaken appropriate postgraduate studies of the full-time year's duration (or the part-time equivalent) at the University of New South Wales or studies considered equivalent from another university or tertiary institution at a level acceptable to the Committee.

(2) An applicant who submits evidence of such other academic or professional attainments as may be approved by the Committee may be permitted to enrol for the degree.

(3) If the Committee is not satisfied with the qualifications submitted by an applicant the Committee may require the applicant to undergo such assessment or carry out such work as the Committee may prescribe, before permitting enrolment.

Enrolment and Progression

3. (1) An application to enrol as a candidate for the degree shall be made on the prescribed form which shall be lodged with the Registrar at least two calendar months before the commencement of the session in which enrolment is to begin.

(2) A candidate for the degree shall be required to undertake such formal courses including the submission of a report on a project, and pass such assessment as prescribed. The project shall be under the supervision of an academic staff member and shall be assessed by two examiners (for a major project).

(3) The progress of a candidate shall be reviewed at least once a year by the Committee and as a result of its review the Committee may cancel enrolment or take such other action as it considers appropriate.

(4) No candidate shall be awarded the degree until the lapse of two academic sessions from the date of enrolment in the case of a full-time candidate and four sessions in the case of a part-time candidate. The maximum period of candidature shall be four academic sessions from the date of enrolment for a full-time candidate, eight sessions for a part-time candidate, and ten sessions for an external candidate. In special cases an extension of these times may be granted by the Committee.
Fees
4. A candidate shall pay such fees as may be determined from time to time by the Council.

Master of Environmental Studies (MEnvStudies)

1. The degree of Master of Environmental Studies by formal course work may be awarded by the Council to a candidate who has satisfactorily completed a program of advanced study.

Qualifications
2. (1) A candidate of the degree shall:
(a) have been awarded an appropriate degree of Bachelor of four full-time years duration (or the part-time equivalent) from the University of New South Wales or a qualification considered equivalent from another university or tertiary institution at a level acceptable to the Higher Degree Committee of the Faculty of Science and Technology (hereinafter referred to as the Committee), or
(b)(i) have been awarded an appropriate degree of Bachelor of three full-time years duration (or the part-time equivalent) from the University of New South Wales or a qualification considered equivalent from another university or tertiary institution at a level acceptable to the Committee and
(ii) have undertaken appropriate postgraduate studies of the full-time year's duration (or the part-time equivalent) at the University of New South Wales or studies considered equivalent from another university or tertiary institution at a level acceptable to the Committee.
(2) An applicant who submits evidence of such other academic or professional attainments as may be approved by the Committee may be permitted to enrol for the degree.
(3) If the Committee is not satisfied with the qualifications submitted by an applicant the Committee may require the applicant to undergo such assessment or carry out such work as the Committee may prescribe, before permitting enrolment.

Enrolment and Progression
3. (1) An application to enrol as a candidate for the degree shall be made on the prescribed form which shall be lodged with the Registrar at least two calendar months before the commencement of the session in which enrolment is to begin.
(2) A candidate for the degree shall be required to undertake such formal courses including the submission of a report on a project, and pass such assessment as prescribed. The project shall be under the supervision of an academic staff member and shall be assessed by two examiners (for a major project).
(3) The progress of a candidate shall be reviewed at least once a year by the Committee and as a result of its review the Committee may cancel enrolment or take such other action as it considers appropriate.
(4) No candidate shall be awarded the degree until the lapse of two academic sessions from the date of enrolment in the case of a full-time candidate and four sessions in the case of a part-time candidate. The maximum period of candidature shall be four academic sessions from the date of enrolment for a full-time candidate, eight sessions for a part-time candidate, and ten sessions for an external candidate. In special cases an extension of these times may be granted by the Committee.

Fees
4. A candidate shall pay such fees as may be determined from time to time by the Council.

Master of Optometry (MOptom)

1. The degree of Master of Optometry by formal coursework may be awarded by the Council to a candidate who has satisfactorily completed a program of advanced study.

Qualifications
2. (1) A candidate for the degree shall have been awarded an appropriate degree of Bachelor of four full-time year's duration (or the part-time equivalent) from The University of New South Wales or a qualification considered equivalent from another university or tertiary institution at a level acceptable to the Higher Degree Committee of the Faculty of Science and Technology (hereinafter referred to as the Committee).
(2) In exceptional cases an applicant who submits evidence of such other academic and professional qualifications as may be approved by the Committee may be permitted to enrol for the degree.
(3) If the Committee is not satisfied with the qualifications submitted by an applicant the Committee may require the applicant to undertake such assessment or carry out such work as the Committee may prescribe, before permitting enrolment.
Enrolment and Progression

3. (1) An application to enrol as a candidate for the degree shall be made on the prescribed form which shall be lodged with the Registrar two calendar months before the commencement of the session in which enrolment is to begin.

(2) A candidate for the degree shall be required to undertake such formal courses and pass such assessment as prescribed.

(3) The progress of a candidate shall be reviewed at least once annually by the Committee and as a result of its review the Committee may cancel enrolment or take such other action as it considers appropriate.

(4) No candidate shall be awarded the degree until the lapse of two academic sessions from the date of enrolment in the case of a full-time candidate or four sessions in the case of a part-time candidate. The maximum period of a candidature shall be four academic sessions in the case of a full-time candidate and eight sessions for a part-time candidate. In special cases an extension of this time may be granted by the Committee.

Fees

4. A candidate shall pay such fees as may be determined from time to time by the Council.

Master of Psychology (Clinical) (MPsychol(Clin)), Master of Psychology (Forensic) (MPsychol(For)) and Master of Psychology (Organisational) (MPsychol(Org))

1. The degree of Master of Psychology (Clinical), Master of Psychology (Forensic) or Master of Psychology (Organisational) by formal coursework and thesis may be awarded by the Council to a candidate who has satisfactorily completed a program of advanced study. The degree shall be awarded at the Pass level or with the grade of Honours Class 1 or with the grade of Honours Class 2 (two divisions).

Qualifications

2. (1) A candidate for the degree shall have been awarded an appropriate degree of Bachelor with Honours in Psychology from the University of New South Wales or a qualification considered equivalent from another university or tertiary institution, at a level acceptable to the Higher Degree Committee of the Faculty of Life Sciences (hereinafter referred to as the Committee).

(2) In exceptional cases an applicant who submits evidence of such other academic and professional qualifications as may be approved by the Committee may be permitted to enrol for the degree.

(3) If the Committee is not satisfied with the qualifications submitted by an applicant the Committee may require the applicant to undergo such assessment or carry out such work as the Committee may prescribe, before permitting enrolment.

Enrolment and Progression

3. (1) An application to enrol as a candidate for the degree shall be made on the prescribed form which shall be lodged with the Registrar at least four calendar months before the commencement of the session in which enrolment is to begin.

(2) A candidate for the degree shall be required to undertake such formal courses and pass such assessment as prescribed.

(3) The progress of a candidate shall be reviewed at least once annually by the Committee and as a result of its review the Committee may cancel enrolment or take such other action as it considers appropriate.

(4) No candidate shall be awarded the degree until the lapse of four academic sessions from the date of enrolment in the case of a full-time candidate or six sessions in the case of a part-time candidate. The maximum period of candidature shall be six academic sessions from the date of enrolment for a full-time candidate and ten sessions for a part-time candidate. In special cases a variation of these times may be granted by the Committee.

Fees

4. A candidate shall pay such fees as may be determined from time to time by the Council.

Master of Safety Science (MSafetySc)

1. The degree of Master of Safety Science may be awarded by the Council to a candidate who has satisfactorily completed a program of advanced study.

Qualifications

2. (1) A candidate for the degree shall have been awarded an appropriate degree of Bachelor from the University of New South Wales or a qualification considered equivalent from another university or tertiary institution at a level acceptable to the Higher Degree Committee of the Faculty of Science and Technology (hereinafter referred to as the Committee).
(2) In exceptional cases an applicant who submits evidence of such other academic and professional qualifications as may be approved by the Committee may be permitted to enrol for the degree.

(3) If the Committee is not satisfied with the qualifications submitted by an applicant the Committee may require the applicant to undergo such assessment or carry out such work as the Committee may prescribe, before permitting enrolment.

Enrolment and Progression

3. (1) An application to enrol as a candidate for the degree shall be made on the prescribed form which shall be lodged with the Registrar at least two calendar months before the commencement of the session in which enrolment is to begin.

(2) A candidate for the degree shall be required to undertake such formal courses and pass such assessment as prescribed. The program of advanced study shall total a minimum of 45 units of credit. The number of credits allocated for each course shall be determined by the Committee on the recommendation of the Course Director (hereinafter referred to as the head of the school).

(3) The progress of a candidate shall be reviewed at least once annually by the Committee and as a result of its review the Committee may cancel enrolment or take such other action as it considers appropriate.

(4) No candidate shall be awarded the degree until the lapse of two academic sessions from the date of enrolment in the case of a full-time candidate or four sessions in the case of a part-time candidate. The maximum period of candidature shall be six academic sessions from the date of enrolment for a full-time candidate and ten sessions for a part-time candidate. In special cases an extension of these times may be granted by the Committee.

Project Report

4. (1) The program of advanced study may include a 48 units of credit project on an approved topic.

(2) The work shall be carried out under the direction of a supervisor appointed from the full-time academic members of the University staff.

(3) The candidate shall give in writing to the Registrar two months notice of intention to submit a report on the project.

(4) Three copies of the project report shall be presented in a form which complies with the requirements of the University for the preparation and submission of project reports for higher degrees.

(5) It shall be understood that the University retains the three copies of the project report submitted for examination and is free to allow the project report to be consulted or borrowed. Subject to the provisions of the Copyright Act, 1968, the University may issue the project report in whole or in part, in microfilm or other copying medium.

Examination of Project Report

5. (1) There shall be not fewer than two examiners of the project report, appointed by the Committee.

(2) At the conclusion of the examination each examiner shall submit to the Committee a concise report on the project and shall recommend to the Committee that:

(a) the project report be noted as satisfactory; or

(b) the project report be noted as satisfactory subject to minor corrections being made to the satisfaction of the head of the school; or

(c) the project report be noted as unsatisfactory but that the candidate be permitted to resubmit it in a revised form after a further period of study and/or research; or

(d) the project report be noted as unsatisfactory and that the candidate be not permitted to resubmit it.

(3) The Committee shall, after considering the examiners' reports and the candidate's results of assessment in the prescribed formal subject, recommend whether or not the candidate may be awarded the degree. If it is decided that the project report is unsatisfactory the Committee shall determine whether or not the candidate may resubmit it after a further period of study and/or research.

Fees

6. A candidate shall pay such fees as may be determined from time to time by the Council.

Master of Science (MSc), Master of Science (MSc) without supervision

See Master of Engineering above for these degrees.
Master of Statistics (MStats)

1. The degree of Master of Statistics by formal coursework may be awarded by the Council to a candidate who has satisfactorily completed a program of advanced study.

Qualifications

2. (1) A candidate for the degree shall have been awarded a degree of Bachelor with major studies in statistics from the University of New South Wales or a qualification considered equivalent from another university or tertiary institution at a level acceptable to the Higher Degree Committee of the Faculty of Science and Technology (hereinafter referred to as the Committee).

(2) In exceptional cases an applicant who submits evidence of such other academic and professional qualifications as may be approved by the Committee may be permitted to enrol for the degree.

(3) If the Committee is not satisfied with qualifications submitted by an applicant the Committee may require the applicant to undergo such assessment or carry out such work as the Committee may prescribe, before permitting enrolment.

Enrolment and Progression

3. (1) An application to enrol as a candidate for the degree shall be made on the prescribed form which shall be lodged with the Registrar at least two calendar months before the commencement of the Session in which enrolment is to begin.

(2) A candidate for the degree shall be required to undertake such formal courses and pass such assessment as prescribed.

(3) The progress of a candidate shall be reviewed at least once annually by the Committee and as a result of its review the Committee may cancel enrolment or take such other action as it considers appropriate.

(4) No candidate shall be awarded the degree until the lapse of three academic sessions from the date of enrolment in the case of a full-time candidate or six sessions in the case of a part-time candidate. In the case of a candidate who has been awarded a degree of Bachelor with Honours in statistics the Committee may approve remissions of up to one session for a full-time candidate and two sessions for a part-time candidate. The maximum period of candidature shall be four academic sessions from the date of enrolment for a full-time candidate and eight sessions for a part-time candidate. In special cases an extension of these times may be granted by the Committee.

Fees

4. A candidate shall pay such fees as may be determined from time to time by the Council.

Master of Technology Management (MTM)

1. The degree of Master of Technology Management by formal coursework may be awarded by the Council to a candidate who has satisfactorily completed a program of advanced study.

Qualifications

2. (1) A candidate for the degree shall have been awarded an appropriate degree of Bachelor from the University of New South Wales or a qualification considered equivalent from another university or tertiary institution at a level considered acceptable to the Course Committee. This is normally either:

(a) a four year degree, or,

(b) a three year degree plus either another qualification at an acceptable level, or, other academic or professional attainments (including relevant work experience).

(2) An applicant who submits evidence of such other academic and professional qualifications as may be approved by the Committee may be permitted to enrol in the degree.

If the Committee is not satisfied with the qualifications submitted by an applicant the Committee may require that the applicant undergo such assessment, or carry out such work, as the Committee may prescribe before permitting enrolment.

Enrolment and Progression

3. An application to enrol as a candidate for a degree shall be made on the prescribed form which shall be lodged with the registrar at least two calendar months before the commencement of the Session in which enrolment is to begin.

A candidate for the degree shall be required to undertake such formal courses and pass such assessments as prescribed.

The progress of a candidate shall be reviewed at least once annually by the Committee and, as a result of its review, the Committee may cancel enrolment or take such other action as it considers appropriate.
No candidate shall be awarded the degree until the lapse of at least two academic sessions from the date of enrolment in the case of full time enrolment or four academic sessions in the case of part time enrolment. The maximum period of enrolment shall be 4 academic sessions for a full time candidate and 8 academic sessions for a part time candidate. In special cases variations to these times may be granted by the Committee.

Fees
4. A candidate shall pay such fees as may be determined from time to time by the Council.

Graduate Diploma (GradDip)
1. A Graduate Diploma may be awarded by the Council to a candidate who has satisfactorily completed a program of advanced study.

Qualifications
2. (1) A candidate for the diploma shall have been awarded an appropriate degree of Bachelor from the University of New South Wales or a qualification considered equivalent from another university or tertiary institution at a level acceptable to the Higher Degree Committee of the appropriate faculty (hereinafter referred to as the Committee).
(2) An applicant who submits evidence of such other academic or professional attainments as may be approved by the Committee may be permitted to enrol for the diploma.
(3) If the Committee is not satisfied with the qualifications submitted by an applicant the Committee may require the applicant to undergo such assessment or carry out such work as the Committee may prescribe, before permitting enrolment.

Enrolment and Progression
3. (1) An application to enrol as a candidate for diploma shall be made on the prescribed form which shall be lodged with the Registrar at least two calendar months before the commencement of the session in which enrolment is to begin.
(2) A candidate for the diploma shall be required to undertake such formal courses and pass such assessment as prescribed.
(3) The progress of a candidate shall be reviewed at least once annually by the Committee and as a result of its review the Committee may cancel enrolment or take such other action as it considers appropriate.
(4) No candidate shall be awarded the diploma until the lapse of two academic sessions from the date of enrolment in the case of a full-time candidate or four sessions in the case of a part-time candidate. The maximum period of candidature shall be four academic sessions from the date of enrolment for a full-time candidate and six sessions for a part-time candidate. In special cases an extension of these times may be granted by the Committee.

Fees
4. A candidate shall pay such fees as may be determined from time to time by the Council.

Graduate Certificate
1. A Graduate Certificate may be awarded by the Council to a candidate who has satisfactorily completed an approved program of study.

Qualifications
2. (1) A candidate for the Graduate Certificate shall have been awarded an appropriate degree of Bachelor from the University of New South Wales or a qualification considered equivalent from another university or tertiary institution at a level acceptable to the Higher Degree Committee of the Faculty (hereinafter referred to as the Committee).
(2) An applicant who submits evidence of such other academic and professional qualifications as may be approved by the Committee may be permitted to enrol for the Graduate Certificate.
(3) If the Committee is not satisfied with the qualifications submitted by an applicant the Committee may require the applicant to undergo such assessment or carry out such work as the Committee may prescribe, before permitting enrolment.

Enrolment and Progression
3. (1) An application to enrol as a candidate for the Graduate Certificate shall be made on the prescribed form which shall be lodged with the Registrar by the advertised closing date, which shall be set at least two calendar months before the commencement of the session in which enrolment is to begin.
(2) A candidate for the certificate shall be required to undertake courses and pass any assessment prescribed.

(3) The progress of a candidate shall be reviewed by the end of two sessions by the Committee and as a result of its review the Committee may cancel enrolment or take such other action as it considers appropriate.

(4) The normal duration of the course is one academic session from the date of enrolment in the case of a full-time student or two sessions in the case of a part-time. For an open learning or external candidate the normal duration is two sessions from the date of enrolment. In special cases a variation of these times may be approved by the head of school.

Fees

4. Candidates shall pay such fees as may be determined from time to time by Council.
The scholarships listed below are available to students whose courses are listed in this book. Each Faculty Handbook contains in its scholarships section the scholarships available for study in that Faculty. Travel scholarships are shown separately. Applicants should note that the scholarships and their conditions are subject to review and the closing dates for awards may vary from year to year.

Scholarship information is regularly included in the University publication 'Focus' and updated on the UNSW Web site: [http://www.infonet.unsw.edu.au/academic/schopriz/httoc.htm](http://www.infonet.unsw.edu.au/academic/schopriz/httoc.htm).

Students investigating study opportunities overseas should also consult "Study Abroad" which is published by UNESCO. The British Council (02 9326 2365) may be of assistance for information about study in Britain. The Australian-American Education Foundation (02 6247 9331) or the U.S. Consulate General Educational Advising Centre (02 9373 9230) can provide information about study in America. Information may also be obtained from the embassy or consulate of the country in which the study is proposed and from the proposed overseas institution. Details of overseas awards and exchanges administered by the Department of Education, Training and Youth Affairs (DETYA) can be obtained from the Awards and Exchanges Section, DEETYA, PO Box 826, Woden, ACT 2606.

**KEY**

L Students with Australian Citizenship or Permanent Resident status can apply.

I International students can apply.

**Postgraduate scholarships for research or coursework are identified with the following codes:**

R Available for study by research (normally Masters by Research or PhD).

C Available for study by coursework (normally Masters by Coursework or Graduate Diploma).

The scholarship information is normally provided in the following format:

- Amount
- Duration
- Conditions

Unless otherwise stated, application forms are available from the Scholarships and Student Loans Unit, c/- New South W' (Lower Ground Floor, Chancellery). Applications normally become available four to six weeks before the closing date.
Undergraduate Scholarships

Following are details of scholarships available to undergraduate students at UNSW. The scholarships are listed according to the year of study for which the scholarship is available (ie scholarships for first year students; scholarships for second or later year students; scholarships for Honours year students) or whether they are available to undertake travel, and then also by Faculty and course (eg scholarships in Science and Technology or Engineering). If students from more than one Faculty are able to apply the scholarship is listed in the General Scholarships section.

For further information contact:
The Scholarships and Student Loans Unit
The University of New South Wales
Sydney 2052 Australia
Tel: (02) 9385 3100/3101/1462
Fax: (02) 9385 3732
Email: scholarships@unsw.edu.au

Scholarships for students entering the first year of an undergraduate course

General

The Alumni Association Scholarships (I,L)
- Up to $1,500 pa
- 1 year renewable subject to satisfactory progress
The scholarships are available to students enrolled in any year of a full-time undergraduate course. Candidates must be the children or grandchildren of alumni of UNSW. Applications close early January.

The AUSIMM Education Endowment Fund (L)
- $2,500-$5,000 pa
- 1 year may be renewable subject to satisfactory progress
The scholarships are open to full-time undergraduate students enrolled in a course leading to the award of a Geoscience, Mining Engineering or Minerals Engineering (Mineral's Processing or Extractive Metallurgy) degree related to the interests of the mineral industry. Further information is available from The Australian Institute of Mining and Metallurgy (AUSIMM), PO Box 660, Carlton South VIC 3053, Tel (03) 9662 3166.

The Australian Development Scholarships (ADS) (I)
- Tuition fees, medical cover, airfare and a stipend
- Duration of the course subject to satisfactory progress
This award is for international students from selected countries only. Information and applications can only be obtained from Australian Diplomatic Posts or Australian Education Centres in the home country. Applications normally close at least 12 months before the year of study.

The Australian Vietnam Veterans Trust Education Assistance Scheme (L)
- $3,500 pa
- Duration of the course subject to satisfactory progress
The scholarship is available to the children of Vietnam veterans who are aged under 25 at the time of application. The award is subject to the same income test as AUSTUDY. Applicants can be undertaking any year of a Bachelors course. Applications and further information are available from the Australian Vietnam War Veterans Trust National Office, PO Box K978, Haymarket NSW 1240, Tel (02) 9261 7077, Email: vvt@acsoft.com.au. Applications close 31 October.

