Subjects, courses and any arrangements for courses 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 1 November 1993, but may be amended without notice by the University Council.

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Designed and published by the Publications Section, The University of New South Wales
Printed by Bridge Printery Pty Ltd, Rosebery, NSW 2018

ISSN 0811-7640

It is University policy to promote equal opportunity in education (refer to EOE Policy Statement, The University of New South Wales Calendar (Summary Volume) and Student Guide 1994).
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Conditions for the Award of Degrees

First Degrees

Higher Degrees

Doctor of Philosophy (PhD)

Master of Chemistry (MChem), Master of Mathematics (MMath)

and Master of Physics (MPhysics)

Master of Engineering (ME) and Master of Science (MSc)

Master of Engineering (ME), Master of Science (MSc)

and Master of Surveying (MSurv) without supervision

Master of Mathematics (MMath) Master of Physics (MPhysics)

Master of Optometry (MOptom)

Master of Psychology (Applied) (MPsychol(Applied))

and Master of Psychology (Clinical) (MPsychol(Clinical))

Master of Science (MSc), Master of Science (MSc) without supervision

Master of Statistics (MStats)

Graduate Diploma (GradDip or DipFDA)

Scholarships and Prizes

Scholarships

Undergraduate Scholarships

General

Science

BSSM

Chemistry

Mathematics

Optometry

The UNSW Co-op Program

Graduate Scholarships

General

Biological and Behavioural Sciences

Science

Prizes

Undergraduate University Prizes

General

School of Chemistry

School of Mathematics

School of Optometry

School of Physics

School of Psychology

Graduate University Prizes

School of Optometry
Welcome to The University of New South Wales

This Handbook sets out information about the Science Courses, which are amongst the most varied and flexible available in our University.

In such a large institution as the University of New South Wales, Science based subjects are taught in more than one Faculty. They are brought together through a cross-Faculty organization, The Board of Studies in Science and Mathematics, which embraces topics from theoretical physics to anatomy, from mathematics to ecology. The Course is so organized that it can lead direct to a career in experimental science; or provide a broad program in which you have the opportunity to keep a number of options open.

All of you will have the opportunity to be taught by active scientists who are engaging in research of international significance, and all of you will acquire skills of great importance to the future of the community. While this handbook sets out the possibilities, we hope that you will feel free to take personal advice over your subject and career choices.

General course advice is always available from the Board of Studies in Science and Mathematics office and every science-based School will be happy to discuss options with interested students. Not all new students are new to universities, of course, and many of the new students this year will have chosen to pursue higher degree work in science at the University of New South Wales.

For graduate students the link with an individual school and discipline is even closer but all of you should feel that the general resources of the Board and Faculties associated with it, are very much at your disposal. And remember that essentially science is an adventure, science is fun. We wish you every success and sincerely hope that your student years as valued members of our community will be stimulating, happy and rewarding.

W.J. O’Sullivan
Dean
Board of Studies in Science and Mathematics
The Academic year is divided into two sessions each containing 14 weeks for teaching. There is a recess of approximately six weeks between the two sessions and there are short recesses of one week within each of the sessions.

Session 1 commences on the Monday nearest 1 March.

### All Faculties (other than Medicine)

<table>
<thead>
<tr>
<th>Session 1</th>
<th>1994</th>
<th>1995</th>
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<tr>
<td>(14 weeks)</td>
<td>28 February to 31 March</td>
<td>27 February to 13 April</td>
</tr>
<tr>
<td>Recess:</td>
<td>11 April to 10 June</td>
<td>24 April to 9 June</td>
</tr>
<tr>
<td>Study Period:</td>
<td>1 April to 10 April</td>
<td>14 April to 23 April</td>
</tr>
<tr>
<td>Examinations:</td>
<td>11 June to 16 June</td>
<td>10 June to 15 June</td>
</tr>
<tr>
<td>Midyear Recess:</td>
<td>17 June to 5 July</td>
<td>16 June 4 July</td>
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<td>6 July to 24 July</td>
<td>5 July to 23 July</td>
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<tr>
<th>Session 2</th>
<th>1994</th>
<th>1995</th>
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<tr>
<td>(14 weeks)</td>
<td>25 July to 23 September</td>
<td>24 July to 22 September</td>
</tr>
<tr>
<td>Recess:</td>
<td>4 October to 4 November</td>
<td>3 October to 3 November</td>
</tr>
<tr>
<td>Study Period:</td>
<td>24 September to 3 October</td>
<td>23 September to 2 October</td>
</tr>
<tr>
<td>Examinations:</td>
<td>5 November to 10 November</td>
<td>4 November to 9 November</td>
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<td>11 November to 29 November</td>
<td>10 November to 28 November</td>
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### Important Dates for 1994

**January**
- M 3 New Year's Day Public Holiday
- M 10 Term 1 begins - Medicine IV
- M 17 Term 1 begins - Medicine V
- W 26 Australia Day - Public Holiday

**February**
- T 1 Enrolment period begins for new undergraduate students and undergraduate students repeating first year.
- M 7 Re-enrolment period begins for second and later year undergraduate and graduate students enrolled in formal courses. Students should consult the Re-enrolling 1994 leaflets applicable to their courses for details.
- M 14 Semester 1 begins - AGSM Graduate Management Qualification

**March**
- M 7 Term 1 begins - Australian Graduate School of Management
- F 11 Last day applications are accepted from students to enrol in Session 1 or whole year subjects.
- Su 13 Term 1 ends - Medicine IV

**Calendar of Dates**

M 21 Semester 1 begins - AGSM Graduate Diploma in Management
Term 1 begins - AGSM MBA Program, Year 1 classes
(Late fee payable thereafter if enrolment approved.)

M 28 Session 1 begins - all courses except Medicine IV, V, VI
Session 1 begins - University College, Australian Defence Force Academy
Term 1 begins - AGSM MBA Program, Year 2 classes
April
F  1     Good Friday - Public Holiday
S  2     Mid-session Recess begins
M  4     Easter Monday - Public Holiday
Su 10    Mid-session Recess ends
Su 17    Term 2 ends - Medicine VI
Su 24    Term 2 ends - Medicine IV
M  25    Anzac Day - Public Holiday
S  30    May Recess begins - University College

May
M  2     Term 3 begins - Medicine IV
        Term 3 begins - Medicine VI
F  6     Term 1 ends - AGSM MBA Program, all classes
M  9     Examination week begins - AGSM MBA Program, all classes
T 10     Publication of provisional timetable for June examinations.
S 14     Examination - AGSM Graduate Management Qualification
Su 15    May Recess ends - University College, Australian Defence Force Academy
W 18     Last day for students to advise of examination clashes.
Su 29    Term 2 ends - Medicine V
M  30    Term 2 begins - AGSM MBA Program, all classes
T 31     Publication of timetable for June examinations.

June
S  4     Final examination - AGSM Graduate Management Qualification
         Semester 1 ends - AGSM Graduate Management Qualification
M  6     Term 3 begins - Medicine V
F 10     Session 1 ends
         Semester 1 ends - AGSM Graduate Management Qualification
S 11     Study recess begins
         College of Fine Arts assessment week begins
Su 12    Term 3 ends - Medicine IV
         Term 3 ends - Medicine VI
M 13     Queen's Birthday Public Holiday
T 14     Term 4 begins - Medicine IV
         Term 4 begins - Medicine VI
Th 16    Study Recess ends
F 17     Examinations begin
         Session 1 ends - University College, Australian Defence Force Academy
         College of Fine Arts assessment week ends
S 18     Mid-year Recess begins - University College, Australian Defence Force Academy
M 20     Examinations begin - University College, Australian Defence Force Academy

July
S  2     Examinations end - University College
T  5     Examinations end
W  6     Mid-year Recess begins
M 11     Semester 2 begins - AGSM Graduate Diploma in Management
Su 17    Mid-year Recess ends - University College, Australian Defence Force Academy
M 18     Semester 2 begins - AGSM Graduate Management Qualification
         Session 2 begins - University College, Australian Defence Force Academy
Su 24    Mid-year Recess ends
M 25     Session 2 begins - all courses except Medicine IV, V, and VI

August
F  5     Last day applications are accepted from students to enrol in Session 2 subjects.
         Last day for students to discontinue without failure subjects which extend over the whole academic year.
        Term 2 ends - AGSM MBA Program, all classes
Su 7     Term 4 ends - Medicine IV
         Term 3 ends - Medicine V
         Term 4 ends - Medicine VI
M  8     Exam week begins - AGSM MBA Program, all classes
M 15     Term 5 begins - Medicine IV
         Term 4 begins - Medicine V
         Term 5 begins - Medicine VI
M 29     Term 3 begins - AGSM MBA Program, all classes
W 31     HECS Census Date for Session 2
         Last day for students to discontinue without failure subjects which extend over Session 2 only.

September
S 24     Mid-session Recess begins
         September Recess begins - University College
Su 25     Term 5 ends - Medicine IV
         Term 5 ends - Medicine VI
M 26     Term 6 begins - Medicine IV
         Term 6 begins - Medicine VI
F 30     Closing date for applications to the Universities Admission Centre.

October
M  3     Labour Day Public Holiday
         Mid-session Recess ends
         September Recess ends - University College, Australian Defence Force Academy
W 12     Last day for students to advise of examination clashes.
S 15     Examination - AGSM Graduate Diploma in Management
Su 16    Term 4 ends - Medicine V
F 21     Session 2 ends - University College, Australian Defence Force Academy
M 24     Examinations begin - University College, Australian Defence Force Academy
T 25     Publication of timetable for November examinations.

November
F  4     Session 2 ends
         Term 3 ends - AGSM MBA Program, all classes
S  5     Study recess begins
         College of Fine Arts assessment week begins
         Final examination - AGSM Graduate Management Qualification
         Semester 2 ends - AGSM Graduate Management Qualification
         Examination - AGSM Graduate Diploma in Management
         Semester 2 ends - AGSM Graduate Diploma in Management
Su 6     Term 6 ends Medicine - IV
         Term 6 ends Medicine - VI
M  7     Exam week begins - AGSM MBA Program, all classes
Th 10    Study Recess ends
F 11     Examinations begin
         College of Fine Arts assessment week ends
         Examinations end - University College, Australian Defence Force Academy
T 29     Examinations end

December
Th 22    Last day for acceptance of applications by the Admissions Section for transfer to another undergraduate course within the University.
M 26     Christmas Day Holiday
T 27     Boxing Day Holiday
Board of Studies in Science and Mathematics

The Board of Studies in Science and Mathematics includes all members of the Faculty of Biological and Behavioural Sciences and the Faculty of Science, and some members of specific schools in other faculties contributing to the Science and Mathematics Course 3970: Applied Geology (Department), Biotechnology (Department), Chemical Engineering and Industrial Chemistry, Geography, Materials Science and Engineering, Metallurgy (Applied Science); Philosophy, Science and Technology Studies (Arts and Social Sciences); Accounting, Economics, Information Systems (Commerce and Economics); Electrical Engineering, Computer Science and Engineering, Mechanical and Manufacturing Engineering, Surveying (Engineering); Anatomy, Community Medicine, Physiology and Pharmacology (Medicine); Education (Professional Studies); and the Centre for Liberal and General Studies.

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Professor W.J. O'Sullivan

Presiding Member
Associate Professor G. Russell

Coordinator of Studies in Science and Mathematics
Associate Professor H. Goodwin

Administrative Officer
Paul Buist, BA MEd UNSW
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Comprises Schools of Biochemistry and Molecular Genetics, Biological Science, Microbiology and Immunology, and Psychology.

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Professor W. J. O'Sullivan

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Administrative Assistant
Kim Salvatori

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Barry Vaughan Milborrow, BSc PhD DSc Lond., FLS, FIBiol

Professor of Medical Biochemistry
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Alan Norman Wilton, BSc PhD Syd.

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Alec Edward Wood, BScAgr Syd., PhD UNSW
Arthur Woods, MA Oxf., FRES, MIBiol

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Iain Suthers, BSc Syd., MSc Manitoba, PhD Dalhousie

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Jillian Frederika Hallam, BSc PhD UNSW
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Anthony Ross SmithWhite, BSc Syd., MSc PhD UNSW
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Kenneth John Voges, BSc Syd.

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Haydn John Willetts, BSc Brist., PhD UNSW

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(In association with Unisearch Limited)

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Christopher Terence Frances Virgona, BSc UNSW

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Adrian Lee, BSc PhD Melb., MASM

Professor of Microbiology
Professor Staffan Kjelleberg, BSc PhD Goteborg

Professors
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*(in association with the Faculty of Applied Science)*

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1. Faculty 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
- Subject descriptions: this section includes HSC requirements, prerequisites, corequisites, exclusions and other notes

3. Graduate Study

This contains:
- Courses and Programs: followed by course outlines
- Subject 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>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>credit points</td>
</tr>
<tr>
<td>F</td>
<td>full year (Session 1 plus Session 2)</td>
</tr>
<tr>
<td>HPW</td>
<td>hours per week</td>
</tr>
<tr>
<td>L</td>
<td>lecture</td>
</tr>
<tr>
<td>P/T</td>
<td>part-time</td>
</tr>
<tr>
<td>S1</td>
<td>Session 1</td>
</tr>
<tr>
<td>S2</td>
<td>Session 2</td>
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<tr>
<td>SS</td>
<td>single Session, but which Session taught is not known at time of publication</td>
</tr>
<tr>
<td>T</td>
<td>tutorial/laboratory</td>
</tr>
<tr>
<td>U</td>
<td>unit value</td>
</tr>
<tr>
<td>WKS</td>
<td>weeks of duration</td>
</tr>
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<td>X</td>
<td>external</td>
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</tbody>
</table>
Prefixes

The identifying alphabetical prefixes for each organizational unit offering subjects to students in the Faculty of Commerce and Economics follow.

<table>
<thead>
<tr>
<th>Prefix</th>
<th>Organizational Unit</th>
<th>Faculty/Board</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCT</td>
<td>School of Accounting</td>
<td>Commerce and Economics</td>
</tr>
<tr>
<td>ANAT</td>
<td>School of Anatomy</td>
<td>Medicine</td>
</tr>
<tr>
<td>BIOC</td>
<td>School of Biochemistry and Molecular Genetics</td>
<td>Biological and Behavioural Sciences</td>
</tr>
<tr>
<td>BIOS</td>
<td>School of Biological Science</td>
<td>Biological and Behavioural Sciences</td>
</tr>
<tr>
<td>BIOM</td>
<td>Centre for Biomedical Engineering</td>
<td>Engineering</td>
</tr>
<tr>
<td>BIOT</td>
<td>Department of Biotechnology</td>
<td>Applied Science</td>
</tr>
<tr>
<td>BSSM</td>
<td>Board of Studies in Science and Mathematics</td>
<td>Science</td>
</tr>
<tr>
<td>CHEM</td>
<td>School of Chemistry</td>
<td>Science</td>
</tr>
<tr>
<td>CIVL</td>
<td>School of Civil 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>Biological and Behavioural 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>Commerce and Economics</td>
</tr>
<tr>
<td>GEOG</td>
<td>School of Geography</td>
<td>Applied Science</td>
</tr>
<tr>
<td>GEOL</td>
<td>Department of Applied Geology</td>
<td>Applied Science</td>
</tr>
<tr>
<td>INFSS</td>
<td>School of Information Systems</td>
<td>Commerce and Economics</td>
</tr>
<tr>
<td>JAPN</td>
<td>Asian Studies Unit</td>
<td>Commerce and Economics</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</td>
</tr>
<tr>
<td>MDCM</td>
<td>School of Medicine</td>
<td>Medicine</td>
</tr>
<tr>
<td>MECH</td>
<td>School of Mechanical and Manufacturing Engineering</td>
<td>Engineering</td>
</tr>
<tr>
<td>MICR</td>
<td>School of Microbiology and Immunology</td>
<td>Biological and Behavioural Sciences</td>
</tr>
<tr>
<td>MINP</td>
<td>School of Chemical Engineering and Industrial Chemistry</td>
<td>Applied Science</td>
</tr>
<tr>
<td>MSCI</td>
<td>Centre for Marine Science</td>
<td>Science</td>
</tr>
<tr>
<td>OCEA</td>
<td>Oceanography (Mathematics)</td>
<td>Science</td>
</tr>
<tr>
<td>OPTM</td>
<td>School of Optometry</td>
<td>Science</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</td>
</tr>
<tr>
<td>POLY</td>
<td>Department of Polymer Science</td>
<td>Applied Science</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>Biological and Behavioural Sciences</td>
</tr>
<tr>
<td>REMO</td>
<td>Centre for Remote Sensing</td>
<td>Engineering</td>
</tr>
<tr>
<td>SAFE</td>
<td>Department of Safety Science</td>
<td>Applied Science</td>
</tr>
<tr>
<td>SCTS</td>
<td>School of Science and Technology Studies</td>
<td>Arts and Social Sciences</td>
</tr>
<tr>
<td>HPST</td>
<td>Technology Studies</td>
<td>Engineering</td>
</tr>
<tr>
<td>WOOL</td>
<td>Department of Wool and Animal Science</td>
<td>Applied Science</td>
</tr>
</tbody>
</table>
Science courses take advantage of a wide range of science and technology based subjects available across the University.

The Board of Studies in Science and Mathematics administers these courses and is therefore responsible for the undergraduate studies of students specialising in disciplines associated with the faculties of Biological and Behavioural Sciences and of Science along with several schools from other faculties.

Board of Studies in Science and Mathematics

The Science Courses are administered by the Board of Studies in Science and Mathematics which includes all members of the Faculty of Biological and Behavioural Sciences and the Faculty of Science and some members of specific Schools in other faculties contributing to the Science and Mathematics Course: Biotechnology, Chemical Engineering and Industrial Chemistry, Geography, Mines (Applied Science); Science and Technology Studies, Philosophy (Arts); Accounting, Economics, Information Systems (Commerce); Electrical Engineering, Computer Science and Engineering, Mechanical and Manufacturing Engineering, Surveying (Engineering); Anatomy, Community Medicine, Physiology and Pharmacology (Medicine); Education (Professional Studies); and the Centre for Liberal and General Studies.

The Dean is Professor W. O'Sullivan who is also the Dean of the Faculty of Biological and Behavioural Science.

The Presiding Member is Associate Professor G. Russell.

The Coordinator of Studies in Science and Mathematics is Associate Professor H. A. Goodwin.

The Administrative Officer is Mr P. Buist.

Some People Who Can Help You

If after reading this handbook you still have problems, which concern the administration of the science course, consult with the staff of the Board of Studies in Science and Mathematics Office (Room G27, Biological Sciences Building, map reference D25).

If you require academic advice regarding particular programs or subjects consult the appropriate staff member for each program of study or subject, as listed later in this handbook.
Enrolment Procedures

New students will receive enrolment information with their offer of a place in the Science course. All students re-enrolling in 1994 should obtain a copy of the leaflet *Re-Enrolling 1994: Procedures and Fees for Science Courses*. This is available from the Course Administration Office and the Admissions Office. *All quotas are assessed on the basis of applications made at the time of preliminary enrolment. Students enrolling in graduate courses should contact the Postgraduate Section.*

The subject timetable for the Science and Mathematics Course and the Advanced Science Courses is available in late October/early November from the Science and Mathematics Course Office, Room G27, Biological Sciences Building. All re-enrolling students should collect one of these timetables along with a preliminary enrolment form (SM94). The preliminary enrolment form is to be completed and returned to the Science and Mathematics 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 subjects offered in that year. This is particularly important for subjects where laboratory space is limited. Students should be aware that some subjects may require a field trip which may involve personal costs to the student. Consult with individual subject authorities for details.

*It should be noted that quotas apply to certain subjects and programs, as indicated in the relevant programs or subject descriptions.*

General Information

While this Handbook has been specially designed as a detailed source of reference in all matters related to both the Faculty of Biological and Behavioural Sciences, and the Faculty of Science, the University’s *Student Guide* is intended to provide general information on some important rules and procedures, and introduces students to many of the services available to them. The *Guide*, which puts the Faculties into perspective within the University as a whole, is issued free of charge to all enrolled students. For other details about some aspects of the University and its activities students might need to consult the *University Calendar*. 
Science and Mathematics Course Programs

The Science and Mathematics Course (3970) and the Advanced Science and Mathematics Courses (3972-3977) lead to the award of the degree of Bachelor of Science on the completion of a three year program or a Bachelor of Science degree at honours level on the completion of a four year program. The main aims of the Science and Mathematics Course may be summarized as providing opportunities for students to prepare themselves for careers in research technology, science, mathematics and education, areas of management or public policy, involving the use of science or mathematics.

UAC Codes:

NSC (science); NCS (computing); NSD (advanced science)

The Board of Studies in Science and Mathematics offers a wide choice of programs each designed to meet specific aims and objectives. Most programs are identified with a particular School or discipline but some are multidisciplinary.

Programs in the Science and Mathematics Course have been designed to:

1. develop and sustain an interest in and knowledge of Science and Mathematics.
2. develop a working knowledge of scientific methods of investigation and a favourable attitude towards them.
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 humans’ material conditions and in widening their imaginative horizons and their understanding of the universe.
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.

Details of the programs follow the general information on the structure of the course.
How to structure your course

Bachelor of Science
BSc

The Bachelor of Science degree is awarded on completion of a three year program (leading to the award of the degree at pass level) or a four year program (leading to the award of the degree at honours level) chosen from specific programs approved by the Board of Studies in Science and Mathematics. The time specified is a minimum time required for completion of the degree. It may be taken over a longer period of time or as a part-time candidate, but note that it is not possible to complete studies even at Level I by evening classes alone.

Students are required to fulfill all of the requirements of their particular program as specified in the handbook in the year in which they first enrolled.

Three year degree at pass level

Basic requirements

1. A total of 23 science units and 2 general education units (ie 56 hours of Category A and 56 hours of Category B). Each subject offered to science students has a unit value (usually 1 but ranging from 0.5 to 4 units) based on the number of hours taught and the type of study.

2. A student must select and be enrolled in one of the prescribed programs. Programs are designed to link subjects in such a way that a coherent pattern of study is achieved in a specified discipline. All programs consist of a total of 23 units specified as either Level I, II, II/II or III.

Not less than eight nor more than ten units may be from Level I, and two of the Level I units must be mathematics (MATH1032 Mathematics I or MATH1042 Higher Mathematics, or both MATH1011 and MATH1021 General Mathematics B and C).

3. In order to graduate a student must pass all the units specified in a program.

4. Where a choice of subjects is indicated in a program care must be taken to satisfy prerequisites and corequisites. A prerequisite unit is one which must be completed prior to enrolment in the unit for which it is prescribed. A corequisite unit is one which must either be completed successfully before or be studied concurrently with the unit for which it is prescribed. An excluded unit is one which cannot be counted towards the degree qualification together with the unit which excludes it.

5. A student may change from one program to another only with approval. A written application to make the change, together with details of any optional units selected in the new program, must be lodged at the office of the Board of Studies in Science and Mathematics, Room G27 (Biological Sciences Building).

6. A student may not undertake more than 8 Science units in any one year. Exceptional cases must be discussed with and have approval from the Coordinator of the Board of Studies in Science and Mathematics.

7. Some subjects and programs have quotas. When such restrictions apply, entry to these subjects or programs is based solely on academic achievement.

8. General education electives in the three year (pass) degree are those in Categories A and B as indicated here. General Education is an integral part of the degree. Among its objectives, the General Education program provides the opportunity to address some of the key questions you will face as individuals, citizens and professionals.

Note:
Students enrolled in the Advanced Science course (course code 3972) who wish to take out the BSc at pass level and without proceeding to Stage 4, are required to transfer to course 3970. Applications 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 at the next round of graduation ceremonies. The application should state the Science Program in which the student wishes to be enrolled.
Students must satisfy all requirements for the designated Course 3970 program in order to qualify for the award of the BSc. Further information regarding the conversion of Advanced Science programs to programs that are available to students in course 3970 is available through the BSSM Office.

General Education Electives

Category A. The External Context; an introduction in non specialist terms to an understanding of the environments in which humans function.

Course Requirement: 56 hours

1. Australia and the Development of the World Economy. How do we, can we, generate wealth?
2. Human Inequality. How can we, ought we, distribute wealth, status and power?
3. Science and Civilization. What steps should we take, and what policies should we adopt, in science and technology?
4. Ecosystems, Technology and Human Habitation. What effects do our wealth generating and technoscientific activities have on the environment?
5. Mass Media and Communication. What are the effects of the new mass media of communication?
6. Australian Society and Culture. What are the key social and cultural influences on Australia today?

Category B: The Internal Context of Assumptions And Values: an introduction to, and a critical reflection upon, the cultural bases of knowledge, belief, language, identity and purpose.

Course Requirement: 56 hours

1. The Self and Society. How do we define ourselves in relation to the larger human community?
2. Changing Conceptions of Human Nature and Well-Being. How do our conceptions of human nature and well being influence both individual and social behaviour?
3. The Pursuit of Human Rationality. What are the prevailing conceptions of and challenges to human rationality?
4. The Use of Language, Images and Symbols. How do language, images and symbols function as means and media of communication?
5. The Computer: Its Impact, Significance and Uses. What is the impact of the computer on human society and culture?
6. Beliefs, Values and the Search for Meaning. Which systems of belief and configurations of values are most conducive to the survival and enhancement of the human species and the planet earth?

Four year degree at honours level

Basic requirements

1. All requirements of a three year program, including both the Science and the General Education electives specified.
2. (1) An approved honours program offered by one or more schools; or (2) at least 10 units at Level IV as specified in an individual program.
3. the general education elective in the honours degree is from Category C.

General Education Elective

Category C. An Introduction To The Design And Responsible Management Of The Human And Planetary Future. An introduction to the systems over which human beings exercise some influence and control.

The central question to be addressed by students in a systematic and formal way is: for what purpose or purposes will I use my intellectual skills, my expertise, or my technological prowess?
Will these abilities be used, for example:
- in a creative and innovative way?
- to widen the circle of human participation in the benefits they bring?
- to break down the barriers of exclusion and discrimination?
- to enhance the prospects for survival of the human species?
- to enhance the capacity of the planet earth to sustain life?
The exact way in which Category C is satisfied depends on the honours program in each discipline.

For entry to Year 4 students are required:
1. to have completed Years 1, 2 and 3 of the specific program and to have satisfied prerequisite requirements as specified in that program. The Category A and Category B General Education electives must be completed;
2. to seek the guidance of the appropriate Head of School at an early stage of study to ensure that the program being followed is best suited to lead to the Year 4 honours program;
3. to have completed relevant subjects normally with better than passing grades;
4. to have the approval of the appropriate Head of School.

Satisfactory Progress and Workloads

The expected maximum workload for students is four science units per session. This can be exceeded only in exceptional circumstances by students with a good academic record and requires the permission of the Coordinator of Studies. Students with external commitments, such as part-time employment, in excess of ten hours per week, should take fewer units. External commitments are not to be taken into consideration in relation to such matters as extensions of time for written work or failure to attend examinations, which may, for some subjects, be scheduled on Saturday mornings. Students whose performance is unsatisfactory will be asked to show cause why they should remain in their course of study.

Failure to show cause can result in exclusion from a subject or the course.

Any student who fails a subject twice, or is deemed to be making unsatisfactory progress will be required to show cause.

Unsatisfactory progress can be evidenced by failure of more than 50% of subjects attempted in a particular year, failing to pass the equivalent of four science units in one year, or failing to complete the requirements of first year in the first two years of study.

Students enrolled in Advanced Science are required to maintain satisfactory progress in order to remain in Advanced Science.

Rules governing admission to the Science and Mathematics Course with advanced standing

Any person who makes application to enrol in the Science and Mathematics Course (3970), the Advanced Science Courses (3972-3977), or in a combined degree course which includes the Science degree course administered by the Board of Studies in Science and Mathematics, may be admitted to the course of study leading to such degree with such standing on the basis of previous attainment as may be determined by the Board of Studies in Science and Mathematics provided that:

1. where students transfer from another tertiary institution, they shall not in general be granted standing in the course which is superior to that which they have enjoyed at the institution from which they transferred.

2. the standing granted by the Board of Studies in Science and Mathematics in the case of any application based upon any degrees or other award held by applicants, should not be such as will permit the applicants to qualify for the award of the science degree, without completing
the course of instruction and passing examinations in at least those subjects comprising the latter half of the four year Science and Mathematics course, so that where such a program of study would involve the applicants in repeating courses of instruction in which the Board of Studies in Science and Mathematics deems the applicants to have already qualified, the Board may prescribe an alternative program of studies in lieu thereof.

3. the standing granted by the Board of Studies in Science and Mathematics in the case of applications based on partial completion of the requirement for any degree or other award of another institution shall not be such that it will permit the applicants to qualify for the award of the science degree by satisfactory completion of the program of study deemed by the Board to be less than that required for students in full time attendance in the final year of the Science and Mathematics Course.

4. the standing granted by the Board of Studies in Science and Mathematics in the case of applications based upon the partial completion of the requirements for any degree or award of the University may be such as to give full credit in the Science and Mathematics Course for work done in the course from which the students transfer.

Program Outlines

Each program has a four-digit identifying number. Most programs are set out as Years 1, 2, 3 and 4 for the four year program and in these cases Years 1, 2 and 3 comprise a three year program. A few programs are set out as Years 1, 2 and 3 and lead to the award of the pass degree only.

Students wishing to take units additional to the specified 23 required for the pass degree should be aware that these units will attract an additional fee as voluntary subjects.

Range of programs

The range of programs has been designed to cover a wide variety of needs in the various areas of science and mathematics. The programs are listed below in alphabetical order.

ANATOMY see program 7000
BIOCHEMISTRY see program 4100
BIOLOGICAL SCIENCE see program 1700
BIOTECHNOLOGY see program 4200
BOTANY see program 1743
BUSINESS INFORMATION TECHNOLOGY see course 3971
CHEMISTRY see program 0200
COMMUNITY MEDICINE subjects available in some programs
COMPUTER SCIENCE see program 0600 (separate UAC entry code NCS)
EARTH AND ENVIRONMENTAL SCIENCE see program 2527
ECOLOGY see programs 6851, 6852, 6853
GENETICS see program 6840 and MOLECULAR GENETICS 4110
GEOGRAPHY see program 2700
GEOLOGY see programs 2500, 2503
GEOPHYSICS see program 2503 under GEOLOGY
INFORMATION SYSTEMS see program 1400 (separate UAC entry code NIT)
MARINE SCIENCE see programs 6831, 6832, 6833, 6834
MATHEMATICS see programs 1000, 1006, 1061
MOLECULAR GENETICS see program 4110
MICROBIOLOGY AND IMMUNOLOGY see program 4400
PHARMACOLOGY see program 7301
Details of Programs

ANATOMY

Entry to Anatomy programs is normally limited to students enrolled in Advanced Science. Entry is only possible at Level II and academic merit is the sole criterion. All students are advised to enrol initially in the Biological Sciences holding program 6817 and apply to meet the quota at the time of pre-enrolment for Level II.

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

7000
Anatomy

Year 1
BIOS1011, BIOS1021
MATH1032 or MATH1042
or both MATH1011 and MATH1021
4 elective Level I units

Year 2
ANAT2111, ANAT2211
5 or 6 elective units Recommended: Biological Science, Biochemistry, Physiology, Psychology
One 56 hour or two 28 hour Category A General Education subjects

Year 3
At least 4 Level III Anatomy units (may include PATH3201)
One 56 hour or two 28 hour Category B General Education subjects
Further units to give a total of 23 science units
Students proposing to proceed to Year 4 (Honours) must complete 6 Level III units

Year 4 (Honours)
ANAT4000

BIOCHEMISTRY AND MOLECULAR GENETICS

Biochemistry is concerned with understanding life processes, especially molecular aspects of living
organisms. Historically, the diverse approaches of chemistry and physiology were applied to biological systems but now Biochemistry has achieved its own techniques, approaches and body of knowledge, and its ideas pervade biology. It, however, retains a molecular basis and is an ideal study for those students who are interested in understanding and appreciating biological processes at the molecular rather than descriptive level. Integration of this molecular approach at the cellular, tissue, organ and whole organism level is an important part of Biochemistry. Biochemistry also represents a fundamental component of medical science and has an important role in many aspects of modern medicine.

See also program 4110 Molecular Genetics.

4100
Biochemistry

The program allows students to combine Biochemistry with other disciplines, for example Microbiology, Chemistry, Physiology, Biotechnology, Biological Science, Genetics or Anatomy.

Year 1
BIOS1011, BIOS1021
CHEM1002
MATH1032 or MATH1042 or both MATH1011 and MATH1021
2 elective Level I units (Recommended: Physics, Computing)

Year 2
BIOC2312 or BIOC2372*
BIOS2011, BIOS2021
CHEM2021 or CHEM2041
2 or 3 elective units
One 56 hour or two 28 hour Category A General Education subjects

Year 3
BIOC3111 or BIOC3121 or both BIOC3111 and BIOC3121
2 or more units from Level III Biochemistry to make a total of at least 4 Level III Biochemistry units (one of these units may be replaced by a Level III unit offered by the Department of Biotechnology, Immunology units offered by the School of Microbiology and Immunology or by BIOS3141)
Further elective units to give a total of 23
One 56 hour or two 28 hour Category B General Education subjects
Students proposing to proceed to Year 4 (Honours) must complete 8 Level III units

Year 4 (Honours)
BIOC4318
*Preference will be given to students enrolling in selected advanced science programs such as 7000 Anatomy, 7370 Biomedical Science, 0141 Medical Physics, 7312 Neuroscience A or 1273 Neuroscience B.
Other students may be admitted with the permission of the Head of School.

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. Specialisations are available in both Botany and Zoology as well as Ecology (6853), Marine Science-Biological Oceanography (6832) and Environmental Science (6861).

6817
Biological Sciences Holding Programs

Level I is identical in most programs in the Biological Sciences. Students who wish to study the biological sciences, but at Level I are unsure of the field in which they wish to specialise, are advised to enrol in this program and then transfer to the appropriate program in Level II.

Year 1
BIOS1011, BIOS1021
CHEM1002
MATH1032 or MATH1042 or both MATH1011 and MATH1021
2 elective Level I units

Year 2
BIOC2312
BIOS2011, BIOS2021
CHEM2021 or CHEM2041
2 or 3 elective units
One 56 hour or two 28 hour Category A General Education subjects

Year 3
5 units from BIOS3011, BIOS3021, BIOS3031, BIOS3041, BIOS3051, BIOS3061, BIOS3071, BIOS3081, BIOS3091, BIOS3101, BIOS3111, BIOS3121, BIOS3131, BIOS3141, MICR3071
2 elective units (which may be also from this list)
One 56 hour or two 28 hour Category B General Education subjects
Students proposing to proceed to Year 4 (Honours) must complete 7 Level III units

Year 4 (Honours)
BIOS4013 (F/T), BIOS4019 (P/T)
BIOMEDICAL SCIENCE

Entry to this program is limited to Advanced Science students at Level II and academic merit is the sole criterion. Students planning this are advised to enrol initially in the Biological Sciences Holding Program (6817) and apply to meet the Anatomy quota at the time of pre-enrolment for Level II.

7370
Biomedical Science (Advanced Science only)

Year 1
BIOS1011, BIOS1021
CHEM1002
MATH1032, MATH1042 or both MATH1011 and MATH1021
One of the following subjects:
PHYS1002 or PHYS1022 or COMP1811 and 1 other Level I unit or PSYC1002
Before Year 2 commences students should consult with Schools contributing to their proposed program about appropriate subjects and levels required for any particular honours year subject.

Year 2
Students must take 7 or 8 units, with at least 5 units from:
ANAT2111, ANAT2211, BIOC2312 or BIOC2372**, BIOS2021, MCR2201 or MIRC2011*, PHPH2112**
One 56 hour or two 28 hour Category A General Education subjects
Elective units should be preferably in subject areas such as Mathematics, Physics, Chemistry, Computing or Psychology (see comments for Year 4).

Year 3
After consultation with appropriate Schools about the proposed Honours Year subject students would ordinarily choose 7 or 8 units (to complete a total of 23 or 24 units) from the following subject areas: Physiology and Pharmacology***, Anatomy, Biochemistry, Microbiology and Immunology, Pathology, Biotechnology
One 56 hour or two 28 hour Category B General Education subjects

Year 4
Subject to satisfactory progress through the course students may proceed to the honours year. Before commencement of Level II students should consult an appropriate school (see the lists under Year 3) about the subjects required for a particular honours program.

*Students wishing to enrol in MIRC2011 are required to attend a one day bridging course in the mid-year break.

**From 1994 Student numbers in PHPH2112 and BIOC2372 will be limited. Entry to these subjects will be based on academic merit.

***From 1995 Student numbers in Level III Physiology and Pharmacology subjects will be limited. Entry to these subjects will be based on academic merit.

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 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 also expanded 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.

The Department of Biotechnology offers undergraduate training through the Board of Studies in Science and Mathematics (BSc Course) and in the BE Course in Bioprocess Engineering and the BSc course in Biotechnology. The BSc Course is three years for a Pass degree during which the student can study aspects of biotechnology in combination with another major in a relevant discipline, preferably biochemistry, microbiology or chemistry. The fourth Honours Year of the BSc Course includes further formal training in biotechnology as well as an extensive research project. The BE Degree Course in Bioprocess Engineering is four years full-time and has been designed to meet the requirements for membership of the Institution of Engineers, Australia. The BSc degree course in Biotechnology is four years full-time. Details of the BE Degree Course in Bioprocess Engineering and the BSc degree course in Biotechnology are given in the Faculty of Applied Science Handbook.
4200
Biotechnology

Year 1
BIOS1011, BIOS1021
CHEM1002
MATH1032 or MATH1042 or both MATH1011 and MATH1021
2 elective Level I units

Year 2
BIOC2312
BIOS2011, BIOS2021
MICR2201
2 elective units (Recommended: Chemistry, Microbiology)
One 56 hour or two 28 hour Category A and One 56 hour or two 28 hour Category B General Education subjects

Year 3
BIOT3011, BIOT3021, BIOT3031, BIOT3061
Additional elective units to give a total of 23.
Students proposing to undertake Year 4 (Honours) must complete 8 Level III units.

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

BOTANY

Plant Science is concerned with all aspects of the structure and function of both green and non-green plants and the relationship of plants to their environments. The major aspects of the subject range from plant anatomy and morphology through physiology, ecology, taxonomy, palynology, phycology and mycology. The applications of these studies are particularly relevant in the fields of agriculture, horticulture, forestry, marine studies, conservation and related environmental sciences.

1743
Botany

Year 1
BIOS1011, BIOS1021
CHEM1002
MATH1032 or MATH1042 or both MATH1011 and MATH1021
2 elective Level I units

Year 2
BIOC2312
BIOS2011, BIOS2021, BIOS2041, BIOS2051
2 elective units to make a total of 8
One 56 hour or two 28 hour Category A General Education subjects

Year 3
4 units from BIOS3071, BIOS3061, BIOS3091, BIOS3121, BIOS3141, MICR3071
3 elective units (which may be also from this list)
Students with an interest in molecular aspects of plant science should choose at least two of BIOT3131, BIOC3271 or BIOC3281.

One 56 hour or two 28 hour Category B General Education subjects
Students proposing to proceed to Year 4 (Honours) must complete 7 Level III units

Year 4 (Honours)
BIOS4023 (F/T), BIOS4029 (P/T)

CHEMISTRY

The programs in Chemistry are 0200 (Chemistry) and 0205 (Pure and Applied Chemistry, for Advanced Science only). Both programs provide a basic scientific education and a professional training in the chemical sciences. Fundamental, applied, environmental and industrial aspects of chemistry are included.

The following combinations should be considered:
Chemistry/Biochemistry: programs 0200 and 4100 are mutually compatible;
Chemistry/Computer Science: programs 0200 and 0600 are mutually compatible;
Chemistry/Geology: programs 0200 and 2500 can be made compatible (initially consult the School of Chemistry);
Chemistry/Mathematics: programs 0200 and 1000 are mutually compatible;
Chemistry/Physiology: programs 0200 and 7300 (strand 2: Pharmacology) are mutually compatible as a 24 unit program.
Other combinations can be arranged by consultation initially with the School of Chemistry.

0200
Chemistry

Program 0200 combines chemistry with other disciplines such as physics, geology, biochemistry, mathematics, computer science, biotechnology, physiology and pharmacology. These programs with more than one field of specialisation result in a broadly based degree in the chemical sciences. For example: a combination of chemistry and biochemistry leads to further work in areas such as toxicology and neurochemistry; a combination of 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 fields of hitech materials.

Year 1
CHEM1002
MATH1032 or MATH1042 or both MATH1011 and MATH1021
PHYS1002 or PHYS1022
2 elective Level I units
Year 2*
CHEM2011, CHEM2021, CHEM2031, CHEM2041
3 elective units
One 56 hour or two 28 hour Category A and one 56 hour or two 28 hour Category B General Education subjects

Year 3
Choose 4 Level III Chemistry units of which at least 3 are from:
CHEM3011, CHEM3021, CHEM3031, CHEM3041
Choose 4 elective units
Students proposing to proceed to Year 4 (Honours) must complete 8 Level III units.

Year 4 (Honours)
CHEM4003
* Students wishing to specialise in Chemistry with either Geology or Biotechnology may vary specified units with approval of the Board of Studies in Science and Mathematics.

0205
Pure and Applied Chemistry (Advanced Science only)

Program 0205 is designed for students who wish to specialise in the chemical sciences, and undertake the maximum number of chemistry subjects. It is designed to provide education and training in all contemporary fields of chemistry, and should be selected by students who wish to devote their studies at Level III entirely to chemistry.

Year 1
CHEM1002
MATH1032 or MATH1042 or both MATH1011 and MATH1021
PHYS1002
2 elective Level I units

Year 2
CHEM2011, CHEM2021, CHEM2031, CHEM2041
3 elective units (Recommended: Biochemistry, Biotechnology, Computer Science, Geology, Mathematics, Physics, Physiology)
One 56 hour or two 28 hour Category A and One 56 hour or two 28 hour Category B General Education subjects

Year 3
CHEM3011, CHEM3021, CHEM3031, CHEM3041
4 Level III Chemistry units

Year 4 (Honours)
CHEM4003

COMPUTER SCIENCE

Entry to this program is restricted to students who have been offered a place directly (UAC code NCS). Entry to later years is considered only in exceptional circumstances.

Computer Science involves the study of the design, construction and use 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 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 subjects. See specific programs available: Computer Science/Physics (0161 Physics/Computer Science); Computer Science/Mathematics/Statistics (1061 Mathematics or Statistics/Computer Science and 1060 Mathematics with Computing); Computer Science/Psychology (1206 (UAC entry code NCS)); Computer Science/Philosophy (5206 (UAC entry code NCS)); Information Systems (1400 UAC entry code NIT)).

0600
Computer Science

Year 1
COMP1011, COMP1021
MATH1032 or MATH1042, MATH1081
3 elective Level I units*

Year 2
COMP2011, COMP2021, COMP2031
5 elective units*
One 56 hour or two 28 hour Category A General Education subjects

Year 3
4 Level III Computer Science units including at least 1 unit from COMP3111, COMP3121, COMP3131 and at least 1 unit from COMP3211, COMP3221, COMP3231, COMP3331
Further elective units to make a total of 7*
One 56 hour or two 28 hour Category B General Education subjects

Students may not include more than 6 Level III Computer Science units
Students proposing to proceed to Year 4 (Honours) must complete 6 Level III Units

Year 4 (Honours)
COMP4914
* Up to 8 units may be counted from appropriate subjects not listed in this handbook. Enrolment in subjects available for study in the Faculty of Arts and Social Sciences is subject to approval by the relevant subject authority.
EARTH AND ENVIRONMENTAL SCIENCE

This program combines Geology and Geography giving an understanding of present geological processes and their relationships with the land surface. The effects on the natural processes of human activities, from industrial pressures to urban developments, are an integral part of the course. Community need for developments in a variety of environments and the vital role of environmental interdisciplinary safeguards have been among the main guidelines in the selection of subjects within the program.

2527
Earth and Environmental Science

Year 1
CHEM1002 or CHEM1302
GEOG1031, GEOG1051
GEOL1101, GEOL1201
MATH1032 or MATH1042 or both MATH1011 and MATH1021

Year 2
BIOS1011, BIOS1021
GEOG2021, GEOG2032, GEOG3051
GEOL6231, GEOL7223, GEOL7333
One 56 hour or two 28 hour Category A General Education subjects

Year 3
GEOL6321, GEOL7323, GEOL7333
Plus 4 Level III units of Geology and/or Biology and/or Geography
One 56 hour or two 28 hour Category B General Education subjects

Year 4 (Honours)
GEOL4313 or GEOG4050/GEOG4100

ECOLOGY

The Ecology programs allow students to specialise in selected areas of Ecology yet provide experience in a range of related cross disciplinary units, Biological Ecology (6853), Geographical Ecology (6851) and Mathematical Ecology (6852). Optional units allow students to match their interests and career aspirations. The selection of these units must be discussed with a Program adviser.

6851
Geographical Ecology

Year 1
BIOS1011, BIOS1021
GEOG1031, GEOG1051

6852
Mathematical Ecology

Year 1
BIOS1011, BIOS1021
COMP1811
MATH1081, MATH1032 or MATH1042
Choose 1 of the strands:
1. CHEM1002
2. GEOG1031, GEOG1051
3. PHYS1002 or PHYS1022

Year 2
BIOS2011, BIOS2051, MATH2501, MATH2510
BIOS2031 or BIOS2061
Choose 1 of the strands:
1. MATH2120, MATH2200, MATH2841
2. MATH2801, MATH2821
At least 1 unit from: BIOS2021, BIOS2031, BIOS2061, GEOG2021, GEOG2032, GEOG3032, GEOG3042, GEOG3062, MATH2160, MATH2180, MATH2290, MATH2301, MATH2520, MATH2810, MATH2830, MICR2201 or MICR2011
One 56 hour or two 28 hour Category A General Education subjects

Students proposing to proceed to Year 4 (Honours) must complete at least 6 Level III units

Year 4 (Honours)
BSSM4023 (F/T), BSSM4029 (P/T)
ENVIRONMENTAL SCIENCE

Electives in these programs may be restricted to those in table ENVS immediately below. Environmental Science programs allow specialisation in a number of aspects: Biological Environments (Terrestrial, Marine and Microbial), Environmental Chemistry, Earth Environments, Environmental Mathematics (Fluid Dynamics, Statistics and Population Dynamics).

All programs have the requirements for subjects to be selected from the following table.

**TABLE ENVS**

<table>
<thead>
<tr>
<th>Level I Units</th>
<th>BIOS1011, PHYS1002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 3</td>
<td>BIOS3111, BIOS3061 and GEOG3021 or GEOG3211</td>
</tr>
<tr>
<td>BIOS3111, BIOS3061 and GEOG3021 or GEOG3211</td>
<td></td>
</tr>
<tr>
<td>At least 3 units from subjects related to the strand chosen in Year 2:</td>
<td></td>
</tr>
<tr>
<td>1. MATH3161, MATH3181, MATH3201, MATH3540, MATH3550, MATH3870, MATH3880</td>
<td></td>
</tr>
<tr>
<td>2. MATH2810, MATH2830, MATH3801, MATH3811, MATH3820, MATH3830, MATH3840, MATH3850, MATH3861</td>
<td></td>
</tr>
<tr>
<td>At least 1 unit from: BIOS3011, BIOS3021, BIOS3031, BIOS3051, BIOS3061, BIOS3071, BIOS3081, BIOS3091, BIOS3121, BIOS3131, BIOS3141, GEOG2013, GEOG3011, GEOG3021, GEOG3051, GEOG3062, MICR3071</td>
<td></td>
</tr>
<tr>
<td>Further elective units (to be discussed with Program adviser) to give a total of 23</td>
<td></td>
</tr>
<tr>
<td>One 56 hour or two 28 hour Category B General Education subjects</td>
<td></td>
</tr>
<tr>
<td>Students proposing to proceed to Year 4 (Honours) must complete at least 6 Level III units</td>
<td></td>
</tr>
<tr>
<td>Year 4 (Honours)</td>
<td>BISSM4023 (F/T), BISSM4029 (P/T)</td>
</tr>
<tr>
<td>Category C General Education requirement</td>
<td></td>
</tr>
</tbody>
</table>

6861

**Biological Environments (Terrestrial)**

(Advanced Science only)

<table>
<thead>
<tr>
<th>Year 1</th>
<th>BIOS1011, BIOS1021</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOS1011, BIOS1021</td>
<td></td>
</tr>
<tr>
<td>CHEM1002</td>
<td></td>
</tr>
<tr>
<td>GEOG1031, GEOG1051</td>
<td></td>
</tr>
<tr>
<td>MATH1032 or MATH1042 or both MATH1011 and MATH1021</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year 2</th>
<th>BIOC2312</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOC2312</td>
<td></td>
</tr>
<tr>
<td>BIOS2011, BIOS2021, BIOS2041, BIOS2051 and BIOS2031 or BIOS2061</td>
<td></td>
</tr>
<tr>
<td>1 unit from: BIOS2031, BIOS2061, GEOG2021, GEOG2032, GEOG3042, MICR2011, MICR2201</td>
<td></td>
</tr>
<tr>
<td>One 56 hour or two 28 hour Category A General Education subjects</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year 3</th>
<th>BIOS3071, BIOS3111</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOS3071, BIOS3111</td>
<td></td>
</tr>
<tr>
<td>GEOG3021, GEOG3211</td>
<td></td>
</tr>
<tr>
<td>2 further Level III units from: BIOS3011, BIOS3031, BIOS3051, BIOS3061, BIOS3081, BIOS3121, BIOS3131, GEOG2032, GEOG3021, GEOG3032, GEOG3042, GEOG3051, MICR3071</td>
<td></td>
</tr>
<tr>
<td>Further elective units (to be discussed with Program adviser) to give a total of 23</td>
<td></td>
</tr>
<tr>
<td>One 56 hour or two 28 hour Category B General Education subjects</td>
<td></td>
</tr>
<tr>
<td>Students proposing to proceed to Year 4 (Honours) must complete at least 6 Level III units</td>
<td></td>
</tr>
</tbody>
</table>

| Year 4 (Honours) | BISSM4023 (F/T), BISSM4029 (P/T) |
Year 3
BIOS3071, BIOS3111, BIOS3061
GEOG2021, GEOG3021, GEOG3211
At least one unit for major sequence from Table ENVS
One 56 hour or two 28 hour Category B General Education subjects

Year 4
ENVS3011
GEOG3042, GEOG3062
BIOS4004 (Thesis Project 4 units) or
BIOS4002 (Thesis Project 2 units) plus 2 further units from Table ENVS
Category C General Education requirement

6862
Biological Environments (Marine) (Advanced Science only)

Year 1
BIOS1011, BIOS1021
CHEM1002
ENVS1011, GEOG1031
MATH1032 or MATH1011 and MATH1021

Year 2
BIOS2011, BIOS2041
ECON1107
ENVS2010, ENVS2020
GEO1101
LAW8000
MICR2001
At least 2 units from: BIOS2031, BIOS2051, BIOS2061,
MICR2201
One 56 hour or two 28 hour Category A General Education subjects

Year 3
BIOS3071, BIOS3081, BIOS3091, BIOS3111
GEOG2021, GEOG6231
MICR3001
One 56 hour or two 28 hour Category B General Education subjects

Year 4
ENVS3011
GEOG3042, GEOG3062
MICR4004 (Thesis Project 4 units) or
MICR4002 (Thesis Project 2 units) plus 2 further units from Table ENVS
Category C General Education requirement

6864
Environmental Chemistry (Advanced Science only)

Year 1
BIOS1021
CHEM1002
ENVS1011, GEOG1031
GEO1101
MATH1032 or MATH1011 and MATH1021

Year 2
CHEM2011, CHEM2021, CHEM2031, CHEM2041
ECON1107
ENVS2010, ENVS2020
LAW8000
1 statistics unit from: BIOS2041, GEOG2013, or
MATH2841
One 56 hour or two 28 hour Category A General Education subjects

Year 3
CHEM3311, CHEM3421, CHEM3431, CHEM3441
PHY1002
1 optional unit from Table ENVS
One 56 hour or two 28 hour Category B General Education subjects

Year 4
ENVS3011
GEOG2021, GEOG3042, GEOG3062
CHEM4005 (Environmental Chemistry/Science project 3 units)
Category C General Education requirement
6865
Earth Environments (Geography) (Advanced Science only)

Year 1
CHEM1002
ENVS1011
GEOG1031, GEOG1051
GEOL1101 or GEOL1201
MATH1032 or MATH1011 and MATH1021

Year 2
BIOS1021
ECON1107
ENVS2010, ENVS2020
GEOG2013, GEOG2021, GEOG3051, GEOG3211
LAWS8000
One 56 hour or two 28 hour Category A General Education subjects

Year 3
BIOS3071
GEOG2032, GEOG2102, GEOG3011, GEOG3032
Additional units from Table ENVS to make 8
One 56 hour or two 28 hour Category B General Education subjects

Year 4
ENVS3011
GEOG3042, GEOG3062, GEOG3122, GEOG4062
APSE4XXX (Thesis project. 2 units)
Additional units from Table ENVS to total 30
Category C General Education requirement

6866
Earth Environments (Geology)
(Advanced Science only)

Year 1
CHEM1002
ENVS1011
GEOG1031
GEOL1101, GEOL1201
MATH1032 or MATH1011 and MATH1021

Year 2
BIOS1021
ECON1107
ENVS2010, ENVS2020
GEOG2021
GEOL7223, GEOL7233
LAWS8000
MSCi2001
One 56 hour or two 28 hour Category A General Education subjects

Year 3
BIOS3071, GEOG3032
GEOL6231, GEOL7323, GEOL7333
Additional units from Table ENVS to make 8
One 56 hour or two 28 hour Category B General Education subjects

Year 4
ENVS3011
GEOG3042, GEOG3062
MATHXXXX* (2 units) Major project involving analysis and interpretation of existing data, or modelling of a simple process. An additional unit is taken in a topic associated with environmental fluid dynamics, numerical modelling or data analysis, chosen after consultation.
Category C General Education requirement

* Please note subjects ending in XXX are yet to be finalised; students should consult subsequent handbooks.