The Ben Lexcen Sports Scholarships (I,L)
- $2,000 pa
- 1 year with possibility of renewal
The scholarships are available to students who are accepted into a course of at least two years duration. Prospective applicants should have an outstanding ability in a particular sport and are expected to be active members of a UNSW Sports Club. Applications close late January.

The Captain Reg Saunders Scholarship (L)
- $3,000
- Up to 4 years
Applicants must be Aborignal or Torres Strait Islanders eligible to commence a university degree in the area of psychology, nursing, applied science, social work or education. Further information and applications are available from the Aboriginal Education Program, UNSW, Tel (02) 9385 3805.

The UNSW Co-Op Program (L)
- $11,150 pa, and between 9 and 20 months industry training
- Duration of the course subject to satisfactory progress
The scholarships are offered by industry sponsors through the University for some of the disciplines in the Faculties of Science and Technology, Commerce and Economics, and Engineering. Scholars are selected by interview with emphasis placed on achievements in community and extra-curricular activities as well as communication and leadership skills. A minimum UAI of 93.8 is expected. The UNSW Co-Op Program application form is available from school Careers Advisers or the Co-op Program Office on (02) 9385 5116. Applications close September 30 with interviews held at the end of November and beginning of December. Further information is available at the Co-op program web page http://coop.web.unsw.edu.au.

The Girls Realm Guild Scholarships (L)
- Up to $1,500 pa
- 1 year with the prospect of renewal subject to satisfactory progress and continued demonstration of need
The scholarships are available to female students under 35 years of age who are enrolling in any year of a full-time undergraduate course. Selection is based on academic merit and financial need. Applications close 25 March.
The Ian Somervaille Scholarships (L,L)
- Up to $3,000
- 1 year
The scholarships are available to immediate family members (i.e., children, parents, brothers, sisters, spouses, de facto partners) of UNSW staff members. Applicants must be full-time students enrolling in any year of an undergraduate course leading to the degree of Bachelor at UNSW. Selection will be based on academic merit, aptitude and commitment to the proposed course. Consideration may be given in cases of hardship or disadvantage. Applications close 31 January.

The John Niland Scholarships (L)
- $5,000
- 1 year
The scholarship assists rural students to undertake study at UNSW. Applicants will be students who complete the HSC (or its counterpart matriculation requirement) in the top five percent of their state-wide cohort, having been enrolled at a country high school in Australia. Selection will be based on academic merit, potential to contribute to the wider life of the University and consideration of social and/or economic circumstances which might otherwise hinder successful transition to UNSW. Applications close 30 October.

The Kensington Colleges Scholarships
Further information concerning the awards below is available from The Kensington Colleges, Tel (02) 9315 0000, Fax (02) 9315 0011, Email: kenso-colleges@unsw.edu.au, Web: http://www.kenso.colli.unsw.edu.au.

The Mathews Scholarship
The scholarship provides $1,500 credit towards accommodation costs and is awarded to a resident at the commencement of the second year of an undergraduate degree. Candidates will be assessed on their academic performance in the first year of their course.

The Access Scholarship
The scholarship provides up to half the accommodation fee for a limited number of first year ACCESS scheme students experiencing long term financial hardship. Nominations are forwarded by the UNSW ACCESS office.

The Malcolm Chaklin Scholarship (L)
- $15,000 pa
- Renewable for the duration of the course subject to satisfactory progress
The scholarship is available to students entering the first year of a Bachelor of Science or Engineering in the Faculties of Life Sciences, Science and Technology, or Engineering. Selection will take into account academic merit and interview performance. Applications close 31 October.

The Matthew James Reid Scholarship (L)
- $1,000
- one year only
The Scholarships are to be awarded to encourage students from interstate to undertake study in an undergraduate degree at UNSW. The Scholarship is available to a student who completed the HSC (or its equivalent) in the previous year. Applicants must normally be resident interstate. Selection will be based on academic merit, demonstrated ability, leadership qualities, and potential to contribute to the wider life of the University and community. Consideration may also be given to circumstances which might otherwise hinder successful transition to UNSW. Applicants will be required to submit a statement detailing their reasons for undertaking the course of study. Applications close 31 January.

The National Health and Medical Research Council (NHMRC) Training Scholarship for Aboriginal Health Research (L,R)
- $16,135 - $23,997 pa (depending on qualifications)
- Up to 3 years
Applicants must be undertaking an undergraduate or postgraduate degree which includes, or leads to, research relevant to Aboriginal health. Applications will be assessed in terms of previous qualifications and experience. Consideration will be given to prior knowledge and experience of Aboriginal culture and health. Applications close early August.

The New College Access Scholarship
The scholarship provides up to half of the accommodation fee for a first year ACCESS scheme student selected by the College. Nominations are forwarded by the UNSW ACCESS office. For further information contact New College, Tel (02) 9381 1999, Fax (02) 9381 1919, Email: admissions@newcollege.unsw.edu.au.

The New South Scholarships (L)
- $6,000
- 1 year
The scholarships are available to students commencing the first year of undergraduate study at UNSW in any discipline. Scholarships will be available only to those students who achieved a perfect score in the NSW HSC in the year prior to commencing study. No application form is required.

The Ngunnagan Club Scholarship (L)
- Up to $2,000
- 1 year
The scholarship is available to students enrolled at an Australian country high school who complete the HSC (or its counterpart matriculation requirement) in the top five percent of their state cohort. Applicants should complete an official application form by 31 October in the year prior to their intended enrolment at UNSW. Final performance in the HSC (or its counterpart matriculation) examination should be reported to the Scholarships and Student Loans Unit once known.

Robert Riley Scholarships (L)
- $5,000
The Scholarships are awarded to promote the pursuit of justice and human rights for Aboriginal Australians through education. Applicants must be Aboriginals or Torres Strait Islanders up to the age of 25 and proposing to pursue studies in the fields of law, human rights or juvenile justice. Further information and applications are available from the Aboriginal Education Program, UNSW, Tel (02) 9385 3905. Applications close 1 November.

The Smith Family Tertiary Scholarship Scheme (L,L)
- Up to $2,000 for University fees, books, laboratory/field or practical fees
- 1 year
The scheme offers scholarships to first year undergraduate students from disadvantaged families who demonstrate high academic ability and the personal commitment to succeed in tertiary studies. Applicants must be economically disadvantaged, as assessed by The Smith Family, and have demonstrated consistently high academic results. Applications are available from The Education Support Co-ordinator, The Smith Family, Locked Bag 1000, Camperdown NSW 2050, Tel (02) 9550 4422, fax (02) 9516 4063. Applications close late July.
The St George Students' Association Lexcen Scholarship (L)
- $2,000
- 1 year only

Two Scholarships will be awarded annually to high achieving sports persons undertaking, or proposing to undertake, study at UNSW. To be eligible, applicants must be enrolled in, or proposing to enrol in, a course of at least two years duration at UNSW. Applicants should possess an outstanding ability in a particular sport. It is desirable, but not essential, that an applicant's family home is located in the St George/Sutherland Shire region. Each applicant will be assessed on the basis of outstanding ability in a particular sport. Consideration may also be given to an applicant's leadership qualities, potential to contribute to the wider life of the University, any social and economic circumstances which may affect the applicant and academic merit. Application must be made using the Ben Lexcen Scholarship application form. An interview may be required. Applications will normally close on 31 January.

The Vice-Chancellor's Equity Scholarships (L)
- $1,500 pa
- 1 year

In 1999, a small number of scholarships were awarded for financially disadvantaged students commencing full-time undergraduate study. Consideration is normally given to academic merit and financial need. The conditions may change each year.

The W.S. and L.B. Robinson Scholarship (L)
- Up to $5,500 pa
- 1 year renewable for the duration of the course subject to satisfactory progress

Applicants must have completed their schooling in Broken Hill or have parents who reside in Broken Hill. Applicants should be undertaking a course related to the mining industry, for example courses in mining engineering, geology, electrical and mechanical engineering, metallurgical process engineering, chemical engineering or science. A letter of application should be sent to Pasminco Mining, PO Box 460, Broken Hill, NSW 2880. Applications normally close 30 September.

The UNSW Golden Jubilee Scholarships (L)
- Course fees for the minimum course duration less any advanced standing, subject to satisfactory progress

The Scholarships have been established to encourage outstanding Diplomates from Singapore and Malaysia to complete an undergraduate degree at UNSW. To be eligible, applicant's must be proposing to undertake an undergraduate qualification at UNSW in one of the Faculties of Arts and Social Sciences, the Built Environment, Commerce and Economics, Engineering, Life Sciences or Science and Technology or the College of Fine Arts. Successful applicants will be granted advanced standing on the basis of their studies in Singapore and Malaysia. The Scholarship is only available to graduates of specific institutions. Applicants must be Citizens or Permanent Residents of Singapore or Malaysia. Selection will be based on academic merit. Applications will normally close on 30 November for study commencing in Session One of the following year and 30 April for study commencing in Session Two of the same year.

Faculty Scholarships

Faculty of Science and Technology

The School Scholarships (Chemistry, Mathematics and Physics)- including the John Ragnar Anderson Chemistry Scholarships (L)
- Up to $2,000 pa
- 1 year renewable for the duration of the course subject to satisfactory progress

Up to six scholarships are available to full-time students enrolled in the Schools of Chemistry, Mathematics or Physics. Application forms are available from the Faculty Office or the Scholarships and Student Loans Unit. Applications normally close mid-February.

The Science and Technology Faculty Scholarships (L)
- Up to $3,000 pa
- 1 year renewable for the duration of the course subject to satisfactory progress

Six scholarships are available and carry the title of Faculty Scholar. The scholarships are available to full-time students enrolled in one of the disciplines of the Faculty of Science and Technology Students undertaking the combined Bachelor of Science/Bachelor of Arts course may also apply. Application forms are available from the Faculty Office or the Scholarships and Student Loans Unit. Applications normally close mid-February.

Ceramic Engineering

The Clay Brick Association Scholarship (L)
- Up to $2,500 pa
- 1 year renewable for the duration of the course subject to satisfactory progress

Applicants must be eligible for admission to Year 1 of the full-time course. It is expected that a new award will be available in 1999. Applications normally close at the end of January.

The Thomson Family Scholarship (L)
- Up to $1,000 pa
- 1 year renewable for the duration of the course subject to satisfactory progress

Applications must be eligible for admission to Year 1 of the full-time degree course in Ceramic Engineering. Applications normally close at the end of January.
### Metallurgy

**The CSIRO Division of Minerals Scholarship in Metallurgical Engineering (L)**
- $2,500 pa
- 4 years subject to satisfactory progress

The scholarship is available to a full-time student enrolled in Year 1 of the course leading to a Bachelor of Metallurgical Engineering (Process Metallurgy) degree. Selection is based on academic merit and personal qualities. Applications close in early December.

**The Sir Rupert Myers Scholarship (L,L)**
- Up to $2,500 pa
- 1 year renewable for the duration of the course subject to satisfactory progress

The scholarship is available to students who are Permanent Residents of Australia or whose parents are Permanent Residents of Australia. Applicants must be eligible for admission to Year 1 of the full-time degree course in Metallurgy or Metallurgical Engineering. Applications normally close at the end of January.

### Physics

**The CSIRO Division of Telecommunications and Industrial Physics Scholarship (L)**
- Up to $1,000 pa
- Duration of the course subject to satisfactory progress

The scholarship is available to a full-time student entering the first year of the Engineering Physics program in the Advanced Science course. The scholarship will be awarded on the recommendation of the Head of School of Physics. There is no application form.

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### Scholarships for students in their second or later year of study

#### General

**The AITD-MMI Insurance-Mark Pompei Scholarship (L)**
- $1,000

The Australian Institute of Training and Development and MMI Insurance offer an annual scholarship to a part-time student currently working in the field of Training and Development. Applicants should be completing their first accredited qualification to assist their development in this field. Applications are available from AITD NSW Division Administrator, PO Box 5452, West Chatswood NSW 2057, Tel (02) 9419 4966, Fax (02) 9419 4142, Email n4wdvn@aitd.com.au. Applications close in May.

**The Alumni Association Scholarships (L,L)**
- Up to $1,500 pa
- 1 year renewable subject to satisfactory progress

The scholarships are available to students enrolled in any year of a full-time undergraduate course. Candidates must be the children or grandchildren of alumni of UNSW. Applications close early January.

**The Australian Vietnam Veterans Trust Education Assistance Scheme (L)**
- $3,500 pa
- Duration of the course subject to satisfactory progress

The scholarship is available to the children of Vietnam veterans who are aged under 25 at the time of application. The award is subject to the same income test as AUSTUDY. Applicants can be undertaking any year of a Bachelor's course. Applications and further information are available from the Australian Vietnam War Veterans Trust National Office, PO Box K978, Haymarket NSW 1240, Tel (02) 9261 7077, Email: vvt@accsoft.com.au. Applications close 31 March.

**The Girls Realm Guild Scholarship (L)**
- Up to $1,500 pa
- 1 year with the prospect of renewal subject to satisfactory progress and continued demonstration of need

The scholarships are available only to female students under 35 years of age who are enrolling in any year of a full-time undergraduate course. Selection is based on academic merit and financial need. Applications close 25 March.

**The Ben Lecsen Sports Scholarships (L,L)**
- $2,000 pa
- 1 year with possibility of renewal

The scholarships are available to students who are accepted into a course of at least two years duration. Prospective applicants should have an outstanding ability in a particular sport and are expected to be active members of a UNSW Sports Club. Applications close late January.

**The Bill Pardy University Challenge Scholarship (L,L)**
- $1,000
- 1 year only

The Scholarship is established to recognise Bill Pardy's achievement in winning the 1998 University Challenge on the television program Sale of the Century, and to encourage students to participate in and contribute to the cultural life of the University. To be eligible, applicants must be enrolled in the second or later year of an undergraduate degree at UNSW. Each applicant will be assessed on the basis of a personal statement detailing their previous and proposed contribution to the cultural life of the University. Consideration may also be given to academic merit. Applications will normally close on 31 March.

**The Dried Fruits Research and Development Council (DFRDC) Studentships and Student Awards (L,L)**
- Up to $3,000 for Studentships, up to $1,000 for Student Awards

The Studentships assist students to undertake research projects in the final year of a Bachelor's degree (applications close April 15), or to undertake a research project during the summer vacation (applications close October 15). The Student Awards are provided for excellence in student research projects related to the dried fruit industry. Further information and applications are available from the Executive Officer, Dried Fruits Research and Development Council, Box 1142, Mildura VIC 3502, Tel (050) 221515, Fax (050) 233321.
The Esso Australia Ltd Geosciences Scholarship (L,L)
- Up to $3,000
- 1 year

The scholarship is for a full-time student seeking to undertake study in the final year (Year 4) of a Bachelor of Science (AppGeol) or an equivalent Honours year, majoring in geology or geophysics. The successful applicant is expected to have an interest in petroleum related studies ie sedimentology, biostratigraphy, seismic/magnetic/ gravity geophysical studies, basin studies, palynology or palaeontology. Selection is based on academic merit, the benefit the student will gain by being awarded the scholarship and can include consideration of financial need. Applications close 30 November.

The Ian Somervaille Scholarships (L,L)
- Up to $3,000
- 1 year

The scholarships are available to immediate family members (ie. children, parents, brothers, sisters, spouses, de facto partners) of UNSW staff members. Applicants must be full-time students enrolling in any year of an undergraduate course leading to the degree of Bachelor at UNSW. Selection will be based on academic merit, aptitude and commitment to the proposed course. Consideration may be given in cases of hardship or disadvantage. Applications close 31 January.

The Julian Small Foundation Annual Research Grant (L,L)
- Up to $5,000

Applications are open to postgraduate and undergraduate students undertaking research and involved in the study of law, or industrial relations. Selection will be based on a research proposal which outlines how the research will advance thinking and practice in the area of employment law and industrial relations in Australia. Applications close mid-August.

The Kensington Colleges Scholarships

Further information concerning the awards below may be available from The Kensington Colleges, Tel (02) 9315 0000, Fax (02) 9315 0011, Email kenko-colleges@unsw.edu.au, Web: http://www.kensocoll.unsw.edu.au.

The Fell Scholarship

The scholarship provides $650 credit for accommodation costs and is awarded to a returning resident in each College. Applicants will be assessed on their academic performance in the second or later year of their course.

Resident Assistant Scheme

The program provides subsidised accommodation, valued at up to $1,000, for 22 academically promising residents, and an apprenticeship in the collegiate Residential Academic Staff role. All residents who have successfully completed at least one year of university study are eligible to apply.

The National Health and Medical Research Council (NHMRC) Training Scholarship for Aboriginal Health Research (L,R)
- $16,135 - $23,997 pa (depending on qualifications)
- Up to 3 years

Applicants must be undertaking an undergraduate or postgraduate degree which includes, or leads to, research relevant to Aboriginal health. Applications will be assessed in terms of previous qualifications and experience. Consideration will be given to prior knowledge and experience of Aboriginal culture and health. Applications close late July.

The Nicholas Catchlove Scholarship in Flying (L)
- $10,000
- 1 year

The scholarship will be awarded to provide a final year student with the opportunity to undertake further flying training to prepare for a career in the aviation industry. Applicants must be proposing to undertake the final year of an appropriate course and hold a Commercial Pilot's Licence. Selection will be based on academic merit, reasons for undertaking the course, financial need, commitment to flying and to the course, demonstrated ability, leadership qualities and interview performance. Applications close in October.

The NSW Ministry for the Arts Scholarships (L,R C)
- $5,000 - $25,000 (depending on the award)

The NSW Government offers a number of scholarships and awards to writers, artists and scholars living in NSW. Further information is available from the New South Wales Ministry for the Arts, GPO Box 5341, Sydney NSW 2000, Tel (02) 9228 3533, Fax (02) 9228 4722.

The RGC Scholarship in Economic Geology (L)
- $5,000
- 1 year

The scholarship is available to a student entering Year 4 of the Applied Geology course or an Honours year in geology in the Science course and who is proposing to undertake a field project relevant to economic geology. Letters of application and requests for information should be directed to RGC, Gold Fields House, 1 Alfred St, Sydney NSW 2000. Applications close 31 January.

The Rural Allied Health Placement Grants (L)
- Up to $500

Grants are available to students undertaking rural placements, who are in the final two years of an undergraduate course in dietetics, diagnostic radiography, occupational therapy, pharmacy, physiotherapy, podiatry, social work, speech pathology, psychology (honours) or any year of a postgraduate course in dietetics or psychology (Masters). Applications are available from the NSW Health Rural Health Support Unit, Tel (02) 6640 2302, Fax (02) 6640 2499, Email rhsu@nor.com.au, web: www.nor.com.au/community/rhsu. Session One applications close 15 May. Session Two applications close in August.

The Rural Allied Health Scholarships (L)
- $5,750

Scholarships are available to students who are in the final two years of a four year undergraduate course in Aboriginal health, dietetics, diagnostic radiography, occupational therapy, pharmacy, physiotherapy, podiatry, social work, speech pathology, or the final year of psychology (honours) degree or any year of a Masters qualification in dietetics or psychology. Applications are available from the NSW Health Rural Health Support Unit, Tel (02) 6640 2302, Fax (02) 6640 2499, Email rhsu@nor.com.au, web: www.nor.com.au/community/rhsu. Applications close late September.

The Sam Cracknell Memorial Scholarships (L,L)
- Up to $1,500
- 1 year

Applicants should have already completed at least 2 years of a degree or diploma course and be enrolled in a full-time course during the year of application. Selection is based on academic merit, participation in sport both directly and administratively and financial need. Applications close 31 March.
The St George Students' Association Lexcen Scholarship (L)

- $2,000
- 1 year only

Two Scholarships will be awarded annually to high achieving sports persons undertaking, or proposing to undertake, study at UNSW. To be eligible, applicants must be enrolled in, or proposing to enrol in, a course of at least two years duration at UNSW. Applicants should possess an outstanding ability in a particular sport. It is desirable, but not essential, that an applicant's family home is located in the St George/Sutherland Shire region. Each applicant will be assessed on the basis of outstanding ability in a particular sport. Consideration may also be given to an applicant's leadership qualities, potential to contribute to the wider life of the University, any social and economic circumstances which may affect the applicant and academic merit. Application must be made using the Ben Lexcen Scholarship application form. An interview may be required. Applications will normally close on 31 January.

The Spruson and Ferguson (Patent Attorneys) Scholarship for Innovation (L)

- At least $1,000
- 1 year

The scholarship is available to a student who is undertaking the final year of an undergraduate course in any school of the Faculty of Science and Technology or the Faculty of Engineering. Selection will be based on academic merit and the innovative nature of the proposed final year project. Applicants are required to submit an application and a 200 word outline of their proposed research topic. Applications close 7 March.