6867
Environmental Mathematics (Fluid Dynamics)
(Advanced Science only)

Year 1
BIOS1021
CHEM1002
ENVS1011, GEOG1031
MATH1032 or MATH1042
PHYS1002

Year 2
ECON1107
ENVS2010, ENVS2020
LAWS8000
MATH2100, MATH2120, MATH2200, MATH2220,
MATH2301, MATH2510, MATH2520
One 56 hour or two 28 hour Category A General Education subjects

Year 3
BIOS3071
GEOG2021, GEOL1101
MATH3121, MATH3301, MATH3241, MATH3261
One 56 hour or two 28 hour Category B General Education subjects

Year 4
ENVS3011
GEOG3042, GEOG3062
MATHXXXX* (2 units) Major project involving analysis and interpretation of existing data, or modelling of a simple process. An additional unit is taken in a topic associated with environmental fluid dynamics, numerical modelling or data analysis, chosen after consultation.
Category C General Education requirement

6868
Environmental Mathematics
(Statistics) (Advanced Science only)

Year 1
BIOS1011, BIOS1021
CHEM1002
ENVS1011, GEOG1031
MATH1032 or MATH1042
GENETICS

Genetics is covered in two programs: Program 6840 is broadly based and initially covers all aspects of Genetics. It allows students at Level III to maintain a broad range of interests including Molecular Genetics, Evolutionary and Population Genetics and Human Genetics or to concentrate on a particular field. Molecular Genetics (4110) allows students to specialise in Molecular Biology and Genetics. In both programs students can also specialise in Biochemistry, Biological Science, Biotechnology or Microbiology/Immunology. Year 4 (Honours) programs in Genetics are available in any of these schools and also in the School of Community Medicine.

6840
Genetics

Year 1
BIOS1011, BIOS1021
CHEM1002
MATH1032 or MATH1042 or both MATH1011 and MATH1021
2 elective Level I units

Year 2
BIOS2011
ECON1107
ENVS1011, GEOG1031
MATH1032 or MATH1042

Year 3
BIOS3061, BIOS3071, BIOS3111
GEOG2021
MATH2810, MATH2830, MATH3811, MATH3820, MATH3830
One 56 hour or two 28 hour Category B General Education subjects

Year 4
ENVS3011
GEOG3042, GEOG3062
MATHXXXX* (Thesis Project 2 units)
Category C General Education requirement
* Please note subjects ending in XXXX are yet to be finalised; students should consult subsequent handbooks.

6869
Environmental Mathematics (Population Dynamics) (Advanced Science Only)

Year 1
BIOS1011, BIOS1021
CHEM1002
ENVS1011, GEOG1031
MATH1032 or MATH1042

Year 2
BIOS2011
ECON1107
ENVS2010, ENVS2020
GEOG1101
LAW8000
MATH2501, MATH2510, MATH2520, MATH2801, MATH2821
One 56 hour or two 28 hour Category A General Education subjects

Year 3
BIOS3061, BIOS3071, BIOS3111
GEOG2021
MATH2810, MATH2830, MATH3811, MATH3820, MATH3830
One 56 hour or two 28 hour Category B General Education subjects

Year 4
ENVS3011
GEOG3042
MATH3161, MATH3181, MATHXXXX* (Thesis project 2 units)
Category C General Education requirement
* Please note subjects ending in XXXX are yet to be finalised; students should consult subsequent handbooks.

GEOGRAPHY

Geography is the scientific study of variations from place to place on the earth’s surface. It provides an analytical framework for understanding and investigating many of society’s pressing problems such as the use and
management of scarce resources, the impact of environmental hazards on human activities, soil erosion and conservation, land use conflicts, and the spatial organization of human affairs.

The program 2700 includes physical and human Geography, with particular emphasis on studies of the natural environment, as well as a grounding in basic analytical skills and techniques (e.g. statistical methods and computing, remote sensing and airphoto interpretation, geographical information systems, field and laboratory techniques) required for problem solving and application.

Geography can be usefully combined with other sciences, especially Geology and Biological Science, studied with Geology in the Earth and Environmental Science (2527), with Biological Science in Ecology (6851) and with Environmental Science programs (especially 6865).

2700 Geography

Year 1
GEOG1062 and at least one of GEOG1031 and GEOG1051
MATH1032 or MATH1042 or both MATH1011 and MATH1021
Elective Level I units to make a total of 8

Year 2
3 Geography units
5 elective units
One 56 hour or two 28 hour Category A General Education subjects

Year 3
4 Level III Geography units
GEOG3000
3 elective units
One 56 hour or two 28 hour Category B General Education subjects

Students proposing to proceed to Year 4 (Honours) must complete 8 Level III units and must have completed GEOG2013 or GEOG3221

Year 4 (Honours)
GEOG4100/GEOG4050

GEOLOGY AND GEOPHYSICS

Geology is the study of the nature and evolution of our planet. It is concerned with the composition and modes of formation and deformation of the igneous, sedimentary and metamorphosed rocks and concentrations of minerals that comprise the earth's crust and interior. Geology enquires into the essential controls on the development and distribution of such rocks and minerals in space and geological time. Likewise it is concerned with the nature, distribution, and evolution of life forms through time. Resource geology is concerned with the application of all geological knowledge to the location and extraction of mineral and energy deposits, and to engineering and environmental tasks, activities fundamental to society. Thus geology has an applied, professional function as well as being a scientific discipline.

Geophysics employs sophisticated instrumentation in order to construct physical earth models and is a companion discipline to Geology.

Program for Professional Geology

Since June 1986, the Australasian Institute of Mining and Metallurgy has required that its corporate members, including professional geologists, shall have completed a four year course. Students wishing to enter the geology profession through Science should take program 2500 with a double specialisation in Applied Geology and then take a Year 4 honours program. Year 4 is divided between a core of advanced geological topics, and one strand chosen from mineral resources, sedimentary basin resources, engineering and environmental geology, or geophysics. Session 2 of Year 4 is devoted to a specialised research project.

Single Specialisation in Geology
Geology is a natural companion to other sciences, such as Chemistry (in Geochemistry), Botany and Zoology (in Palaeontology) and Geography. Program 2500 also allows a single specialisation in Geology. Students who wish to undertake an honours degree program that includes geology with another science should consult the Department of Applied Geology. Those interested in combining Geology with Biology should read the following section.

Geology with Biological Science
Geology and the Biological Sciences meet in palaeontology, the evolution and environmental controls on the growth of ancient life forms. Palaeontology provides geologists with essential information about the relative ages and depositional environments of sedimentary rocks, particularly the strata with potential to yield fossil fuels.

Geology in Marine Science
See Marine Science (Earth Science Oceanography) (6833).

2500 Geology

Year 1
CHEM1002 or CHEM1302
GEOL1101, GEOL1201
MATH1032 or MATH1042 or both MATH1011 and MATH1021
and either
BIOS1011 and BIOS1021* or
GEOG1031, GEOG1051 or
PHYS1002 or PHYS1022

* Students following a combination of Applied Geology with Botany and/or Zoology at Level I must take Biology subjects, BIOS1011, BIOS1021. At Level II they should take BIOS2031, BIOS2041, BIOS2051, BIOS2061 and 3 units of Geology which must include GEOG2031 and GEOG2062. At Level III at least 4 units of Geology which must include GEOG3031 plus BIOS3131 and 3 units chosen from BIOS3101, BIOS3051, BIOS3071, BIOS3081, BIOS3091, BIOS3121
INFORMATION SYSTEMS

Entry to this program is restricted to students who have been offered a place directly (UAC code NIT). There is a strict quota on entry to later years 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 organizations. 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 organizations - 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 year, students study systems design, database, communications and commercial programming in parallel with computer science, mathematics and management accounting units. In the honours year, well qualified students may specialise in advanced information systems and data management topics.

See also Course 3971

1400 Information Systems

Year 1
ACCT1501, ACCT1511
COMP1811
ECON1101, ECON1102
INF51602
MATH1032 or MATH1042

Year 2
COMP1821
INF52603, INF52609
MATH2841 or MATH2801
4 elective units
One 56 hour or two 28 hour Category A General Education subjects
Students proposing to proceed to Year 4 (Honours) must complete 8 Level III units

Year 2 (Direct Year 2 Entrants)*
COMP1821
ACCT1501, ACCT1511, INF51602, INF52603, INF52609
MATH2801 or MATH2841
1 elective unit
One 56 hour or two 28 hour Category A General Education subjects

* Students admitted at Level II must enrol in another science program for Year 1. Transfer is based on academic performance at Level I. Students in this category are not required to complete ECON1101 and ECON1102.
Year 3
ACCT2522, INFS3605, INFS3607, INFS3608
3 elective units including at least one at Level III
One 56 hour or two 28 hour Category B General Education subjects
Students proposing to proceed to Year 4 (Honours) must complete 6 Level III units

Year 4 (Honours)
INFS4794
The Category C General Education requirement is covered by components of compulsory subjects in the course.

MARINE SCIENCE

Marine Science programs allow specialisations in selected areas of marine science, yet also include adequate exposure to other pertinent disciplines.
All students must select one major sequence from: Physical Oceanography (6831) or Biological Oceanography (6832) or Earth Science Oceanography (6833) or Environmental Chemistry (6834). In addition, two minor sequences from the Physical, Biological, Earth Science, and Chemical minor sequences must be taken.

6831
Marine Science (Physical Oceanography)

Year 1
MATH1032 or MATH1042
PHYS1002, PHYS1611 or PHYS1601
2 units from 1 of the strands:
1. BIOS1011, BIOS1021 or
2. CHEM1002 or
3. GEOL1101, GEOL1201
MATH1081 or 1 further unit from the above strands

Year 2
MATH2120, MATH2160, MATH2180, MATH2501, MATH2200 or MATH2220
MSCI2001
PHYS2001
Continue the strand chosen in Year 1:
1. CHEM2041 or CHEM2011 or
2. at least 1 unit from: BIOS2011, BIOS2051, BIOS3111 or
3. GEOL6201
Additional elective units to give a total of 8
One 56 hour or two 28 hour Category A General Education subjects

Year 3
MATH2280, MATH3121, MATH3201, MATH3241, MATH3261
MSCI3001
2.5 units from: PHYS2021, PHYS2031, PHYS2601, PHYS3150, PHYS3631, MATH3101, MATH3301, GEOL6330, BIOS3081 or GEOL6311 or GEOL6231 or BIOS3091
One 56 hour or two 28 hour Category B General Education subjects

Students proposing to proceed to Year 4 (Honours) must complete 6 Level III units

Year 4 (Honours)
MSCI4003 F/T, MSCI4009 P/T
Units in waves, turbulence and geophysical fluid mechanics are offered

6832
Marine Science (Biological Oceanography)

Year 1
BIOS1011, BIOS1021
CHEM1002
MATH1032 or MATH1042 or both MATH1011 and MATH1021
2 units from 1 of the strands:
1. GEOL1101, GEOL1201
2. PHYS1002 or PHYS1022

Year 2
BIOC2312
BIOS2031, BIOS2051
CHEM2011 or CHEM2041
MICR2201
MSCI2001
1 unit from the subjects related to the strand chosen in Year 1:
1. GEOL6231
2. MATH2021 or MATH2801 or MATH2841
An additional unit from: BIOS2011, BIOS2021, BIOS2041, BIOS2051, BIOS2061, to give a total of 8 for the year

One 56 hour or two 28 hour Category A General Education subjects

Year 3
BIOS3081, BIOS3091
MICR3071
2 Level III units which may include the subjects corresponding to the strand chosen in Years 1 and 2:
1. GEOL6321
2. MATH3021, MSCI3001
2 elective units
One 56 hour or two 28 hour Category B General Education subjects

Students proposing to proceed to Year 4 (Honours) must complete at least 6 Level III units

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

6833
Marine Science (Earth Science Oceanography)

Year 1
GEOL1101, GEOL1201
MATH1032 or MATH1042 or both MATH1011 and MATH1021
4 units from 2 of the strands:
Students proposing to proceed to Year 4 (Honours) must complete 6 Level III units

Year 4 (Honours)
MSCI4003 (F/T) MSCI4009 (P/T)

MATHMATICS

The School is divided into Departments of Pure Mathematics, Applied Mathematics and Statistics. Program 1000 allows specialisation in any of these areas. Students wishing to major or undertake Honours in Statistics should consult program 1006. Students wishing to proceed to Year 4 (Honours) should select higher mathematics subjects. There is also a specified interdisciplinary program, Mathematics of Management (6810). Mathematics is also available through the Marine Science (Physical Oceanography) program 6831.

Pure Mathematics is concerned with the whole structure of mathematics. Research focuses on the creation of new mathematical systems and the finer analysis of partially understood fields. Problems of mathematics come from many sources of science and industry but the pure mathematician is concerned with the problems themselves rather than with their sources. Courses provide the necessary equipment for those using mathematics in any way, to give basic familiarity with the fundamental language of modern science and technology and to develop appreciation for, and insight into, one of our major cultural achievements.

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 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.

Pure Mathematics major
A 1000 program is considered as a degree in Pure Mathematics if it includes four units of Pure Mathematics Level III. MATH1081 in Year 1 is highly recommended. Furthermore:

1. Pure Mathematics subjects relevant to the mathematical aspects of Computer Science are MATH2400 and MATH2410 in Year 2, and MATH3400, MATH3420 and MATH3430 in Year 3.
2. Pure Mathematics subjects relevant to mathematics teaching are MATH3500, MATH3510, MATH3520, MATH3530, MATH3560 and MATH3570 in Year 3, or their higher equivalents.
3. Pure Mathematics subjects relevant to the applications of mathematics in physics or engineering are MATH3540, MATH3550, MATH3570 and MATH3580 in Year 3, or their higher equivalents.

Applied Mathematics major
A 1000 program is considered a degree in Applied Mathematics if it includes four units of Level III Applied Mathematics.

Note the following recommendation:
Level II: At least two of: MATH2160, MATH2180, MATH2200, MATH2220, MATH2301.
Level III: At least three of: MATH3101, MATH3110, MATH3121, MATH3130, MATH3161, MATH3170, MATH3181, MATH3201, MATH3241, MATH3261, MATH3301.

In addition, the following are recommended in Year 1
1. For students interested in physical sciences or for theoretical oceanography and fluid mechanics: either PHYS1002 or appropriate Level I Engineering subjects.
2. For students interested in economic or management sciences: see Mathematics for Management (6810).
3. For students interested in social or biological sciences, at least two of the following: BIOS1011 and BIOS1021; PSYC1002; PHYS1002; CHEM1002.
4. Applied mathematics for computational methods or computer science: COMP1811, MATH1081.

Statistics major
See program 1006 (Statistics).

1000
Mathematics

Year 1
MATH1032 or MATH1042
6 elective Level I units*

Year 2
MATH2100, MATH2120, MATH2501, MATH2510, MATH2520
1 further Level II or Level III Mathematics unit
4 elective units*
One 56 hour or two 28 hour Category A General Education subjects

Year 3
4 Level III Mathematics units
3 elective units*
One 56 hour or two 28 hour Category B General Education subjects

Students proposing to proceed to Year 4 (Honours) must complete 6 Level III Mathematics units

Year 4 (Honours)
MATH4903

* Up to 8 units may be from subjects that are restricted to this program or Arts subjects from the following subject areas: Chinese, Economics, English, French, German, History, Indonesian, Modern Greek, Music, Political Science, Russian, Sociology, Spanish and Latin American Studies and Theatre and Film Studies. Upper Level Economics subjects are restricted to those in Economic History plus ECON2103, ECON2104. Japanese is also available for students in Advanced Science.

1060
Mathematics with Computing (Advanced Science only)

Year 1
COMP1811, COMP1821—
MATH1042, MATH1081
3 elective Level I units*

Year 2
COMP2011, COMP2031
MATH2501, MATH2301, MATH2510** or MATH2100, MATH2400, MATH2801** or MATH2841
2 elective Level II units*

(Recommended alternative strands: Applied Mathematics: Level II MATH2120. Level III MATH3101 and at least one of MATH3161, MATH3181, MATH3201. Pure Mathematics: Level II MATH2410. Level III MATH3420, MATH3430, MATH3520. Statistics: Level II
MATH2810, MATH2821. Level III: MATH3811, MATH3861
One 56 hour or two 28 hour Category A General Education subjects

Year 3
2 Computer Science Level III units from: COMP3111, COMP3121, COMP3311, COMP3411
MATH3301, MATH3400
3.5 elective units*
(Recommended alternative strands: as listed in Year 2 above)
One 56 hour or two 28 hour Category B General Education subjects

Students proposing to proceed to Year 4 (Honours) must complete at least 6 Level III units. Consult the head of the appropriate department at the commencement of Year 3.

Year 4 (Honours)
MATH4003 or MATH4103 or MATH4603 or MATH4903
* Up to 8 units may be from subjects that are restricted to this program or Arts subjects from the following subject areas: Chinese, Economics, English, French, German, History, Indonesian, Modern Greek, Music, Political Science, Russian, Sociology, Spanish and Latin American Studies and Theatre and Film Studies. Upper Level Economics subjects are restricted to those in Economic History plus ECON2103, ECON2104. Japanese is also available for students in Advanced Science.

6810
Mathematics of Management (Advanced Science only)

This program includes subjects given by the Schools of Accountancy and of Economics. There has been an increasing trend towards more use of mathematics, and the use of more advanced mathematics, in scientific management. This program trains mathematicians with an interest in the application of mathematics to management science. The mathematics content is that of a full mathematics degree. Students completing this program with good records are eligible for entry to the Master of Commerce graduate degree program in the School of Accountancy. If appropriate subjects are selected, then this degree (MCom), which may be awarded by part-time study, qualifies the graduate for provisional membership of the Australian Society of Accountants; full membership is then granted after appropriate experience.

Year 1
ACCT1501, ACCT1511
ECON1101, ECON1102
MATH1032 or MATH1042
2 elective Level I units*

Year 2
COMP1821
MATH2120, MATH2501, MATH2510, MATH2520
One of the strands:
1. MATH2100, MATH2301, MATH2841
and at least 1 unit from: MATH2160, MATH2200, MATH2400, MATH2410

or
2. MATH2801, MATH2810, MATH2821, MATH2830.
Further units from Mathematics and/or Computer Science to make a total of 8
One 56 hour or two 28 hour Category A General Education subjects

Year 3
Continue the strand chosen in Year 2:
1. COMP2011, MATH3301 and 3 Level III Mathematics units
or
2. MATH3861 and 4 Level III Statistics units
Further units from Mathematics and or Computer Science to make a total of 7
One 56 hour or two 28 hour Category B General Education subjects

Year 4 (Honours)
MATH4003 or MATH4103 or MATH4603 or MATH4903
* Up to 4 units may be from subjects that are restricted to this program or Arts subjects from the following subject areas: Chinese, Economics, English, French, German, History, Indonesian, Modern Greek, Music, Political Science, Russian, Sociology, Spanish and Latin American Studies and Theatre and Film Studies. Upper Level Economics subjects are restricted to those in Economic History plus ECON2103, ECON2104. Japanese is also available for students in Advanced Science.
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 will be awarded on the basis of suitable weighted performance over the last three years of this four years advanced science degree.

0141
Medical Physics (Advanced Science only)

Year 1
BIOS1011, BIOS1021
CHEM1002
MATH1032
PHYS1002 (or PHYS1022 at distinction level)

Year 2
BIOC2312
MATH2510, MATH2100
PHYS2410, PHYS2001, PHYS2021, PHYS2011, PHYS2031
.5 elective units
One 56 hour or two 28 hour Category A General Education subjects

Year 3
ANAT2111 or ANAT2120
MATH2120
PHPH2112
PHYS3410, PHYS3041, PHYS3060, PHYS1601
Plus elective units to make a total of 7.5 chosen from:
MATH2520, MATH2160, MATH2841, MATH3121
PATH3201
PHYS3630, PHYS3620, PHYS3710, PHYS3720, PHYS2001,
PHYS3010, PHYS3050*, PHYS3760
One 56 hour or two 28 hour Category B General Education subjects

Year 4
PHYS3021, PHYS3030, PHYS4411, PHYS4413, SAFE4410
1 General Education (Category C) subject
Plus at least 1.5 elective units from the subjects listed for year 3 electives

* Students intending to undertake a higher degree in Physics would need to select PHYS3010 and PHYS3050.

Microbiology and Immunology

Microbiology encompasses the scientific study of the smallest forms of life, namely bacteria, viruses, algae, fungi and protozoa. Microorganisms are probably best known as agents of disease in people, in other animals and in plants. Other microorganisms cause food spoilage, as well as serious deterioration in textiles and structural materials. Not all microorganisms are harmful. We depend on microorganisms for the recycling of organic wastes, for biodegradation of pollutants, for maintenance of soil fertility, and for production of foods, beverages, pharmaceuticals (especially antibiotics), and other industrially important materials. Molecular biology and microbial genetics are increasingly important in microbiology.

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-cell cooperation and the triggering of proliferation and differentiation by cell surface receptors.

4400
Microbiology and Immunology

Year 1
BIOS1011, BIOS1021
CHEM1002
MATH1032 or MATH1042 or both MATH1011 and MATH1021
2 elective Level I units

Year 2
BIOC2312
BIOS2011, BIOS2021
MICR2201, MICR2011
1 or 2 elective units*
One 56 hour or two 28 hour Category A General Education subjects

Year 3
MICR3021
At least 3 units from MICR3041, MICR3051, MICR3061, MICR3071, MICR3081
Additional elective units to give a total of 23
One 56 hour or two 28 hour Category B General Education subjects

Students proposing to undertake Year 4 (Honours) must complete 8 Level III units

Year 4 (Honours)
MICR4013, MICR4023

*BIOS2041 Biometry is recommended, particularly for students interested in MICR3071 Environmental Microbiology or in research. Other recommended elective subjects include: biochemistry, biotechnology, biological science.
MOLECULAR GENETICS

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.

NEUROSCIENCE

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

Entry to the Neuroscience Programs is limited to Advanced Science students at Level II and academic merit is the sole criterion. Students planning this are advised to enrol initially in the Biological Sciences Holding Program (6817) and must apply and be accepted into the Anatomy quota at the time of pre-enrolment for Level II.

4110 Molecular Genetics

Year 1
BIOS1011, BIOS1021
CHEM1002
MATH1032 or MATH1042 or both MATH1011 and MATH1021
2 elective Level I units

Year 2
BIOC2312 or BIOC2372*
BIOS2011, BIOS2021
CHEM2011 or CHEM2041
MICR2201
1 or 2 elective units
One 56 hour or two 28 hour Category A General Education subjects

Year 3
BIOC3121, BIOC3281
At least 1 unit from: BIOC3131, BIOT3031 or MICR3021
1 or 2 units from: BIOC3111, BIOT3011, CMED303, MICR3041 to give a total of at least 5 Level III units from the above.
A further 2 or 3 units to give a total of 23
Highly recommended: BIOC3271, BIOT3061, CMED302, MICR3051
One 56 hour or two 28 hour Category B General Education subjects

Students proposing to proceed to Year 4 (Honours) must complete 9 Level 3 units

Year 4 (Honours)
BIOC4318 or BIOS4013 or BIOC4073 or CMED8001 or MICR4013

*Preference will be given to students enrolling in selected advanced science programs such as: 7000 Anatomy, 7370 Biomedical Science, 0141 Medical Physics, 7312 Neuroscience A, 1273 Neuroscience B. Other students may be admitted with the permission of the Head of School.

7312 Neuroscience A (Advanced Science only)

Year 1
BIOS1011, BIOS1021
CHEM1002
MATH1011 and MATH1021 or MATH1032 or MATH1042
PSYC1002

Year 2
ANAT2111
BIOC2372* (BIOC2312 may, with approval, be accepted)
PHPH2112*
PSYC2001, PSYC2021
One 56 hour or two 28 hour Category A General Education subjects

Year 3
ANAT3411, ANAT3421
PHPH3121**, PHPH3131**
PSYC3021, PSYC3031
Two additional units at Level II or Level III to complete 23 units
One 56 hour or two 28 hour Category B General Education subjects

Year 4
Subject to satisfactory progress throughout the course, students may proceed to the Honours year. Before the commencement of Year 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.

*From 1994 student numbers in PHPH2112 and BIOC2372 will be limited. Entry to these subjects will be based on academic merit.

**From 1995, student numbers in Level III Physiology and Pharmacology subjects will be limited. Entry to these subjects will be on academic merit.
PHILOSOPHY

Philosophy is a wideranging 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. 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.

Value of Upper Level Subjects in Philosophy
All Level II/III subjects in Philosophy have one unit value in science.

Specialisation in Philosophy
Students specialising in Philosophy must complete, in addition to PHIL1006 and PHIL1007 (Introductory Philosophy A and Introductory Philosophy B), the equivalent of six fullpoint Upper Level (II/III) units. Of these, at least four units must be chosen from List A, which includes subjects in Logic, Philosophy of Mind, Philosophy of Science, and areas of History of Philosophy relevant to those subject areas. Students normally take the equivalent of two Level II/III units in Year 2, and the equivalent of four Level II/III units in Year 3. Subject to approval of the School, which considers the individual subjects nominated by a student and the student’s overall program in Philosophy, a student may be permitted to count up to one unit offered outside the School toward specialisation in Philosophy.

List A

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>PHIL106</td>
<td>Logic</td>
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<tr>
<td>PHIL107</td>
<td>Advanced Philosophy of Science</td>
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<td>PHIL108</td>
<td>Ways of Reasoning</td>
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<td>PHIL109</td>
<td>Metaphysics (Realisms)</td>
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<td>PHIL116</td>
<td>Scientific Method</td>
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<td>PHIL117</td>
<td>Philosophical Logic</td>
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<td>PHIL206</td>
<td>Contemporary Philosophy of Mind</td>
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<td>PHIL207</td>
<td>Issues in the Philosophy of Psychology</td>
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<tr>
<td>PHIL208</td>
<td>Epistemology (Scepticisms)</td>
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<td>PHIL209</td>
<td>Epistemology (Knowledge and Justification)</td>
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<tr>
<td>PHIL216</td>
<td>Human Nature and Human Understanding: the Empiricist Approach</td>
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<tr>
<td>PHIL217</td>
<td>Personal Identity</td>
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<tr>
<td>PHIL218</td>
<td>Philosophical Foundations of Artificial Intelligence</td>
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<tr>
<td>PHIL219</td>
<td>Topics in Philosophy of Language</td>
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<td>PHIL225</td>
<td>Twentieth Century Analytic Philosophy</td>
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<tr>
<td>PHIL227</td>
<td>Hume, Leibniz, Kant: Themes in Metaphysics</td>
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<tr>
<td>PHIL230</td>
<td>Reason and the Passions: Descartes, Spinoza and Hume</td>
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<tr>
<td>PHIL241</td>
<td>Relativism: Cognitive and Moral</td>
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<td>PHIL251</td>
<td>Greek Philosophy: Issues in Ethics and Epistemology</td>
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<tr>
<td>PHIL306</td>
<td>PreHonours Seminar</td>
</tr>
</tbody>
</table>

The remaining two units are to be chosen from other UpperLevel Philosophy subjects.

Level II/III

Some Level II/III subjects deal with particular philosophical topics; others can be taken in sequence to give more sustained treatments of larger areas. Students may select freely among these, subject to stipulations regarding prerequisites. Students are welcome to seek advice and further information from the School.

In certain circumstances the prerequisite specified for a subject may be waived; for example, in the case of students who have already studied similar material, or who wish to take isolated subjects relevant to another discipline. Students who feel they have a case for a concession of this kind should consult the School.
Honours Entry Requirements
Students intending to proceed to an Honours degree in Philosophy must normally complete Years 1 – 3 of Programs 5200 (Philosophy) or 5262 (Philosophy of Science) with an average of at least 70% in their Philosophy subjects, including at least one Distinction result; plus PHIL3106 (Pre-Honours Seminar). Subject to the approval of the School, which considers the individual subjects nominated by a student and the student’s overall program in Philosophy, a student may be permitted to count up to one unit offered outside the School toward satisfying the Honours entry requirements. Students contemplating Honours are urged to seek advice from the School early in their course.

5200
Philosophy

Year 1
MATH1032 or MATH1042 or both MATH1011 and MATH1021
PHIL1006, PHIL1007
4 elective Level I units

Year 2
2 Philosophy units*
6 elective units
One 56 hour or two 28 hour Category A General Education subjects

Year 3
4 Philosophy units*
3 elective units
One 56 hour or two 28 hour Category B General Education subjects

Students proposing to proceed to Year 4 (Honours) must complete 7 Level II/III or Level III units including PHIL3106.

Year 4 (Honours)
PHIL4000
*Refer to List A above for compulsory subjects.

5262
Philosophy of Science

Year 1
MATH1032 or MATH1042 or both MATH1011 and MATH1021
1 unit from: HPST1106, HPST1107, HPST1108 or PHIL1006 PHIL1007
5 elective Level I units

Year 2
PHIL2106
PHIL2116 or HPST2106
HPST2116
Further elective units to make a total of 8
One 56 hour or two 28 hour Category A General Education subjects

Year 3
3 units from: PHIL2107, PHIL2109, PHIL2116, *PHIL2117, PHIL2207, PHIL2208, PHIL2209, PHIL2218, HPST2014, HPST2109, HPST3106, HPST3117
*students may not count the same subject toward satisfaction of both requirements
3 elective units
One 56 hour or two 28 hour Category B General Education subjects

Year 4 (Honours)
PHIL4000 or SCTS4106

5209
One 56 hour or two 28 hour Category A General Education subjects

Year 3
COMP3411
A further 2 Computer Science subjects must be selected from: COMP3131, COMP3311, COMP3121, COMP3111
A further three subjects from Philosophy must be selected from the previous list
One 56 hour or two 28 hour Category B General Education subjects

Year 4
The fourth year honours program allows specialisation in either computer Science or Philosophy or in the combined program. The specialisation is determined by the thesis. Students intending to specialise in philosophy must complete PHIL3106.

Philosophy of Science
The Philosophy of Science program provides a coherent sequence of subjects for advanced study within the areas of logic, methodology and philosophy of science, or is suitable for those who merely wish to deepen their comprehension of the subject matter of a major in another field. The program leads towards a core subject PHIL2107 Advanced Philosophy of Science in Year 3.
PHYSICS

The programs offered by the School (0100, 0121, 0141 and 0161) reflect the importance of Physics in science and technology at both the fundamental and at the applied levels.

0100
Physics

Program 0100 Physics offers great flexibility in the choice of subjects for students enrolled in the BSc degree at pass level. Students who proceed further, may take honours in either Physics or Physics/Geology.

Year 1
MATH1032 or MATH1042*
PHYS1002
4 elective Level I units** ***

Year 2
MATH2100, MATH2120, MATH2510, MATH2520*
PHYS2001, PHYS2011, PHYS2021, PHYS2031
2 elective units**
One 56 hour or two 28 hour Category A General Education subjects

Year 3
PHYS3010, PHYS3021, PHYS3030, PHYS3041, PHYS3050***, PHYS3060***
3 elective units****
One 56 hour or two 28 hour Category B General Education subjects

Year 4 (Honours)
Students proposing to proceed to Year 4 Honours must complete 7 Level III units.

0121
Physics and Astronomy (Advanced Science only)

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 year of the program. There are special lectures and projects in the version of PHYS1002 for physics majors. The other astronomy subjects are PHYS2160 and PHYS3160 and a lecture unit and projects in the Honours year.

Year 1
MATH1032 or MATH1042*
PHYS1002
4 elective Level I units**

Year 2
MATH2100, MATH2120, MATH2510, MATH2520*
PHYS2001, PHYS2011, PHYS2021, PHYS2031, PHYS2160
1.5 elective units
One 56 hour or two 28 hour Category A General Education subjects

Year 3
PHYS3010, PHYS3021, PHYS3030, PHYS3041, PHYS3050, PHYS3060, PHYS3160
2.5 elective Level III units
One 56 hour or two 28 hour Category B General Education subject.

Year 4 (Honours)
PHYS4103 (A Category C General Education subject is incorporated)

* Students are encouraged to select Higher Level Mathematics subjects where available

**Appropriate Level I electives include: CHEM1002, PHYS1601, COMP1811

0161
Physics/Computer Science

Program 0161, (Physics/Computer Science) includes basic Physics, Mathematics and Computer Science subjects necessary to meet the specific aims of the program.

Year 1
COMP1811*
MATH1032 or MATH1042
PHYS1002, PHYS1601
2 elective Level I units**

Year 2
COMP1821
MATH2100, MATH2120, MATH2510, MATH2520
PHYS2011, PHYS2021, PHYS2031
1 Level II Computer Science unit***
1 unit from PHYS2601, MATH2501, MATH2301 or a Level II Computer Science unit*
One 56 hour or two 28 hour Category A General Education subjects

**Year 3**
PHYS2001, PHYS3010, PHYS3021, PHYS3030
2 further Level III Physics units
1 Level III Computer Science unit*
1 unit from:
1. PHYS2601, PHYS3601, MATH3101, MATH3121, MATH2301, MATH3301
2. Level III Physics
3. Computer Science*

One 56 hour or two 28 hour Category B General Education subjects

Students proposing to proceed to Year 4 Honours must complete 6 Level III units

**Year 4 (Honours)**
PHYS4103 (A Category C General Education subject is incorporated)

*Quota restrictions apply to most Level III Computer Science subjects and students wishing to take these subjects should in Year 1 apply for entry to the Computer Science quota.

**Consult the School of Physics for advice about appropriate subjects.

***COMP2011 provides the widest choice of Level III Computer Science subjects.

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**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 with a full year core subject Physiology I.

Students majoring in Physiology (Program 7300) should note the prerequisites for Physiology 2, normally: satisfactory completion of PHPH2112 Physiology I and BIOC2312 Principles of Biochemistry and Molecular Biology. Physiology 2 provides the 4 units at Year 3 level 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 Anatomy and Physiology and Pharmacology subjects.

Students majoring in Pharmacology (Program 7301) should note that the prerequisites for Pharmacology are normally the same as for Physiology, namely satisfactory completion of PHPH2112 Physiology I and BIOC2312 Principles of Biochemistry and Molecular Biology. Pharmacology is a 2 unit subject at the Year 3 level and students should note that the completion of program 7301 requires additional Level III subjects which must be chosen from the closely related subjects listed below in Physiology, Biochemistry and Molecular Genetics, Microbiology and Immunology, or Chemistry. Where sufficient extra units are taken from these or allied subjects 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

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**7300**

**Physiology**

**Year 1**
BIOS1011, BIOS1021
CHEM1002
MATH1032 or MATH1042 or both MATH1011 and MATH1021
2 elective Level I Units

**Year 2**
PHPH2112*
BIOC2312 or BIOC2372*
4 elective units (Recommended electives: Anatomy, Biological Science, Biochemistry, Chemistry, Psychology)

One 56 hour or two 28 hour Category A General Education subjects

**Year 3**
PHPH3114**

Further units to give a total of 23

One 56 hour or two 28 hour Category B General Education subjects

Students taking Year 4 (Honours) must complete 7 Level III units

**Year 4 (Honours)**
PHPH4218

The Category C General Education requirements are met within the Honours Program through seminars, an essay and participation in discussion groups.

*From 1994, student numbers in PHPH2112 and BIOC2372 will be limited and entry based on academic merit.

**From 1995, student numbers in PHPH3114 and PHPH3152 will be limited and entry based on academic merit.

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**7301**

**Pharmacology**

**Year 1**
BIOS1011, BIOS1021
CHEM1002
MATH1032 or MATH1042 or both MATH1011 and MATH1021
2 elective Level I units

**Year 2**
PHPH2112*
BIOC2312 or BIOC2372*
4 elective units (Recommended electives: Anatomy, Biological Science, Chemistry, Psychology)

One 56 hour or two 28 hour Category A General Education subjects

*From 1994 student numbers in PHPH2112 and BIOC2372 will be limited and entry based on academic merit.
Year 3
PHPH3152 and either:
- at least 2 units selected from PHPH3121, PHPH3131 and PHPH3142
- or at least 2 units selected from BIOC3111, BIOC3121, BIOC3261, BIOC3271 and BIOC3281
- or MICR3011 and at least 2 units selected from MICR3041, MICR3051 and MICR3061
- or at least 2 units selected from CHEM3021, CHEM3041, CHEM3141, CHEM3221, CHEM3630 and CHEM3640

Further units to give a total of 23
One 56 hour or two 28 hour Category B General Education subjects.

Note: Students wishing to study Pharmacology with Microbiology or Chemistry subjects should contact the School of Physiology and Pharmacology before enrolment.

Students proposing to proceed to Year 4 (Honours) must complete 7 Level III units.

Year 4 (Honours)
PHPH4258
The Category C General Education requirements are met within the Honours program through seminars, an essay and participation in discussion groups.

PSYCHOLOGY

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 organizational settings. In addition, people with training 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.

To meet the academic requirements for registration as a psychologist in New South Wales and for membership in the Australian Psychological Society, students will need to complete a four-year honours program in psychology. In addition, full registration and full membership require two years of either postgraduate study or supervised practical experience in psychology.

There is also a four-year full-time science course for psychology (3431) described later in this handbook.

English Proficiency
A high proficiency in English is needed to pass Psychology subjects.

1200 Psychology

Note: From 1994 the prerequisite for entry into PSYC2001, PSYC2021, PSYC2031 will be an Advanced Pass (a mark of 55 or greater) in PSYC1002.

Year 1
MATH1032 or MATH1042 or both MATH1011 and MATH1021
PSYC1002
4 elective Level I units*

Year 2**
PSYC2001
2 units from:
PSYC2011, PSYC2021, PSYC2031, PSYC2051
5 elective units* (no more than 1 additional unit from Level II Psychology)
One 56 hour or two 28 hour Category A General Education subjects

Year 3**
4 Level III Psychology units
3 elective units*
One 56 hour or two 28 hour Category B General Education subjects

Year 4 (Honours)**
PSYC4023
* Suitable supporting subjects include Anatomy, Physiology, Genetics of Behaviour, Science and Technology Studies, and Philosophy. Students may contact the School for advice.
** Students intending to proceed to honours must include PSYC2001, PSYC2021, PSYC2031 and PSYC2051 at Level II together with 3 other elective units (a total of 7 units in Year 2), and 8 Level III Psychology units including PSYC3001, PSYC3011, PSYC3021 and PSYC3031. Entrance to Level IV honours requires students to have completed Psychology units with an average of at least 68% (PSYC1002 is not included in the average) and is at the discretion of the Head of School.

1206 Computer Science/Psychology (Advanced Science only)

Note: From 1994 the prerequisite for entry into PSYC2001, PSYC2021, PSYC2031 will be an Advanced Pass (a mark of 55 or greater) in PSYC1002.

This program is for students with interests in computational modelling and artificial intelligence, on the one hand, and human information processing, cognition, and group decision making, on the other. The program should be particularly useful for those who will work in a commercial environment that requires both 'people skills' and an application oriented knowledge of computing. It would also serve as a good basis for interdisciplinary research in areas that include both Psychology and Computer Science.

Year 1
COMP1011 and COMP1021
MATH1032 or MATH1042, MATH1081
PSYC1002
1 elective Level I unit

Year 2
COMP2011 and COMP2031
PSYC2001, PSYC2011 and PSYC2021
2 elective units from the list below*
One 56 hour or two 28 hour Category A General Education subjects

Year 3
COMP3111, COMP3411 and COMP3511
PSYC3001 and PSYC3191
3 units from the list below, including at least 2 Level III Psychology units
One 56 hour or two 28 hour Category B General Education subjects

Year 4 (Honours)
COMP4913 or PSYC4023 or PSYC4043
Students proposing to proceed to the honours year in Psychology must take 4 Level II and 4 Level III Psychology units, including PSYC2031, PSYC3021 and PSYC3031, in Years 2 and 3
Students proposing to proceed to the honours year in Computer Science must take 4 Level III Computer Science units

*Elective List
COMP2021, Level III Computer Science not otherwise specified
PSYC2031, PSYC3011, PSYC3021, PSYC3031, PSYC3041, PSYC3061, PSYC3141, PSYC3151, PSYC3161

**SCIENCE AND TECHNOLOGY STUDIES**

Science and Technology Studies offers an integrated program combining subjects in the History and Philosophy of Science and Technology (HPST) and in Science, Technology, and Society (SCTS).

Subjects in the History and Philosophy of Science and Technology (HPST) examine the history of scientific and technological development, the nature and philosophical implications of the knowledge and methods involved in this development, and the historical dynamics of scientific and technological change. Subjects in Science, Technology, and Society (SCTS) examine the social, economic, environmental and political dimensions of scientific and technological change, especially in the twentieth century.

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6200
Science and Technology Studies

Year 1
MATH1032 or MATH1042 or both MATH1011 and MATH1021
Any Level I HPST or SCTS unit
5 elective Level I units

Year 2
HPST2106
SCTS2107
1 additional HPST or SCTS unit
5 elective units
One 56 hour or two 28 hour Category A General Education subjects

Year 3
4 HPST or SCTS units
3 elective units
One 56 hour or two 28 hour Category B General Education subjects
Students proposing to proceed to Year 4 (Honours) must complete 7 Level II/III units

Year 4 (Honours)
SCTS4106

**ZOOLOGY**

Animal Science is the study of the structure, function, classification, genetics, evolution, habits and distribution of animals and their relationship to each other and to the environment. The school has special expertise in animal behaviour, ecology, entomology, evolutionary studies and palaeontology, marine biology, neurobiology and physiology. The courses leading to the award of a science degree in Zoology are dependent on adequate background in biometry and biochemistry.

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1745
Zoology

Year 1
BIOS1011, BIOS1021
CHEM1002
MATH1032 or MATH1042 or both MATH1011 and MATH1021
2 elective Level I units

Year 2
BIOC2312
BIOS2011, BIOS2021, BIOS2031, BIOS2041, BIOS2061
1 elective unit
One 56 hour or two 28 hour Category A General Education subjects

Year 3
4 units from BIOS3011, BIOS3021, BIOS3031, BIOS3051, BIOS3071, BIOS3081, BIOS3091, BIOS3111, BIOS3131, BIOS3141
3 elective units (which may be also from this list)
One 56 hour or two 28 hour Category B General Education subjects
Students proposing to proceed to Year 4 (Honours) must complete 7 Level III units

Year 4 (Honours)
BIOS4033 (F/T), BIOS4039 (P/T)
Specific Science degree courses

Besides the undergraduate studies in Science and Advanced Science there are other specific courses offered in the Faculty of Biological and Behavioural Sciences and in the Faculty of Science. These are the Psychology Full-time Degree Course 3431 (UACNPS), Business Information Technology Course 3971 (UACNIT), Optometry Course 3950 (UACNOP), and Combined Science/Optometry Course 3951.

There are also other degrees from Faculties other than Science which can be combined with a science degree.

Board of Studies in Science and Mathematics

Bachelor of Science (Psychology)
BSc(Psychol)

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 organizational settings. In addition, people with training 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-year full-time course leads to the degree of Bachelor of Science (Psychology). The course is designed to provide the student with (1) a sound understanding of psychological theory, research skills, and psychological techniques, (2) elective studies in areas of individual interest, and (3) supporting studies in mathematics and/or biology (a minimum of one year is compulsory), and in arts or social sciences (a minimum of one year is compulsory).

This course meets the academic requirements for registration as a psychologist in New South Wales and for membership in the Australian Psychological Society. In addition, full registration and full membership require two years of either postgraduate study or supervised practical experience in psychology.

Degree Program

Year 1
- PSYC1002
  - BIOS1011 and BIOS1021 or
  - MATH1032 or MATH1042, or both MATH1011 and MATH1021
  - ECON1101 and ECON1102, or PHIL1006 and PHIL1007
  - 12 Arts credit points of Level I Sociology or Political Science or other approved Arts and Social Sciences discipline

Choose 1 elective Level 1 subject from Arts and Social Sciences or Science

Year 2
PSYC2001, PSYC2011, PSYC2021, PSYC2031, PSYC2042

One Level II subject following on from one of the Level 1 non-psychology subjects taken which constitutes a recognised sequence of two years (one Level II subject is equivalent to 2 Science Level II units or 12 Arts Upper Level credit points)

Category A General Education (56 hours) and Category B General Education (56 hours)

Note: If one of the Year 1 non-psychology subjects is divided into 2 single session subjects students may be able to replace the Session 2 subject with the Category A General Education (56 hours) requirement and in Year 2 take the other non-psychology subject and the Category B General Education (56 hours) requirement.

Year 3
Choose 8 Level III Psychology units including PSYC3001, PSYC3021 and PSYC3031
Students intending to take PSYC4003 in Year 4 must also include PSYC3011 as one of the 8 units.

Examples of recognised sequences:

**Arts and Social Sciences**
- Year 1:
  - 12 Level I credit points of Economics, Philosophy, Political Science, Sociology or other approved discipline.
- Year 2:
  - 12 Upper Level credit points following on from the Year 1 choice.

**Biochemistry**
- Year 1:
  - BIOS1011, BIOS1021
  - CHEM1002
- Year 2:
  - BIOC2312

**Genetics**
- Year 1:
  - BIOS1011, BIOS1021
  - CHEM1002 (for BIOS2021 only)
- Year 2:
  - Choose 2 units from BIOS2021 and BIOC2312, BIOS2011, BIOS3071, BSSM2101

**Mathematics or Statistics**
- Year 1:
  - MATH1032 or MATH1042
- Year 2:
  - Choose either 2 Level II units of Pure or Applied Mathematics for Mathematics, or MATH2801 and MATH2821 for Statistics.

**Physiology**
- Year 1:
  - BIOS1011, BIOS1021
  - CHEM1002
- Year 2:
  - PHPH2112

For students in Course 3431 the additional prerequisite of MATH1032 or MATH1042 or both MATH1011 and MATH1021 for PHPH2112 has been waived by the School of Physiology and Pharmacology.

**Zoology**
- Year 1:
  - BIOS1011, BIOS1021
- Year 2:
  - Choose 2 units from BIOS2011, BIOS2031, BIOS2051, BIOS2061, BIOS3011

**Objective of the Course**
- This four year course teaches Information Systems (see Program 1400 in 3970 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 Years 2 and 4, and July of Year 3 of the program.

**Advanced Standing**
- 1. Graduates may be admitted with exemption from no more than five subjects or their unit equivalents that they have completed. No more than two Psychology subjects may be included in these exemptions.
- 2. Undergraduates who transfer from another course to the Psychology Course may be admitted with exemption in no more than seven subjects or their unit equivalents that they have completed.

**Award of the Degree**
- The final grading for the degree is based on performance in all Psychology subjects excluding PSYC1002 taken over the four years. The degree may be awarded at either Pass level or with Honours.

**3971 Business Information Technology Full-time**

**Bachelor of Science BS:**
- 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.

For further details, please refer to the Faculty of Arts and Social Sciences handbook.
Degree Program

Year 1
ACCT1501 ACCT1511
COMP1811,
ECON1101, ECON1102
INFS1602
MATH1032 or MATH1042

Year 2
COMP1821
INFS2603, INFS2609, INFS2691
2 elective units
One 56 hour or two 28 hour Category A General Education subjects

Year 3
ACCT2522,
INFS3605, INFS3608, INFS3616, INFS3692
MATH2841
1 elective unit
Honours students additionally take INFS3607 and a further elective unit

Year 4 (Pass Degree)
INFS3607, INFS3611, INFS4693
2 units including at least one at Level III
One 56 hour or two 28 hour Category B General Education subjects

Year 4 (Honours Degree)
INFS3611, INFS4886, INFS4887, INFS4693, INFS4893,
INFS4794, INFS4898
One option must be chosen from INFS4805, INFS4810,
INFS4811, INFS4812, INFS4825, INFS4848, INFS4853,
INFS4857, INFS4891
Choose 1 elective Level III unit
One 56 hour or two 28 hour Category B General Education subjects (which alternatively could be taken in Year 3).

3950
Optometry Degree Course
Full-time

Bachelor of Optometry
BOptom

The School provides a four year full-time course in Optometry leading to the award of the degree of Bachelor of Optometry, at either the Pass or Honours level. A new course structure for Year 4 has been implemented from 1994. Professional training including clinical optometry are interwoven with basic studies of visual and ocular science over the four years of the course. The only entry point into Optometry will be at the Year 1 level.

Degree Program

Year 1
BIO1011 Biology A
CHEM1809 Biological Chemistry for Optometry Students
MATH1051 Mathematics 1F
OPTM1201 Ocular and Visual Science I
OPTM1202 Clinical Optometry I
OPTM1203 Physical and Geometrical Optics
OPTM1204 Dispensing
OPTM1205 Measurement of Light and Colour
PHYS1999 Physics (Optometry)

Year 2
Full Year
MATH2819 Statistics SA
OPTM2106 Pathology for Optometry Students
OPTM2107 Microbiology for Optometry Students
OPTM2208 Diagnosis of Ocular Disease
OPTM2301 Ocular and Visual Science II
OPTM2302 Clinical Optometry II
OPTM2303 Spectacle Lens and Optical Systems
PSYC2112 Principles of Physiology
PSYC2116 Human Development (Optometry)

Year 3
OPTM3208 Diagnosis and Management of Ocular Disease
OPTM3301 Visual Science III
OPTM3302 Clinical Optometry III
OPTM3309 Ocular Science III
PSYC3506 Psychology for Optometrical Practice
One 56 hour or two 28 hour Category A and one 56 hour or two 28 hour Category B General Education subjects

Year 4 (Commencing 1994)
MDCN8001 Principles of Medicine for Optometry Students
OPTM4301 Visual Science IV
OPTM4302 Clinical Optometry IV
OPTM4310 Research Project
OPTM4311 Current Issues in Optometry and Visual Science
OPTM4312 Optometry and the Professional Environment

Year 4 (Repeating Students)
MDCN8001 Principles of Medicine for Optometry Students
OPTM9041 Clinical Optometry
OPTM9042 Optometry B
OPTM9043 General Education C: Optometry and the Professional Environment
PSYC4106 Psychology (Optometry)

3951
Combined Science / Optometry Course

BSc BOptom

Conditions for the combined course 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 years of the Optometry degree course may be admitted to the Science degree course 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.

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 four units of either Level II or Level III and four other Level III units, in accordance with the Science and Mathematics Course regulations. The units submitted for the award of the Bachelor's degree under these regulations must include at least four Level III units chosen from related disciplines in accordance with the Science Course regulations.

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

*In Rule 1, the word 'undergraduates' includes graduands, i.e. 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.

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**Professional and Combined degrees with Science**

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### Board of Studies in Science and Mathematics and another Faculty

#### 3930
**Combined Science / Arts Course**

**BSc/BA**

The double degree of BSc/BA normally requires an additional year of study, and enables students to complete a major sequence in a School, Department, or Program of the Faculty of Arts while proceeding with their studies in Science. In each year of the combined degree course, students normally take 5.5 or 6 Science Units and 12 Arts Credit Points.

For admission to the course, 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 48 Credit Points in subjects offered by Schools, Departments or Programs within the Faculty of Arts and Social Sciences, including an approved major sequence. This degree is administered by the Board of Studies in Science and Mathematics.

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#### 3935
**Combined Science / Social Science Course**

**BSc/BScSc**

The double degree of BSc/BScSc normally requires an additional year of study, and enables students to complete the core program of the Bachelor of Social Science degree in the Faculty of Arts while proceeding with their studies in Science. In each year of the combined degree course, students normally take 5.5 or 6 Science Units and 12 Arts Credit Points.

For admission to the course, 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 48 Credit Points in the core program from the Bachelor of Social Science degree. This degree is administered by the Board of Studies in Science and Mathematics and the Faculty of Arts and Social Sciences.

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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

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.

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

3995
Combined Science / Commerce Course

Bachelor of Science / Bachelor of Commerce
BSc BCom

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

Board of Studies in Science and Mathematics and the Faculty of Professional Studies

4075
Combined Science / Education Course

Bachelor of Science / Bachelor of Education
BSc BEd

For details of the Combined Science / Education Course refer to the Faculty of Professional Studies Handbook.

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

For details of the Combined Science / Law Course refer to the Faculty of Law Handbook.
Subject Descriptions

Undergraduate Study

Descriptions of all subjects are presented in alphanumeric order within organizational 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.

Accounting

Accounting Level I

ACCT1501
Accounting and Financial Management 1A
Staff Contact: School Office
U1 S1 or S2 L2 T2
Note/s: Restricted to programs 0600, 1000, 1400, 6810, Courses 3681 and 3971. Not available in Year 1 of programs 0600, 1000, 1400. May be counted in combined degree courses 3611, 3661 and 3701 only in special circumstances.

This is the first unit in a sequence of subjects dealing with aspects of the practice of financial reporting, and reviewing the analytical and investigative tools and processes used within the discipline of accounting. The basic accounting process, whereby financial data from source documents are recorded, processed, summarised and adjusted (in terms of a given set of accounting concepts) culminating in the preparation of financial reports. Design of accounting systems and incorporation of internal controls. Accounting for cash debtors, inventories and properly, plant and equipment. Uses and limitations of traditional financial reports.

ACCT1511
Accounting and Financial Management 1B
Staff Contact: School Office
U1 S1 or S2 L2 T2
Prerequisite: ACCT1501
Note/s: Restricted to programs 0600, 1000, 1400, 6810 and Course 3971.

The second unit in a sequence of financial accounting subjects including the definition and recognition of assets, liabilities, revenues and expenses, partnerships, joint


Accounting Level II

ACCT2522
Accounting and Financial Management 2A
Staff Contact: School Office
U1 S1 L2 T2
Prerequisite: ACCT1511
Note/s: Excluded ACCT2532. Restricted to programs 0600, 1000, 1400, 6810 and Course 3971.

The design and operation of management accounting systems, including product costing systems and budgeting planning and control systems. In particular, attention is focused on the theoretical and practical implications of management accounting system design on organizational functioning, with emphasis on both manufacturing and service organizations. Involves the use of spread sheet modelling and the use of personal computers.

ACCT2532
Accounting and Financial Management 2A (Hons)
Staff Contact: School Office
U1 S1 L2 T2
Prerequisite: ACCT1511
Note/s: Restricted to programs 0600, 1000, 1400, 6810 and Course 3971. Excluded ACCT2522.

Content includes that of ACCT2522 Accounting and Financial Management 2A plus additional and more advanced work in management accounting.

ACCT2542
Accounting and Financial Management 2B
Staff Contact: School Office
U1 S2 L2 T2
Prerequisite: ACCT1511
Note/s: Excluded ACCT2552. Restricted to programs 0600, 1000, 1400, 6810 and Course 3971.

The third financial reporting unit after ACCT1501 and ACCT1511 with a consideration of more complicated
transactions and events as well as the accounting problems in certain specific industries. The contracting cost and other frameworks for the analysis of financial reporting. More advanced aspects of accounting for shareholders’ equity, liabilities and assets including interperiod company tax allocation and lease accounting. Accounts of a company. Profit and Loss account, balance sheet, and summary of sources and applications of funds. Application of computer technology to financial accounting problems.