The Telstra Education Fellowships (L)

- $7,500
- 1 year

Applicants must be entering the final year of study in the disciplines of computer, electrical or electronic engineering, computer science or human factors. Students may also have the opportunity to undertake up to 12 weeks non-compulsory vacation employment. Further information is available from the Fellowship Applications Officer, Telstra Research Laboratories, PO Box 249, Rosebank MDC, Clayton Victoria 3169. Email c.zaman@trl.telstra.com.au. Applications normally close at the end of July.

Telstra Network Technology Group and Multimedia (NTG&M) EEO Scholarships (L)

- $10,000, plus summer vacation work and guaranteed employment
- 1 year

The scholarships are open to undergraduate students enrolled in the second last year in electrical/electronic engineering, computers systems engineering, communications or other degree related to telecommunications. Applicants must belong to one of the following EEO groups: women, people from a non-English-speaking background, Aborigines or Islanders, people with a disability. The successful candidates are expected to work for Telstra NTG&M in the summer break and for at least two years after the completion of study. Enquiries to Karen Stewart on (03) 9634 3448, Email kstewart@vcomfin.telstra.com.au. Applications close late June.

The W.S. and L.B. Scholarship (L)

- Up to $6,500 pa
- 1 year renewable for the duration of the course subject to satisfactory progress

Applicants must have completed their schooling in Broken Hill or have parents who reside in Broken Hill. Applicants should be undertaking a course related to the mining industry, for example courses in mining engineering, geology, electrical and mechanical engineering, metallurgical process engineering, chemical engineering or science. A letter of application should be sent to Pasminco Mining, PO Box 460, Broken Hill, NSW 2880. Applications close 30 September.

Faculty second year or later

Faculty of Science and Technology

Metallurgy

The Pasminco Scholarship (L)

- Up to $1,000
- 1 year

One scholarship is available for a student entering Year 4 of the Bachelor of Metallurgical Engineering. A letter of application should be sent direct to the School of Materials Science and Engineering. Applications close early March.
Honours Year Scholarships

General

The Alumni Association Scholarships (L,L)
- Up to $1,500 pa
- 1 year renewable subject to satisfactory progress
The scholarships are available to students enrolled in any year of a full-time undergraduate course. Candidates must be the children or grandchildren of alumni of UNSW. Applications close early January.

The Apex Foundation for Research into Intellectual Disability Studentships (L,L)
- $1,000
The studentships are available to students preparing a thesis related to intellectual disability. Applications should be in the form of a letter which includes a curriculum-vitae and thesis plan and must be supported by a letter from the Head of School/Department. Applications should be sent to the Honorary Secretary, Apex Foundation Studentships, PO Box 311, Mt Evelyn Vic 3796. Applications close 31 May.

The Australian and New Zealand Council for the Care of Animals in Research and Teaching (ANZCCART) Student Award (L,L)
- $1,000 for attendance at the annual conference
Applicants can be Honours students from any discipline. The award provides assistance for a student to attend the annual conference. Applications are available from ANZCCART, PO Box 19 Glen Osmond, SA, 5064, Tel (08) 303 7325. Applications close in July.

The Australian Vietnam Veterans Trust Education Assistance Scheme (L)
- $3,500 pa
- Duration of the course
The scholarship is available to the children of Vietnam veterans who are aged under 25 at the time of application. The award is subject to the same income test as AUSTUDY. Applicants can be undertaking any year of a Bachelor's course. Applications and further information are available from the Australian Vietnam War Veterans Trust National Office, PO Box K978, Haymarket NSW 1240, Tel (02) 9281 7077, Email: vvt@accsoft.com.au. Applications close 31 October.

The Ben Lexcen Sports Scholarships (L,L)
- $2,000 pa
- 1 year with the possibility of renewal
The scholarships are available to students who are accepted into a course of at least two years duration. Prospective applicants should have an outstanding ability in a particular sport and are expected to be active members of a UNSW Sports Club. Applications close late January.

The Esso Australia Ltd Geosciences Scholarship (L, L)
- Up to $3,000
- 1 year
The scholarship is for a full-time student seeking to undertake study in the final year (Stage 4) of a Bachelor of Science degree in Applied Geology or an equivalent Honours year, majoring in geology or geophysics. The successful applicant is expected to have an interest in petroleum related studies ie sedimentology, biostratigraphy, seismic/magnetic/gravity geophysical studies, basin studies, palynology or palaeontology. Selection is based on academic merit, the benefit the student will gain by being awarded the scholarship and can include consideration of financial need. Applications close 30 November.

The Girls Realm Guild Scholarships (L)
- Up to $1,500 pa
- 1 year with the prospect of renewal subject to satisfactory progress and continued demonstration of need
The scholarships are available only to female students under 35 years of age who are enrolling in any year of a full-time undergraduate course. Selection is based on academic merit and financial need. Applications close 25 March.

The Grains Research and Development Corporation (GRDC) Undergraduate Honours Scholarship (L,L)
- $6,000 (ie $5,000 to the student and $1,000 to the host School/Department).
- 1 year
Applicants must be undertaking a full-time Honours program. Study in an area of significance to the grains industry will be viewed favourably. A letter of application, including a curriculum-vitae, academic record, letter of support from the Head of School/Department and two referees' supporting statements, should be sent to GRDC Undergraduate Honours Scholarship, PO Box E6, Queen Victoria Terrace, Canberra ACT 2600, Tel (02) 62725528. Applications close early November.

The Great Barrier Reef Marine Park Authority Research Support (L,L)
- $1,500
Applicants must be undertaking a full-time Honours year or PhD research project that could contribute to the planning and managing of work undertaken by the Great Barrier Reef Marine Park Authority. Applications and further information may be obtained from the Executive Officer, Great Barrier Reef Marine Park Authority, PO Box 1379, Townsville QLD 4810, Tel (077) 819300. Applications close mid-December.

The Ian Somervaille Scholarships (L,L)
- Up to $3,000
- 1 year
The scholarships are available to immediate family members (ie. children, parents, brothers or sisters) of UNSW staff members or their married or de facto partners. Applicants must be full-time students enrolling in any year of an undergraduate course leading to the degree of Bachelor at UNSW. Selection will be based on academic merit, aptitude and commitment to the proposed course. Consideration may be given in cases of hardship or disadvantage. Applications close 31 January.

The National Health and Medical Research Council (NHMRC) Training Scholarship for Aboriginal Health Research (L,R)
- $16,135 - $23,997 pa (depending on qualifications)
- Up to 3 years
Applicants must be undertaking an undergraduate or postgraduate degree which includes, or leads to, research relevant to Aboriginal
health. Applications will be assessed in terms of previous qualifications and experience. Consideration will be given to prior knowledge and experience of Aboriginal culture and health. Applications close late July.

The NSW Ministry for the Arts Scholarships (L,R,C)
- $5,000 - $25,000 (depending on the award)
The NSW Government offers a number of scholarships and awards to writers, artists and scholars living in NSW. Further information is available from the New South Wales Ministry for the Arts, GPO Box 5341, Sydney NSW 2000, Tel (02) 9228 3533, Fax (02) 9228 4722.

The RGC Scholarship in Economic Geology (L)
- $5,000
- 1 year
The scholarship is available to a student entering Stage 4 of the Applied Geology course or an Honours year in geology in the Science course and who is proposing to undertake a field project relevant to economic geology. Letters of application and requests for information should be directed to RGC, Gold Fields House, 1 Alfred St, Sydney NSW 2000. Applications close 31 January.

The River Basin Management Society Ernest Jackson Memorial Research Grants (L,L)
- Up to $2,000
The scholarship assists PhD and Masters students undertaking research in the field of river basin management. Fourth year Honours students are encouraged to apply. Further information is available from RBMS, PO Box 113, Forest Hill Vic 3131, Tel (03) 9816 6896. Applications close in April.

The RSPCA Alan White Scholarship (L,L)
- $2,500
Applicants should be undertaking original research to improve the understanding and welfare of animals. A letter of application should be sent to the Executive Officer, RSPCA Australia, PO Box E369, Queen Victoria Terrace, Canberra ACT 2600, Tel (02) 62311437. Applications close 31 March.

The Rural Allied Health Placement Grants (L)
- Up to $500
Grants are available to students undertaking rural placements, who are in the final two years of an undergraduate course in dietetics, diagnostic radiography, occupational therapy, pharmacy, physiotherapy, podiatry, social work, speech pathology, psychology (honours) or any year of a postgraduate course in dietetics or psychology (Masters). Applications are available from the NSW Health Rural Health Support Unit, Tel (02) 6640 2302, Fax (02) 6640 2499, Email: rhsu@nor.com.au, web: www.nor.com.au/community/rhsu. Session One applications close 15 May. Session Two applications close in August.

The Rural Allied Health Scholarships (L)
- $5,750
Scholarships are available to students who are in the final two years of a four year undergraduate course in Aboriginal Health, dietetics, diagnostic radiography, occupational therapy, pharmacy, physiotherapy, podiatry, social work, speech pathology, or the final year of psychology (honours) degree or any year of a Masters qualification in dietetics or psychology. Applications are available from the NSW Health Rural Health Support Unit, Tel (02) 6640 2302, Fax (02) 6640 2499, Email: rhsu@nor.com.au, web: www.nor.com.au/community/rhsu. Applications close late September.

The Sam Cracknell Memorial Scholarship (L,L)
- Up to $1,500
- 1 year
Applicants should be full-time students who have already completed at least 2 years of a degree or diploma course. Selection is based on academic merit, participation in sport both directly and administratively, and financial need. Applications close 31 March.

The St George Students' Association Lexcen Scholarship (L)
- $2,000
- 1 year only
Two Scholarships will be awarded annually to high achieving sports persons undertaking, or proposing to undertake, study at UNSW. To be eligible, applicants must be enrolled in, or proposing to enrol in, a course of at least two years duration at UNSW. Applicants should possess an outstanding ability in a particular sport. It is desirable, but not essential, that an applicant's family home is located in the St George/Sutherland Shire region. Each applicant will be assessed on the basis of outstanding ability in a particular sport. Consideration may also be given to an applicant's leadership qualities, potential to contribute to the wider life of the University, any social and economic circumstances which may affect the applicant and academic merit. Application must be made using the Ben Lexcen Scholarship application form. An interview may be required. Applications will normally close on 31 January.

The Ukrainian Studies Foundation of Australia Endowed Scholarship (L,L)
- $1,000 in 2000, $1,500 from 2001
- 1 year only
The Scholarship is available to students undertaking, or proposing to undertake, postgraduate or honours level studies at UNSW on a Ukrainian topic/theme, or comparative Ukrainian/Australian topic/theme. Selection will be based on academic merit and the reasons for undertaking the current and/or proposed studies. Applications will normally close on January 31.

The University Honours Year Scholarships (L,L)
- $1,000
- 1 year
A number of scholarships will be awarded on the basis of academic merit for students entering an 'add-on' honours year, le the honours year in a degree course which is normally a pass degree but which has the option of a further year of study at Honours level. Applications close 30 November.

The W.S. and L.B. Robinson Scholarship (L)
- Up to $6,500 pa
- 1 year renewable for the duration of the course subject to satisfactory progress
Applicants must have completed their schooling in Broken Hill or have parents who reside in Broken Hill. Applicants should be undertaking a course related to the mining industry, for example courses in mining engineering, geology, electrical and mechanical engineering, metallurgical process engineering, chemical engineering or science. A letter of application should be sent to Pasminco Mining, PO Box 460, Broken Hill, NSW 2880. Applications close 30 September.
Faculty Scholarships

Faculty of Life Sciences

The Dean’s Honours Year Scholarship (L,L)
• $2,500
• 1 year only
One Scholarship is available for a student undertaking an Honours Year in the Faculty of Life Sciences. Selection will be based on academic merit. The Scholarship cannot be held concurrently with a Faculty of Life Sciences Undergraduate Scholarship or a University Honours Year Scholarship. Applications close 30 January.

Biological Science

The Alton and Neryda Fancourt Chappie Biological Science Scholarship (L,L)
• $1,000
• 1 year
The scholarship is available to a student undertaking the Honours year in the School of Biological Science at UNSW. Selection will be based on academic merit. Applications close 30 April.

Faculty of Science and Technology

The Brother Vincent Cotter Honours Scholarship in Physics (L)
• $1,000
• 1 year only
Applicants must be proposing to undertake the fourth year Honours program in the School of Physics at UNSW. Selection will be based on academic merit and the applicants reasons for undertaking the course. Applications will normally close on 31 January.

The H.C. & M.E. Porter Memorial Scholarship (L,L)
• Up to $3,000
• 1 year
The scholarship is available to a full-time student undertaking an Honours year in Chemistry, Mathematics or Physics in the Faculty of Science and Technology. Applications close 20 December in the year prior to the proposed Honours year.

The Howard Memorial Scholarship in Science at UNSW (L)
• HECS liability, $4,000 living allowance
• 1 year
Applicants must be undertaking a full-time Honours Year in one of the Schools of the Faculty of Science and Technology. Students who will not be completing their Pass degree until the end of Session One, in the following year can apply. Benefits for these students will not commence until completion of the Pass degree. Selection is based on academic merit and a demonstrated capacity for research. Applications close 31 October.

Chemistry

The Howard Memorial Scholarship for Honours in Chemistry (L)
• HECS liability, $4,000 living allowance
• 1 year
Applicants must be undertaking the Honours Year in the School of Chemistry. Students who will not be completing their Pass degree until the end of Session One, in the following year can apply. Benefits for these students will not commence until completion of the Pass degree. Selection is based on academic merit and a demonstrated capacity for research. Applications close 31 October.

Mathematics

The Buchwald Award in Applied Mathematics (L,L)
• Up to $400
• 1 year
One scholarship is available for a student in the final year of the Honours course in Applied Mathematics. Applications close 31 March.

The George Szekeres Award (L,L)
• $300
• 1 year
The scholarship is available to students entering the final year of the Honours course in Pure Mathematics. Applications close 31 March.
Travel Scholarships

General

The Arthur Anderson Study Abroad Scholarship (L)
- Up to $2,500
The scholarship provides financial assistance to undergraduate students to undertake a period of study or research in the Arthur Anderson offices in Singapore. Applicants must be full-time students undertaking study in law, commerce, or economics. Applicants must normally be intending to undertake the final year of study and to complete the travel prior to completion of the final year. Applications are also open to students undertaking an official exchange program with a university in Asia. Further information and application forms are available from the International Student Centre. Applications normally close 31 July in the year prior to the final year of study.

The Association of International Education Japan (AIEJ) Short-Term Student Exchange Promotion Program (Inbound) Peace and Friendship Scholarships (L)
- 50,000 yen (settling-in allowance), 100,000 yen per month, plus airfare
- Ten months to one year
Applicants must be accepted by a Japanese University under a student exchange program agreement with UNSW. Students must initially apply directly to a Japanese University through the International Student Centre at UNSW. The Japanese host university will recommend candidates to AIEJ and students must apply as directed by the host university. Applications close in February, May and September each year.

The Association of International Education Japan (AIEJ) Short-Term Student Exchange Promotion Program (Inbound) Scholarships (L)
- 50,000 yen (settling-in allowance), 80,000 yen per month, plus airfare
- Six months to one year
Applicants must be accepted by a Japanese University under a student exchange program agreement with UNSW. Students must initially apply directly to a Japanese University through the International Student Centre at UNSW. The Japanese host university will recommend candidates to AIEJ and students must apply as directed by the host university. Applications close in February, May and September each year.

The AT&T Leadership Award (l,L,R,C)
- US$5,000
The award is open to students who will be commencing full-time undergraduate or postgraduate study in the United States between January and September in the year of application. The scholarship is open to students from the following Asia/Pacific countries: Australia, China, Hong Kong, India, Indonesia, Japan, Republic of Korea, Malaysia, Philippines, Singapore, Taiwan and Thailand. Information and applications are available from the U.S. Consulate General, USIS, Level 59 MLC Centre, 19-20 Martin Place, Sydney NSW 2000, Tel (02) 9662 3016. Applications close 15 September.

The Australia-Korea Foundation/National Korean Studies Centre Exchange Scholarships (L)
- Up to $2,500
The scholarships provide financial assistance to undergraduate students who have been accepted as exchange students by a Korean University. Information and applications are available from the Programs Co-ordinator, National Korean Studies Centre, PO Box 218, Hawthorn Vic 3122, Email nksc@swin.edu.au. Applications close early January.

The Australia-Korea Foundation Undergraduate Bursaries (L)
- $1,000
- 1 year
Bursaries are available for students commencing the first year of an undergraduate course intending to study the Korean language. Information and applications are available from the Programs Co-ordinator, National Korean Studies Centre, PO Box 218, Hawthorn Vic 3122, Email nksc@swin.edu.au. Applications close in December.

Churchill Fellowships (L)
- Tuition, travel and living allowances
Churchill Fellowships provide financial support for Australian Citizens to undertake study, training or projects overseas. Fellowships will not normally be awarded for higher academic or formal qualifications. Applicants must be over 18 years of age. Further information and applications are available from the Chief Executive Officer, The Winston Churchill Memorial Trust, 218 Northbourne Ave, Braddon ACT 2612, Tel (02) 6247 8333. Applications close late February.

DAAD - The German Academic Exchange Service Scholarships (L)
Application forms for the following scholarships are available from the Consulate General of the Federal Republic of Germany, PO Box 204, Woolahra NSW 2025.

One-Semester German Studies Scholarships
- DM1,000 a month living allowance, travel assistance of DM2,500 and the health insurance contribution
- One semester
Applicants must be in their third year of German Studies. Applications close 1 July.

Deutschlandkundlicher Winterkurs
- DM3,500 to assist with travel and living expenses and course fees
Undergraduate and postgraduate students from all fields with at least two years University level German (with a better than B average) may apply for this scholarship. The students should be aged from 19 to 32 and proposing to undertake the 8 week German studies course (in German) at the University of Freiburg. The course provides language instruction and concentrates on historical and cultural aspects of contemporary Germany for students with some knowledge of German and a background in German Studies. Applications close 1 August.

Greek Government Scholarships (L)
- Tuition fees, monthly subsidy plus other allowances
Scholarships are available for undergraduate and postgraduate study in Greece. Applicants must be Australian citizens. Further information is available from the Embassy of Greece, 9 Turana St, Yarralumla ACT 2600, Tel (02) 6273 3011. Applications normally close late March.
The Harry Manson Scholarship (L)
• $4,000, payable on receipt of evidence that the travel will take place within three months
• 1 year only

Up to five Scholarships will be awarded annually to promote the growing international dimension of UNSW. Applicants should be enrolled in, or proposing to enrol in the first year of an undergraduate course at UNSW. The Scholarships are to be used either for an approved Study Exchange program or other overseas project in the second or later year of a course at UNSW. Each applicant will be assessed on the basis of academic merit, ability to contribute to the wider life of the University, and a statement detailing the benefits to be gained and/or the reasons for the proposed travel. Applications will normally close on 30 November of the year preceding the first year of study at UNSW. The scholarships will normally be awarded at the time students are enrolling at UNSW for the first time. Should awards become available later in the year a second selection may be undertaken with a closing date of 30 September of the first year of study at UNSW.

The Harvard Travel Scholarships (L)
• $15,000 contribution towards fees, travel and living expenses
• One-off payment

The scholarship will be awarded by the Vice-Chancellor on the basis of recommendations from the Deans of the Faculties. Candidates must have completed at least 2 years full-time (or the part-time equivalent) of an undergraduate course at the UNSW and have an impressive academic record. Award of the scholarship is subject to the recipient gaining entry to the Harvard-Radcliffe Visiting Undergraduate Program. Applications close mid-November for travel in the following year.

The International Exchange Travel Scholarships (L)
• Up to $1,500
• 1 year

The scholarships were established to encourage UNSW students to participate in the University’s formal international exchange programs. Students must be undergraduates embarking on a period of study overseas which will count toward their UNSW degree. Awards will be granted on the basis of academic merit. Further information is available from the International Student Centre, Tel (02) 9385 5333.

Italian Government Scholarships (L)
• 1 million Italian lira per month
• 2-24 months

Scholarships are open to Australian citizens to undertake research and language studies in Italy. Applicants must be aged under 35 years. Further information is available from the Italian Embassy, 12 Grey St, Deakin ACT 2600, Tel (02) 6273 3333, Fax (02) 6273 4223. Applications close early March.

Japanese Government (Monbusho) Scholarships (L)

Scholarships are available to Australian Citizens for study in Japan for postgraduate research or five years of undergraduate study. Applicants must be willing to study the Japanese language and receive instruction in Japanese. Further information and applications are available from Monbusho Scholarships, Embassy of Japan, 112 Empire Circuit, Yarralumla ACT 2600, Tel (02) 6272 7269, Fax (02) 6273 1848. Applications close early July.

Learn Arabic in Cairo Scholarship (L,L)
• Course fees, AUD$70 per month living allowance
• 8 months

Scholarships are available to undertake the Arabic as a Foreign Language course in Cairo. Applications are available from the Embassy of the Republic of Egypt, 1 Darwin Avenue, Yarralumla ACT 2600, Tel (02) 6273 4437, Fax (02) 6273 4279. Applications close 1 July.