ACCT2552
Accounting and Financial Management 2B (Hons)
Staff Contact: School Office
U1 S2 L2 T2
Prerequisite: ACCT1511
Note/s: Excluded ACCT2542.
Content includes that of ACCT2542 Accounting and Financial Management 2B plus additional and more advanced work in financial accounting.

Accounting Level III
ACCT3563
Accounting and Financial Management 3A
Staff Contact: School Office
U1 S1 or S2 L2 T2
Prerequisite: ACCT2542
Note/s: Excluded ACCT3573.
The final financial reporting unit following ACCT1501, ACCT1511 and ACCT2542.
The practices and problems associated with reporting on the affairs of complex organizations and structures including the technique of consolidation accounting; reporting on relationships with subsidiaries, associated companies, joint ventures, trusts, etc; segment reporting; reporting where the affairs of subsidiaries or associates are stated in foreign currencies, and other foreign currency translation issues. Accounting for new generation financial instruments, share buy-backs and corporate insolvency. Overall view of developments in financial reporting; major themes in the professional and research literatures in financial accounting and perspectives on the process whereby regulations governing the practice of external reporting are produced and compliance with those rules is monitored.

ACCT3573
Accounting and Financial Management 3A (Honours)
Staff Contact: School Office
U1 S1 L2 T2.5
Prerequisite: ACCT2552
Note/s: Excluded ACCT3563. Restricted to program 6810.
Includes ACCT3563 Accounting and Financial Management 3A plus additional and more advanced work in both accounting theory and in the financial management and accountability of corporate enterprises.

ACCT3583
Accounting and Financial Management 3B
Staff Contact: School Office
U1 S1 or S2 L2 T2
Prerequisite: ACCT2552
Note/s: Excluded ACCT3593. Restricted to programs 1400, 6810 and Course 3971.

Management Accounting for decision making: development of skills in financial analysis, and analytical skills and techniques for modelling and solving a variety of typical managerial decision problems with regard to organizational content. Use of the mainframe computer financial modelling package IFPS.

ACCT3593
Accounting and Financial Management 3B (Honours)
Staff Contact: School Office
U1 S2 L2 T2.5
Prerequisite: ACCT2532
Note/s: Excluded ACCT3583. Restricted to program 6810.
Includes ACCT3583 Accounting and Financial Management 3B, plus more advanced work dealing with theoretical and research issues in management accounting.

Anatomy
Anatomy units may be taken in programs other than 7000 only with the special permission of the Head of the School of Anatomy.

Anatomy Level II
ANAT2111
Introductory Anatomy
Staff Contact: Dr P. Pandey
U1 S1 HPW6
Prerequisites: BIOS1011, BIOS1021
Note/s: Restricted to program 7000 or in the Anatomy Quota.

Introduction to gross anatomy, based on a study of prosected specimens. Musculoskeletal, cardiovascular, respiratory, gastrointestinal, genitourinary and nervous systems. General topographical and surface anatomy.

ANAT2211
Histology 1
Staff Contact: A/Prof P. Waite
U1 F HPW3
Prerequisites: BIOS1011, BIOS1021
Corequisite: ANAT2111
Note/s: Restricted to program 7000 or in the Anatomy Quota.

Elementary theory of light and electron microscopy. General cell morphology and ultrastructure. Introduction to simple histological techniques and artefacts. Basic histology, including the morphological and functional properties of epithelial, connective, muscle and nervous tissues. Systematic histology, including a histological examination of the major systems of the body; cardiovascular, respiratory, lymphatic, integumentary, digestive, endocrine, urinary, reproductive and nervous (including eye and ear) systems. Emphasis on the ability to interpret histological sections and selected electron micrographs of mammalian tissues and organs and to relate morphology to tissue and organ function.
Anatomy Level III

ANAT3121
Visceral Anatomy
Staff Contact: Dr K. Ashwell
U1 S2 HPW6
Prerequisite: ANAT2111
Note/s: Restricted to program 7000 or in the Anatomy Quota.
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: A/Prof D. Tracey
U1 S1 HPW6
Prerequisite: ANAT2111
Note/s: Restricted to program 7000 or in the Anatomy Quota.
Functional anatomy of the musculoskeletal system in the head and 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 also carry out their own dissections of the upper limb.

ANAT3141
Functional Anatomy 2
Staff Contact: A/Prof D. Tracey
U1 S2 HPW6
Prerequisite: ANAT3131
Note/s: Restricted to program 7000 or in the Anatomy Quota.
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, Xrays and surface anatomy; students also carry out their own dissections of the lower limb.

ANAT3211
Histology 2
Staff Contact: Dr B. Freeman
U1 F HPW3
Prerequisite: ANAT2211
Note/s: ANAT3211 and ANAT3220 are mutually exclusive. Students who have completed ANAT3220 may undertake additional work for ANAT3211. The two subjects together count as 1 unit. Restricted to program 7000 or in the Anatomy Quota.

ANAT3220
Histological and Histochemical Techniques
Staff Contact: Dr B. Freeman
U1 S2 HPW3
Prerequisites: BIOS1011, BIOS1021 and any 1 of BIOC2312, BIOS2061 or ANAT2211
Note/s: Excluded ANAT3211.

ANAT3311
Mammalian Embryology
Staff Contact: Dr M. Smith
U1 F HPW3
Corequisites: ANAT2211, ANAT2111
Note/s: Restricted to program 7000 or in the Anatomy Quota.

ANAT3411
Neuroanatomy 1
Staff Contact: Dr E. Tancred
U1 S1 HPW6
Prerequisites: ANAT2211, ANAT2111
Note/s: Restricted to program 7000 or in the Anatomy Quota.
Nerve cells and glial cells, cytoarchitecture of brain and spinal cord. Functional anatomy of sensory and motor processing, and higher cerebral functions such as language and emotions. Blood supply of the central nervous system, cerebrospinal fluid and membranous coverings. Comparative anatomy of the brain.

ANAT3421
Neuroanatomy 2
Staff Contact: A/Prof P. Waite
U1 S2 HPW3
Prerequisite: ANAT3411
Note/s: Restricted to program 7000 or in the Anatomy Quota.
Topics of contemporary neuroanatomy and neuroscience. Includes: sensory, motor, and associational areas of the cerebral cortex, cerebral asymmetry, hippocampus, regulatory centres of the brainstem, organization of cerebellum, sensory organs. Recent advances in chemical neuroanatomy and neuroendocrinology. Neuroanatomy of major neurological diseases, scientific basis of novel approaches to treatment. Recent work on the development of the brain. The course is organized in seminar format, and is based primarily on original publications. Students are required to undertake a substantial amount of private study.

Anatomy Level IV

ANAT4000
Anatomy 4
Staff Contact: Dr K. Ashwell
U10 F
Prerequisites: Completion of Year 3 of program 7000 or equivalent including 6 Level III units, 4 of which must be Anatomy units.
An honours program consisting of the preparation of a thesis proposal, an undergraduate thesis and participation in School seminars.
The Category C General Education requirements are met within the Honours Program through seminars, essays and participation in School seminars.

Banking and Finance

Banking and Finance Level II

FINS2613
Business Finance 2A
Staff Contact: School Office
U1 S1 or S2 L2 T1
Prerequisites: ACCT1511, ECON1102 and ECON1203
Note/s: Restricted to programs 1400, 6810.
The essential aspects of financial decisionmaking in business including: factors influencing capital expenditure decisions; alternative approaches to valuation; factors affecting the formulation of the capital structure; influence of the capital market environment.

Banking and Finance Level II/III

FINS2612
Australian Capital Markets
Staff Contact: School Office
U1 S1 or S2 L2 T1
Prerequisites: ACCT1511, ECON1102 and ECON1203 or completion of Stage 1 for students from other faculties.
Note/s: Restricted to program 1400.
Analysis of the markets for the financial assets including the money, bond, stock and futures markets; the structure of interest rates; flow of funds of financial institutions; the regulatory structure of markets and the interrelations among markets.

Banking and Finance Level III

FINS2624
Investments
Staff Contact: School Office
U1 S1 or S2 L2 T1
Prerequisite: FINS2613
Note/s: Excluded FINS2714 and FINS3615. Restricted to program 6810.
An introduction to investment theory and practice. The first part of the course develops the primary asset pricing models, including CAPM and APT models, examines relevant empirical tests, and applies the models to the problem of measuring portfolio performance. This is followed by a study of investment management in the social, ethical and economic context. Topics include security analysis of bonds and equities; the use of options, futures and forwards in portfolio hedging and risk management; and current issues in portfolio management including "green" funds, passive vs active management, index funds and international diversification.

Biochemistry and Molecular Genetics

Biochemistry Level II

BIOC2101
Principles of Biochemistry
Staff Contact: A/Prof. K. Barrow
U1 S1 HPW6
Prerequisites: BIOS1011 and BIOS1021, CHEM1101 and CHEM1201 or CHEM1002
Note/s: Excluded BIOC2312, BIOC2372, CHEM2929
An introduction to modern biochemistry covering fundamental aspects of the structure-function relationships of proteins and an overall coverage of intermediary metabolism. Major topics to be covered will include: the nature and function of enzymes; the metabolic working of cells, tissues and organs; the interrelationships between the pathways of carbohydrate, lipid and amino acid metabolism; the vital role 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.

BIOC2312
Principles of Biochemistry and Molecular Biology
Staff Contact: Dr K. Moon
U2 F HPW6
Prerequisites: BIOS1011 and BIOS1021, CHEM1101 and CHEM1201 or CHEM1002
Note/s: Excluded BIOC2101, BIOC2372, CHEM2929.
Enrolment in this unit may be subject to quota restrictions. Such restrictions will only apply to students taking this unit as an elective part of their program.
BIOC2372
Biomedical Biochemistry
Staff Contact: Dr M. Edwards
U2 F HPW6
Prerequisites: BIOS1011 and BIOS1021, CHEM1101 and CHEM1201 or CHEM1002
Note/s: Excluded BI0C2101, BI0C2312, CHEM2929
Introduction to modern biochemistry and molecular biology with emphasis on the human. The properties and roles of the biologically important molecules including amino acids, peptides and proteins, carbohydrates, lipids and nucleic acids. The nature and function of enzymes as catalysts. The intermediary metabolism of carbohydrates, lipids and nitrogenous compounds in the various tissues and organs and the interrelationships between these pathways. The role of hormones in metabolic regulation. The respiratory chain, oxidative phosphorylation and energy-trapping systems. The molecular mechanism of gene expression including DNA, RNA and protein synthesis. Recombinant DNA technology and protein engineering. The impact of modern molecular biology in forensic science and in the study of inherited diseases. Practical work to complement the lectures.

Biochemistry Level III

BI0C3111
Molecular Biology of Proteins
Staff Contact: Dr G. King
U1 S1 HPW6
Prerequisites: BI0C2312, CHEM2021 or CHEM2041
Note/s: Excluded 41.102, 41.102A.
Modern aspects of the structurefunction 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 proteinprotein 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.

BI0C3121
Molecular Biology of Nucleic Acids
Staff Contact: A/Prof A. Mackinlay
U1 S1 HPW6
Prerequisites: BI0C2312, CHEM2021 or CHEM2041
Note/s: Excluded 41.102, 41.102A.
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 biochemical techniques.

BI0C3131
Biochemistry and Genetic Engineering of Plants
Staff Contact: Dr I. McFarlane
U1 S1 HPW6
Prerequisite: BI0C2312
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, embryogenesis 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.

BI0C3261
Human Biochemistry
Staff Contact: Dr A. Bagnara
U1 S2 HPW6
Prerequisite: BI0C2312
Aspects of metabolism that are of particular relevance to the human: nutrition, exercise, neurochemistry, xenobiotics and genetic diseases.
The role of triglyceride, cholesterol and lipoprotein metabolism in human health, and other selected areas of human nutrition. Exercise, the metabolic fuels utilised and the use of in vivo NMR to monitor changes in energy metabolism. Specialised aspects of endocrinology and neurochemistry including prostaglandins, leukotrienes, enkephalins 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. Practical work amplifies the lectures.

BI0C3271
Cellular Biochemistry and Control
Staff Contact: Dr M. Edwards
U1 S2 HPW6
Prerequisite: BI0C2312
Cell biology from a molecular viewpoint. Biochemical aspects of cellular organization 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. Complementary to BI0S3141 Ultrastructure and Function of Cells and students with a special interest in cell biology are encouraged to take both subjects. Practical work amplifies the lectures.
BIOC3281
Recombinant DNA Techniques and Eukaryotic
Molecular Biology
Staff Contact: A/Prof. A. Mackintay
U1 S2 HPW6
Prerequisite: BIOC3121
Note/s: Excluded 41.132, 41.102E.
The organization 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 organization 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.

Biochemistry Level IV
BIOC4318/BIOC4618
Biochemistry 4 (Honours)
Staff Contact: Dr I. McFarlane
U1 O F
Prerequisites: Completion of program 4100 including 8
Level III units 4 of which must be Biochemistry units.
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 Category C General Education requirements are met
within the Honours Program 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.
BIOC1319
Biochemistry for Medical Students
BIOC2329
Medical Biochemistry and Genetics

Biological Science

Biological Science Registration Centre
for courses in Botany and Zoology)
This will be held in Biology Lab A (room G20, Biological
Science building) as follows:
8-11 Feb 1000-1700
14-18 Feb 1000-1700
21-25 Feb 1000-1700
(late closing 9 and 16 Feb - 2100)
Students must obtain practical slots at that time for:
BIOS 2011 Evolutionary and Physiological Ecology
BIOS 2021 Introductory Genetics
BIOS 2051 Flowering Plants
BIOS 2061 Vertebrate Zoology
BIOS 3071 Conservation Biology and Biodiversity
Pre-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 subjects do not need to sign on
at the Biological Science Registration Centre but only need
to attend the first lecture of the relevant course for practical
assignments and further details. The location and
timetable of lectures and practicals for all subjects in the
School of Biological Science (Botany and Zoology) can be
obtained from the Biological Science Registration Centre or
from the notice boards on the fifth floor of the Biological
Sciences Building

Biological Science Level I
BIOS1011
Biology A
Staff Contact: Dr M.L. Augee
U1 S1 HPW6
Prerequisites: HSC Exam Score Required: 2 unit Science
(Physics) 53100, or 2 unit Science (Chemistry) 53100, or 2
unit Science (Geology) 53100, or 2 unit Science (Biology)
53100, or 3 unit Science 90150, or 4 unit Science 150
Notes: 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 biology of cells; their structure as seen with light and
electron microscopes; how they move, take in and excrete
substances; their chemistry and use of energy. Inheritance
and mutations; genes and how they work. The theory
covered in the lectures and tutorials is illustrated by
observation and experiment in laboratory classes.

BIOS1021
Biology B
Staff Contact: Dr M.L. Augee
U1 S2 HPW6
Prerequisites: BIOS1011
The evolution, diversity and behaviour of living things and
the ways in which they have adapted to varying
environments. Emphasis on the structure and function of
flowering plants and vertebrate animals, and their roles in
Australian ecosystems. The theory covered in lectures and
tutorials is illustrated by observation and experiment in
laboratory classes, which include dissection of a toad and
a rat.
Biological Science Level II

BIOS2011
Evolutionary and Physiological Ecology
Staff Contact: Dr P Steinberg
U1 S1 HPW6
Prerequisites: BIOS1011 and BIOS1021
Introduction to functional relationships between living organisms and environments in which they live. Emphasis on interactions within and between populations, ecological energies, ecophysiology, and the theory of evolution by natural selection. Plants, animals and microbes are covered. Also serves content as an introduction to the process of scientific enquiry.

BIOS2021
Introductory Genetics
Staff Contact: Dr W. Sherwin, Dr A. Wilton
U1 S2 HPW6
Prerequisites: BIOS1011 and BIOS1021
Corequisite: BIOC2312
Note/s: Enrolment in this unit may be subject to quota restrictions. Such restrictions will only apply to students taking this unit as an elective part of their program.

BIOS2031
Biology of Invertebrates
Staff Contact: A/Prof P. Greenaway
U1 S2 HPW6
Prerequisites: BIOS1011 and BIOS1021
Note/s: Enrolment in this unit may be subject to quota restrictions. Such restrictions will only apply to students taking this unit as an elective part of their program.

BIOS2041
Biometry
Staff Contact: Mr A. Woods
U1 S1 HPW6
Prerequisites: BIOS1011 and BIOS1021
Note/s: Excluded MATH2801, MATH2901, MATH2841.

BIOS2051
Flowering Plants
Staff Contact: A/Prof A. Ashford
U1 S2 HPW6
Prerequisites: BIOS1011 and BIOS1021
Note/s: Enrolment in this unit may be subject to quota restrictions. Such restrictions will only apply to students taking this unit as an elective part of their program.

Basic plant biology including cell structure, plant morphology and anatomy, water and sugar transport, seed structure and physiology, plant growth and development, arborescence, leaves and photosynthesis, roots, microorganisms 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 M. Augee
U1 S1 HPW6
Prerequisites: BIOS1011 and BIOS1021
Note/s: Excluded 45.301, 17.732. Practical class allocations must be obtained during re-enrolment week from room G20, Biological Science Building. Enrolment in this unit may be subject to quota restrictions. Such restrictions will only apply to students taking this unit as an elective part of their program.

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. Participations in field excursions is compulsory. Personal expenses will be incurred.

Biological Science Level III

BIOS3011
Animal Behaviour
Staff Contact: Dr D. Croft
U1 S1 HPW6
Prerequisites: BIOS2041, and BIOS2031 or BIOS2061
Introduction to ethology, the biological study of behaviour. Neurophysiological, ecological, developmental and evolutionary aspects of behaviour as important elements in the analysis of behaviour, particularly social behaviour. Includes both field and laboratory work.

BIOS3021
Comparative Animal Physiology
Staff Contact: A/Prof A. Beat
U1 S1 HPW6
Prerequisite: BIOS2031 or BIOS2061
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
U1 S2 HPW6
Prerequisite: BIOS2031 or BIOS2061
Physiological adaptation to habitat in animals. The problems imposed by the basic physiological characteristics of major animal groups under different environmental conditions are examined, especially osmotic
and ionic regulation, oxygen availability, metabolism, temperature regulation and acclimation. Particular attention is given to Australian fauna and conditions. A compulsory field trip to Western NSW is part of the course. Personal expenses will be incurred.

BIOS3051
Entomology
Staff Contact: Dr C. Orton
U1 S1 HPW6
Prerequisites: BIOS2031
Classification, external morphology and internal anatomy of insects, studies on environmental sensory physiology and behaviour, especially reproductive behaviour, social organization and pheromones. Ecology; chemical, biological and physical control of insect pests which attack people, crops or livestock; and side effects of pest control methods. Practical work to illustrate the lectures.

BIOS3061
Plant Ecosystem Processes
Staff Contact: Dr R. McMurtrie
U1 S1 HPW6
Prerequisites: BIOS1011 and BIOS102 and any 2 Level II Science subjects
Soil and atmospheric environments in which plants live and their interaction with the environment. Interactions at scales ranging from the microenvironment to the ecosystem; energy and mass transfer over these scales is investigated and modelled. Impacts of global change on vegetation. Exchange of greenhouse gases between atmosphere and biosphere.

BIOS3071
Conservation Biology and Biodiversity
Staff Contact: Dr W. Sherwin
U1 S1 HPW6
Prerequisites: BIOS1011 and BIOS1021, plus any 2 Level II Biological Science subjects
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 compulsory.

BIOS3081
Ocean Biology and Fisheries
Staff Contact: Dr I. Suthers
U1 S1 HPW6
Prerequisite: MSCI2001 or 2 Level II units in Biological Science
Notes: Students intending to enrol in this unit should register with the School of Biological Science for the February field trip by 10 December.

The ocean environment and its effect on the life of marine organisms. Emphasis on the biology of zooplankton and fish, together with the study of fisheries. Field studies are an integral component. Personal expenses will be incurred. Complements BIOS3091 Marine Biology.

BIOS3091
Marine Biology
Staff Contact: A/Prof R. King
U1 S2 HPW6
Prerequisite: MSCI2011 or 2 Level II units in Biological Science
Complements BIOS3081 Ocean Biology and Fisheries.

BIOS3111
Population and Community Ecology
Staff Contact: A/Prof B. Fox
U1 S1 HPW6
Prerequisites: BIOS1021 and MATH1032 or MATH1042 or MATH1021
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). Participation in fieldwork is essential.

BIOS3121
Evolution and Phylogenetics
Staff Contact: A/Prof C. Quinn
U1 S1 HPW6
Prerequisite: BIOS2051 or BIOS2061 or BIOS2031
Evolutionary and ecological genetics: variation between individuals, populations and species. Assessing relationships and reconstructing phylogenies; evolution and biogeography of Australian groups of vertebrates and land plants.

BIOS3131
Mammalogy
Staff Contact: Prof M. Archer
U1 S2 HPW6
Prerequisite: 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.

BIOS3141
Ultrastructure and Function of Cells
Staff Contact: A/Prof A. Ashford
U1 S1 HPW6
Prerequisite: BIOS2051 or BIOS2031 or BIOS2061 or BIOC2312 or MIRC2201
Concepts and techniques in ultrastructure and cell biology of plant and animal cells including secretion of macromolecules, cell recognition, membrane structure and function, transport, communication and nerve function. Practical work includes histochemistry, electrophysiology, specimen preparation, and use of transmission and scanning electron microscopes.
Biological Science Level IV

Staff Contact: A/Prof C. Quinn

BIOS4013/BIOS4019
Biological Science 4 (Honours)
U10 F
Prerequisites: Completion of program 1700 including 7 Level III units

BIOS4023/BIOS4029
Botany 4 (Honours)
U10 F
Prerequisites: Completion of program 1743 including 7 Level III units, 4 of which must be Botany units or a closely related discipline

BIOS4033/BIOS4039
Zoology 4 (Honours)
U10 F
Prerequisites: Completion of program 1745 including 7 Level III units 4 of which must be Zoology units

The Category C General Education requirements are met within these Honours Programs by seminars, an essay and participation in discussion groups.

Biotechnology

Biotechnology Level III

BIOT3011
Biotechnology A
Staff Contact: Prof N Dunn
S1 L3 T3
Prerequisite: BIOS2312

The basic principles involved in the operation of microbial processes on an industrial scale. Includes: the selection, maintenance and improvement of microorganisms; 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, microbial waste treatment and environmental control. The laboratory component includes manipulation of microorganisms, laboratoryscale fermenter operation, microbial enzyme isolation, visits to industrial fermentation plants and industrial seminars.

BIOT3021
Biotechnology B
Staff Contact: Prof P. Rogers
S2 L2 T4
Prerequisite: BIOT3011

Application of principles of biotechnology to the analysis and design of microbial processes of industrial relevance (antibiotics, microbial enzymes, single cell protein from carbohydrates and hydrocarbons, fermented foods and beverages, amino acids and vitamins, microbial polysaccharides, activated sludge and photosynthetic processes for waste treatment, microbial leaching of low grade minerals). Emphasis on quantitative approach: mass and heat balance calculations, kinetic and thermodynamic analysis, detailed equipment design and specification, process design and layout, 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, and a design project.

BIOT3031
Microbial Genetics
Staff Contact: Dr S. Delaney
U1 S2 L2 T4
Prerequisites: BIOS2011, BIOS2021, BIOC2312 and MICR2201
Note/s: Excluded MICR3021.

This unit is suitable for students majoring in Microbiology, Biochemistry, Biotechnology or Genetics. It deals with major aspects of the genetics of bacteriophage, bacteria and yeast. Topics include plasmids and transposable genetic elements, gene transfer, mutagenesis and DNA repair, mutants, bacteriophage genetics, gene cloning (vectors, recombinant DNA techniques) and genetics of nitrogen fixation.

BIOT3061
Monoclonal Antibody and Genetic Techniques in Biotechnology
Staff Contact: Dr S. Mahler
U1 S2 L2 T4
Prerequisite: BIOC2312

Recent developments in biotechnology have resulted in techniques which are widely applied in industrial, clinical, veterinary, agricultural and research laboratories. Many of these techniques have resulted from the development of monoclonal antibodies and the development of gene probes. The course includes: antibody structure; production of monoclonal antibodies, cell fusion, hybridoma selection, culture techniques, purification; analytical techniques employing monoclonal antibodies (RIA, ELISA); therapeutic application of antibodies, immunotoxins; gene probes; restriction fragment length polymorphisms (RFLP); gene probes for disease detection, identification of bacteria and viruses; forensic application of DNA fingerprinting. Tutorial and practical work to complement the lectures.

Biotechnology Level IV

BIOT4073/BIOT4083
Biotechnology (Honours)
Staff Contact: Prof N. Dunn
U10 F
Prerequisites: Completion of 8 Level III units 4 of which must be Biotechnology or related discipline

Advanced formal training in selected areas of biotechnology and participation in one of the School's research projects.

The Category C General Education requirements are met within the Honours Program by seminars, an essay and participation in discussion groups.
Board of Studies in Science and Mathematics

Level IV

BSSM4013/BSSM4019
Geology and Physics 4 (Honours)
U10 F
Prerequisites: Completion of program 0100 including 8 Level III units
Combines Geology and Physics in Program 0100, made by arrangement with the Heads of the two Schools.

BSSM4023/BSSM4029
Ecology 4 (Honours)
A/Prof B. Fox
U10 F
Prerequisites: Completion of Program 6851, 6852 or 6853 including 6 Level III units

BSSM4103/BSSM4109
Genetics 4 (Honours)
Staff Contact: Prof I. Dawes
U10 F
Prerequisites: Completion of Program 6840 including 6 Level III units
The Category C General Education requirements are met by participation in the Category C program offered by the supervisor’s School.

Chemical Engineering and Industrial Chemistry

Polymer Science

POLY3010
Polymer Science
Staff Contact: A/Prof R. Burford
S1 L2 S2 Lab2
Prerequisites: CHEM2011, CHEM2021, MATH2021, MATH2819
Co or prerequisites: INDC3090
Note/s: Restricted to Combined degree course 3681.

Chemistry

Chemistry Level I

CHEM1002
Chemistry 1
Staff Contact: Dr P. Chia
U2 F HPW6
Prerequisites: HSC Exam Score Range Required: 2 unit Mathematics 55-100, or 3 unit Mathematics 1-50, or 4 unit Mathematics 1-100 and 2 unit Chemistry 53-100, or 3 unit Science 90-150, or 4 unit Science 1-50, or 2 unit Physics 53-100
Note/s: CHEM1002 is the normal prerequisite for Level II Chemistry.

CHEM1101
Chemistry 1A
Staff Contact: Dr P. Chia
U1 S1 HPW6
Prerequisites: HSC Exam Score Range Required: 2 unit Mathematics 55-100, or 3 unit Mathematics 1-50, or 4 unit Mathematics 1-100 and 2 unit Chemistry 53-100, or 3 unit Science 90-150, or 4 unit Science 1-50, or 2 unit Physics 53-100

CHEM1201
Chemistry 1B
Staff Contact: Dr P. Chia
U1 S2 HPW6
Prerequisite: CHEM1101
Note/s: The two subjects CHEM1101 and CHEM1201, taken sequentially, are equivalent to CHEM1002.
Molecular geometry, hybridisation of orbitals. Periodicity of physical and chemical properties of elements and compounds. Organic chemistry, including stereoisomerism.