The Malcolm Chaikin Overseas Exchange Scholarship (L)
• $4,000
• 1 year

A scholarship is available for a third or later year student in a Science or Engineering degree program in the Faculty of Life Sciences, Science and Technology or Engineering. Applicants must have applied for the Malcolm Chaikin Scholarship for 1998 or later, and be undertaking an official overseas exchange program. It is expected that the first scholarship will be awarded for travel in 2000. Applications close 30 September.

The Mitsui Education Foundation Scholarship (L)

A three week scholarship to Japan is available to a young Australian national to help promote goodwill between the two countries. Candidates should be full-time undergraduate students in their first degree course who have not previously been to Japan. The successful student will travel to Japan during November and December. Further information regarding applications and participating institutions is available from info@mitsui.com.au. Application forms close mid-July.

The NSW Travelling Art Scholarship (L)
• $25,000

The scholarship is available to an emerging visual artist to undertake a course of study or training overseas for one or two years. Guidelines and applications are available from the NSW Ministry for the Arts, GPO Box 5341, Sydney 2001, Tel (02) 9228 5533. Applications normally close in July.

Queen’s Trust Grants (L)
• Up to $15,000

The Queen’s Trust provides grants to Australian Citizens aged 18-28 years, for the pursuit of excellence in their chosen fields. Projects are supported for the advancement of Australian youth, development of community leadership and/or other skills which will be of benefit to Australia. Information and applications may be obtained from the Queen’s Trust, Tel 1800 033 625. Applications close late April.

The R.C. Sutton/ Jardine Matheson Scholarship (L)
• Up to $1,000

The scholarship is to provide financial assistance to undergraduate students to undertake a period of study/research in the R.C. Sutton/ Jardine Matheson offices in Asia. Applicants must be full-time students undertaking study in law, commerce, or economics. Applicants must normally be intending to undertake their final year of study and to complete the travel prior to completion of the final year. Applications are also open to students undertaking an official exchange program with a university in Asia. Further information and application forms are available from the International Student Centre. Applications normally close 31 July in the year prior to the final year of study.
The Rotary Foundation Ambassadorial Scholarships (L)
The Rotary Foundation offers scholarships to study or train in another country where Rotary clubs are located. Applicants must have completed at least two years of a university or college course, or have completed high school and have been employed for at least two years. Applicants must also be Citizens of a country in which there is a Rotary club. Information regarding scholarship availability, closing dates and applications should be obtained from the applicant’s local Rotary club.

The Russian Scholarships (L)
- Payment of an allowance and medical cover
Scholarships are available to Australian citizens to undertake undergraduate or postgraduate study in journalism, law, economics, international relations or medicine in Russia. Applications normally close in May.

The Ship for World Youth Program (L)
- Economy airfare, accommodation, local trips and meals
- Awarded every second year
The objective of this program is to promote understanding and mutual friendship between the youth of Japan and other parts of the world and to foster the spirit of international cooperation. The successful applicants will visit Japan to participate in the program for the period January to March. Students should be aged from 20 to 29, able to participate in the whole program, be in good physical and mental condition, able to speak English and Japanese, have an interest in and an understanding of Japan, and be engaged in youth activities. The next round of scholarships will be available in 2001. Applications close early July 2000.

The Sir Charles Mackerras / Australia-Britain Society Music Scholarship (L)
- 8,000 pounds sterling
The scholarship is open to outstanding young conductors, composers and repetiteurs, aged between 21 and 30 who are likely to be influential leaders in the field of music, to undertake study in the United Kingdom or the Czech republic for at least six months. Applicants must be Australian Citizens or Permanent Residents. Application forms are available from the British Council, PO Box 88, Edgecliff NSW 2027, Tel (02) 9328 2022, Fax (02) 9327 4868, Email bcsydney@sprint.com. Applications close early November.

The STA Travel Grant (L, L)
- Up to $3,000
Applicants must be undertaking study leading to a degree or diploma of the University and be members of the University Union. The grant is awarded on the basis of significant contribution to the community life of the University involving a leadership role in student affairs and the University Union and the relevance and merit of the proposed travel to the student’s academic program or University Union activities. Applications close mid-April.

The Swedish Institute Guest Scholarships (I, L)
- SEK 7,100 per month living allowance
- 9 months (1 academic year)
The scholarships are open to students and researchers who wish to travel to Sweden for study or research which cannot equally well be pursued in countries other than Sweden. Applicants must establish contact with a Swedish University willing to accept the applicant for the proposed studies. Initial requests for application forms must be made in writing, and should include the applicant’s name and address, nationality, educational background, work experience, knowledge of any languages, statement of the purpose of the study or research in Sweden, and a copy of a letter of invitation from a Swedish University Department. Applications are available from the Swedish Institute, Department for Exchanges in Education and Research, Box 7434, SE-103 91, Stockholm, Sweden. Email: grantinfo@si.se. Web: http://www.si.se. Requests for application forms must reach the Swedish Institute before 1 December.

Swiss Government Scholarships (L)
- Tuition fees, living allowance, medical insurance and assistance with airfares
- 1 academic year
One scholarship is available for art/music and two for other disciplines, to undertake postgraduate study or attend an art school/conservatory in Switzerland. Applicants will be required to pass a language test in German or French. Applicants must be aged under 35. Applications close early October.

The Turkish Government Language & Culture and Higher Education Scholarships (L, L)
Scholarships are available to high school graduates to undertake study at a Turkish University. Students must be required to undertake a one year Turkish language course before commencement of the degree. The scholarships pay a monthly allowance for the duration of the course. Scholarships are also available to university graduates who would like to attend Turkish Language and Culture Summer Courses conducted by the Turkish Studies Centre. Further information is available from the Embassy of the Republic of Turkey, 60 Mugga Way, Red Hill ACT 2603. Applications close 30 May for Language and Culture Scholarships, and 15 July for Higher Education Scholarships.

Yokoyama Scholarship Awards (L)
Assistance may be available for undergraduate and postgraduate study at a Japanese University. Information is available from Mr Masao Iwashita, Secretary-General, Yokoyama Scholarship Foundation, 6F Shiozaki Building, 2-7-1 Hirakawacho, Chiyoda-Ku, Tokyo 102 Japan, Tel (813) 3238 2913, Fax (813) 5275 1677.
Vacation Scholarships

Some Schools offer scholarships for the long vacation period from December to February each year. Students should contact the relevant School office for information.

General

The Australian Kidney Foundation Summer Vacation Scholarships (I,L)
- Up to $900
- 6 to 8 weeks
The scholarships are open to undergraduate students who have completed at least one year of full-time study in Medicine or a course related to Biological Science. The proposed research project must be related to the kidney and the urinary tract, and carried out at a university department during the summer vacation period. Applications are available from the Medical Director's Office, Australian Kidney Foundation, GPO Box 9993, Adelaide SA 5001, Tel (08) 8267 4555, Fax (08) 8267 4450, Email: ttaylor@terra.net.au. Applications close 15 September.

ANU Summer Research Scholarships (I,L)
- $130 per week, plus full board and travel
- 8-12 weeks
Scholarships are offered to undergraduate students for short research projects in Physics, Chemistry, Astronomy, Biological Sciences, Computer Sciences, Engineering, Medical Sciences, Earth Sciences, Pacific and Asian Studies, Social Sciences and Environmental Sciences, at the Institute of Advanced Studies, ANU. Further information and applications are available from Anna Weidemann, Summer Research Scholarship Program, The Australian National University, Canberra ACT 0200, Tel (02) 6249 3765, Fax (02) 6249 5995, Email: schlsec@rsc.anu.edu.au. Applications close late August.

Cooperative Research Centre for Food Industry Innovation Vacation Scholarships (I,L)
- Up to $2000
- 8 to 12 weeks between November and March
The scholarships are open to final year undergraduate students enrolled in courses in one or more of the following disciplines: biochemistry, biotechnology, bioprocess engineering, chemistry, food science, food technology, immunology, microbiology, or molecular biology. Research projects must be related to one of the research programs of the CRC. Application Kits are available from September, and further information is available from Ms M Romeo, Education Officer, CRC for Food Industry Innovation, c/- Department of Biotechnology, UNSW, Sydney NSW 2052, Tel (02) 9385 1296, Fax (02) 9385 1015, Email: m.romeo@unsw.edu.au. Applications close early September.

The CSIRO Division of Marine Research Vacation Scholarships (I,L)
- Up to $450 per week plus travel expenses
- 8 weeks between December and February
Applicants must be full-time undergraduate students who have completed not less than three years of their course. Research projects will be undertaken with the CSIRO Division of Marine Research at either Hobart, Cleveland or Marmion. Applications close early September.

The CSIRO Vacation Scholarships (I,L)
- $420 per week
- 8 to 12 weeks between December and February
The scholarships are open to postgraduate and undergraduate students who have completed no less than three years of a full-time course in Physics, Mathematics, Computer Science, Electrical Engineering, or a closely allied subject. Research projects are carried out under the individual supervision of a research engineer or scientist. Applications are available on the web at http://www.atnf.csiro.au/educate/summer_vacation.html. Applications close early August.

The Dried Fruits Research and Development Council (DFRDC) Studentships (I,L)
- Up to $3,000 for Studentships, up to $1,000 for Student Awards
The Studentships assist students to undertake research projects during the summer vacation period. Further information and applications are available from the Executive Officer, Dried Fruits Research and Development Council, Box 1142, Mildura Vic 3502, Tel (050) 221515, Fax (050) 233321. Applications close 15 October.

The Heart Foundation Vacation Scholarship Awards
Scholarships are available during the long vacation period for research projects related to cardiovascular function and disease. Applicants should normally have completed at least two years of an appropriate degree course in the biological sciences. Preference will be given to applicants who have had little or no laboratory experience. Applications close early September.

Medical School Vacation Scholarship Scheme - John Flynn Scholarships
- $2,500 pa to cover travel, accommodation, mentor's honorarium, host practice costs, student stipend
- Two weeks per year for up to four years
Scholarships are available to undergraduate medical students to take up vacation placements in rural and remote communities, country towns or regional centres. Placements may be with a general practitioner, rural hospital, rural/remote Aboriginal Medical Service, or a combination of these. Further information may be obtained by telephoning 1800 801 454.

The National Multiple Sclerosis Society of Australia Summer Vacation Scholarships (I)
- $200 per week
- 6 to 8 weeks between November and March
The scholarships are open to undergraduate students completing three or four years of a full-time course leading to an honours degree in medicine, science, or the biological or health sciences. Research projects must be relevant to multiple sclerosis and carried out at a university department during the summer vacation period. Applications close mid-August.

The Novo Nordisk Student Research Scholarship (I,L)
- $1,000 to $1,500
- 6 to 9 weeks over the vacation period
The scholarship is available for diabetes-related research at the Department of Endocrinology, Prince of Wales Hospital and is open to students enrolled at any tertiary institution in Australia. Preference will, however, be given to students enrolled in an undergraduate degree in Science or Medicine at UNSW. Selection will be based on interest in research in diabetes mellitus and academic performance. Further information is available from Associate Professor Bernie Tuch, Prince of Wales Hospital, Tel (02) 9382 4814. Applications close 31 October.
Faculty Vacation Scholarships

Faculty of Life Sciences

Faculty of Life Sciences Vacation Scholarships (I,L)
• $2,000
• 4 to 8 weeks over the summer vacation period
Applicants must be enrolled in an undergraduate course which allows the scholar to proceed to an honours program in the Faculty of Life Sciences. Selection will be based on academic merit and demonstrated interest in a research discipline of the Faculty of Life Sciences. Applications close 30 October.

Faculty of Science and Technology

Chemistry

The School of Chemistry Summer Vacation Scholarships (I,L)
• Up to $250 per week
• Up to 8 weeks
Summer Vacation Scholarships are available to undertake research with staff members of the School of Chemistry. Students completing their first year may receive up to $500, for 4 weeks research.

Mathematics

Vacation Scholarships in Mathematics (I,L)
• $350 per week
• At least 6 weeks
Vacation scholarships are available for research in the School of Mathematics. Applicants should be enrolled in third year of a mathematics or statistics course and be interested in further study. Scholarships may also be available for exceptional second year students. Additional information is available on the web at: http://www.maths.unsw.edu.au or by contacting Dr Brian Jefferies, School of Mathematics, UNSW, Tel (02) 9385 7086, Email b.jefferies@unsw.edu.au. Applications close in mid-October.

Physics

Vacation Scholarships in Physics (I,L)
• $250 per week
• Up to 6 weeks
Vacation scholarships are available to work with research groups in the School of Physics. Applicants should normally have completed their third year of study and be intending to continue to honours and perhaps postgraduate study in Physics. Exceptional second year students may also be considered. Further information can be obtained from Dr Michael Box, School of Physics, UNSW, Tel (02) 9385 4545, Email m.box@unsw.edu.au. Applications close in mid-October.
Postgraduate Scholarships

Following are details of scholarships available to postgraduate students at UNSW. The scholarships are listed by Faculty and course (eg, scholarships in Science and Technology or Engineering) or whether they are available to undertake travel. If students from more than one Faculty are able to apply the scholarship is listed in the General Scholarships section.

For further information contact:
The Scholarships and Student Loans Unit
The University of New South Wales
Sydney 2052 Australia
Tel (02) 9385 3100/3101/1462
Fax (02) 9385 3732
Email scholarships@unsw.edu.au

General Scholarships

Main programs of assistance for postgraduate study

The Australian Postgraduate Awards (APA) (L,R)
- $16,135 pa (1999 rate). Other allowances may also be paid.
- Up to 2 years for a Masters by Research, 3 years for a PhD degree. PhD students may apply for up to 6 months extension in certain circumstances

Applicants must have graduated, or be proposing to graduate in the current academic year, with Honours 1 or equivalent. Students with Permanent Resident status should normally have lived in Australia continuously for 12 months. Applications close 29 October.

The Australian Development Scholarship (ADS) (I)
- Tuition fees, medical cover, airfare and a stipend.
- Duration of the course

This award is for international students from selected countries only. Information and applications can only be obtained from Australian Diplomatic Posts or Australian Education Centres in the home country. Applications normally close at least 12 months before the year of study.

The International Postgraduate Research Scholarships (IPRS) (I,R)
- Tuition fees and medical cover only
- 2 years for a Masters by Research, 3 years for a PhD degree

Eligibility is confined to postgraduate research students who are Citizens of countries other than Australia or New Zealand. Applications close 30 September.

Other General Scholarships

Indigenous Researchers Development Scheme (L,R)
- At least $3,000
- Up to 3 years

The Scholarships are awarded to support research projects by Aboriginal and Torres Strait Islander researchers in the biological, mathematical, physical, chemical, engineering, earth and applied sciences and the humanities and social sciences, which are likely to lead to a significant conceptual advance in understanding of a subject or lead to the solution of an important practical problem. Further information and applications are available from the Research Office, UNSW, Tel (02) 9385 1074 or the Research Office Web site: http://www.ro.unsw.edu.au. Applications close mid-June.

The Anthony Rothe Scholarship (I,L,R)
- $28,000 pa plus allowances
- Up to 3 years

Applications are open to postgraduate students proposing to undertake a PhD in a field related to the causes, prevention, treatment or cure of leukaemia and allied blood disorders. Information and applications are available from The Secretary, Anthony Rothe Memorial Trust, c/- Brigden & Partners, GPO Box 2564, Sydney NSW 2001. Applications close late August.

The Apex Foundation for Research into Intellectual Disability Research Grants (I,L,R)

Grants may be awarded for new or existing research projects in any discipline concerned with the causes, diagnosis, prevention or treatment of intellectual disability and allied conditions. Applications can be obtained from the Hon. Secretary, Apex Foundation for Research into Intellectual Disability Limited, PO Box 311, Mount Evelyn VIC 3796. Applications close late July.

The Arthritis Foundation of Australia Research & Professional Education Awards (L,R)
- $5,000 - $32,000 pa
- 1 to 3 years

Scholarships, fellowships and grants are available to support research projects into arthritis, osteoporosis and other musculoskeletal disorders. Applicants must be enrolled in studies leading to a Masters by Research or PhD. Further information and applications are available from The Arthritis Foundation of Australia, GPO Box 121, Sydney NSW 2001, Tel (02) 9552 6085, Fax (02) 9552 6078. Applications close early June.

The Asthma Foundation of New South Wales Research Scholarships (I,L,R)
- To be determined
- 1 to 3 years

The scholarships are available for research into asthma including the basic medical services or clinical and psychological investigations. Further information is available from The Asthma Foundation of NSW, Unit 1 "Garden Mews", 82-86 Pacific Highway, St Leonards NSW 2065. Applications close in early August.

The Australian Brewers Foundation Alcohol Related Medical Research Postgraduate Scholarships (I,L,R)
- Similar to the NHMRC (see NHMRC entry)
- 1 year

Similar to the NHMRC. The scholarships are available to support research into the medical, social and public health aspects of moderate, hazardous or harmful alcohol consumption. Information and applications are available from ABF-Medical Research Advisory.
Applications close mid-September.

The Australian Coral Reef Society (ACRS) Inc Student Grants (L,L,R,C)
- $1,000 (plus $1,500 Walker prize for the best proposal)
The grant is open to students who are enrolled at an Australian University in a PhD or MSc involving research on coral reefs. Recipients must be a member of, or willing to join the ACRS. Applications normally close late November.

Australian Food Industry Science Centre (AFISC) Scholarships (L,L,R)
- $25,000 pa plus allowances
- Up to 2 years for a Masters by Research, 3 years for a PhD
It is expected that applicants will be of Honours 1 or high 2A standard or equivalent. Graduates from non-food technology disciplines, such as engineering, mathematics and physics, are also encouraged to apply. Further information and applications are available from AFISC, Private Bag 16, Sneydes Road, Werribee VIC 3030, Tel (03) 9742 0111. Applications close early November.

The Australian Federation of University Women (L,L,R,C)
Each year the Federation offers to its members a number of awards for study in Australia and overseas. Details of awards are included in a booklet available from the Australian Federation of University Women Inc, 215 Clarence Street, Sydney NSW 2000, Tel (02) 9299 9888.

The Australian Institute of Nuclear Science and Engineering (AINSE) Postgraduate Research Awards (L,L,R)
- $7,500 supplement to an APA or equivalent scholarship and $5,500 pa for facility costs plus allowances
- Up to 3 years
The Institute offers awards for postgraduate students whose research projects are associated with nuclear science or its applications. Applicants must be eligible for an APA or equivalent scholarship after having completed a Bachelor of Engineering or Bachelor of Science with Honours. At least one month per year must be spent at the Institute at Lucas Heights, NSW. Applications close early December.

The Australian Kidney Foundation Grants and Scholarships (L,L,R)
The AKF supports research into the causes, prevention and treatment of disorders of the kidneys and urinary tract. Programs include Medical Research Seeding Grants, Medical Research Equipment Grants, Biomedical Research Scholarships and Summer Vacation Scholarships. Applications are available from the Medical Director's Office, Australian Kidney Foundation, GPO Box 9993, Adelaide SA 5001, Tel (08) 8267 4555, Fax (08) 8267 4450, Email: taylor@terra.net.au. Applications close 30 June.

The Australian and New Zealand Council for the Care of Animals in Research and Teaching (ANZCCART) Student Award (L,L,R,C)
- $1,000, for attendance at the annual conference
Applicants can be postgraduate students from any discipline. The award provides assistance for a student to attend the annual conference. Applications are available from ANZCCART, PO Box 19, Glen Osmond, SA, 5064, Tel (08) 303 7325. Applications close in July.

The Australian Pain Relief Association and Australian Pain Society PhD Scholarship (L,R)
- $16,750 pa plus allowances
- Up to 3 years subject to satisfactory progress
Applicants must hold an Honours 1 degree and be proposing to undertake a PhD in the mechanism, diagnosis, treatment or epidemiological features of acute or chronic (including cancer) pain. Further information and applications are available from the Australian Pain Society Secretariat, PO Box 629, Willoughby NSW 2068, Tel (02) 9439 6744. The award is offered bi-annually. Applications close early November.

The Australian Society for Microbiology (L,R,C)
- $100 - $10,000
The Australian Society for Microbiology (ASM) provides prizes and awards, for study, research and projects related to Microbiology. Further information and applications can be obtained from the ASM National Office, Unit 23/20 Commercial Rd, Melbourne VIC 3004, Tel (03) 9867 8699, Fax (03) 9867 8699.

The Australian Spinal Research Foundation Postgraduate Research Awards (L,L,R)
- Equivalent to Australian Postgraduate Award (see APA entry under General)
- Up to 2 years for a Masters by Research or 3 years for a PhD degree
Applicants must be undertaking a Masters by Research or PhD in an area designed to contribute to an understanding of the anatomical and physiological mechanisms underlying chiropractic care or the clinical efficiency of chiropractic care and management procedures. Information and applications are available from the Australian Spinal Research Foundation, PO Box 1047, Springwood Qld 4127, Tel (07) 3808 4096, Fax (07) 3808 8109, Email: t.Flack@qut.edu.au. Applications close mid-October.