CHEM1302
Introductory Chemistry
Staff Contact: Dr P. Chia
U2 F HPW6
Prerequisites: HSC Exam Score Range Required: 2 unit Mathematics 55-100, or 3 unit Mathematics 1-50, or 4 unit Mathematics 1-100
Note/s: Students who perform very well in CHEM1302 are permitted to continue on to Level II chemistry with the permission of the Head of School of Chemistry.
Stoichiometry and solution stoichiometry. States of matter, changes of state, phase diagrams, gases, liquids, solids, solutions. Thermodynamics, enthalpy, entropy, free
energy. Oxidation and reduction, electrode potentials. Kinetics. Atomic and Molecular structure, equilibrium constants, acid-base and solubility. Periodicity of physical and chemical properties of elements and compounds. Organic chemistry, including stereoisomerism.

**CHEM1401**
**Introductory Chemistry A**
*Staff Contact: Dr P. Chia*

- **Prerequisites:** HSC Exam Score Range Required: 2 unit Mathematics 55-100, or 3 unit Mathematics 1-50, or 4 unit Mathematics 1-100

**CHEM1501**
**Introductory Chemistry B**
*Staff Contact: Dr P. Chia*

- **Prerequisites:** HSC Exam Score Range Required: 2 unit Mathematics 55-100, or 3 unit Mathematics 1-50, or 4 unit Mathematics 1-100 and 2 unit Chemistry 53-100, or 3 unit Science 90-150, or 4 unit Science 1-50, or 2 unit Physics 53-100

**Note/s:** The two subjects CHEM1401 and CHEM1501, taken sequentially, are equivalent to CHEM1302.

Atomic and molecular structure. Equilibrium constants, acid-base and solubility. Periodicity of physical and chemical properties of elements and compounds. Organic chemistry including stereoisomerism.

**CHEM1601**
**Living with Chemistry**
*Staff Contact: Dr P. Chia*

- **Prerequisites:** HSC Exam Score Range Required: 2 unit Mathematics 55-100, or 3 unit Mathematics 1-50, or 4 unit Mathematics 1-100

This course is a study of the impact of chemistry on the development of our civilisation. The physical and chemical properties of matter and the rules that govern these properties will be introduced through the study and analysis of some everyday materials. Topics include elements and compounds; chemical energy as a source of electricity; atomic and molecular structure; stoichiometry and solution stoichiometry; energy: food, fuels and chemical; acids and bases: acidity of common substances; the gas laws; organic chemistry and its importance in biological systems.

**Chemistry Level II**

**CHEM2011**
**Physical Chemistry**
*Staff Contact: Prof R. F. Howe*

- **Prerequisites:** CHEM1002, MATH1032 or MATH1042 or MATH1011 and MATH1021


**CHEM2021**
**Organic Chemistry**
*Staff Contact: Dr R. Read*

- **U1 F or S2 HPW6**
- **Prerequisite:** CHEM1002

Discussion of the major types of organic reaction mechanisms, eg addition, substitution, elimination, free radical, molecular rearrangement within context of important functional groups. Introduction to the application of spectroscopic methods to structure determination.

**CHEM2031**
**Inorganic Chemistry and Structure**
*Staff Contact: Dr N. Roberts*

- **U1 S1 or S2 HPW6**
- **Prerequisite:** CHEM1002


**CHEM2041**
**Chemical and Spectroscopic Analysis**
*Staff Contact: Dr G. Moran*

- **U1 S1 or S2 HPW6**
- **Prerequisites:** CHEM1002, MATH1032 or MATH1042 or MATH1011 and MATH1021


**Chemistry Level III**

**CHEM3011**
**Physical Chemistry**
*Staff Contact: Dr D. Alderdice*

- **U1 S1 HPW6**
- **Prerequisites:** PHYS1002, CHEM2011, CHEM2031, CHEM2041


**CHEM3021**
**Organic Chemistry**
*Staff Contact: A/Prof M. Gallagher*

- **U1 S1 HPW6**
- **Prerequisite:** CHEM2021

CHEM3031
Inorganic Chemistry
Staff Contact: A/Prof H. Goodwin
U1 S1 HPW6
Prerequisite: CHEM2031
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: A/Prof J. Matousek
U1 S1 or S2* HPW6
Prerequisite: CHEM2041
Note(s): * S2 availability subject to demand
Instrument design, theory and operating principles for the following instrumental areas: electrochemical, atomic and molecular spectroscopy, chromatography, mass spectrometry, automated analysis.

CHEM3111
Surface Chemistry: Principles and Applications
Staff Contact: Dr R. Lamb
U1 S2 HPW6
Prerequisite: CHEM3011

CHEM3121
Synthetic Organic Chemistry
Staff Contact: Prof M Paddon-Row
U1 S2 HPW6
Prerequisite: CHEM3021

CHEM3131
Advanced Inorganic Chemistry
Staff Contact: Dr D. Phillips
U1 S2 HPW6
Prerequisite: CHEM3031
Inorganic reactions and reactivity, reactions of co-ordinated ligands and activation of small molecules. Group theory and spectroscopy. Bio-inorganic chemistry; the occurrence and co-ordination of metals in biology, common metal containing enzymes. Heavy metals, detoxification mechanisms and inorganic aspects of environmental chemistry. Inorganic compounds and materials with significant electronic and magnetic properties.

CHEM3141
Advanced Analytical Chemistry
Staff Contact: A/Prof J. Matousek
U1 S2 HPW6
Prerequisite: CHEM3041
Advanced approaches to problem solving in analytical science using modern instrumental techniques and microcomputers for the analysis of complex organic, biological, inorganic and environmental materials. Selection and optimisation of instrumental parameters; theory of separation strategies for identification and quantitative determinations. Networking of computer-controlled workstations for laboratory automation and management.

CHEM3211
Physical Chemistry of Large Molecules
Staff Contact: Dr D. Smith
U1 S2 HPW6
Prerequisite: CHEM2011

CHEM3221
Biological Organic Chemistry
Staff Contact: A/Prof N. Cheetham
U1 S2 HPW6
Prerequisite: CHEM3021
Interdisciplinary aspects of selected classes of organic compounds of biological significance. Properties of proteins, poly-saccharides. Structural and synthetic aspects of selected drugs; metabolism and analysis. Herbicides, fungicides, pesticides; synthesis, degradation, mode of action.

CHEM3231
Nuclear and Radiation Chemistry
Staff Contact: A/Prof M. Long
U1 S1* or S2* HPW6
Prerequisites: CHEM2011 or CHEM2021 or CHEM2031 or CHEM2041
Note(s): Availability subject to demand
Origin and properties of nuclear radiations, their interaction with matter and their detection and measurement. Effect of radiation on living cells, contamination and radiation hazards, factors affecting radiotoxicity. Applications of isotopes as tracers and radiation sources.

CHEM3311
Environmental Chemistry
Staff Contact: Dr W. Johnson
U1 S2 HPW6
Prerequisite: CHEM2011, CHEM2041

CHEM3321
Applied Organic Chemistry
Staff Contact: A/Prof N. Cheetham
U1 S1 HPW6
Corequisite: CHEM3021
Polymerisation processes and synthetic polymers; initiators, chain transfer agents, retarders. Pigments and
dyestuffs; Basis of colour in organic compounds. Oxidation
and reduction processes; theory and industrial importance.

CHEM3421
Materials and Processes Affecting the Environment
Staff Contact: Prof I. Dance
U1 S1 HPW6
Prerequisite: CHEM2011, CHEM2021, CHEM2031,
CHEM2041
Note/s: Excluded CHEM3221, CHEM3231

Metal ions in aquatic environments: sources, distribution
and transport. Organometallic compounds: industrial and
biological sources, reactivities and transformations.
Compounds of heavy metals and their environmental
effects. Naturally occurring and man-made radioisotopes;
mechanisms of transport; radionuclides in the food chain.
Production and properties of hydrocarbons, solvents,
agricultural chemical and pesticides. Common plastics and
cellolosic products. Toxic byproducts of industrial
processes. Types and origins of air pollution.

CHEM3431
Chemistry of Pollution Control
Staff Contact: A/Prof G. Crank
U1 S2 HPW6
Prerequisite: CHEM2011, CHEM2021, CHEM2031,
CHEM2041, CHEM3421

Handling and disposal of reactive and toxic chemicals.
Modes of dispersal of organic materials in the environment.
Chemical transformations in the environment; oxidations,
hydrolysis, photochemical and microbiological changes.
Catalytic and photochemical processes for the degradation
of wastes. Detoxification of heavy metals. The chemistry of
waste water and sewage treatment. Catalytic processes for
air pollution control. Isolation and disposal of radiochemical
wastes.

CHEM3441
Environmental Monitoring
Staff Contact: Prof B. Hibbert
U1 S1 HPW6
Prerequisite: CHEM2011, CHEM2021, CHEM2031,
CHEM2041
Note/s: Excluded CHEM3041

Environmental sampling. Theory and operating principles of
analytical methods: chromatography, spectrophotometry, ICP
mass spectrometry and radiochemical assay. EPA standard methods and their
relevance to Australia pollution problems. Remote
sampling. Interpretation of analytical data from
environmental samples.

CHEM3510
Quantum Chemistry and Symmetry
Staff Contact: Prof R. Howe
U1 S2 HPW3
Prerequisite: CHEM2031

Principles of quantum mechanics. Approximate methods
for quantum mechanical problems. Molecular orbital
theories for molecules (eg Hückel, ab initio, SCF) and the
calculation of molecular properties. Group theory and
Symmetry operations applied to molecules. Correlation
diagrams for chemical reactions and bonding. Applications
to vibrational spectroscopy.

CHEM3530
Molecular Structure Determination
Staff Contact: Dr N. Duffy
U.5 S2 HPW3
Prerequisites: CHEM2031, CHEM2041

Techniques for the determination of molecular structure,
with emphasis on multinuclear NMR and X-ray diffraction.
Experimental requirements and procedures, instruments.
Interpretation of results, applications in current research
problems. Databases and computing; computer graphics
and molecular modelling.

CHEM3630
Organometallic Chemistry
Staff Contact: Dr N. Duffy
U.5 S2 HPW3
Prerequisites: CHEM2021, CHEM2031

Preparation, structure and reactions of transition metal and
main group organometallic compounds. Structure and
bonding of ligands; ligand stabilisation and activation; novel
effects of ligand bulk and geometry. Catalytic applications
of organometallic compounds.

CHEM3640
Computers in Chemistry
Staff Contact: A/Prof P. Alexander
U.5 S2 HPW3
Prerequisites: CHEM2011, CHEM2041

Computing techniques introduced through specific
chemical applications; simple and complex equilibria, rate
equations, analysis of multicomponent mixtures,
instrumental calibration curves. Treatment of transient
signals. Specific case studies selected from spectroscopy,
chromatography, and electrochemistry. Chemical
databases and the literature, spectroscopic databases.

Chemistry Level IV

CHEM4003/CHEM4004
Chemistry 4 (Honours)
U10 F
Prerequisites: Completion of Program 0200 or 0205
Including 8 Level III Units 4 of which must be Chemistry
units.

Consists of selected series of lectures on advanced topics
in Chemistry and a research project.
The Category C General Education requirements are met
within the Honours Program by seminars, discussion and
the safety training program.

Students intending to seek admission to this program
should consult the School re selection of units in the earlier
years and apply to the Head of the School for consideration
for admission at the end of Year 3 (or completion of
requirements for the award of the pass degree).

Servicing Subjects

These are subjects taught within courses offered by other
faculties.

For further information regarding the following subjects see
the Faculty of Applied Science Handbook and Faculty of
Engineering Handbook.
CHEM1806
Chemistry 1EE
Staff Contact: Dr P. Chia
U.S S1 HPW3
Prerequisites: HSC Exam Score Range Required: 2 unit Mathematics 67-100, or 3 unit Mathematics 1-50, or 4 unit Mathematics 1-100 and 2 unit Science (Physics) 53-100, or 2 unit Science (Chemistry) 53-150, or 4 unit Science 1-50, or 3 unit Science 90-150
Note/s: Restricted to Courses 3640 and 3725

CHEM1807
Chemistry 1ME
Staff Contact: Dr P. Chia
U1 S1 HPW6
Note/s: excluded CHEM1101, CHEM1201, CHEM1002
Restricted to Course 3581

CHEM1808
Chemistry 1CE
Staff Contact: Dr P. Chia
U1 S2 HPW6
Note/s: Excluded CHEM1101, CHEM1201, CHEM1002
Restricted to course 3730

CHEM1809
Biological Chemistry for Optometry Students
Staff Contact: Dr P. Chia
U2 F HPW6
Prerequisites: HSC Exam Score Range Required: 2 unit Mathematics 55-100, or 3 unit Mathematics 1-50, or 4 unit Mathematics 1-100 and 2 unit Chemistry 53-100, or 3 unit Science 50-150, or 4 unit Science 1-50, or 2 unit Physics 53-100
Note/s: Restricted to course 3950

CHEM2818
Physical Chemistry for Materials Science and Engineering
Staff Contact: Prof R. F. Howe
S1 or S2 HPW5
Prerequisites: CHEM1002 or CHEM1101 and CHEM1201 and MATH1042 or MATH1032 or MATH1011 and MATH1021
Note/s: Excluded 02.022A

CHEM2819
Physical Chemistry for Food and Fibre Science and Technology
Staff Contact: Prof R. F. Rowe
S1 or S2 HPW6
Prerequisites: CHEM1002 or CHEM1101 and CHEM1201 and MATH1042 or MATH1032 or MATH1011 and MATH1021
Note/s: Excluded 02.002A

CHEM2828
Organic and Inorganic Chemistry for Chemical Engineers
Staff Contact: Prof P. Clezy
Discussion of selected types of organic reactions to provide a broad cover of the chemistry of aliphatic and aromatic compounds. Survey of the structures, energetics, bonding, reactions and physical properties, and applications, of selected compounds of main group elements and of lanthanide and d-block transition elements.

CHEM2929
Fundamentals of Biological and Agricultural Chemistry
Staff Contact: Dr P. Southwell-Keely

CHEM2838
Inorganic Chemistry and Structure for Materials Science
Staff Contact: Dr N. Roberts
U1 S1 or S2 HPW5
Prerequisite: CHEM1002
Experimental basis for theories of electronic structure of atoms and molecules. Concepts and consequences of
quantum theory, Structure, energetics and bonding in the solid state. Principles or coordination chemistry. Occurrence, preparation, properties and reactions of selected compounds of transition and main group elements.

CHEM3829
Organic Chemistry
Staff Contact: Prof D. Black
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.

CHEM3926
Instrumental Methods of Food Analysis
Staff Contact: A/Prof G. Crank
Treatment of theory and practice of modern instrumental methods of analysis, with strong emphasis on the analysis of food constituents. Variety of spectroscopic and chromatographic techniques.

CHEM3929
Food Chemistry
Staff Contact: A/Prof G. Crank
Treatment of the chemistry of important food constituents. Topics include: proteins, carbohydrates, fats and oils, vitamins, natural and synthetic pigments essential oils and flavours, importance of water in foods.

Community Medicine

Community Medicine Level II/III

CMED3111
Genetics of Behaviour
Staff Contact: Dr L. Lai
U1 S2 HPW6
Prerequisite: BIOS1011
Principles of Mendelian, polygene and chromosomal genetics with examples from behavioural genetics. Emphasis on human behaviour in particular the genetics of mental retardation and psychiatric disorders. DNA technology in behavioural genetics. Practical classes aim at pedigree studies and the mathematical treatment of data.

Community Medicine Level III

CMED8001
Human Genetics
Staff Contact: Dr L. Lai
U10 F
Prerequisites: Completion of at least 3 of the following: BIOC3111 and BIOC3121, BIOT3031, MICR3041, BIOS3071, CMED3111, CMED8201, CMED8202, CMED8302, CMED8303 as well as 8 Level III units

between populations, genetic load, stable populations, molecular population genetics, evolutionary trees; computer methods.

CMED8202
Human Genetic Analysis
Staff Contact: Dr A. Stark
U1 S2 HPW5
Prerequisites: A unit of genetics and a unit of statistical methods, or theory, as approved by the Head of School.
Principles and methods of human genetics: design of surveys, estimation and applications of genic and genotypic frequencies, selective values, mutation and migration rates, coefficients of kinship, inbreeding and assortative mating, recombination fractions and heritabilities; segregation analysis; risks of recurrence of disease; consequences of human intervention; computer methods.

CMED8302
Biochemical Genetics of Man
Staff Contact: Dr L. Lai
U1 S2 HPW6
Prerequisites: BIOC2312 and BIOS2021 or CMED8303
Inherited variation of blood group proteins, their possible selective roles, and their application to the study of biological relationships between populations and recent advances in their gene characterisation. Inherited DNA variation or restriction fragment length polymorphism and variable number of tandem repeats, their application to studies of genetic diseases and of human populations. General approach from two loci per chromosome. Application of statistical techniques to analysing population data.

CMED8303
Human Genetics
Staff Contact: Dr L. Lai
U1 S1 HPW6
Prerequisite: 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 cytogenetics; 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.

Community Medicine Level IV

CMED8201
Population Genetics
Staff Contact: Dr A. Stark
U1 S1 HPW5
Prerequisites: One unit of statistical methods, or theory, as approved by the Head of School
The genetic structure of populations: genetic relationships, mating systems random and assortative mating, inbreeding, sexual selection, finite populations, systematic forces selection, mutation, migration, genetic distance
Computer Science and Engineering

Computer Science and Engineering Level I

COMP1011
Computing 1A
Staff Contact: Dr N. Parameswaran
U1 S1 or S2 L3 T3
Prerequisites: As for MATH1032
Corequisite: MATH1032 or MATH1042
Note/s: Excluded COMP1811. Restricted to programs 0600, 1206, 5206 and Combined degree courses 3611, 3661, 3681, 3701, 3725, 3730, 4770.

Defining problems. Reasoning about and solving problems using logic, abstraction, specification, algorithms and data structures. Exposure to a functional programming language (Miranda) for practical experience with these concepts. Computing systems: hardware (CPU, memory, peripherals), software (operating systems, networks, languages) and users. Introduction to computing applications: document processing, spreadsheets, data bases, graphics and communications.

COMP1021
Computing 1B
Staff Contact: Dr J. Shepherd
U1 S1 or S2 L3 T3
Prerequisite: COMP1011
Note/s: Excluded COMP1821, 6.620, 6.621, 6.021D.


COMP1811
Computing 1 (Procedural)
Staff Contact: A/Prof P. Compton
U1 S1 or S2 L3 T3
Prerequisites: As for MATH1032
Note/s: Excluded COMP1011, 6.611, 6.600

Defining problems. Reasoning about and solving problems using logic, abstraction, specification, algorithms and data structures. Exposure to a procedural programming language (Modula-2) for practical experience with these concepts. Introduction to computing systems: hardware (CPU, memory, peripherals), software (operating systems, networks, languages) and users. Computing applications: document processing, spreadsheets, data bases, graphics and communications.

Computer Science and Engineering Level II

COMP1821
Computing 2
Staff Contact: Dr T. Gedeon
U1 S1 or S2 L3 T3
Prerequisite: COMP1811
Note/s: Excluded COMP1021, 6.621, 6.021D.


COMP2011
Data Organization
Staff Contact: Dr G. Whale
U1 S1 or S2 L3 T2
Prerequisite: COMP1021 or COMP1821
Note/s: Excluded 6.641.

Data types and data structures: abstractions and implementations. Data representation: logical and physical. Files: access methods, implementation, external data structures. Primary and secondary memory: performance, management policies. Data encapsulation and information hiding; introduction to object orientation.

COMP2021
Digital System Structures
Staff Contact: Dr G. Heiser
U1 S1 or S2 L3 T2
Prerequisite: 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.

COMP2031
Concurrent Computing
Staff Contact: Dr J. Olszewski
U1 S1 or S2 L3 T2
Prerequisite: COMP1021 or COMP1821


Computer Science and Engineering Level III

COMP3111
Software Engineering
Staff Contact: Mr K. Robinson
U1 S1 L3 T2
Prerequisites: COMP2011
Note/s: Excluded 6.642, 6.660G. Restricted to program 0600, 1060, 1206, 5206 and Combined degree courses 3611, 3661, 3681, 3701, 3725, 3730, 4770.

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 lifecycle. CASE tools. A major group project is undertaken.
COMP3121
Algorithms and Programming Techniques
Staff Contact: Dr. A. Goswami
U1 S1 L3 T2
Prerequisite: COMP2011
Note/s: Excluded 6.642, 6.660G, COMP9101. Restricted to program 0600, 1206, 5206 and Combined degree courses 3611, 3661, 3681, 3701, 3725, 3730, 4770.

COMP3131
Parsing and Translation
Staff Contact: Mr. K. Robinson
U1 S2 L3 T2
Prerequisites: COMP2011
Note/s: Excluded 6.643, 6.664G. Restricted to program 0600, 5206 and Combined degree courses 3611, 3661, 3681, 3701, 3725, 3730, 4770.

COMP3211
Computer Organization and Design
Staff Contact: Prof. G. Hellestrand
U1 S1 L3 T2
Prerequisites: COMP2021 or ELEC2021
Note/s: Excluded 6.654, COMP9211. Restricted to program 0600 and Combined degree courses 3611, 3661, 3681, 3701, 3725, 3730, 4770.
Combinational and sequential circuit design; synchronisation, communication and arbitration; register transfer specification (modal). Arithmetic design strategies. Memory organization: physical and virtual address space; operating system and compiler support; memory mapping and caching. Communications organization: shared memory, memory mapping; network systems. Processor design: the instruction pipeline; hardwired and micro-programmed control; instruction sets; RISC and object-based processor organization. Error Detection/Correction and Fault Tolerance; coding theory.

COMP3221
Microprocessors and Interfacing
Staff Contact: Dr. S. Matheson
U1 S2 L3 T2
Prerequisite: COMP2021
Note/s: Excluded 6.0318, 6.060G, 6.613, 6.732E, COMP9221, ELEC3020. Restricted to program 0600 and Combined degree courses 3611, 3661, 3681, 3701, 3725, 3730, 4770.
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 driver software environment, other microprocessors, advanced topics. Laboratory work involves interfacing to and programming MC68000 series microprocessor-based systems.

COMP3231
Operating Systems
Staff Contact: Mr. S. Russell
U1 S1 or S2 L3 T2
Prerequisite: COMP2011, COMP2031 or ELEC3020
Note/s: Excluded 6.632, 6.672, COMP9201. Restricted to program 0600 and Combined degree courses 3611, 3661, 3681, 3701, 3725, 3730, 4770.

COMP3311
Database Systems
Staff Contact: Dr. A. Ngu
U1 S1 L3 T2
Prerequisite: COMP2011
The relational database model, object data bases, 4GL query languages, database design and implementation, deductive databases. Concurrency, optimisation, distribution. A major project involving both design and realisation is included.

COMP3331
Business Systems Organization
Staff Contact: School Office
U1 S L3 T2
Prerequisite: COMP2011
Review of the organization of accounting systems: in journals, accruals, merchandising. The structure, design, development, and integration of various business systems selected from the following: general ledger; financial reporting; debtors; creditors; stock control; invoicing; purchasing and receiving; fixed assets; payroll. Systems for generating application systems and packages. User interfaces. File specifications and Btree index files. Distributed commercial systems. The partial implementation of a business system is undertaken as a group project.
Computer Science and Engineering Level IV

COMP4914/COMP4913
Computer Science 4
Staff Contact: Dr T. Lambert
U10 F
Prerequisites: Completion of program 0600 including 6 Level III units.
The Honours year consists of advanced coursework electives and a thesis. Category C General Education requirements are satisfied by the completion of the subject COMP9015 Issues in Computing, which is taken as part of the Honours subject.

Economics

Economics Level I

ECON1101
Microeconomics 1
Staff Contact: Dr N. Warren
U1 S1 or S2 L2 T1.5
Prerequisites: HSC minimum mark required: Contemporary English 60, 2 unit English (General) 60, or 2 unit English 53, or 3 unit English 1
Note/s: Restricted to programs 0600, 1000, 1400, 6810.

ECON1102
Macroeconomics 1
Staff Contact: Dr P. Kriesler
U1 S1 or S2 L2 T1.5
Prerequisite: ECON1101
Note/s: Restricted to programs 0600, 1000, 1400, 6810.
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. Social accounting and aggregate income and expenditure analysis. Introduction to macroeconomic models of income determination; consumption and investment functions. Role of money and financial institutions; interactions between goods and money markets in equilibrium and disequilibrium situations. Analysis of recent Australian macroeconomic experience.

ECOH1301
Australia in the International Economy in the 20th Century
Staff Contact: Dr D. Meredith
U1 S1 L2 T1
Prerequisites: HSC minimum mark required: Contemporary English 60, 2 unit English (General) 60, or 2 unit English 53, or 3 unit English 1
Note/s: Restricted to program 6810.
The international economy at the end of the 19th century: trade, factor flows, and payments arrangements. Problems
of the international economy between the wars. The impact of World War II and the international economy in the postwar era. Australian economic development and its relationship with the international economy; economic fluctuations; problems of the interwar period; growth of manufacturing; government policy and action; the importance of the mining industry; economic development and the distribution of income and wealth.

Economics Level II

ECON2103
Applied Microeconomics
Staff Contact: Dr G. Fishburn
U1 S2 L2 T1.5
Prerequisite: ECON1102
Note/s: Excluded ECON2101, ECON2121. Restricted to program 6810.

Structural change in the Australian economy. The effect of different market structures on firms and consumer welfare. Consequences of market failure and the effects of government regulation. Investment decisions in the public and private sectors, including the estimation of future benefits, revenues and costs, the measurement of consumer and producer surplus. Economics of nonrenewable and other resources. Australia's international trade and investment and the effects of restrictions on international trade and investment.

ECON2104
Applied Macroeconomics
Staff Contact: Dr P. Kriesler
U1 S1 L2 T1.5
Prerequisite: ECON1102
Note/s: Excluded ECON2102, ECON2122. Restricted to program 6810.


Environmental Science

Environmental Science Level I

ENVS1011
Environmental Science 1A
Staff Contact: A/Prof B. Fox
U1 S1 HPW6
Note/s: Restricted to the Environmental Science Programs.

A mix of lecture, tutorial and laboratory classes outline the global environmental processes which underline major global-scale environmental problems. These problems are placed in perspective with regional case studies to highlight specific issues using seminars, workshops, field excursions and group projects. Processes examined include linkage between the lithosphere and biosphere, atmospheric circulation energy and radiation balance and ecosystem function. Desertification, deforestation, climate change, ozone depletion, energy conversion and pollution are considered together with the political aspects and values inherent in environmental issues.
Environmental Science 1B

Staff Contact: A/Prof B. Fox
U1 S2 HPW6

Prerequisite: ENVS1011

A mix of lecture, tutorial and laboratory classes outline the linkages between components of the physical environment, particularly the movement of energy and matter. Topics include the Earth’s energy balance, nutrient cycles in vegetation and soil, imbalances leading to land degradation and instability. The hydrological cycle is used as a specific example linking inland water sources and marine resources. Regional case studies are used to highlight specific issues using seminars, workshops, field excursions and group projects.

Environmental Science Level II

ENVS2010
Population Analysis and Environment
Staff Contact: A/Prof B. Fox
U.5 S2 HPW3
Prerequisite: 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 and compared to the Australian situation.

ENVS2020
The Urban Environment
Staff Contact: A/Prof B. Fox
U.5 S2 HPW3
Prerequisites: BIOS1021, CHEM1002, ENVS1011, ENVS1021

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.