The Captain Reg Saunders Scholarship (L,R,C)
- $3,000
- Up to 4 years
Applicants must be Aboriginals or Torres Strait Islanders eligible to commence a university degree in the area of psychology, nursing, applied science, social work or education. Further information and applications are available from the Aboriginal Education Program, UNSW, Tel (02) 9385 3805.

The Community Health and Anti-Tuberculosis Association - The Harry Windsor Biomedical and Medical Research Scholarship (L,R)
- $23,997 pa (Medical postgraduates), $16,135 (Biomedical Science graduates) plus allowances
- Up to 3 years
Applicants must be proposing to undertake full-time postgraduate medical research in the areas of tuberculosis, respiratory disease (particularly community aspects) or the health of disadvantaged people. Only original application forms will be accepted and are available from The Executive Officer, Community Health and Anti-Tuberculosis Association, PO Box 200, Rose Bay, NSW 2029, Fax (02) 9371 9768. Applications close 1 August.

The Cooperative Research Centre for Eye Research and Technology (CRCERT) Postgraduate Research Scholarship (L,L,R)
- $15,321 - $19,827 pa (depending on the type of research)
- 3 years
The scholarship is available for full-time PhD studies in subjects such as optometry, microbiology, biochemistry, optics, materials...
science, polymer chemistry and immunology. For information about application procedures applicants should initially contact Dr Mark Wilcox, CRCERT, University of New South Wales, Sydney 2052, Tel (02) 9385 0222.

The Clean Air Society of Australia and New Zealand Inc Postgraduate Research Award (I,L,R,C)
- $5,000 pa
- 1 year, with a possible 1 year extension
The scholarship is open to students enrolled in a Masters degree program with a significant research component connected with air quality. Applications close early February.

The CSIRO Division of Fisheries Supplementary PhD Awards (L,R)
- $10,000 pa
- Up to 3 years
This scholarship is a supplement to any primary scholarship (eg APA) for PhD study in marine studies, environmental studies, zoology, botany, broadly-based life sciences, economics and mathematics. Applications close early March.

The Dairy Research and Development Corporation (DRDC) Postgraduate Scholarships and Study Awards (L,R)
Awards to undertake full-time postgraduate research degrees are available in a wide range of disciplines including dairy manufacturing, farm research, economics and marketing, and agricultural extension. New and experienced applicants are welcome to apply. Guidelines and applications are available from the Scholarships and Student Loans Unit or DRDC, Level 3, 84 William Street, Melbourne VIC 3000, Tel (03) 9602 5300. Applications close 31 October.

The Forest and Wood Products Research and Development Corporation (FWPRDC) Scholarships (L,R)
- Up to $25,000 pa
- Up to 3 years
The scholarships are open to students undertaking a postgraduate research degree at an Australian University. Selection is based on academic merit and the relevance of the project to FWPRDC Programs. Further information and applications are available from the Executive Director, FWPRDC, PO Box 157, Bond University Qld 4229, Fax (07) 5578 7911. Applications close 31 October.

The Garnett Passe and Rodney Williams Memorial Foundation Research Scholarships in Otolaryngology (I,L,R)
- $15,364 pa for science graduates, $22,850 pa for medical graduates, plus allowances
- 3 years
The scholarships are available to medical or science graduates for research in Otolaryngology or in related fields of biomedical science. Applicants must be enrolled in a postgraduate degree in Australia or New Zealand. Information and applications are available from the Garnett Passe and Rodney Williams Memorial Foundation, Pelham House, 165 Bouverie St, Carlton VIC 3053, Tel (03) 9349 2622, Fax (03) 9349 2615. Applications normally close in August.

The Gerontology Foundation Grant-In-Aid (I,L,R,C)
- Up to $5,000 for a specific research project
Grants-In-Aid are awarded to students who have not had their work published in a refereed journal and who have not won any research grants in open competition. The grant supports a proposed scientific investigation topic specified by the Foundation. Information and applications are available from The Executive Officer, Gerontology Foundation of Australia Inc, PO Box 199, Annandale NSW 2038. Applications normally close late July.

The Gowrie Scholarship Trust Fund (L,R)
- $4,000 pa
- 2 years
Applicants must be members of the Forces or children (or grandchildren or lineal descendants) of members of the Forces who were on active service during the 1939-45 War. Tenable at tertiary institutions in Australia and overseas. Applications close early October.

The Grains Research and Development Corporation (GRDC) Junior Research Fellowship (L,R)
- $21,000 pa plus up to $3,000 to the supporting institution, some conference/workshop attendance allowances
- Up to 3 years
Applicants must be undertaking full-time PhD studies in fields of high priority to the grains industry. Applications close mid-October.

The Great Barrier Reef Marine Park Authority Research Support (I,L,R)
- $1,000
Applicants must be undertaking a full-time Masters or PhD research project that could contribute to planning and managing the Great Barrier Reef Marine Park and to the Reef's ecologically sustainable development. Applications and further information may be obtained from the Executive Officer, Great Barrier Reef Marine Park Authority, PO Box 1379, Townsville QLD 4810, Email: k.lally@gbrmpa.gov.au. Applications close mid December.

The Harold G. Conde Memorial Fellowship (L,R,C)
- $5,000 pa subject to the availability of funds
- Up to 3 years
Applicants should be honours graduates. The Fellowship is a supplementary award to be held in conjunction with another scholarship and is for postgraduate study or research in a field related to the electricity industry. Applications close early April.

The Julian Small Foundation Annual Research Grant (I,L,R)
- Up to $5,000
Applications are open to postgraduate and undergraduate students undertaking research and involved in the study of law, or industrial relations. Selection will be based on a research proposal which outlines how the research will advance thinking and practice in the area of employment law and industrial relations in Australia. Applications close mid-August.

The June Opie Fellowship (I,L,R,C)
- NZD$12,000
- 1 year
The award is administered by the University of Auckland and is available to Citizens and Permanent Residents of Australia, Canada and New Zealand, and is designed as an incentive for students of high academic achievement who have a severe disability. It is primarily intended for those who plan to undertake postgraduate study with a view to preparing themselves for a role in the professions, in politics or more particularly in university teaching and research and who have disability issues as a continuing interest. Applications close with the University of Auckland in late October.
Land and Water Resources Research and Development Corporation (LWRRDC) Postgraduate Research Scholarships (L,R,L)

- $20,000 pa plus $5,000 for operating expenses
- 2 years for Masters, 3 years for a PhD degree

General Research Scholarships are available for research that will lead to better management, sustainable use and conservation of land, water and vegetation resources in Australia. Irrigation Research Scholarships are specifically for research that will lead to better management, sustainable use and conservation of natural resources in Australia. Applications are available from the Scholarships and Student Loans Unit or LWRRDC, GPO Box 2162, Canberra ACT 2601, Tel (02) 62573379. Applications close early October.

The Lionel Murphy Postgraduate Scholarship (L,R,C)

- $15,000 pa for study in Australia, up to $30,000 for study overseas
- 1 year

Applicants must be intending to undertake a postgraduate degree in Law, Science, Legal Studies or other appropriate discipline. Preference will be given to applicants who propose to study the law and legal system in a social context, science/law or international law. Information and application forms are available from the Lionel Murphy Foundation, GPO Box 4545, Sydney NSW 2001, Tel (02) 9223 5151, Fax (02) 9223 5267. Applications close mid-September.

The MBF Health Research Awards- Postgraduate Research Scholarships

- Similar to NHMRC guidelines

The scholarships are open to students undertaking an MD or PhD in the areas of preventative health care, disease/drug management, evaluation of health care delivery outcomes, health policy evaluation and public health promotion/communication. Applications are available from The Executive Assistant, Research Team, Medical Benefits Fund of Australia Ltd, 97-99 Bathurst St, Sydney NSW 2000. Tel (02) 9323 9158. Fax (02) 9323 9168. Applications close late February.

The Meat and Livestock Australia (MLA) Studentships and Junior Research Fellowships (L,R,C)

- $15,888 pa for study in a Masters or Diploma, $20,000 for a PhD in Australia or US$17,500 for study overseas, plus airfares, insurance and allowances
- 2 years for Studentships (Masters or Diploma), 3 years for Junior Research Fellowships (PhD)

Applicants should be proposing to undertake research in disciplines relevant to the Australian meat and livestock industry. Applications close late September.

The Menzies Research Scholarship in Allied Health Sciences (L,R)

- Up to $24,000 pa
- 2 years

The scholarship is awarded to stimulate research in the non-medical allied health disciplines. Applicants should be full-time students, who have completed the first stage of a PhD program. Applications are available from The Menzies Foundation, 210 Clarendon St, East Melbourne VIC 3002, Fax (03) 9417 7049. Applications close late June.

The Minerals Council of Australia Student Research Award (L,L,R)

- $500 plus travel and accommodation for the Environmental Workshop

The award is open to scholars who have completed or are undertaking postgraduate studies, and is aimed at encouraging excellence in student research and communication in the field of environmental management in mining. The award will be judged on a paper written for and presented at the Minerals Council of Australia's Environmental Workshop. Nominations close early May.

The National Health and Medical Research Council (NHMRC) Training Scholarship for Aboriginal Health Research (L,R)

- $16,135 - $23,997 pa (depending on qualifications)
- Up to 3 years

Applicants must be undertaking an undergraduate or postgraduate degree which includes, or leads to, research relevant to Aboriginal health. Applications will be assessed in terms of previous qualifications and experience. Consideration will be given to prior knowledge and experience of Aboriginal culture and health. Applications close early August.

The National Health and Medical Research Council (NHMRC) Dora Lush Biomedical Postgraduate Scholarships (L,R)

- $16,135 pa, $20,997 for HIV/AIDS research, $17,888 for special initiative scholars, plus allowances
- Up to 3 years

Applicants must have completed a Science degree with Honours, or equivalent, at the time of submission of the application. Current APA holders or students enrolled in the final year of an Honours degree at the time of application are not eligible. Applications close early August.

The National Health and Medical Research Council (NHMRC) Medical and Dental Postgraduate Scholarships (L,R)

- $23,997 pa plus allowances
- Up to 3 years

The scholarships are open to medical and dental graduates to undertake full-time research. Applications are particularly encouraged for research in the following special initiative areas: Aboriginal health and disease, prostate cancer, alcohol and substance abuse, nursing and allied health services, dementia, schizophrenia, injury and HIV/AIDS. Applications close early August.

The National Health and Medical Research Council (NHMRC) Public Health Postgraduate Scholarships (L,R)

- $23,997 pa (medical/dental graduates), $16,135 pa (other graduates), $20,822 pa for HIV/AIDS research, $17,888 pa for special incentive scholars, plus allowances
- Up to 3 years

The scholarships are open to medical/dental or health related graduates to obtain training in public health research. Applications are particularly encouraged for research in the following special initiative areas: Aboriginal health and disease, prostate cancer, alcohol and substance abuse, nursing and allied health services, dementia, schizophrenia, injury and HIV/AIDS. Applications close early August.

The National Heart Foundation of Australia Postgraduate Medical and Science Research Scholarships (L,R)

- $17,637 pa (science), $23,257 pa (medical) plus $1,200 departmental allowance
- Up to 3 years subject to satisfactory progress

Scholarships are available to science or medical graduates for research in cardiovascular function, disease or related problems. Applicants must usually reside in Australia. Further information and applications are available from the Medical Director, National Heart Foundation of Australia.
Foundation, PO Box 2, Woden ACT 2606. Medical applications close in May and Science applications close in October.

The National Tertiary Education Union (NTEU) Scholarship for the Study of Industrial Relations and Unionism in Australian Tertiary Education (L,R)

- $5,000 pa
- Up to 3 years

Applicants must have made or intend to make an application for candidacy for a Masters by Research or PhD in a topic which covers some aspect of industrial relations, policy issues and/or unionism related to Australian tertiary education. Further information is available from NTEU, PO Box 1323, South Melbourne VIC 3205, Tel (03) 9254 1910. Applications close early November.

The National Multiple Sclerosis Society of Australia Postgraduate Research Scholarships (L,R)

- Same as NHMRC scholarship stipends for medical and biomedical graduates
- Up to 2 years

Scholarships are available to medical graduates (or to appropriately qualified science graduates or health professionals) enrolled in a postgraduate research degree. Applications close mid-July.

The NSW Ministry for the Arts Scholarships (L)

- $5,000 - $25,000 (depending on the award)

The NSW Government offers a number of scholarships and awards to writers, artists and scholars living in NSW. Further information is available from the New South Wales Ministry for the Arts, GPO Box 5341, Sydney NSW 2000, Tel (02) 9228 3533, Fax (02) 9228 4722.

The Pig Research and Development Corporation (PRDC) Postgraduate Top-Up Scholarships (L,R)

- Up to a maximum of $21,000 as a supplement to other scholarships, plus allowances

Applicants must be eligible for another scholarship and be undertaking research relevant to increasing the competitiveness of the Australian pig industry. Applications close mid-December.

The Postgraduate Equity Scholarships (L,C)

- Substitution of HECS for tuition fees
- Duration of the course if eligibility criteria continue to be satisfied

These scholarships allow postgraduate students enrolled in full-fee courses to pay HECS for their course rather than course fees. Students granted the scholarship must still pay Student Activity Fees. Students who have previously completed a postgraduate course in Australia at the same or higher level are not eligible. Applications for Session One close 30 January. Applications for Session Two close 15 July.

Financial Need HECS Substitution Scholarships

Applicants must be in receipt of a full allowance from the Department of Social Security (DSS), Department of Veteran Affairs, or AUSTUDY.

HECS Substitution for Scholarships for Women

A limited number of scholarships are provided to women enrolling in postgraduate courses after a period of absence from study and/or employment who are seeking to extend their professional experience in order to re-enter the workforce. Preference will be given to women enrolling in courses which have a low female enrolment. Selection will take into account the applicant's academic merit, her personal statement, including details of a well-planned future career path, and referee's support. The scholarship is tenable for the duration of the course.

The Re-Entry Scholarship for Women (L,R,C)

- $16,135 pa (equivalent to the Australian Postgraduate Award)
- 1 year

Applicants must be women who have been out of full-time paid professional employment for a period of time and who wish to take up or resume a full-time research or coursework program of postgraduate study. Priority will be given to applicants wishing to update their research skills or to those who wish to gain further experience in order to return to employment in industry, business or education. Applicants must be able to demonstrate a well-planned career path. A letter of application and curriculum vitae should be forwarded to the Scholarships and Student Loans Unit, UNSW. Applications close 31 October.

The River Basin Management Society Ernest Jackson Memorial Research Grants (L,R)

- Up to $2,000

The scholarship assists PhD and Masters students undertaking research in the field of river basin management. PhD, Masters and 4th year Honours students are encouraged to apply. Further information is available from RBMS, PO Box 113, Forest Hill Vic 3131, Tel (03) 9816 6896. Applications close in April.

The Ronald Henderson Postgraduate Scholarships (L,R)

- $5,000 pa as a supplement to an APA
- Up to 2 years for Masters by Research, 3 years for a PhD

The scholarships are open to graduates who intend to commence Masters or PhD studies in social economics, and who obtain an APA or equivalent university postgraduate award. Applicants may be proposing study in qualifications in economics, commerce or arts. Information and applications are available from the Ronald Henderson Research Foundation, 5th Floor, 165 Flinders Lane, Melbourne VIC 3000, Tel (03) 9654 8299, Fax (03) 9650 7501, Email: lance@creativeaccess.com.au. Applications close in late October.

The RSPCA Alan White Scholarship (L,R)

- $2,500

Applicants should be undertaking original research to improve the understanding and welfare of animals. Applicants must have a sound academic record and demonstrate a major commitment animal welfare issues. A letter of application including two referees and academic transcripts, should be sent to the Executive Officer, RSPCA Australia, PO Box E369, Queen Victoria Terrace, Canberra ACT 2600, Tel (02) 62311437. Applications close mid-March.

The Rural Allied Health Placement Grants (L,R)

- Up to $500

Grants are available to students undertaking a postgraduate course in dietetics or psychology (Masters). Applications are available from the NSW Heath Rural Health Support Unit, Tel (02) 6640 2302, Fax (02) 6640 2499, Email: rhsu@nor.com.au, web: www.nor.com.au/community/rhsu. Session One applications close 15 May. Session Two closing dates are available in August.

The Rural Allied Health Scholarships (L)

- $5,750

Scholarships are available to students in any year of a postgraduate course in dietetics or psychology (Masters). Applications are available from the NSW Health Rural Health Support Unit. Tel (02) 6640 2302, Fax (02) 6640 2499, Email: rhsu@nor.com.au, web: www.nor.com.au/community/rhsu. Applications close late September.
The Rural Industries Research and Development Corporation (RIRDC) Postgraduate Scholarships (L,R)
- $21,500 pa plus $3,500 to the host institution
- Up to 3 years

The scholarships are available for postgraduate study in rural research and development in areas of interest to the Corporation. Applicants must hold an Honours 1 or 2/1 degree in an appropriate discipline. Applications from mature age students with rural industry experience are particularly encouraged. Applications close in early November.

The Social Policy Research Centre (SPRC) Postgraduate Research Scholarship (L,R)
- $16,135 pa (equivalent to the APA), plus allowances
- 3 years for a PhD

Applicants should hold a Bachelors Degree with at least Honours 2/1 in any of the fields of study relevant to social policy. The successful candidate will be enrolled in a relevant School of the University but will undertake research at the Centre. Prospective applicants must contact the School in which they wish to enrol. Application packages are available from the Administrator, Social Policy Research Centre, UNSW, Tel (02) 9385 3833. Applications close late November.

The State Librarian's Metcalfe Scholarship at UNSW (L,R,C)
- At least $2,000

The scholarship is open to suitably qualified applicants to undertake a Masters or PhD in the areas of librarianship, marketing or technology. Selection will be based on academic merit, the outline for the proposed area of study and demonstrated interest in librarianship. Applications normally close 30 November.

The Sugar Research and Development Corporation (SRDC) Postgraduate Scholarships (L,R)
- $22,000 pa plus $3,000 to the host institution
- Up to 3 years

The scholarships are available to foster research in disciplines compatible with the SRDC's research priorities. Applicants should hold an Honours degree or equivalent and have a strong motivation to make a professional career in the sugar industry. Further information and applications are available from the Executive Director, Sugar Research and Development Corporation, PO Box 12050, Brisbane Elizabeth St Qld 4002, Tel (07) 3210 0495, Fax (07) 3210 0506. Applications close mid-September.

The Sydney Gay and Lesbian Business Association Scholarship (L, R, C)
- $1,500
- 1 year

The scholarship is provided to encourage the participation of gay men and lesbians in business and management careers. Scholarships are available to full-time students in Commerce or the AGSM. Applicants must be gay or lesbian. Applications normally close 15 April.

The Telstra Research Laboratories Postgraduate Research Fellowship (L,R)

University departments may apply for the Fellowships for one or more of their PhD students who are undertaking research relevant to the telecommunications industry in the fields of electrical engineering, computer science, science, psychology, social science or economics or other appropriate course. Further information is available from the Fellowship Applications Officer, Telstra Research Laboratories, Box 249, Rosebank MDC, Clayton VIC 3169. Email: c.zaman@trl.telstra.com.au. Applications close late September.

The Ukrainian Studies Foundation of Australia Endowed Scholarship (L,R)
- $1,000 in 2000, $1,500 from 2001
- 1 year only

The Scholarship is available to students undertaking, or proposing to undertake, postgraduate or honours level studies at UNSW on a Ukrainian topic/theme, or comparative Ukrainian/Australian topic/theme. Selection will be based on academic merit and the reasons for undertaking the current and/or proposed studies. Applications will normally close on January 31.

United Uranium Trust Fund Scholarship
This Scholarship is available for the study of nuclear science and technology at the Australian Nuclear Science and Technology Organisation (ANSTO) or other designated institution. Applicants must be under 40 years of age. Further information and applications are available from ANSTO on telephone (02) 9543 3111.

VSDC Deafness Projects (L)
Tertiary Education Scholarships may be awarded to deaf students undertaking tertiary courses related to deafness, deaf education, or fields which will advance the interests of deaf people. Applicants must be Permanent Residents of Australia. Further information is available from the VSDC-SerVices for Deaf Children, PO Box 6466, St Kilda Rd Central, Melbourne Vic 3004. Applications close mid-May.

The Wenkart Foundation Grants (L,R)
- Up to $22,000 pa
- 2 years with the possibility of renewal

Applicants must be undertaking full-time research in clinical, biomedical or health related clinical sciences. The grants will not be available again until the 1999 academic year. Applications close mid-May.

The Zonta International Amelia Earhart Awards (L,R)
- US$6,000
- 1 year

Applicants must be women who have completed one year graduate study in an aero-space related science or engineering degree. Further information and applications are available from Zonta International, 557 West Randolph St, Chicago, Illinois 60661-2206, USA, Tel +1 312 930 5848, Fax +1 312 930 0951. Applications close early November.