Geography Level I

GEOG1031
Environmental Processes
Staff Contact: A/Profs M. Fox and M. Melville, Mr A. Evans
U1 S2 L2 T2
Note/s: Excluded GENS4240.

Essential and continuing links between components of the physical environment. Movement of energy and matter in the physical environment, including consideration of Earth’s energy balance, the hydrological cycle, nutrient cycles in vegetation and soil, imbalances leading to land degradation and instability, and to movement of materials.

GEOG1051
Global Environmental Problems and Processes
Staff Contact: Dr I. Prosser
U1 S1 L2 T1

The subject outlines the principles and processes necessary to appreciate the physical background behind major global-scale environmental problems. Principles and processes include the linkages between the lithosphere, hydrosphere and biosphere, atmospheric circulation, energy and radiation balance and ecosystem function. Problems covered are the issues of desertification, deforestation, ‘greenhouse’, ozone depletion, energy conservation and pollution.

GEOG1062
Australia and Global Development
Staff Contact: A/Prof I. Burnley, Drs M. Sant, P. Simons
U1 S2 L2 T1

The main concern is the progressive integration of Australia into global capitalism and the developmental and environmental consequences of this process in Australia and Pacific Rim countries and adjacent territories. Topics covered include colonial and dependent development in Australia and resource use; applications of development theory as applied to coreperiphery relationships between world financial centres and Australia, and between Australia and Pacific Island territories; transnational organizations and technology transfer and investment in Australia and Pacific countries; the relationship between changing trade patterns, production and development in Australia and Pacific Rim countries; Australia in a future world.

Geography Level II

GEOG2013
Geographical Data Analysis
Staff Contact: A/Prof J. Dodson
U1 S1 L1 T3
Prerequisite: Both GEOG1051 and either GEOG1031 or GEOG1062
Note/s: Excluded GEOG2093.

Inferential statistics and hypothesis testing in the analysis of spatial data. Methods of sampling, comparing populations and of identifying relationships through correlation, association, regression, time series and classification. Topics covered are applicable to physical and economic geography.

GEOG2021
Introduction to Remote Sensing
Staff Contact: Mr A. Evans
U1 S2 L2 T2
Prerequisite: Successful completion of a Year 1 program in Applied Science, Science or Arts or equivalent as approved by the Head of School

Principles and technical aspects of remote sensing. Forms of available imagery, their utility and facilities for interpretation. Basic airphoto interpretation techniques relevant to environmental assessment. Introduction to principles of the electromagnetic spectrum, photometry and radiometry. Sensor types, image formation and end products associated with selected satellite programs, including Landsat. Land-cover and land-use interpretation.
procedures in visual image analysis. Basic procedures in machine-assisted image enhancement.

GEOG2032
Geomorphology
Staff Contact: Drs W. Erskine, I. Prosser
U1 S2 L2 T2
Prerequisites: GEOG3051

Drainage basin processes including: weathering, the production of runoff and sediment, sediment tracing, sediment budgets and denudation histories. The processes of river channel changes including sediment transport, hydraulics, hydrology, hydraulic geometry and channel patterns. There will be an emphasis on the application of geomorphic principles to land management.

GEOG2092
Australian Social and Economic Landscapes
Staff Contact: A/Prof I. Burnley & Dr P. Simons
U1 S1 L2 T2
Prerequisite: GEOG1062

Analysis of the principal factors and forces shaping the contemporary social and economic landscapes of Australia and the problems arising. Themes include Australia's changing population profile and distribution, the changing face of Australian cities, regional disparities in social and economic well-being, changing patterns of employment and industrial location, and the declining fortunes of rural Australia. Planning and policy responses to the problems of spatial change and reorganization are emphasised and future scenarios addressed.

GEOG2093
Geographic Methods
Staff Contact: Dr S. Walker
U1 S2 L2 T2
Prerequisites: Both GEOG1051 and either GEOG1031 or GEOG1062

Note/s: Excluded GEOG2013.

Statistical procedures and field methods used in both human and physical geography. Includes: measures of dispersion; measures of spatial distribution; samples and estimates; correlation and regression; tests for distribution in space; data collection and analysis; field observations. Three days field work is a compulsory part of the subject and students will incur some personal expenses with this.

Geography Level III

GEOG3000
Field Project 3
Staff Contact: A/Prof M. Melville (Physical), Prof B. Garner & Dr B. Parolin (Economic)
U0 F T1.5
Prerequisite: One of GEOG3011, GEOG3021, GEOG2032. This prerequisite does not apply to students registered in course 3010

Note/s: Students will incur personal costs.

A five days field project normally undertaken during a recess, designed to support teaching in Year 3 Level III subjects in physical and economic geography and to demonstrate the application of field methods in problem solving and research projects. Students will incur some personal expenses in connection with this subject, which is a compulsory part of the course.

GEOG3011
Pedology
Staff Contact: Dr M. Melville
U1 S2 L2 T2
Prerequisites: GEOG1031 or GEOG1051 and one of CHEM1110 or CHEM1401 or both GEOL1101 and GEOL1201 or both BIOS1011 or BIOS1021

Methodology of pedogenetic studies and the application of these studies to the understanding of soil-landform relationships. Soil physical and chemical properties and their interrelationships, emphasising claymineral structure and behaviour, soil solution chemistry, soil water movement and the application of these properties to elements of soil mechanics. Soil properties in natural, rural and urban landscapes, including assessment of soil fertility, swelling characteristics, dispersibility, erodibility and aggregate stability. Laboratory analysis of soil physical and chemical characteristics with emphasis on properties associated with land capability assessment. Statistical analysis of soil data and its application to mapping. The use of soil micromorphological and mineralogical studies in pedology.

GEOG3021
Biogeography
Staff Contact: A/Prof J. Dodson & Dr M. Fox
U1 S1 L2 T2
Prerequisites: GEOG1031 or GEOG1051 or both BIOS1011 and BIOS1021


GEOG3032
Remote Sensing Applications
Staff Contact: Mr A. Evans
U1 S1 L2 T2
Prerequisite: GEOG2021 or SURV8711

Spectral characteristics of natural phenomena and image formation. Ground truthing, collection and calibration. Introduction to computer classification procedures. Multitemporal sampling procedures, image to image registration and map to image registration. Major applications of remote sensing in the investigation of renewable and non-renewable resources to include: soils, geology, hydrology, vegetation, agriculture, rangelands, urban analysis, regional planning, transportation and route location and hazard monitoring.

GEOG3042
Environmental Impact Assessment
Staff Contact: Dr W. Erskine & Prof B. Garner
U1 S2 L2 T2
Prerequisites: GEOG1031 or GEOG1051 or by permission from Head of School

Rationale and basic objectives; history and legislative framework: standardised types of environmental impact assessment EIA, including matrix approach, adopted
methods of EIA in Australia. Techniques of impact evaluation in terms of socio-economic criteria. Environmental decision making and planning under conditions of uncertainty. Case studies exemplifying procedures, techniques and issues. Trends, changes and future developments in EIA. Practical exercises representing components of typical EIAs.

GEOG3051
Soils and Landforms
*Staff Contact: Drs W. Erskine, I. Prosser*
U1 S1 L2 T2
**Prerequisite:** GEOG1031 or GEOG1051

An introduction to soil classification schemes with particular emphasis on the soils and landforms of floodplains and the Riverine Plain, NSW. Long term development of landscapes with emphasis on the evolution of mountain ranges. Arid zone and coastal landforms emphasising current processes and Quaternary history.

GEOG3062
Environmental Change
*Staff Contact: A/Prof J. Dodson*
U1 S2 L2 T2
**Prerequisite:** Successful completion of a Year 2 Program in Applied Science, Science, or Arts or equivalent as approved by the Head of School


GEOG3122
Geographic Information Systems
*Staff Contact: Prof. B.J. Garner & Mr S. Filan*
U1 S2 L2 T2
**Prerequisite:** GEOG3161 or by permission from the Head of School

This prerequisite does not apply to students enrolled in course 3010.

An introduction to information systems of particular relevance for geographers with special reference to computer-based systems for resource evaluation. Case study evaluation, application of the MAP and other GIS software.

GEOG3142
Geographic Information Systems Applications
*Staff Contact: Dr Q. Zhou*
U1 S1 L2 T2
**Prerequisite:** GEOG3122

Examples of applications of geographical information systems in resources and environmental management and urban and regional analysis. Case studies include the monitoring of land degradation, management of biological and physical resources, environmental conflict resolution, administration of land records, provision of health services, transport and land use planning, marketing and territory assignment. Visits to inspect facilities and activities of key government agencies are included.

GEOG3152
Social Welfare and Urban Development
*Staff Contact: Dr S. Walker (A/Prof I. Burnley)*
U1 S1 L2 T2

**Prerequisite:** GEOG2092 or GEOG3202. This prerequisite does not apply to students enrolled in course 3010.

A consideration of welfare aspects of urban development, including social policies and urban structure; social costs and benefits of urban renewal especially in the inner city; growth centres and new towns; distributional aspects of social services; and spatial disparities in social well-being.

GEOG3161
Computer Mapping and Data Display
*Staff Contact: Prof. B.J. Garner*
U1 S1 L1 T3
**Prerequisites:** Successful completion of a Year 1 program in Science or Arts or equivalent as approved by Head of School

Introduction to theoretical and practical problems in displaying data graphically and constructing thematic maps by computer using the GIMMS 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.

GEOG3172
Spatial Population Analysis
*Staff Contact: A/Prof I. Burnley*
U1 S1 L2 T2
**Prerequisite:** GEOG3202

Population growth and structure in an international urban and regional context. The components and processes of population change; fertility, mortality and migration set within the framework of demographic transition and development theory. Theories of migration and mobility and of optimal populations. Demographic and social indicators for urban and regional analysis and their implications for inequalities in living conditions, at local, regional, and international scales. The adjustment of immigrant and migrant populations to the urban environment.

GEOG3181
Urban Activity Systems
*Staff Contact: Dr B. Parolin*
U1 S1 L2 T2
**Prerequisite:** GEOG3202

Focus is on trip making, movement, and activity patterns in urban areas. Topics include: the activity concept, travel behaviour and urban spatial structure; constraints to individual travel behaviour and activity pattern linkages; the urban transport disadvantaged; public transport problems and issues in Australian capital cities; travel and activity consequences of transport infrastructure developments.

GEOG3192
Urban and Regional Development
*Staff Contact: Dr M. Sant*
U1 S2 L2 T2

Focus is on the growing importance of recreation and tourism in urban and regional systems. Emphasis is on problems of land use and resource allocation and implications for planning in Australia. Theoretical and practical studies of leisure environments, open space provision, recreational demand, methods of forecasting, management of supply, resort development, economic and environmental impact assessment.
GEOG3211
Australian Environment and Natural Resources
Staff Contact: A/Prof M. Fox and Dr I. Prosser
U1 S2 L2 T2
Prerequisite: GEOG1051 or GEOG1031
The characteristics of Australia's physical and biotic environment: geology, climate, geomorphology, soils, vegetation and fauna. The problems of exploiting Australia's water and land resources including the degradation of land by erosion, salinisation and soil fertility decline; and habitat loss and fragmentation.

GEOG3221
Advanced Geographic Methods
Staff Contact: Dr S. Walker
U1 S1 L2 T2
Prerequisite: GEOG2093
Note/s: Excluded GEOG2013.
Additional quantitative research techniques normally taken by Honours students in their third year. Research organization; computer analysis; collection and organization of data; statistical description; hypothesis testing and sampling; simple and multiple association analysis; nonparametric methods.

GEOG3333
Special Topic
Staff Contact: School Office
U1 F T4
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.

Geography Level IV
GEOG4032
Honours Geography
Staff Contact: Dr A. Skidmore
U10 F
Prerequisites: Completion of program 2700, 2527 or 6851 including GEOG2013, GEOG3221 and 8 Level III units.
Details of Honours Geography for Science students are available from the School of Geography office. Students are required to undertake an original piece of work extending throughout the year and to submit a thesis based upon it; and to participate in seminars and fieldwork as notified by the School.

The Category C General Education requirements are met through compulsory coursework during the Honours program.

Applied Geology
Field tutorials are an essential part of these subjects, and are held during weekends and/or recesses. Dates and costs are available during the first week of the subject. Attendance is compulsory.

Applied Geology Level I
GEO1101
Geological Processes
Staff Contact: Dr M. D. Buck
U1 S1 L3 T2
Prerequisites: HSC Exam Score Range Required - 2 unit Mathematics or 60-100, 3 unit Mathematics or 1-50 4 unit Mathematics 1-100, and 2 unit Science (Physics) or 53-100, 2 unit Science (Chemistry) or 53100, 2 unit Science (Geology) or 53-100, 2 unit Science (Biology) or 53-100, 4 unit Science 1-50, 3 unit Science 90-150
Note/s: Up to 2 days of fieldwork is a compulsory part of this subject. Students will incur personal costs in connection with the fieldwork component. Details will be provided during the first week of the subject.
Stream 1
or
Stream 2
Available only with permission of the Head of School. A program of projects and independent study of selected aspects of geology. Assessment includes practical and theory examinations.

GEO1201
Geological Environments
Staff Contact: Dr M. D. Buck
U1 S2 L3 T2
Prerequisites: GEO1101 (except for program 6866)
Note/s: Up to 4 days of fieldwork is a compulsory part of this subject. Students will incur personal costs in connection with the fieldwork component. Details will be provided during the first week of the subject.

Applied Geology Level II
GEO1201
Mineralogy & Igneous Petrology
Staff Contact: Dr P.C. Rickwood/ A/Prof B.J. Hensen
U1.5 S1 L2 T3
Prerequisite: GEO1201
Note/s: Fieldwork of up to 4 days is a compulsory part of this subject. Students will incur personal costs.
GEOL 2022
Petroleum & Structural Geology
Staff Contact: Prof. C.R. Ward/ Prof. J. Hensen/Dr P.G. Lennox
U.5 S2 L3 T2
Prerequisite: GEOL 2011
Note/s: Fieldwork of up to 4 days, is a compulsory part of this subject. Students will incur personal costs.


GEOL 2031
Sedimentology and Palaeontology
Staff Contact: Prof. C.R. Ward/Prof. J. Roberts
U.5 S1 L3 T2 Field 1
Prerequisite: GEOL 1201
Note/s: Fieldwork of up to 5 days is a compulsory part of this subject. Students will incur personal costs.

Sedimentology. Flow regimes and bedding forms, sedimentary structures. Modern and ancient sedimentary environments of deposition: alluvial, nearshore, shelf and deep sea, in both terrigenous clastic and carbonate/evaporite domains. The facies concept: lateral and vertical relationships between depositional environments and associated lithofacies within developing sediment wedges. Palaeontology. Morphology and geological significance of invertebrates including Foraminifera, Brachiopoda, Mollusca, Coelenterata, Arthropoda, Protochordata and Echinodermata. Introductory paleobotany, biogeography, ichnology (trace fossils) and biostratigraphy.

GEOL 2041
Geological Computing
Staff Contact: Dr. D. R. Cohen
U.5 S1 L2 T1
Prerequisite: GEOL 1101

Introduction to the use of PC, NETWORK and VAX computer systems with emphasis on geological software. Introduction to programming in FORTRAN with statistical applications pertinent to geoscience.

GEOL 2042
Geological Statistics
Staff Contact: Dr D.R. Cohen
U.5 S2 L2 T1
Prerequisite: GEOL 2041

Introduction to geostatistics, population characterisation and splitting. ANOVA methods, regression analysis, EDA, Markov chains, analysis of oriented data and processing of spatial geological data.

GEOL 2051
Introductory Geophysics
Staff Contact: Mr. D. Palmer
U.5 S1 L2 T1
Prerequisite: GEOL 1101

Note/s: Fieldwork of up to 5 days is a compulsory part of this subject. Students will incur personal costs.

Principles of gravity, geomagnetism, palaeomagnetism, geothermy and seismology and their relation to shape, internal constitution and dynamic processes of the earth. Introduction to radiometric, gravity and magnetic exploration methods.

GEOL 2062
Geological Mapping
Staff Contact: Prof. A.D. Albani/Prof. G. McNally
U.5 S2 L2 T1
Prerequisite: GEOL 1101 or GEOL 1201


GEOL 2072
Environmental Geology
Staff Contact: Dr. J. Jankowski
U.5 S2 L2 T1


GEOL 2092
Geochemistry
Staff Contact: Prof. P.C. Rickwood/Prof. P.R. Atherden
U.5 S2 L2 T1
Prerequisite: GEOL 1201

GEOL6201
Marine Geology 1
Staff Contact: A/Prof A.D. Albani
U1 F L1 T2
Prerequisites: GEOL1101 and GEOL1201
Note/s: Field work of five days in a compulsory part of the subject. Students will incur personal costs.
Sedimentology. Flow regimes and bedding forms, sedimentary structures. Modern and ancient sedimentary environments of deposition, alluvial, nearshore, shelf and deep sea, in both terrigenous clastic and carbonate/evaporite domains. The facies concept: lateral and vertical relationships between depositional environments and associated lithofacies within developing sediment wedges. Mineralogy and Petrology. Igneous and sedimentary rock types of the ocean floor and their significance.

GEOL6221
Introductory Geophysics
Staff Contact: Dr. D. Palmer
U.5 S1 HP1
Note/s: Excluded GEOL2051. Fieldwork of up to 5 days is a compulsory part of the subject. Students will incur personal costs.
Principles of gravity, geomagnetism, palaeomagnetism, geothermy and seismology and their relation to shape, internal constitution and dynamic processes of the earth. Introduction to radiometric, gravity and magnetic exploration methods.

GEOL7223
Surficial Constituents
Staff Contact: A/Prof C. R. Ward
U1 S3 L2 T1
Prerequisite: GEOL1101 or GEOL1201
Exclusions: GEOL2011, GEOL2022, GEOL3102

GEOL7233
Processes in Environmental Geology
Staff Contact: A/Prof A.D. Albani
U1 S3 L2 T1
Prerequisite: GEOL1101 or GEOL1201
Exclusions: GEOL2031, GEOL2072
Note/s: Field work of up to 5 days is a compulsory part of this subject. Students will incur personal costs.

GEOL8220
Sedimentology
Staff Contact: A/Prof C.R. Ward
U.5 S1 L1 T1
Prerequisite: GEOL1201
Note/s: Excluded GEOL2031. Field work of up to 5 days in a compulsory part of the subject. Students will incur personal costs.
As for Sedimentology in GEOL2031 Sedimentology and Palaeontology.

Applied Geology Level II/III
GEOL6231
Coastal Monitoring Techniques
Staff Contact: A/Prof A.D. Albani
U1 S1 L1 T2
Note/s: Field work of up to 4 days is a compulsory part of this subject. Students will incur personal costs.
General principles of surveying. Optical and electronic methods of distance and elevation measuring. Coastal position fixing. Coordinates systems and their application to coastal mapping. Map projections. Long and short term monitoring of coastal changes. Tides, their measurement and determination of tidal planes. Soundings and bathometric surveys. Shallow water investigations for seabed and bedrock morphologies. Through its intensive practical approach, the course is designed to give each student an understanding of coastal surveying applicable to a large variety of small scale investigations, from beach to estuarine monitoring.

Applied Geology Level III
GEOL3011
Mineralogical Techniques
Staff Contact: Dr P.C. Rickwood
U.5 S1 L2 T1
Prerequisite: GEOL1201

GEOL3021
Igneous and Metamorphic Processes
Staff Contact: A/Prof B.J. Hensen
U1 S1 L2 T1.5
Prerequisite: GEOL2011 and GEOL2022
Note/s: Field work of up to 3 days is a compulsory part of this subject. Students will incur personal costs.
and microscopic study of metamorphic suites from different tectonic regimes.

* Pressure, temperature, timepaths and Tectonic setting of metamorphism in the earth's crust.

**GEOL3031**

*Stratigraphy & Basin Analysis*

*Staff Contact: Prof J. Roberts*

**U.5 S2 L2 T2**

**Prerequisite:** GEOL2031

**Note/s:** Field work of up to 8 days is a compulsory part of this subject. Students will incur personal costs.


**GEOL3052**

*Exploration Geophysics*

*Staff Contact: Mr D. Palmer*

**U.1 S2 L2 T1**

**Prerequisite:** GEOL1201

**Note/s:** Field work of up to 3 days is a compulsory part of this subject. Students will incur personal costs.

Introduction to seismic, electrical and electromagnetic and methods of geophysical exploration. Data interpretation and application of these methods for mineral petroleum, coal and groundwater exploration and engineering projects.

**GEOL3072**

*Engineering Geology*

*Staff Contact: Mr G. McNally*

**U.5 S2 L2 T1**

**Prerequisite:** GEOL2011

**Note/s:** Field work of up to 2 days is a compulsory part of this subject. Students will incur personal costs.


**GEOL3082**

*Structural Geology*

*Staff Contact: Dr P.G. Lennox*

**U.1 S2 L2 Field 1**

**Prerequisite:** GEOL2022

**Note/s:** Field work of up to 5 days is a compulsory part of this subject. Students will incur personal costs.

Structural Geology. Structural analysis at the microscopic, mesoscopic and macroscopic scales. Structural analysis using Bermagui, Cooma and Broken Hill Terrains. Folds, faults and foliation development. Strain analysis, deformation mechanisms and the relationship between deformation and metamorphism.

**GEOL3092**

*Exploration Geochemistry*

*Staff Contact: Dr A.C. Dunlop/ Prof G.J.S. Govett/ Dr D. R. Cohen*

**U.5 S2 L2**

**Prerequisites:** GEOL2092 and GEOL3101

**Note/s:** Field work of up to 3 days is a compulsory part of this subject. Students will incur personal costs.

Principles and techniques of soil drainage and rock geochemistry as applied to mineral exploration.

**GEOL3101**

*Ore Deposits*

*Staff Contact: Dr A.C. Dunlop*

**U.1 S1 L3 T2 Field 1**

**Corequisite:** GEOL2022 or GEOL3011

**Prerequisites:** GEOL2011 and GEOL2031

**Note/s:** Fieldwork of up to 2 days is a compulsory part of this subject. Students will incur personal costs.

Metallic Resources: Classification and origin of the ore deposits, geochemical processes, research methods. Orthomagmatic, hydrothermal, porphyry, volcanic sedimentary, Mississippi Valley type, chromium, iron, manganese ores, residual and mechanical ores. Introduction to mineral exploration. Laboratory study of hand specimens, thin sections and polished sections of various ore types; study of selected mining areas representing various genetic types of ore. Economic Mineralogy. Nature of reflected light. Ore textures and their interpretation. Phase relations and paragenesis of ore minerals. Practical work in optical properties of ore minerals, hardness and reflectivity measurements; study of selected ores and ore minerals under the microscope including textural studies.

**GEOL3102**

*Fossil Fuels & Nonmetallic Resources*

*Staff Contact: A/Prof C.R. Ward*

**U.1 S2 L3T2 Field 1**

**Prerequisites:** GEOL1201 and GEOL2031

**Note/s:** Fieldwork of up to 2 days is a compulsory part of this subject. Students will incur personal costs.


**GEOL6311**

*Marine Geology 2*

*Staff Contact: A/Prof A.D. Albani*

**U.1 F L1 T2**

**Prerequisite:** GEOL6201

**Note/s:** Field work of up to 2 days is a compulsory part of this subject. Students will incur personal costs.

Structure and properties of the clay mineral groups including the kaolinites, illites, smectites, chlorites, mixed layered and fibrous clay minerals. Techniques for identification of the clay minerals. Clay-water systems and ion exchange. Chemical weathering and the origin of the clay minerals. Geological evolution of the Australian
continent. Depositional regions within and adjacent to continents, islands and ocean basins. Development of the Pre-Cambrian craton. Palaeozoic-Mesozoic evolution of the eastern Australian mobile belt. Intracratonic basins of western and southern Australia and development of divergent margins. The northern collision zone.

GEOL6321
Coastal Environmental Assessment
Staff Contact: A/Prof A.D. Albani
U1 F L1 T2
Note/s: Field work of up to 3 days in a compulsory part of this subject. Students will incur personal costs.

The physical nature of the various coastal environments: their morphology and the relationship between water masses and the sedimentary and benthic characteristics of the bottom. Sampling techniques, analytical methodology and statistical data evaluation. Environmental assessment of Australia and overseas areas. An important aspect of the course is its practical approach: from data gathering, data evaluation and environmental assessment report writing. Practical work in the course involves each student as an active member of a project team.

GEOL6330
Exploration Geophysics
Staff Contact: Mr D. Palmer
U5 S2 L2 T1
Note/s: Excluded GEOL3052. Field work of up to 3 days is a compulsory part of this subject. Students will incur personal costs.

Geophysics of ocean basins and off-shore areas and the techniques of their study. Seismic refraction, reflection and computational methods, instrumentation of seismic and acoustic sources, recording systems and signal processing. Geological and physical interpretation of results. Practical work on instrumentation, recording and interpretation of field data.

GEOL6331
Geochemistry
Staff Contact: Mr P. Atherden
Prerequisites: GEOL1201
Notes: Excluded programs 2500, 2503, GEOL2092.
As for GEOL2092.

GEOL7223
Environmental Processes
Staff Contact: Dr P. C. Rickwood/ Mr P. R. Atherden
U1 S3 L2 T1
Prerequisites: GEOL7223
Note/s: Excluded GEOL2092, GEOL3011


GEOL7233
Environmental Statistical Methods
Staff Contact: Dr D. R. Cohen
U1 S3 L2 T1

Prerequisites: GEOL1101 or GEOL1201
Note/s: Excluded GEOL2041, GEOL2042
Introduction to the use of PC, network and VAX computer systems with emphasis on geological software. Introduction to programming in FORTRAN with statistical applications pertinent to geoscience. Sampling of geological materials; stochastic geological processes. Introduction to geostatistics, population characterisation and splitting, ANOVA methods, regression analysis, EDA, Markov chains. Analysis of oriented data and processing of spatial geological data.

GEOL8310
Stratigraphy
Staff Contact: Prof J. Roberts
U.5 S1 L2
Prerequisite: GEOL8220
Note/s: Excluded program 2500 GEOL3031. Restricted to program 2503
As for Stratigraphy, in GEOL3031 Stratigraphy and Basin Analysis

GEOL8320
Gravity and Magnetic Methods
Staff Contact: Mr D. Palmer
U.5 S1 L2 T1
Prerequisites: PHYS1002 and MATH1032. It is desirable that students taking this unit have a background in geology.
Note/s: Excluded program 2500. Restricted to program 2503. Field work of one day is a compulsory part of this subject. Students will incur personal costs.

Fundamental principles. Field procedures and instruments. Reduction of field data. Regionals and residuals. Effects of sources of simple geometrical shapes and generalised two and three-dimensional distributions. Applications. Field work of one day is a compulsory part of the subject.

GEOL8330
Seismic Methods
Staff Contact: Mr D. Palmer
U.5 S1 L2 T1
Prerequisites: PHYS1002 and MATH1032. It is desirable that students taking this unit have a background in geology.
Note/s: Excluded program 2500. Restricted to program 2503. Field work of one day is a compulsory part of this subject. Students will incur personal costs.


GEOL8340
Electrical Methods
Staff Contact: Mr D. Palmer
U.5 S1 L2 T1
Prerequisites: PHYS1002 and MATH1032. It is desirable that students taking this unit have a background in geology.
Note/s: Excluded program 2500. Restricted to program 2503. Field work of one day is a compulsory part of the subject. Students will incur personal costs.