Faculty Scholarships

Faculty of Life Sciences

Biological Science

The Australian Biological Resources (ABRS) Postgraduate Research Scholarship (L,R)
- $16,135 pa (subject to annual review to match the APA)
- Up to 3 years for a PhD

Applicants should be proposing to undertake full-time study in a PhD, in an area of relevance to ABRS taxonomic principles. Applicants should hold an Honours 1 or 2/1 degree in an appropriate discipline and be strongly motivated to make a professional career

The Faulding Florey Medal (L,R)
• $30,000
The prize is to be awarded every two years to an Australian researcher who is actively working in Australia or overseas for a major discovery in biomedical sciences of benefit to human health. Details are on the Tall Poppy website: www.tallpoppies.net.au. Nominations close mid-April.

Faculty of Science and Technology

Chemistry

The School of Chemistry APA Bridging Scholarship (L,R)
• $11,000
• 1 year
Applicants must be undertaking a full-time PhD in the School of Chemistry and in receipt of an International Postgraduate Research Scholarship (IPRS), an Australian Postgraduate Award (APA), or a School of Chemistry APA Bridging Scholarship. Scholarship recipients are required to perform 3 hours of teaching each week for 28 weeks per annum. Selection will be based on the students application for an IPRS or APA. The IPRS and APA are awarded on the basis of academic merit, publications, research potential and referee's report. IPRS applications close 30 September, APA applications close 31 October.

The School of Chemistry IPRS Living Allowance Scholarships (L,R)
• $11,000
• Up to 3 years, with a possible 6 month extension
The scholarships are available for full-time study leading to the degree of Master of Science or PhD at the Cooperative Research Centre for Eye Research and Technology (CRCERT) at UNSW. The scholarship is open to international students, with special consideration given to applicants from developing countries. Selection will be based on academic merit, the reasons for the proposed study and financial need. Applications close late October.

The Brien A. Holden Postgraduate Research Scholarship (L,R)
• Tuition fees, living allowance (approx $15,000 pa), travel and other allowances
• Up to 3 years, annually renewable
Scholarships are available for full-time study leading to the degree of Master of Science or PhD at the Cooperative Research Centre for Eye Research and Technology (CRCERT) at UNSW. The scholarship is open to international students, with special consideration given to applicants from developing countries. Selection will be based on academic merit, the reasons for the proposed study and financial need. Applications close late October.

The Contact Lens Society of Australia Scholarship (L,R,C)
• $3,500 pa
The scholarship is provided to enable a student to undertake a research degree in theoretical physics. The scholarship may be held concurrently with another award. Information is available from the School of Physics, Tel (02) 9385 4553/5649.

Physics

The Gordon Godfrey Scholarship in Theoretical Physics (L,R)
• $1,500 pa
• 2 years
The scholarship is provided to enable a student to undertake a research degree in theoretical physics. The scholarship may be held concurrently with another award. Information is available from the School of Physics, Tel (02) 9385 4553/5649.

Materials Science and Engineering

The Sir Rupert Myers Postgraduate Scholarship in Materials Science and Engineering (L,R,C)
• $5,000 pa
• 1 year, renewable up to 3 years
Applicants must hold an Honours degree in materials science and engineering, or a related field. The scholarships are available for study towards a postgraduate degree in the School of Materials Science and Engineering. Information is available from the School of Materials Science and Engineering, University of New South Wales, 2052, Tel (02) 9385 4436. Applications close in December.
Travel Scholarships

Students in receipt of postgraduate scholarships not listed below may, if the scholarships conditions allow, spend a period of time overseas undertaking research relevant to their Australian qualification.

General Travel

AAUW Educational Foundation Awards (I,L,R,C)

The American Association of University Women (AAUW) offers a range of scholarships and fellowships for full-time study in the United States. Additional information may be obtained from the Association’s website: http://www.aauw.org

AAUW Educational Foundation International Fellowships (I,L,R,C)

- US$16,000
- 1 year

The American Association of University Women (AAUW) offers Fellowships for full-time postgraduate study or research in the United States for one academic year. Applicants must be females who have earned the equivalent of a United States Bachelor’s degree and who are not US Citizens or Permanent Residents. Applicants can be preparing to undertake study in a broad range of disciplines including arts and humanities, physical and biological sciences, social sciences, law, economics, political sciences, or studies important to changing the lives of women and girls. International fellows can also qualify for a supplemental grant (US$5,000-$7,000) to support a community action project designed to improve the lives of women and girls for study in the fellow’s home country in the year immediately following the fellowship year. Application packs are available from the AAUW Educational Foundation, Customer Centre, Dept 141, N. Dodge St, Iowa City, IA 52243-4030 USA. Applications close mid-January for the Fellowship year commencing in July.

The ACSANZ Postgraduate Awards for Canadian Studies (L,R)

- Up to $2,800 towards a research trip to Canada

The Association for Canadian Studies in Australia and New Zealand will offer grants to postgraduate students wishing to undertake a short research trip to Canada. Applicants must be enrolled in a Masters or Doctoral degree at an Australian or New Zealand university. Grants will be for research into all areas of academic enquiry that have a distinctly Canadian orientation, for example in the humanities, social and political sciences and some branches of the health and environmental sciences. Information and applications are available from the Academic Relations Officer, Canadian High Commission, Commonwealth Avenue, Canberra, ACT 2600, Tel (02) 6273 3844, Fax (02) 6270 4083, Email cnbra@cnbra01.x400.gc.ca. Applications close late September.

The Asian Studies Library Awards (ASLA) (L,R)

- $250 to $800 in a lump sum

Applicants must be undertaking a Masters by Research or PhD. The award provides a contribution towards the travel costs to centres with Asian collections to undertake library research. Further information and application forms are available from the Project Co-ordinator, Asian Studies Library Awards, Collection Management Division, Library ANU, Canberra ACT 2600. Applications close mid-June.

The Association of International Education Japan (AIEJ) Short-Term Student Exchange Promotion Program (Inbound) Scholarships (I,L,R,C)

- 50,000 yen (settling-in allowance), 80,000 yen per month, plus airfare
- Six months to one year

Applicants must be accepted by a Japanese University under a student exchange program agreement with UNSW. The Japanese host university will recommend candidates to AIEJ and students must apply as directed by the host university. Applications close in February, May and September each year.

The Association of International Education Japan (AIEJ) Short-Term Student Exchange Promotion Program (Inbound) Peace and Friendship Scholarships (I,L,R,C)

- 50,000 yen (settling-in allowance), 100,000 yen per month, plus airfare
- Ten months to one year

Applicants must be accepted by a Japanese University under a student exchange program agreement with UNSW. Students must initially apply directly to a Japanese University through the International Student Centre at UNSW. The Japanese host university will recommend candidates to AIEJ and students must apply as directed by the host university. Applications close in February, May and September each year.

Association of University Women Educational Foundation-Charles & June Ross International Fellowship (L,R,C)

- US$15,400
- 1 year

The fellowship is available to Australian women who have graduated from an Australian University and who are proposing to undertake one year of full-time postgraduate study or research in the United States. Applicants must be members of the Australian Federation of University Women or AAUW and intend to return to Australia to pursue their professional career. Information and applications are available only from AAUW Educational Foundation, PO Box 4030, Iowa City, Iowa 52243-4030, USA, Tel +1 319 337 7176, Fax +1 319 337 2201. Applications close late November.

The AT&T Leadership Award (I,L,R,C)

- US$5,000

The award is open to students who will be commencing full-time undergraduate or postgraduate study in the United States between January and September in the year of application. The scholarship is open to students from the following Asia/Pacific countries: Australia, China, Hong Kong, India, Indonesia, Japan, Republic of Korea, Malaysia, Philippines, Singapore, Taiwan and Thailand. Information and applications are available from the U.S. Consulate General, USIS, Level 59 MLC Centre, 19-20 Martin Place, Sydney NSW 2000, Tel (02) 9662 5016. Applications close 15 September.

The Australian Academy of Science International Exchange Programs (L,R)

The Academy administers exchange programs which support collaborative research between professional Australian scientists and technologists with countries such as the UK, France, Germany, Taiwan, China, Korea and Japan. The programs provide funds for living and travelling costs. Applicants must be Australian citizens who hold a PhD degree or equivalent. Information is available from
The Australia-Korea Foundation Awards (L,R,C)
The AKF provides assistance to Korean language graduates who will be undertaking teacher training in the Korean language, or for work-experience programs. Information and applications are available from the Programs Co-ordinator, National Korean Studies Centre, PO Box 218, Hawthorn Vic 3122. Email: nkac@swin.edu.au.

The Australian Bicentennial Scholarships and Fellowships Scheme (L,R,C)
- 4,000 pounds sterling
- At least 3 months

Awards are available for study or research in the United Kingdom in any discipline, where it can be demonstrated that there is an advantage to be gained from a period of study in the UK. Applications must be enrolled as postgraduate students at an Australian higher education institution and who are usually resident in Australia. Applications are available from the Secretary, Sir Robert Menzies Centre for Australian Studies, University of London, 28 Russell Square, London, WC1B 5DS, UK, Tel (447) 171 590 5876, Fax +44 171 590 9627, Email: mcintyre@sas.ac.uk. Applications close early November.

The Australian Federation of University Women (AFUW) (L,R,C)
Each year the Federation offers to its members a number of awards for study in Australia and overseas. Details of awards are included in a booklet available from the Australian Federation of University Women Inc, 215 Clarence Street, Sydney NSW 2000, Tel (02) 9299 9868.

The British Aerospace Australia Chevening Scholarship (L,R,C)
- Tuition fees, maintenance allowance, airfare
- 1 year

The scholarship is available for study in an approved, one-year MSc course in aerospace engineering at a British university. Applicants must hold, or expect to complete before October, an Honours 1 or 2/1 degree. Application forms are available from the British Council, PO Box 88, Edgecliff NSW 2027, Tel (02) 9326 2022, Fax (02) 9327 4868. Applications close late October.

The British Chevening Scholarships (L,R,C)
- Tuition fees, maintenance allowance and return airfare
- 3 months to 1 year

The awards are intended for outstanding graduates and young professionals with the potential to rise to senior positions in the private or public sectors and will contribute to Australian-British relations and understanding. The awards are tenable for postgraduate study at British universities. Application forms are available from the British Council, PO Box 88, Edgecliff NSW 2027, Tel (02) 9326 2022, Fax (02) 9327 4868. Applications close in October.

British Council Postgraduate Bursaries (L,R)
- Return economy airfare plus monthly stipend of 450 pounds
- 3 months

The scholarships are available for students enrolled in a full-time PhD who are proposing to spend three months at a British University or similar institution to take advantage of British expertise, equipment or data. Applications should be received by the British Council a minimum of 6 months prior to departure. Further information and applications are available from the British Council, PO Box 88, Edgecliff NSW 2027, Tel 9326 2022, Fax 9327 4868.

The Cambridge Commonwealth Trust Scholarships (L,R,C)
The Cambridge Commonwealth Trust administers several scholarships for Australian Citizens to undertake postgraduate study at the University of Cambridge. Scholarship application forms should be requested from the University of Cambridge when applying for admission. Admission forms and copies of the Graduate Studies Prospectus are available from The Board of Graduate Studies, 4 Mill Lane, Cambridge CB2 1RZ, United Kingdom. By submitting one Scholarship Application Form, applicants will be considered for all the Trust's scholarships for which they are eligible. Information on how to apply is available from the Honorary Secretary, Australian Committee of the Cambridge Australia Trust, GPO Box 93, Canberra ACT 2601, Tel (02) 6248 7744, Fax (02) 6248 6287. Applications for admission to Cambridge close 31 January and scholarship applications close 30 April in the following year.

The Cancer Research Fellowship Programme (L,R)
- Travel expenses and living allowances
- 1 year

Applications should be engaged in research in medicine or the allied sciences and intending to pursue a career in cancer research. The awards are tenable at the International Agency for Research on Cancer in France, or any other suitable institution abroad. Areas of research include epidemiology, biostatistics, environmental and viral carcinogenesis and mechanisms of carcinogenesis. Applications are available from the International Agency for Research on Cancer, 150 cours Albert-Thomas, 69372 Lyon Cedex 08, France, tel 72 73 84 65, Fax 72 73 85 75. Applications normally close in December.

Churchill Fellowships (L)
- Tuition, travel and living allowances

Churchill Fellowships provide financial support for Australian Citizens to undertake study, training or projects overseas. Fellowships will not normally be awarded for higher academic or formal qualifications however. Applicants must be over 18 years of age. Further information and applications are available from the Chief Executive Office, The Winston Churchill Memorial Trust, 218 Northbourne Ave, Braddon ACT 2612, Tel (02) 6247 8333. Applications close late February.

The Commonwealth Scholarship and Fellowship Plan (CSFP) (L,R,C)
- Varies for each country. Generally covers travel, living expenses, tuition fees, books and equipment, approved medical expenses
- Usually 2-3 years depending on the country

CSFP provides opportunities for Commonwealth students to undertake advanced academic study in other Commonwealth countries. Candidates should be Commonwealth Citizens who hold an undergraduate degree. Applications close at different times depending on the country in which the study is proposed.

The Coral Sea Scholarship (L,R,C)
- $3,000 per month, plus $2,500 travel entitlement
- Up to 3 months

The award is for applicants holding a tertiary qualification who are proposing study in the United States, to investigate a problem or opportunity relevant to Australian business or industry. Applicants must be Australian Citizens (Permanent Residents are not eligible). Further information and applications are available from the Fulbright Home Page, http://sunsite.anu.edu.au/education/fulbright, or by contacting the Program Officer, Australian-American Educational Foundation, GPO Box 1559, Canberra ACT 2601, Tel (02) 6247 9331, Email rachel@aaf.anu.edu.au. Applications close 30 September.
DAAD—The German Academic Exchange Service Scholarships (L,R,C)

Application forms and information (including closing dates) for the following scholarships are available from the Embassy of the Federal Republic of Germany, 119 Empire Circuit, Yarralumla, Canberra ACT 2600.

One-Year Scholarships
• Monthly allowance between DM1,000 and DM1,700, airfares, health and accident insurance, and tuition fees
• 1 year

Scholarships are available for graduate studies in Germany. Applicants must be aged 32 or under and hold a Bachelors degree (or equivalent). A working knowledge of German is required of those who study arts, others may receive additional language training prior to the commencement of the scholarship. Applications normally close in September.

Research Grants
• Monthly stipend of DM1,700, health insurance contribution and travel assistance of DM2,500
• 2 to 6 months

PhD students can apply for assistance to undertake a short period of research in Germany. Applicants must be aged 32 or under.

Information Visits by Groups of Professors and Students
Groups (minimum of 10 persons, maximum of 20 persons) of professors and students can apply for assistance to visit Germany with the intention of increasing the knowledge of specific German topics. The program offers support in making travel and study arrangements and may include some financial assistance (based on the length of the stay and the number of persons undertaking the study tour). The period of stay must be between 7 and 21 days. No tours will be organised for July or August.

Deutschlandkundlicher Winterkurs
• Course fees, DM3,500 to assist with travel and living expenses, health insurance
• 8 weeks (3 January - 21 February)

Undergraduate and postgraduate students from all fields with at least two years university-level German may apply for this scholarship. Applicants must be members of the German/Austrian/Canadian citizen, aged from 19 to 32 and proposing to undertake a German Studies course (in German) at the Albert-Ludwigs University of Freiburg. The course provides language instruction and concentrates on historical and cultural aspects of contemporary Germany for students with a background in German Studies. Applications usually close in early August.

East West Center Graduate Degree Fellowship (L,R,C)
• Accommodation, monthly stipend of US$600, tuition fees, health insurance plus allowances
• 12 months with a possible one year extension

The Fellowships are available for postgraduate study at the University of Hawaii, preferably at Masters level. Citizens of the United States and Asian or Pacific countries are eligible to apply. Potential applicants must request an application package direct from the East West Centre, Awards Services Officer, Burns Hall 2066, 1601 East-West Road, Honolulu Hawaii 96849-1601, USA, Tel +1 808 944 7735, Fax +1 808 944 7730. Applications close early October.

The English-Speaking Union (NSW Branch) Scholarship (L,R,C)
• Up to $8,000

The scholarship assists graduates who, at the outset of their careers, are seeking to further their education overseas. The scholarship is open to Australian citizens living in NSW or the ACT, whose intention it is to return to Australia after undertaking study overseas. Further information is available from The English-Speaking Union (NSW Branch), PO Box A2156, Sydney South NSW 1235, Tel (02) 9231 0667. Applications close early June.

Frank Knox Memorial Fellowships (L,R,C)
• US$15,000 pa plus tuition fees and health insurance
• 1 year with the possibility of renewal for a further year

Applicants must be undertaking, or near completion of, a postgraduate qualification at an Australian University. The scholarships are tenable at one of Harvard University's graduate schools. Applications close early October.

The Fulbright Postgraduate Student Awards (L,R)
• Up to $32,530, depending on the type of award, with the possibility of other allowances (eg return airfares and tuition fees)
• 1 year

Students planning to undertake an American higher degree or engage in research towards an Australian higher degree in any field can apply for the Fulbright Student Awards. Four other privately sponsored awards are available - The Engineering Award, The Aboriginal and Torres Strait Islander People Award, The Visual and Performing Arts Award, and The Tim Matthews Memorial Award in Statistics and Related Disciplines. Applicants must be Australian Citizens who have completed an Honours degree (or equivalent). Further information and applications are available from the Fulbright Home Page, http://sunsite.anu.edu.au/education/fulbright Tel (02) 6247 9331, Email: rachei@aaaf.anu.edu.au. Applications close 30 September.

The Golda Meir Scholarship (L,R,C)
• Tuition (some allowances may be paid)
• 1 year

The Golda Meir scholarships are available to graduates who are wishing to pursue a course in Jewish studies, religious studies, Israel studies or Middle East studies, who meet the relevant requirements for the Graduate Year Program at the Hebrew University's Rothberg School for Overseas Students. Application forms are available from the Australian Friends of the Hebrew University, 36 Hawthorn Road, South Caulfield VIC 3122, Tel (03) 9272 5511.

The Gowrie Scholarship Trust Fund (L,R)
• $4,000 pa
• 2 years

Applicants must be members of the Forces or children (or grandchildren or lineal descendants) of members of the Forces who were on active service during the 1939-45 War. Special consideration may be given to cases of financial hardship. Applications close October.

Greek Government Scholarships (L,R,C)
• Tuition fees, monthly subsidy plus other allowances

Scholarships are available for undergraduate and postgraduate study in Greece. Applicants must be Australian citizens. Further information is available from the Embassy of Greece, 9 Turanna St, Yarralumla ACT 2600, Tel (02) 6273 3011. Applications normally close late March.

The Harkness Academic Fellowships (L,R,C)
• Some allowances and tuition fees for study in the USA
• 12-21 months

The Academic Fellowships cover academic study and research. Applicants should be active in the public, business or voluntary sectors with an outstanding record of achievement. Special consideration may be given to studies in health care and related
The Harkness Mid-Career Fellowships (L,R,C)

- Professional travel allowance
- 7-12 months

The Mid-career Fellowships are provided to support study and practical experience. Applicants should be active in the public, business or voluntary sectors with an outstanding record of achievement. Special consideration may be given to studies in health care and related community issues. Applications are available from Sylvia Browning, CHERE, University of Sydney, Level 6, Building F, 88 Mallett St Camperdown NSW 2050, Tel (02) 9351 0900 Fax (02) 9351 0930 http://www.cmwf.org Applications close late September.

The Italian Government Scholarships (L)

- 1 million Italian lira per month
- 2 to 24 months

Scholarships are open to Australian citizens to undertake research and language studies in Italy. Applicants must be aged under 35 years. Further information is available from the Italian Embassy, 12 Grey St, Deakin ACT 2600, Tel (02) 6273 3333, Fax (02) 6273 4223. Applications close early March.

The Japanese Government (Monbusho) Scholarships (L)

Scholarships are available to Australian citizens for study in Japan for postgraduate research or five years of undergraduate study. Applicants must be willing to study the Japanese language and receive instruction in Japanese. Further information and applications are available from Monbusho Scholarships, Embassy of Japan, 112 Empire Circuit, Yarralumla ACT 2600, Tel (02) 6273 7268, Fax (02) 6273 1848. Applications close early July.

The Kobe Steel Postgraduate Scholarship (L,R,C)

- Maintenance allowance of at least 7,000 pounds sterling plus tuition fees and travelling expenses.
- Up to 2 years with the possibility of extension

The scholarship is tenable at St Catherine’s College, Oxford University. The scholarship will be awarded to outstanding individuals who display qualities of leadership, excellence in sport as well as academic ability. Students should have a past or future interest in Japan. Applications close mid-October.

The Korean Government Scholarships (L)

- Tuition fees, living allowance, travel and other allowances
- Duration of course

Scholarships are available to Australian citizens for Masters or PhD study in Korea. Preference will be given to applicants with a knowledge of the Korean language. Information and applications are available from the Embassy of the Republic of Korea, 113 Empire Circuit, Yarralumla ACT 2600, Tel (02) 6273 3044, Fax (02) 6283 4839. Applications close early May.

The Lady Davis Fellowship Trust (I,L,R,C)

The Lady Davis Trust provides awards for study, research, or teaching at graduate, post-doctoral or professorial levels at the Hebrew University or the Technion (Israel Institute of Technology). Information is available from the Australian Friends of the Hebrew University, 36 Hawthorn Road, South Caulfield VIC 3162, Tel (03) 9272 5511. Applications normally close in November.

The Laporte Centenary Scholarship (L,R)

- Airfare, living allowance, tuition fees
- 3 to 6 months

The scholarship is tenable for postgraduate research in the United Kingdom. Candidates should be undertaking a postgraduate qualification in a science-based discipline, preferably in the practical application of special chemicals. Applications are available from the Secretary, Sir Robert Menzies Centre for Australian Studies, University of London, 28 Russell Square, London, WC1B 5DS, UK, Tel +44 171 580 5876, Fax +44 171 580 9627, Email: mcintyre@sas.ac.uk. Applications close early November.

Learn Arabic in Cairo Scholarship (I,L,R,C)

- Course fees, AUS$70 per month living allowance
- 8 months

Scholarships are available to undertake the Arabic as a Foreign Language course in Cairo. Applications are available from the Embassy of the Republic of Egypt, 1 Darwin Avenue, Yarralumla ACT 2600, Tel (02) 6273 4437, Fax (02) 6273 4279. Applications close 1 July.

The Lionel Murphy Postgraduate Scholarship (L,R,C)

- $15,000 pa for study in Australia, up to $30,000 for study overseas
- 1 year

Applicants must be intending to undertake a postgraduate degree in Law, Science, Legal Studies or other appropriate discipline. Preference will be given to applicants who are proposing study of the law and legal system in a social context, science/law or international law. Information and application forms are available from the Lionel Murphy Foundation, GPO Box 4545, Sydney NSW 2001, Tel (02) 9223 5151, Fax (02) 9223 5267. Applications close mid-September.

The Lloyd's Register of Shipping Chevening Scholarship (L,R,C)

- Tuition fees, maintenance allowance, airfare
- 1 year

Two scholarships are available to graduates with proven academic merit and leadership potential, to pursue a postgraduate course at a British University. One scholarship is for a one-year MSc course in Marine Engineering/Naval Architecture, and the other is for a one-year MSc course in Environmental Sciences. Applicants must hold, or expect to complete before October, an Honours 1 or 2:1 degree. Application forms are available from the British Council, PO Box 88, Edgecliff NSW 2027, Tel (02) 9326 2022, Fax (02) 9327 4868. Applications close late October.

The Meat Research Corporation (MRC) Studentships and Junior Research Fellowships (L,R,C)

- $15,888 pa for study in a Masters or Diploma, $20,000 for a PhD in Australia or US$17,500 for study overseas, plus airfares, insurance and allowances
- 2 years for Studentships (Masters or Diploma), 3 years for Junior Research Fellowships (PhD)

Applicants should be proposing to undertake research in disciplines relevant to the Australian meat and livestock industry. Applications normally close late September.

The Menzies Scholarships (L,R,C)

The Menzies Scholarships are intended to provide funds for Australian Citizens (aged 21 to 45) who wish to travel to Britain to undertake a course of research and to write a paper on a subject of concern and importance to the relationship between the Australian and British communities. Tertiary qualifications are preferred but the awards are not restricted to graduates or students. Information...
and applications are available from the Australia-Britain Society, GPO Box 551, Sydney NSW 2000, Tel (02) 223 5244. Applications normally close October.

Nanyang Technological University Singapore Research Scholarships (L,R)

- Tuition fees plus S$1,400-$1,500 per month allowance
- 2 years for a Masters, 3 years for a PhD degree

Research scholarships are available to graduates with good Honours degrees to undertake postgraduate study. Information and application forms are available from The Registrar, Nanyang Technological University. Email: gleong@ntu.edu.sg, Fax: +65 7911604.

The NSW Ministry for the Arts Scholarships (L)

- $5,000 - $25,000 (depending on the award)

The NSW Government offers a number of scholarships and awards to writers, artists and scholars living in NSW. Further information is available from The New South Wales Ministry for the Arts, GPO Box 5341, Sydney NSW 2000, Tel (02) 9228 3533, Fax (02) 9228 4722.

The Oxford Nuffield Medical Fellowship (L,R)

- Between 27,525 and 31,945 pounds sterling pa (subject to tax), plus travel expenses
- 2 years with a possible one year extension

The awards are available for research in a clinical medicine or medical science department of the University of Oxford. The appointee is required to return to Australia for at least 3 years to perform work similar to that carried out in the United Kingdom during the tenure of the Nuffield fellowship. Further information is available from Australian Academy of Science, GPO Box 783, Canberra City ACT 2601, Tel (02) 5247 5777, Fax (02) 6257 4820. Applications close mid-March.

Overseas Research Students Awards Scheme (United Kingdom) (L,R)

- Difference in tuition fees for a ‘home’ and an ‘overseas’ student

The ORS Scheme provides partial remission of tuition fees to overseas students of outstanding merit and research potential. The awards are open to graduates who will be commencing full-time research studies at a participating institution in the United Kingdom, and who will be liable to pay tuition fees at the overseas student rate. Information and applications must be obtained directly from the Registrar or Secretary of the institution students are applying to in the United Kingdom. Applications normally close in April in the year of tenure.

Queen’s Trust Grants (L)

- Up to $15,000

The Queen’s Trust provides grants to Australian Citizens aged 18-28 years, for the pursuit of excellence in their chosen fields. Support is provided for projects studying the advancement of Australian youth, development of community leadership and/or other skills which will be of benefit to Australia. Information and applications may be obtained from the Queen’s Trust, Tel 1800 033 625. Applications close in late April.

The Rhodes Scholarship (L,R,C)

- Tuition fees, assistance with travel expenses, up to $17,500 allowance
- 2 years, with a possible one year extension

The scholarship is tenable for postgraduate study at Oxford University. Applicants must be aged between 19 and 25 and have an honours degree or equivalent. Selection for the scholarship will be based on academic and personal achievements and community spirit. Further information is available on the Rhodes home page http://www.usyd.edu.au/su/rhodes. Applications close 1 September.

The Robert Gordon Menzies Scholarship to Harvard (L,R,C)

- Up to $25,000 towards tuition fees, living expenses or travel costs (students who enrol in the Harvard Business School may be eligible for an additional $12,000)
- 1 year

The scholarships are tenable at one of the Harvard University graduate schools. Applicants must be an Honours graduate of an Australian university who intend to return to Australia after studies at Harvard or to represent Australia overseas. Applicants must be eligible for, and have applied for admission to a degree program in a graduate school of Harvard University. The scholarships are awarded on the basis of academic excellence and personal qualities such as leadership and public duty. Applications and additional information may be obtained from the Administrative Officer, Council and Board Secretariat, ANU, Canberra ACT 0200. Fax (02) 6279 8524, Email: cabs.admin@anu.edu.au, Website: http://www.anu.edu.au/cabs/scholarships. Applications close at the end of December.

Rotary Foundation Ambassadorial Scholarships (L,L)

The Rotary Foundation offers scholarships to study or train in another country where Rotary clubs are located. Applicants must have completed at least two years of a university or college course, or have completed high school and have been employed for at least two years. Applicants must also be Citizens of a country in which there is a Rotary club. Information regarding scholarship availability, closing dates and applications should be obtained from the applicant’s local Rotary club.

The Russian Scholarships (L,R,C)

- Payment an allowance and medical cover

Scholarships are available to Australian citizens to undertake undergraduate or postgraduate study in journalism, law, economics, international relations or medicine in Russia. Applications normally close in May.

The Sir Charles Mackerras / Australia-Britain Society Music Scholarship (L)

- 8,000 pounds sterling

The scholarship is open to an outstanding young conductor, composer or repetiteur, aged between 21 and 30 who is likely to be an influential leader in the field of music, to undertake study in the United Kingdom or the Czech republic for at least six months. Application forms are available from the British Council, PO Box 88, Edgecliff NSW 2027, Tel (02) 9326 2022, Fax (02) 9327 4858, Email: bcsydney@ sprint.com. Applications close early November.

The STA Travel Grant (L,L,R,C)

- Up to $3,000

Applicants must be undertaking study leading to a degree or diploma of the University and a member of the University Union. The grant is awarded on the basis of significant contribution to the community life of the University involving a leadership role in student affairs and the University Union and the relevance and merit of the proposed travel to the student’s academic program or University Union activities. Applications close mid-April.

The Swedish Institute Guest Scholarships (L,L)

- SEK 7,100 per month living allowance
- 9 months (1 academic year)

The scholarships are open to students/researchers who wish to travel to Sweden for studies/research which cannot equally well be
pursued in countries other than Sweden. Applicants must establish contact with a Swedish University willing to accept the applicant for the proposed studies. Initial requests for application forms must be made in writing, including the applicant's name and address, nationality, educational background and work experience, knowledge of any languages, statement of the purpose of study/research in Sweden, and a copy of a letter of invitation from a Swedish University Department. Requests for applications should be sent to the Swedish Institute, Department for Exchanges in Education and Research, Box 7434, SE-103 91, Stockholm, Sweden. Email: grantinfo@si.se. Web site: http://www.si.se. Requests for application forms must reach the Swedish Institute before 1 December.

Swiss Government Scholarships (L,R,C)

- Tuition fees, living allowance, medical insurance and assistance with airfares
- 1 academic year

One scholarship is available for art/music and two for other disciplines, to undertake postgraduate study or attend an art school/conservatory in Switzerland. Applicants will be required to pass a language test in German or French. Applicants must be aged under 35. Applications close early October.

The Turkish Government Language & Culture and Higher Education Scholarships (L,L)

Scholarships are available to high school graduates to undertake study at a Turkish University. Students may be required to undertake a one year Turkish language course before commencement of the degree. The scholarships pay a monthly allowance for the duration of the course. Scholarships are also available to university graduates who would like to attend Turkish Language and Culture Summer Courses conducted by Turkish Studies Centre. Further information is available from the Embassy of the Republic of Turkey, 60 Mugga Way, Red Hill ACT 2603. Applications close 30 May for Language and Culture Scholarships, and 15 July for Higher Education Scholarships.

University College London Scholarships

The University College London offers various scholarships to students from overseas, who hold an offer of admission to a full-time programme of study at UCL. Applicants must be self-financing and liable to pay tuition fees at the rate for overseas students. Information and applications are available from the International Office, University College London, Gower St, London WC1E 6BT, UK, Tel +44 171 380 7708, Fax +44 171 380 7380, Email: international@ucl.ac.uk.

Yokoyama Scholarship Awards (L,R,C)

Assistance may be available for undergraduate and postgraduate study at a Japanese University. Information is available from Mr Masao Iwashita, Secretary-General, Yokoyama Scholarship Foundation, 6F Shiozaki Building, 2-7-1 Hirakawacho, Chiyoda-Ku, Tokyo 102 Japan, Tel (813) 3238 2913, Fax (813) 5275 1677.
Prizes

The following information summarises prizes awarded by the University. Prizes are grouped by level as follows: Undergraduate, common Undergraduate/Postgraduate, Postgraduate. Within these groups prizes are listed under the faculty, school or department in which they are awarded. Prizes which are not specific to any school are listed under General. Law prizes are awarded only for students enrolled in the LLB or Jurisprudence programs.

Information regarding the establishment of new prizes may be obtained from the Student Information and Systems Office.

Prize information is normally provided in the following format:
• Prize value
• Conditions

Undergraduate Prizes

The University Of New South Wales
(General Category for Prizes) The Heinz Harant Challenge Prize
• $1000 (bi-annual prize)
For an original piece of assessable work submitted in the program of completing a General Education course

The Spirit of Reconciliation Prize
• $150
For the best piece of work with an Aboriginal theme, emphasising the importance of reconciliation, undertaken by a student in any faculty

The Sydney Technical College Union Award
• $400 and a bronze medal
For leadership in student affairs combined with marked academic proficiency by a graduand

The UNSW Human Rights Essay Prize
• $400
For the best research essay on a Human Rights topic by a student enrolled at the University of New South Wales proceeding to a Bachelor degree

Faculty of Life Sciences

The Faculty of Life Science Prize for 1st Year Science
• $250
For outstanding performance in Year 1 of the Science program (3930 or 3970)

The Faculty of Life Science Prize for 2nd Year Science
• $250
For outstanding performance in Year 2 of the Science program (3930 or 3970)

The Faculty of Life Science Prize for 3rd Year Science
• $250
For outstanding performance in Year 3 of the Science program (3930 or 3970)

The Faculty of Life Science Prize for 1st Year Advanced Science
• $250
For outstanding performance in Year 1 of the Advanced Science program

Faculty of Life Science Prize for 2nd Year Advanced Science
• $250
For outstanding performance in Year 2 of the Advanced Science program

The Faculty of Life Science Prize for 3rd Year Advanced Science
• $250
For outstanding performance in Year 3 of the Advanced Science program

The Faculty of Life Sciences Prize for 4th Year Advanced Science
• $250
For outstanding performance in Year 4 of the Advanced Science program
The Dam! Atapattu Prize

• $100
For the best performance in Year 1 Anatomy (ANAT1006) in program 3801 Bachelor of Science (Medicine) Bachelor of Medicine Bachelor of Surgery or 3840 Bachelor of Arts Bachelor of Science (Medicine) Bachelor of Medicine Bachelor of Surgery

The Jane Skillen Prize in Anatomy

• $250
For the highest average mark in any three Year 3 Anatomy courses by a graduand in the Bachelor of Science degree program with a major in Anatomy

The Maurice (Toby) Arnold Prize

• $100
For the highest mark in Anatomy (including all sub-disciplines) in Year 2 of program 3801 Bachelor of Science (Medicine) Bachelor of Medicine Bachelor of Surgery or 3840 Bachelor of Arts Bachelor of Science (Medicine) Bachelor of Medicine Bachelor of Surgery

The Paxinos & Watson Prize

• $200
For the best performance in ANAT3411 Neuroanatomy 1 in the Bachelor of Science degree program

The Prize in Practical Anatomy

• $200
For the best performance in Practical Anatomy (including Radiological Anatomy) in Year 2 of program 3801 Bachelor of Science (Medicine) Bachelor of Medicine Bachelor of Surgery or 3840 Bachelor of Arts Bachelor of Science (Medicine) Bachelor of Medicine Bachelor of Surgery

The Winifred Dickes Rost Prize

• $100
For outstanding merit in Anatomy in the final year of the Bachelor of Science degree program

Schools of Anatomy, Physiology and Pharmacology and Psychology

The Istvan Tork Prize in Neuroscience

• $100
For the best performance by a Year 4 Honours student who completed a thesis in the field of Neuroscience in the Schools of Psychology or Anatomy or Physiology and Pharmacology

School of Applied Bioscience

The Amersham Modern Techniques Prize in Biotechnology

• $250
For the best performance in BIOT3061 Monoclonal Antibody and Genetic Techniques in Biotechnology

The Baldwin Shelston Waters Prize

• $300
For the best performance in BIOT3071 Commercial Biotechnology in the Bachelor of Science degree program

The Nestlé Australia Limited Prize

• $200
For the best performance in FOOD1400 Project in the Bachelor of Science in Food Science and Technology degree program

The Wilfred B S Bishop Prize

• $75
For the best overall performance in the Bachelor of Science (Technology) degree by a student who has made a significant contribution to staff and student activities

The Yakult Biotechnology Prize

• $250
For the best performance in Stage 4 (Honours) of the Bachelor of Science in Biotechnology degree program

School of Biochemistry and Molecular Genetics

The Australasian Association of Clinical Biochemists Prize

• $100, 1 year Associate Membership of the Association and a plaque
For the best performance in BIOC3261 Human Biochemistry in the Bachelor of Science degree program

The Beckman Coulter Prize

• $200
For the best performance in the Year 4 Biochemistry Honours program in the Bachelor of Science degree program

The Fisher Biotec Prize

• $200
For the best performance in the examinations in level 2 Biochemistry courses in the Bachelor of Science degree program

The Johnson & Johnson Research Pty Ltd Prize

• $200
For the best performance in BIOC3271 Molecular Cell Biology
The Life Technologies Prize
• $200
For the best performance in B10C3281 Recombinant DNA Techniques and Molecular Biology

The Selby - Biolab Prize
• $200
For the best performance in the examinations in level 3 Biochemistry courses in the Bachelor of Science degree program

The W J O'Sullivan Prize
• $200
For the best performance in BIOC2329 Medical Biochemistry and Genetics

The Dow Corning / Millenium Inorganic Chemicals Prize
• $500
For the best performance in the Environmental Management component of CHEN4100 Professional Electives

The Dow Corning Prize
• $300
For the best performance in CHEN4081 Design Project

The Dow Corning Prize
• $300
For the best performance in CHEN4090 Research Project

The Fuel Technology Staff Prize
• $200
For the best performance in FUEL4090 Fuel and Energy Research Project

The Goodman Fielder Ingredients Prize
• $250
For the best performance in CHEN3090 Chemical Engineering Applications

The National Starch & Chemical Prize
• $500
For the best performance in POLY3010 Polymer Science

The Norman Prize in Chemical Engineering
• $1000
For the best project (CHEN4090 Research Project) in the final year in Fuel Technology in the Bachelor of Engineering in Chemical Engineering degree program

The Simon Carves Australia Prize
• $200
For the best performance in CHEN3060 Process Plant Engineering

The Simon Carves Australia Prize
• $200
For meritorious performance in CHEN4081 Design Project

The Waste Service NSW Prize
• $200
For meritorious performance in the Environmental Management component of CHEN4100 Professional Electives

The Wattyl Australia / James Hardie Prize
• $400
For meritorious performance in the Environmental Management component of CHEN4100 Professional Electives
The Western Mining Corporation Ltd Prize
- $150
  For the best performance in CHEN2050 Chemical Engineering Laboratory 1

The Western Mining Corporation Ltd Prize
- $150
  For the best performance in CHEN3080 Chemical Engineering Laboratory 2

The University of New South Wales Chemical Society
George Wright Prize
- $100
  For meritorious performance in Level 2 Chemistry courses

The University of New South Wales Chemical Society
Parke-Pope Prize
- $100
  For meritorious performance in Level 3 Chemistry courses

School of Chemistry

The Bosworth Prize in Physical Chemistry
- $200 and a bronze medal
  For the best performance in CHEM3011 Physical Chemistry in the Bachelor of Science degree program

The Inglis Hudson Bequest
- $15
  For the best performance in CHEM2021 Organic Chemistry

The Jeffery Bequest
- $100
  For the best performance in CHEM2021 Organic Chemistry

The June Griffith Memorial Prize
- $60
  For the best performance in Level 1 Chemistry courses in the Bachelor of Science degree program

The Merck Sharp & Dohme (Australia) Pty Limited Prize
- $150
  For the best performance in Level 2 Chemistry courses in the Board of Studies in Science and Mathematics

The Merck Sharp & Dohme (Australia) Pty Limited Prize
- $150
  For the best performance in Level 3 Chemistry courses in the Board of Studies in Science and Mathematics

The RACI Analytical Chemistry Group Prize
- $150
  For the best performance in CHEM3041 Analytical Chemistry and CHEM3141 Advanced Analytical Chemistry

The School of Chemistry Honours Thesis Prize
- $200
  For the best performance in the Honours Research Project (thesis and oral examination) in the Bachelor of Science degree program

School of Geography

The Jack Mabbutt Medal
- A bronze medal
  For the best performance in the Year 4 Project in Applied Geography in the Bachelor of Science degree program

The Jack Mabbutt Prize
- $150
  For the best performance by a student in Year 3 of the Bachelor of Arts or Bachelor of Science degree program proceeding to Honours in Geography

School of Geology

The F C Loughnan Prize for First Year Geology
- $100
  For the best performance in the Geology component in Year 1 of the Bachelor of Science degree program

The F C Loughnan Prize in Applied Geology
- $340
  For the best performance in the Geology component in Year 3 of the Bachelor of Science degree program

The Lorant Eotvos Prize
- $300 and a bronze medal
  For the best performance in GEOL4111 Advanced Geological Techniques in the final year of the Bachelor of Science in Applied Geology or the Bachelor of Science in Applied Geology at Honours level program

The Prospectors Suunto Prize
- A Suunto tandem (compass clinometer)
  For meritorious performance in the field work associated with Year 2 of programs 2500 Geology or 3000 Applied Geology
The Rio Tinto Ore Deposits Prize
• $200
For the best overall performance in a Year 3 Economic Geology course, or in any course or courses which may be substituted therefore in the Bachelor of Science degree program.

The Structural Geology Field Prize
• $100 and winner’s name engraved on Perpetual Trophy
For the best performance in the Year 3 Structural Geology Field Tutorial in the Bachelor of Science in Applied Geology program or the Bachelor of Science program in the Board of Studies in Science and Mathematics (Geology Program).

The Charles Parsons Prize (Year 2 Textile Technology)
• $500
For the best performance in Year 2 Textile courses in the Bachelor of Science in Textile Technology degree program.

The Charles Parsons Prize (Year 3 Textile Management)
• $500
For the best performance in Year 3 Textile courses in the Bachelor of Science in Textile Management degree program.

The Commercial Minerals Limited Prize
• $200
For the best performance in MATS2133 Ceramic Raw Materials in the Bachelor of Engineering in Ceramic Engineering degree program.

The Austral Bricks Prize
• $100
For the best performance in Year 3 of the Bachelor of Engineering in Ceramic Engineering degree program.

The Australasian Ceramic Society Prize
• $100
For the highest overall program aggregate by a student completing the final year of the Bachelor of Engineering in Ceramic Engineering degree program.

The Australasian Corrosion Association (NSW) Prize
• $150
For the best performance in MATS1213 Design for Corrosion Control in the Bachelor of Metallurgical Engineering degree program.

The Boral Bricks Prize
• $500
For the best performance in MATS2273 Chemistry of Ceramic Processing, Unit 2, Technical and Non-Technical Ceramics in the Bachelor of Engineering in Ceramic Engineering degree program.

The Capral Aluminium Limited Prize
• $200
For the best performance in MATS1284 Light Alloys.

The Australasian Ceramic Society Prize
• $100
For the best performance in MATS1284 Light Alloys.

The Australasian Corrosion Association (NSW) Prize
• $150
For the best performance in MATS1213 Design for Corrosion Control in the Bachelor of Metallurgical Engineering degree program.

The C R Luckock Prize
• $60
For the best performance in Meat Science.

The Fernz Minerals Prize
• $250
For the most aptitude and technique shown in the combined laboratory courses MATS2153 Ceramic Processing Laboratory and MATS2203 Physico-Chemical Ceramics Laboratory (with each course receiving one half of the weighting for the average) in the Bachelor of Engineering in Ceramic Engineering degree program.

The Ferro Corporation (Australia) Prize
• $250
For the best performance in MATS2123 Ceramic Process Principles 2 in the Bachelor of Engineering in Ceramic Engineering degree program.

The Hugh Muir Prize
• $275
For the best performance by a student in the final year seminar class, or who in the opinion of the Head of School, has contributed most to the corporate life of the School of Materials Science and Engineering.
The Institute of Materials Engineering Australasia Prize
• $200 and 1 year membership of the Institute
For the best performance in MATS1022 Materials Process Principles

The J B Speakman Prize
• $50
For the best undergraduate thesis in the final year of the Bachelor of Science in Textile Technology or Textile Management degree program

The Max Hatherly Prize
• $275
For the best performance in MATS1002 Microstructural Analysis

The Monier PGH Prize
• $1000
For the best performance by a graduating student in the Bachelor of Engineering in Ceramic Engineering degree program

The National Farmers' Federation Prize
• $150
For excellent academic attainment by a graduating student in the Bachelor of Science in Wool and Pastoral Sciences degree program

The P R McMahon Memorial Prize
• $100
For excellence in Wool Science in the Bachelor of Science in Wool and Pastoral Science degree program

The R J Webster Prize
• $250
For the best performance throughout the Bachelor of Science in Textile Technology or Textile Management degree program

The Sialon Ceramics Prize
• $100
For the best performance in an honours thesis that reflects an advancement in the technology and development of advanced ceramics in the Bachelor of Engineering in Ceramic Engineering degree program

The Thermal Ceramics Australia Pty Limited Prize
• $200
For the best performance in MATS2254 Ceramic Engineering Design in the Bachelor of Engineering in Ceramic Engineering degree program

The Wallarah Minerals Prize
• $100
For the best performance in an honours thesis in the Bachelor of Engineering in Ceramic Engineering degree program

The Welding Technology Institute of Australia Prize
• Books worth approximately $200 and 1 year membership of the Institute
For the best performance in MATS1214 Welding and Other Joining Processes

The Western Mining Corporation Limited Prize
• $150
For the best overall performance in Year 3 full-time (or its part-time equivalent) in the Bachelor of Metallurgical Engineering or Bachelor of Science (Technology) in Metallurgy degree program

School of Mathematics

The Applied Mathematics Prize
• $100
For excellence in Level 3 Applied Mathematics courses in a Bachelor degree or Diploma program

The C H Peck Prize
• $200
For the best performance in Year 2 Mathematics by a student proceeding to Year 3 in the School of Mathematics

The Head of School's Prize
• $100
For excellence in four or more Mathematics units in Year 2 in a Bachelor degree or Diploma program

The J R Holmes Prize
• $100
For the best performance in Level 3 Pure Mathematics courses in a Bachelor degree or Diploma program
PRIZES

The J R Holmes Prize
• $100
For excellence in at least 4 pass-level Pure Mathematics Level 3 units, taken over no more than two consecutive years by a student in the Bachelor of Science, Bachelor of Arts or Bachelor of Education degree program

The Michael Mihailavitch Erihman Award
• $1000
For the best performance in a Mathematics Program, in examinations conducted by the School of Mathematics in any one year

The School of Mathematics Prize
• $100
For the best performance in MATH1131 Mathematics 1A or MATH1141 Higher Mathematics 1A, and MATH1231 Mathematics 1B or MATH1241 Higher Mathematics 1B in a Bachelor degree or Diploma program

The School of Mathematics Prize
• $100
For the best performance in basic Level 2 Higher Mathematics units in a Bachelor degree or Diploma program

The Statistical Society of Australia (NSW Branch) Prize
• $200
For the best performance in Theory of Statistics courses

The Towers Perrin Fourth Year Prize
• $200
For the best performance in the Year 4 project in the Bachelor of Science at Honours level within the School of Mathematics

The Towers Perrin Third Year Prize
• $200
For the best performance in both MATH3610 Higher Pure Mathematics 3 - Real Analysis and MATH3620 Higher Pure Mathematics 3 - Functional Analysis or in MATH3181 Applied Mathematics 3 - Optimal Control Theory

School of Microbiology and Immunology

The Bio-Rad Prize in Immunology
• $250
For the best performance in MICR3051 Immunology 2

The Clinical Microbiology Update Programme Prize
• $300
For the best performance in MICR3081 Bacteria and Disease in the Bachelor of Science at Pass or Honours level

The Jackson Prize
• $500
For the best Honours student in MICR4013 Microbiology 4 (Honours)

School of Optometry

The ACBO Prize
• Textbooks or visual therapy equipment worth approximately $150
For the best overall performance throughout the Bachelor of Optometry program in Binocular and Children's Vision

The Bausch & Lomb Prize
• $200 and a plaque
For the best overall performance in Year 3 of the Bachelor of Optometry program

The BOC Ophthalmic Instruments Prize
• Colour Vision Test
For the best overall performance throughout the Bachelor of Optometry program in Colour Vision

The Designs for Vision Prize
• Products valued at approximately $250
For the best overall performance throughout the Bachelor of Optometry program in Primary Care Optometry.

The ESSILOR Australia Pty Limited Prize
• $200
For the best performance in OPTM3301 Visual Science 3 and OPTM3309 Ocular Science 3

The Head of School's Prize
• A pocket ophthalmoscope set valued at approximately $500
For distinguished performance throughout the Bachelor of Optometry program

The Hoya Lens Australia Pty Limited Prize
• $250
For the best overall performance in Ocular and Visual Science throughout the Bachelor of Optometry degree program

The Hydron Pty Limited Prize
• $250
For the best performance in OPTM4311 Clinical Optometry 4A, OPTM4312 Clinical Optomtery 4B and OPTM4313 Clinical Optometry 4C in the Bachelor of Optometry degree program

The Hydron Pty Limited Prize
• $250
For the best overall performance in Year 4 of the Bachelor of Optometry degree program
The Optometrists Association Australia Prize  
• $500  
For outstanding academic performance in the Bachelor of Optometry program

The Optometric Vision Research Foundation Prize  
• $250  
For the best research project in the final year of the Bachelor of Optometry degree program

The Perkins Optical Products Pty. Ltd. Prize  
• $200  
For the best overall performance throughout the Bachelor of Optometry program in Dispensing

The Perkins Optical Products Pty. Ltd. Prize  
• $200  
For the best overall performance in OPTM2105 Optics and the Eye

The Protector Technologies Pty. Ltd. Prize  
• $150  
For the best overall performance throughout the Bachelor of Optometry program in Public Health and Occupational Optometry

The Safilo Australia Prize  
• $150  
For the best performance in OPTM2102 Clinical Optometry 2A and OPTM2202 Clinical Optometry 2B

The SOLA Optical Australia Pty. Ltd. Prize  
• $200  
For the best overall performance in OPTM3302 Clinical Optometry III

The Theo Kannis Prize for Clinical Optometry  
• $250  
For the best overall performance in Clinical Optometry throughout the Bachelor of Optometry degree program

The Wesley Jessen Pty Limited Prize  
• A trial fitting set of contact lenses  
For the best overall performance throughout the Bachelor of Optometry program in Contact Lens

School of Physics

The Australian Institute of Physics Prize  
• $200 and 1 year membership of the Institute  
For the highest aggregate in any three units from PHYS3010 Quantum Mechanics, PHYS3050 Nuclear Physics, PHYS3021 Statistical Mechanics and Solid State Physics, PHYS3030 Electromagnetism, PHYS3060 Advanced Optics, or PHYS3041 Experimental Physics A in the Bachelor of Science degree program

The B L Turtle Memorial Astrophysics Prize  
• $150  
For the best performance in PHYS3160 Astrophysics in the Bachelor of Science degree program

The Bob Dalglish Prize  
• $100  
For the best performance in a competition based on the use of microcomputers in PHYS1601 Computer Applications

The Bob Dalglish Prize  
• $100  
For the best performance in a project carried out within PHYS2601 Computer Applications

The Coherent Scientific Prize for Lasers, Optoelectronics & Applications  
• $250  
For the best performance in PHYS3710 Lasers and Applications or PHYS3720 Optoelectronics

The Gordon and Mabel Godfrey Award in Theoretical Physics 3  
• $200  
For the best performance in a selection of Year 3 Theoretical Physics courses chosen from: PHYS3510 Advanced Mechanics, Fields and Chaos PHYS3530 Advanced Quantum Physics PHYS3550 General Relativity and PHYS3560 Relativistic Electrodynamics and Plasmas Physics

The Gordon and Mabel Godfrey Award in Theoretical Physics 4  
• $200  
For excellence in PHYS4503 Theoretical Physics 4 (Honours) in the Bachelor of Science degree program at honours level

The Head of School's Prize in Physics  
• $50  
For the best Year 4 Honours thesis in Physics in the Bachelor of Science degree program

The Nilsen Prize in Electronics  
• Electronic test equipment valued at approximately $200  
For excellence in PHYS3630 Electronics or PHYS3041 Experimental Physics A and PHYS3760 Laser and Optoelectronics Technology Laboratory 1

The Nucletron Prize in Experimental Physics  
• $200  
For the best performance in PHYS3041 Experimental Physics A in Year 3 of the Bachelor of Science degree program
The Physics Staff Prize for Physics 1
• $100
For the best performance in PHYS1002 Physics 1

The Physics Staff Prize for Physics 2
• $150
For the highest aggregate in PHYS2001 Mechanics and Computational Physics, PHYS2011 Electromagnetism and Thermal Physics, PHYS2021 Quantum Physics and Relativity and PHYS2031 Laboratory in the Bachelor of Science degree program

The Physics Staff Prize for Physics Honours
• $200
For the best performance in the Physics Honours Year in the Bachelor of Science degree program

School of Physiology and Pharmacology

The D I McCloskey Prize for Physiology/Pharmacology Honours
• $100
For the best performance in PHPH4218 Physiology 4 Honours or PHPH4258 Pharmacology Honours in program 3801 Bachelor of Science (Medicine) Bachelor of Medicine Bachelor of Surgery in the Faculty of Medicine or program 3970 Bachelor of Science in the Board of Studies in Science and Mathematics

The D N Wade Prize for Medical Pharmacology
• $100
For the best performance in PHPH3055 Medical Pharmacology in program 3801 Bachelor of Science (Medicine) Bachelor of Medicine Bachelor of Surgery, 3821 Bachelor of Science Bachelor of Medicine Bachelor of Surgery or 3840 Bachelor of Arts Bachelor of Science (Medicine) Bachelor of Medicine Bachelor of Surgery

The Doerenkamp-Zbinden Prize in Pharmacology
• $100
For the highest aggregate in PHPH3152 Pharmacology in the Bachelor of Science degree program

The F C Courtice Prize
• $100
For the best performance in PHPH2018 Medical Physiology 1 in program 3801 Bachelor of Science (Medicine) Bachelor of Medicine Bachelor of Surgery or 3840 Bachelor of Arts Bachelor of Science (Medicine) Bachelor of Medicine Bachelor of Surgery

The F C Courtice Prize
• $100
For the best overall performance in Level III Physiology in a Bachelor degree program

The School of Physiology and Pharmacology Staff Prize For Medical Biology
• $100
For the best performance in PHPH1004 Biology for Medical Students in Year 1 of program 3801 Bachelor of Science (Medicine) Bachelor of Medicine Bachelor of Surgery or 3840 Bachelor of Arts Bachelor of Science (Medicine) Bachelor of Medicine Bachelor of Surgery

The School of Physiology and Pharmacology Staff Prize for Physiology 1 or Principles of Physiology
• $100
For the best performance in PHPH2112 Physiology 1 or PHPH2122 Principles of Physiology in program 3821 Bachelor of Science Bachelor of Medicine Bachelor of Surgery

The W E Glover Prize For Physiology
• $100
For the best performance in PHPH3014 Medical Physiology 2 in program 3801 Bachelor of Science (Medicine) Bachelor of Medicine Bachelor of Surgery, 3821 Bachelor of Science Bachelor of Medicine Bachelor of Surgery or 3840 Bachelor of Arts Bachelor of Science (Medicine) Bachelor of Medicine Bachelor of Surgery

School of Psychology

The Australian Psychological Society Prize
• $300
For the best performance in Psychology 4 Honours

The Milon Buneta Prize
• $100
For the best performance in Year 2 of the Bachelor of Science (Psychology) degree program

The Psychology Staff Prize
• $80
For the best performance in Year 2 Psychology

School of Science and Technology Studies

The Ronayne Prize
• $150
For the best First Class Honours result in the Year 4 (Honours) program in the Bachelor of Science or Bachelor of Arts in Science and Technology Studies degree program at Honours level
### Undergraduate and Postgraduate Prizes

#### School of Geology

**The Laric V Hawkins Prize**
- **$500**
  For the best Field Project Report involving a substantial component of Geophysics in a postgraduate program, Year 4 of the Applied Geology program, or an equivalent Honours program in the Science or Advanced Science program

#### School of Safety Science

**The Softway Operating Systems Prize**
- **$2,000**
  For the best performance in any advanced level Operating Systems subject by a student in an undergraduate or postgraduate coursework degree in the School of Computer Science and Engineering

### Postgraduate Prizes

#### School of Applied Bioscience

**The Spruson and Ferguson Patent and Trade Mark Prize**
- **$250**
  For the best performance in the Seminar presentation in the Master of Science or Doctor of Philosophy degree program in the Department of Food Science and Technology

#### School of Materials Science and Engineering

**The Malcolm Chaikin Prize**
- **$200** and a bronze medal
  For an outstanding PhD thesis in the Department of Textile Technology

**The Ergonomics Society of Australia (NSW) Prize**
- **$100** and membership of the Society
  For the best overall contribution to Organisational Psychology by a student in the Master of Psychology (Applied) degree program

#### School of Psychology

**The College of Organisational Psychologists, NSW Section Prize**
- **$250**
  For the best overall contribution to Organisational Psychology by a student in the Master of Psychology (Applied) degree program

#### School of Safety Science

**The Blackmores Ltd Prize for In Vitro Toxicology Laboratory Science**
- **$250**
  For the best performance in Chemical Safety and Applied Toxicology (CSAT) laboratory based course or project report on in-vitro toxicology in a postgraduate program in the School of Safety Science

**The MM! Insurance Prize for Introduction to Occupational Health**
- **$250**
  For the best performance in SESC9600 Introduction to Occupational Health in a postgraduate program in the School of Safety Science

**The MMI Insurance Prize for Occupational Diseases and Injuries**
- **$250**
  For the best performance in SESC9620 Occupational Diseases and Injuries in a postgraduate program in the School of Safety Science

**The MMI Insurance Prize for Principles of Ergonomics**
- **$250**
  For the best performance in SESC9620 Principles of Ergonomics or SESC9400 Ergonomics 1 and SESC9410 Ergonomics 2 (taken in the same calendar year) in a postgraduate program in the School of Safety Science

**The National Safety Council of Australia Prize**
- **$100**
  For the best performance in SESC9100 Physical Hazards and SESC9200 Hazard and Risk Assessment (taken in the same calendar year) in a postgraduate program in the School of Safety Science

**The National Safety Council of Australia Prize in Occupational Health and Safety**
- **$250**
  For the best performance by a graduating student in the Master of Science and Technology in Occupational Health and Safety degree program
The Neil Adams Ergonomics Prize
• $500
For the best performance in three courses, one of which is an Ergonomics course, in the Ergonomics Program in the School of Safety Science

The Quality Occupational Health personnel Pty Ltd Prize
• $250
for the best performance in SESC9300 Effective Behaviour in Organisations by a student in a postgraduate program in the School of Safety Science

The Safety Institute of Australia (NSW Division) Bill Lessels' Memorial Prize for Master of Safety Science
• $250.00
For the best overall performance by a graduating student in the Master of Safety Science degree program

The Safety Institute of Australia (NSW Division) Bill Lessels’ Memorial Prize for Graduate Diploma in Safety Science
• $250
For the best overall performance by a graduating student in the Graduate Diploma in Safety Science degree program

The School of Safety Science Qualifier’s Prize
• $250
For consistent performance in a coursework Masters degree by a student who began studies as a graduate qualifier in the School of Safety Science

The Whiteley Industries Prize
• $200
For the best performance in SESC9820 Chemical Safety and Toxicology in a postgraduate program in the School of Safety Science

The Workcover NSW Prize
• $300
For the best performance in SESC9211 Risk Management in a postgraduate program in the School of Safety Science
Notes
The University of New South Wales • Kensington Campus

Theatres
Applied Science Theatre F11
Athol Lykke Theatre C27
Biomedical Theatre E27
Central Lecture Block (CLB) E19
Clancy Auditorium C24
Classroom Block (Western Grounds) H3
Fig Tree Theatre B14
Heffron Theatres (Dwyer, Mellor, Murphy,
Nyholm, Smith) E12
Io Myers Studio D9
Keith Burrows Theatre J14
Macauley Theatre E15
Mathews Theatres D23
Parade Theatre E3
Physics Theatre K14
Rex Vowels Theatre F17
Science Theatre F22
Webster Theatres G15

Buildings
AGSM G27
Applied Science F10
Arcade D24
Barker Apartments N13
Basser College C18
Baxter College D14
Biological Sciences D26
Blockhouse G6
Chancellery C22
Civil Engineering H22
Dalton F12
Electrical Engineering G17
Goldstein College D16
Golf House A27
Heffron E12
International House C6
Geography and Surveying K17
Goodsell F20
Kensington Colleges (Office) C17
Library (University) E21
Library Stage 2 F21
Mechanical Engineering J17
Main K15
Mathews F23
Morven Brown C20
Myers, Sir Rupert M15
New College L6
Newton J12
NIDA D2
Parking Station (Barker Street) N18
Parking Station (Botany Street) H23
Pavilions, The E24
Philip Baxter College D14
Quadangle E15
Red Centre H13
Roundhouse E6
Sam Cracknell Pavilion H8
Samuels F25
Shalom College N9
Squarehouse E4
The Scientia G19
University Regiment J2
Vallentine Annex H23
Wallace Wurth School of Medicine C27
Warrane College M7
Webster, Sir Robert G14
Willis Annex E18

Faculty Offices
Arts and Social Sciences C20
Australian Graduate School of Management
AGSM G27
Built Environment H13
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Tiggers/Honey Pot – 34 Botany St.

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The University of New South Wales • Kensington Campus
This Handbook has been specifically designed as a source of detailed reference information for first year, re-enrolling undergraduate and postgraduate students.

Separate Handbooks are published for:
- Arts and Social Sciences
- Built Environment
- College of Fine Arts
- Commerce and Economics
- Engineering
- Law
- Medicine
- Science
- Australian Graduate School of Management (AGSM)
- Australian Taxation Studies Program (ATAX)
- University College
- Australian Defence Force Academy (ADFA)
- General Education.

For further information about the University – its organisation; staff members; description of disciplines; scholarships; prizes and so on, consult the University Calendar (Summary Volume). For further information on student matters, consult the UNSW Student Guide.