Introductory theory and field practice of resistivity, selfpotential, induced polarisation and airborne and ground electromagnetic methods. Geological interpretation of field data. Geophysical logging.
GEOL8350
Geological Applications
Staff Contact: A/Prof C.R. Ward/Dr P.G. Lennox
U.5 S1 L1 T1
Prerequisite: GEOL1201
Note/s: Excluded program 2500. Restricted to program 2503. Field work of one day is a compulsory part of the subject. Students will incur personal costs. A subject of ten weeks' duration.

GEOL8360
Geophysical and Geological Applications
Staff Contact: Mr D. Palmer
U.5 S2 L1 T2
Prerequisite: GEOL1201
Note/s: Excluded program 2500 GEOL6330. Restricted to program 2503.

Applied Geology Level IV

GEOL4303
Geology Honours
Staff Contact: Dr P. G. Lennox
U10 F
Prerequisites: Completion of programs 2500, 2503, including 8 Level III units.
Note/s: An extensive field project is a compulsory part of this subject. Students will incur personal costs.
Students with a double major in geology will follow the program set for Year 4 students in the Faculty of Applied Science 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.
The Category C General Education requirements are met through compulsory coursework during the Honours program.

GEOL4313
Earth and Environmental Science (Honours)
Staff Contact: A/Prof A. D. Albani
U10 F
Prerequisites: Completion of program 2527 including 8 Level III units.
Note/s: An extensive field project is a compulsory part of this subject. Students will incur personal costs.
For combined Geology/Physics honours see entry under Board of Studies in Science and Mathematics.

GEOL4323
Earth Environments (Honours)(Advanced Science Only)
Staff Contact: A/Prof A. D. Albani
U2

Information Systems

Information Systems Level II
INFS1602
Computer Information Systems 1
Staff Contact: School Office
U1 S1 or S2 L2 T2
Note/s: Restricted to programs 0600, 1000, 1400, 6810 and Course 3971.
An understanding of the content of Information Systems, the types of Information Systems and the position of Information Systems in Society; Information Systems at an organizational level, typical commercial applications, the systems lifecycle, design concepts, data analysis and models and an introduction to data communications.

INFS2603
Computer Information Systems 2
Staff Contact: School Office
U1 S2 L2 T2
Prerequisite: INFS1602
Note/s: Restricted to programs 0600, 1000, 1400, 6810 and Course 3971.
System analysis and design: requirements analysis and specification, logical and physical design of business systems, specification and updating of files, man-machine dialogue procedures. Comparison of design methodologies: Set within the framework of an actual case study.

INFS2609
Computer Information Systems Technology
Staff Contact: School Office
U1 S1 L2 T2
Prerequisite: INFS1602 or approved studies in computer science
Note/s: Restricted to programs 1400, 6810, 1000, 0600 and Course 3971.
Programming in the commercial environment; COBOL: Hardware and operating systems concepts and their impact on the commercial computing environment. Introduction to computer communications. Introduction to object-oriented programmes.

INFS3616
Commercial Programming Principles
Staff Contact: School Office
U1 S2 L2 T1
Prerequisite: INFS3605
Corequisite: INFS3692
Note/s: Available only to BIT students. Restricted to Course 3971.
An 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, human-machine interface, software testing, CASE tools, documentation, security and control, maintenance.

Information Systems Level II/III

INFS2691
Industrial Training 1
Staff Contact: School Office
U0 S1 HPW1
Prerequisite: INFS1602
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

INFS3605
Computer Systems Implementation
Staff Contact: School Office
U1 S1 L2 T2
Prerequisite: INFS2609
Note/s: Restricted to programs 0600, 1400, 6810 and Course 3971.

Supervised implementation of an information systems project in a commercial programming language. Advanced program design and structured techniques, computer aided software engineering techniques, interface with systems software at application implementation level, comparison of a range of programming languages, test data specification, implementation procedures.

INFS3607
Distributed Computer Systems
Staff Contact: School Office
U1 S2 L2 T2
Prerequisite: INFS2603
Note/s: Restricted to programs 0600, 1400, 6810 and Course 3971.

Advanced data communication concepts, computer networks, reference to international standards and common industry communications software packages; local/metropolitan/wide area networks; network management; telecom services and other options; data security; a case involving the design of a telecommunications-based commercial system.

INFS3608
Database Systems
Staff Contact: School Office
U1 S1 L2 T2
Prerequisite: INFS2603
Note/s: Restricted to programs 0600, 1400, 6810 and Course 3971.

Advanced data analysis and modelling techniques; database management system architectures including hierarchical, network and relational approaches; database reliability, security and integrity issues; data description and manipulation languages.

INFS3611
Information Systems Development
Staff Contact: School Office
U1 S2 L2 T2
Prerequisites: INFS2603 and approval from Head of School
Note/s: Restricted to programs 0600, 6810, 1400 and Course 3971.

A systems analysis design case study where students are required to produce: statement of requirements, feasibility/evaluation study, logical design, physical design and presentation of proposals to users. User requirements elicitation techniques and approaches, project management, alternative design methodologies, information systems life cycle and practical use of CASE tools.

INFS3692
Industrial Training 2
Staff Contact: School Office
U0 S1 HPW1
Corequisite: INFS3606
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
U0 S1 HPW1
Corequisite: 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/INFS4004
Information Systems (Honours) Thesis
Staff Contact: U10 F
Prerequisites: Completion of program 1400 including 6 Level III units.

INFS4774
Information Systems Security
Staff Contact: School Office
S1 L3 LAB1
Prerequisite: Admission to BCom course at honours level majoring in Information Systems and approval of Head of School.

A review of concepts, theory, methodologies and techniques discussed in IS security literature and current practice. Information systems security management, risk analysis and management, physical and logical security, database and telecommunications security, continuity planning, computer abuse, as well as legal and social issues are examined. Students will undertake case studies.
exercises using the University's computing facilities and laboratories to provide them with a better understanding of computerized security techniques used in practice.

INFS4794  
Thesis (Information Systems)  
Staff Contact: School Office  
Available only to Year 4 (Honours) students.

INFS4805  
Information Systems Auditing  
Staff Contact: School Office  
S1 L3 LAB1  
Prerequisite: ACCT3708, INFS1602 and admission to BCom course at Honours level majoring in Information Systems and approval of the Head of the School of Information Systems  
Note/s: Available only to Year 4 (Honours) students.

Management of information systems audit and the evaluation of IT management. Analysis and review of internal controls in contemporary computer installations and applications. Use of basic and advanced information systems audit techniques and methodologies, including audit software, integrated test facility, and concurrent auditing techniques. Technology audit reviews of the audit requirements for such technologies as LANs, EDI, and expert systems. Legal and professional requirements, and computer abuse/fraud auditing. Review of future IS audit techniques, methodologies, research and social implications.

INFS4810  
Advanced Data Management  
Staff Contact: School Office  
S1 L3  
Prerequisites: Admission to BCom course at honours level majoring in Information Systems and approval of Head of School.

The principle and practice of data administration in a large organization. Design, redesign and tuning of database. Distributed databases and database management systems. Reliability, security and integrity of the database.

INFS4811  
Knowledge Based Information Systems  
Staff Contact: School Office  
S2 L3 LAB1  
Prerequisite: Admission to BCom course at honours level majoring in Information Systems and approval of Head of School.

Knowledge acquisition and representation methods, including knowledge engineering as applied to knowledge based systems. Inferential mechanisms, artificial intelligence hardware (KBS) and software applicable to knowledge based information systems. Evaluation, with project work, of (KBS) tools and techniques in specified problem domains.

INFS4812  
Managing Software Development  
Staff Contact: School Office  
S1 L2 T1  
Prerequisite: Admission to BCom course at honours level majoring in Information Systems and approval of Head of School.

Software engineering management and measurement of complex systems, software development maturity, project planning and management, estimation models and techniques, project scheduling, software quality, reliability, assurance, software productivity models.

INFS4825  
Object Orientated Information Systems  
Staff Contact: School Office  
S2 L2 T1  
Prerequisite: Admission to BCom course at honours level majoring in Information Systems and approval of Head of School.

System development methodologies based on the object oriented approach. Techniques of analysis and design (concepts and notation) with detailed consideration of one full life cycle systems development methodology. Project management, reuse and object-oriented metrics.

INFS4848  
Information Systems Project Management  
Staff Contact: School Office  
S2 L2 T1  
Prerequisite: Admission to BCom course at honours level majoring in Information Systems and approval of Head of School.

An introduction to the central concepts and issues of project management and the practical benefits of project planning and management together with resource management. Practical sessions in project planning and the use of a computer based management tool. Additional topics include customer focus, lifecycle customization, work packages, progress monitoring, risk evaluation, quality management, vision and change control, people skills, and training.

INFS4853  
Advanced Systems Management  
Staff Contact: School Office  
S2 L2 T1  
Prerequisites: Admission to BCom course at honours level majoring in Information Systems and approval of Head of School.

Information systems and the organization, strategic planning for information systems, information needs for decision support purposes, organization of the data processing and information systems functions, the role of senior management in information systems administration. Project management techniques, project estimation, project control, EDP audit, security, implications of privacy legislation, sociotechnical issues. Data as a corporate resource, the implications of centralised and decentralised data management policies. Selection of computing equipment and associated software, turnkey systems, contract negotiation.

INFS4857  
Information and Decision Technologies  
Staff Contact: School Office  
S1 L3  
Prerequisite: Admission to BCom course at honours level majoring in Information Systems and approval of Head of School.

The role of information and models in managerial decision making and prediction. The role of information systems in decision making. Assessing the value of information
systems and the contribution of information in decision making under uncertainty. The role of information in managerial prediction and forecasting. The development of computer based models to support tactical management.

INFS4886
Research Topics in Information Systems 1
Staff Contact: School Office
S1 L3
Prerequisite: Admission to BCom course at honours level majoring in Information Systems
The development of science. Alternative social science research methodologies case study, normative, laboratory, field studies and field tests. The research process. Judgement in research. Statistical analysis of research data and interpretation of results. Writing the research report.

INFS4887
Research Topics in Information Systems 2
Staff Contact: School Office
S2 L3
Prerequisite: Admission to BCom course at honours level majoring in Information Systems
A detailed study of current information systems research in the fields of decision support systems, information systems administration and distributed systems.

INFS4891
Decision Support Systems
Staff Contact: School Office
S1 L2 LAB1
Prerequisite: Admission to BCom course at honours level majoring in Information Systems and approval of Head of School.
Information used for decision making and the application of information technology to assist or support the decision making process. Topics include decision making models, the impact of different management styles, the use of decision tools and the development of decision support systems including issues of model management and interface design. Practical examples of decision support systems are examined as are executive information systems and computer mediated communications within an organization.

INFS4893
Special Topic in Information Systems
Staff Contact: School Office
S1 or S2 L3
Prerequisites: Admission to BCom course at honours level majoring in Information Systems and approval of Head of School.
A specially assigned project, program or set of readings relating to information systems research.

INFS4898
Project Seminar
Staff Contact: School Office

Japanese Studies

Subjects in Japanese language are offered both for students without prior knowledge of the language and for those with HSC or other Japanese language studies. Students enrolling in Japanese with no previous knowledge of the language should enrol in JAPN1000 Japanese Communication 1A and JAPN1001 Japanese Communication 1B. For students with HSC or other Japanese language studies, a multipoint entry system operates and, subject to an individual placement test, students will be allocated to the most suitable subject level.

N.B. For students admitted in their first year of studies to JAPN2000 or higher on the grounds of ability and/or previous study, such subjects will be counted as Level 1 subjects in terms of degree regulations. No student will be permitted to enrol in subjects carrying more than 2 Level 1/II units in any School/area of studies under this provision.

All Japanese subjects are restricted to Programs 0600, 1400, and Course 3971 and Advanced Science students in Program 1000.

JAPN1000
Japanese Communication 1A
Staff Contact: Ms S. Schaefer
U1 S1 HPW5
Prerequisite: Nil
Introduces 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 30 kanji are introduced.

JAPN1001
Japanese Communication 1B
Staff Contact: Mr W. Armour
U1 S2 HPW5
Prerequisite: JAPN1000
Further acquisition of interactive skills in basic Japanese, regarding everyday non-technical topics. Introduction of approximately 70 new kanji.

JAPN2000
Japanese Communication 2A
Staff Contact: Ms T. Yalichev
U1 S1 HPW5
Prerequisite: JAPN1001
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 50 new kanji are introduced.

JAPN2001
Japanese Communication 2B
Staff Contact: Ms Y. Hashimoto
U1 S2 HPW5
Prerequisite: JAPN2000
Consolidation of oral-aural skills up to intermediate level. Development of reading and writing skills, with another 50 kanji introduced.
JAPN2400
Japanese Business and Management
Staff Contact: A/Prof W. Purcell
U1 S2 HPW3
Prerequisite: JAPN1001 or ECON1101
Study of Japanese business and management practice, including corporate structure and enterprise groupings; 'shitauke' subcontracting system; 'kanban' just-in-time industry system; 'kaizen' best workplace practice; 'ringi' decision-making; negotiating strategies and techniques; Japanese multinational operations; government-business relations.

JAPN2500
Japanese Studies
Staff Contact: A/Prof W. Purcell
U1 S1 HPW3
Prerequisite: JAPN1001 or JAPN2001
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.

JAPN3000
Japanese Communication 3A
Staff Contact: Ms S. lida
U1 S1 HPW5
Prerequisite: JAPN2001
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: Dr C. Thomson
U1 S2 HPW5
Prerequisite: JAPN3000
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: To be determined
U1 S2 HPW3
Prerequisite: JAPN3000
Concentrates on interactive skills for business situations, including reading and writing. Introduces students 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: Ms H. Masumi-So
U1 S1 HPW5
Prerequisite: JAPN3001
Concentrates on acquisition of late-intermediate to early-advanced interactive skills in Japanese with continued emphasis on reading and writing. Introduces basic linguistic features of advanced level Japanese and provides opportunities to practise skills needed in typical formal and informal Australia-Japan contact situations. Approximately 250 new kanji are introduced.

JAPN4001
Japanese Communication 4B
Staff Contact: Ms H. Masumi-So
U1 S2 HPW5
Prerequisite: JAPN4000
Prepares students in acquisition of well-rounded linguistic and communicative competence necessary for advanced learners. Further extension and systematic practice of interactive skills. Another 250 kanji are introduced.

JAPN4100
Japanese Communication 5A
Staff Contact: To be determined
U1 S1 HPW5
Prerequisite: JAPN4001
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. Approximately 250 new kanji are introduced.

JAPN4101
Japanese Communication 5B
Staff Contact: To be determined
U1 S2 HPW5
Prerequisite: JAPN4100
Honing 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 and related areas of communication. A further 250 kanji are introduced.

JAPN4200
Japanese Communication 6A
Staff Contact: To be determined
U1 S1 HPW5
Prerequisite: JAPN4101
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: To be determined
U1 S2 HPW5
Prerequisite: JAPN4200
Refining of linguistic and communicative skills acquired in JAPN4200. Another 250 kanji are introduced, ie. the remaining jooyoo kanji.
Korean

Introductory Korean will be conducted on a similar basis to first year Japanese. It is currently envisaged that in 1995 and 1996, Intermediate and Advanced Korean language subjects will be introduced, respectively.

Korean Level I

Korean is restricted to Programs 0600, 1400 and Course 3971 and Advanced Science students in Program 1000.

KORE1000

Korean 1A
Staff Contact: To be determined
U1 S1 HPW5
Prerequisite: Nil

Communicative methods are used to introduce students to the four major components of language-learning: speaking, listening, reading and writing. Hanja and the Korean phonetic script, Hangul, are progressively introduced. Emphasis is on appropriate speech for a variety of contemporary situations.

KORE1001

Korean 1B
Staff Contact: To be determined
U1 S2 HPW5
Prerequisite: KORE1000 or equivalent

Further acquisition of communication skills in introductory Korean, with emphasis on contemporary issues. New elements of the Korean writing system are progressively added to knowledge acquired in KORE1000.

Law

LAWS1010
Litigation
Staff Contact: Dr Jill Hunter
U6 F HPW4
Note/s: Restricted to Course 4770.

Civil pre-trial procedure: focus on selected topics largely in the context of Supreme Court actions - parties to an action; pleadings; discovery and exchange of information. Supreme Court Rules are examined to determine the extent to which they facilitate just, accurate and speedy resolution of disputes. Problems of delay and cost are addressed with particular reference to case-flow management techniques and alternative dispute resolution.

Criminal procedure: the law and related issues associated with arrest, warrants, police searches, interrogation and the formulation of pleadings. Comparisons drawn between the civil and criminal pre-trial processes.

Evidence: a basic understanding of the legal and philosophical principles related to the presentation of evidence in court. A comprehensive examination of the rules of evidence, including those designed to protect the accused at trial; the rule against hearsay evidence; the use of expert evidence; the treatment of unreliable evidence; proof and probability theory and questioning of witnesses in court.

The effect of pre-trial procedures on the final outcome at trial highlighted.

LAWS1120
Legal System Torts
Staff Contact: Mr Robert Shelly
U6 F HPW4
Note/s: Restricted to Course 4770.

The legal significance of the arrival of the British in Australia; the principal institutions of the legal system, particularly the courts, the legislature, and the executive arms of government; the judiciary; the legal profession; their history, roles, interrelationships, operation and techniques; general constitutional principles and institutions; the notion and consequences of federalism; Bill of Rights proposals; precedent and statutory interpretation, practice and theory; sources of Australian law, including the past and present status of Aboriginal customary law; origins of the common law; classifications within the common law; jurisdiction of Australian courts.

A number of torts, both intentional and unintentional, relating to economic interests as well as personal injury. The primary focus of the course is a thorough and comprehensive introduction to the tort of negligence. There is a detailed discussion of specific issues such as recovery for personal injury, for nervous shock, for pure economic loss as well affirmative duties of care. In addition there is an introduction to the law relating to limitation periods, vicarious liability, defences to the tort of negligence and the law relating to the assessment of damages. The approach to teaching this material is via extensive discussion of a relatively limited number of leading cases. Students are thus able to build up an understanding of this body of law through their own analysis of case law.

A second strand of this course is to introduce students to the wide ranging debates about the appropriate role and function of tort law. This requires developing a working knowledge of a feminist and economic analysis of tort law and of the various corrective justice theories of tort. In developing this working knowledge students will be exposed to secondary materials which build upon and refer to the cases and statutes which are included in the course.

LAWS1410
Contracts
Staff Contact: Mr Denis Harley
U6 F HPW4
Note/s: Restricted to Course 4770.

This course examines the nature of contractual obligations and how parties make and break contracts. Topics include: how contracts are formed and the necessary elements of a validly constituted contract; express and implied terms of a contract and how such terms are imported into the contract; how courts interpret the terms of a contract; the consequences where a contract is induced by misrepresentation, mistake or unconscionability; exemption clauses; estoppel and contract; contracts which are illegal under statute or contrary to public policy; remedies for breach of contract and the damages payable for such breach.

Students are encouraged to examine the role of contract law from an historical and contemporary standpoint.
Criminal Law

Staff Contact: A/Prof David Brown

U6 F HPW4

Note/s: Restricted to Course 4770.

The principles of criminal law and criminal liability. Aims to: promote and refine research and social policy analysis skills; develop a rigorous analytic and socially oriented approach to the study of criminal law; investigate the constitution of concepts like crime, criminal and criminal law; question traditional approaches which assume a unified set of general principles; suggest an approach to criminal law as a number of diverse fields of regulation; acknowledge the importance of forms of regulation outside the criminal law; examine empirical material on the actual operation of the N.S.W. criminal process such as court statistics and a court observation exercise; examine the substantive rules developed in selected criminal offence areas; stress the importance and relevance of criminal law in an understanding of law, even (and especially) for those who do not intend to practise in the area. Topics include: the phenomenon of crime, the criminal process, criminal responsibility, homicide offences, public order offences, drug offences, offences against the person, offences of dishonesty acquisition, general defences, complicity, conspiracy, sentencing and penal practices.

Property and Equity

Staff Contact: Dr Chris Rossiter

U6 F HPW4

Note/s: Restricted to Course 4770.

The basic principles of the law of property, transcending the traditional boundaries of real and personal property. For reasons of time and convenience, most topics are those usually considered in the context of ‘real property’. Enquiry into the meaning of the concepts of property and the purposes that are or ought to be fulfilled by the law of property. Some of the traditional concepts and classifications adopted by the common law in the content of the study of fixtures. Topics: possession as a proprietary interest in land and goods; some basic concepts such as seisin and title; the fragmentation of proprietary interests, including the doctrines of tenure and estates; an introduction to future interests; the development of legal and equitable interests, including a comparative treatment of their nature, extent and sphere of enforceability and an introduction to trusts; legal and equitable remedies; the statutory regulation of proprietary interests in land, including an examination of the Torrens and deeds registration systems; co-ownership; an introduction to security interests; the acquisition of proprietary interests; the alienability of interests including trusts for sale; commercial transactions involving leasehold estates in land and bailment of goods.

Federal Constitutional Law

Staff Contact: Prof George Winterton

U3 S1 or S2 HPW4

Note/s: Restricted to Course 4770.

Federal constitutional law, stressing the legislative and judicial powers of the Commonwealth and the judicial interpretation by the High Court of the extent of those powers, in particular: trade and commerce, external affairs, corporations, appropriation, grants and taxation powers, family law and industrial law powers, inconsistency of Commonwealth and State laws, freedom of interstate trade and commerce, excise and implied limitations on Commonwealth and State powers. Techniques and approaches adopted by the High Court in interpreting the Australian Constitution, and occasionally, federal executive power.

Further study of constitutional law may be undertaken in LAWS2100 The High Court of Australia.

Administrative Law

Staff Contact: Melinda Jones

U3 S1 or S2 HPW4

Note/s: Restricted to Course 4770.

This course considers the law concerning the accountability and control of government officials. Topics covered include: the principles of responsible government and separation of powers; the regulation of delegated legislation; the problem of corruption; the duty to give reasons for administration decisions; freedom of information, the Ombudsman, the Administrative Appeals Tribunal; and judicial review of administrative action (the principles of legality and procedural fairness).

Legal Research and Writing 1

Staff Contact: Irene Nemes

C2 S1 HPW2

Note/s: Restricted to Course 4770.

The literature, both legal and non-legal, relevant to the law in Australia. The contents of a law library, how it works and is ordered and how lawyers go about using it to find the law. Practice in handling the principal legal materials in the law library, notably law reports, collections of statutes, digests and material on law reform. An introduction to case analysis and statutory interpretation. An introduction to the use of computerised legal research methods. The methods and objectives of legal and empirical research.
LAWS7420
Legal Research and Writing 2
Staff Contact: Irene Nemes
C1 S2 HPW2
Note/s: Restricted to Course 4770.
A revision of legal research skills acquired in LAWS7410 Legal Research and Writing 1, particularly the use of Australian digests, law reform materials and indexes to legal periodicals. Practice in ascertaining delegated legislation, in using English, Commonwealth and US digests and in tracing recent amendments to case-law, statutes and regulations. Further instruction on the use of computers for retrieval of legal materials.

LAWS7430
Research Component
Staff Contact: A/Prof Adrian Brooks
Note/s: Taken after or concurrently with LAWS7420.
This subject must be taken either concurrently with or after LAWS7420 Legal Research and Writing 2, though students are advised where possible to complete Legal Research and Writing 2 first so that they have a command of the relevant research techniques. Students must select one from amongst the subjects for which they are enrolled in which a piece of assessable work (a research essay or moot) will be allocated for Research Component, and must submit a Research Component Form to the Administrative Assistant (Undergraduate) by the end of Week 4 in the Session in which they elect to undertake Research Component. This form must identify the subject in which the work for Research Component will be undertaken, and must be signed by the teacher in the subject. Students must attach to the completed research essay or moot submission a written research report, outlining the research methods adopted in preparation for the essay or moot. The piece of assessable work chosen for allocation to Research Component must be worth 30% of the total mark (in the case of a three-credit point subject, or 15% of the total mark in the case of a six-credit point subject). The assessment of Research Component will be made on the basis of the research report, in addition to the separate assessment of the essay or moot for the purpose of the subject selected. All subjects offered in the Law School are prima facie available to Research Component students for this purpose. Where for compelling reason no provision for a suitable essay or moot is or can be made in a program of assessment of a particular subject, the teacher of that subject may ask the student to select another subject. There is no formal teaching in LAWS7430 Research Component and no credit points are awarded for it. It is compulsory for all students except those taking one or more of the Research Thesis electives (LAWS6510, LAWS6520, LAWS6530).

LAWS8320
Legal Theory
Staff Contact: A/Prof Martin Krygier
U3 S1 or S2 HPW4
Note/s: Restricted to Course 4770.
Introduction to theoretical - particularly philosophical - questions which underlie the practical workings of the law. The course concentrates on questions to do with the reasoning, particularly the reasoning of judges, and of moral reasoning; and the interrelationships between law and morals and law and politics.

LAWS8820
Law and Social Theory
Staff Contact: A/Prof Martin Krygier
U3 S1 or S2 HPW4
Note/s: Restricted to Course 4770.
Examination of sociological assumptions about law, about society, and about the relationships between law, legal institutions and social ordering. Topics include: The role and functions of law within modern society, the extent to which law embodies implicit social theories and the nature of these theories, and the implications of empirical social research on our understanding of the place of law in society. LAWS8320 and LAWS8820 form part of the compulsory core of the LLB and BJuris degree courses with respect to students who entered the Faculty in 1981 or later. Students are required to take one of these two subjects to fulfil compulsory requirements and are permitted to take the other as an elective.

Legal Studies and Taxation

Legal Studies and Taxation Level I

LEG7711
Legal Environment of Commerce
Staff Contact: School Office
U1 S1 or S2 L2 T1
Prerequisites: HSC minimum mark required - Contemporary English 60, or 2 unit English (General) 60 or 2 unit English 53 or 3 unit English 1
Note/s: Restricted to programs 1400, 6810 and Course 3971.
The Australian legal system and areas of substantive law relevant to commerce including contract, business organization, employment, commercial arbitration, advertising, trade regulation, civil compensation, discrimination.

Legal Studies and Taxation Level II

LEG7721
Legal Transactions in Commerce
Staff Contact: School Office
U1 S1 or S2 L2 T1
Prerequisite: LEGT7711
Note/s: Restricted to program 1400 and Course 3971.
General principles of law of contract and specialised commercial transactions including banking and negotiable instruments, insurance, agency, sale of goods, bailment, suretyship.

LEG7731
Legal Regulation of Marketing and Distribution
Staff Contact: School Office
U1 S1 or S2 L2 T1
Note/s: Restricted to program 1400 and Course 3971.
The regulation of restrictive trade practices and sales promotion. The legal framework of marketing strategy with special reference to anticompetitive practices (including collusive activity, exclusive dealing, price discrimination, resale price maintenance, mergers and monopolisation)
and consumer protection law (including misleading and deceptive advertising and other unfair practices). Consumer credit; product liability; protection of intellectual property.

Legal Studies and Taxation Level III

LEG7741
Legal Organization of Commerce
Staff Contact: School Office
U1 S2 L2 T1
Prerequisite: LEGT7721 or LEGT7731
Note/s: Restricted to programs 1400 and Course 3971.
The law relating to corporations including company takeovers and the securities industry, partnerships, joint ventures and trusts, with special reference to their comparative utility.

LEG7751
Taxation Law
Staff Contact: School Office
U1 S1 L3 T1
Prerequisite: LEGT7721 or LEGT7731
Note/s: Restricted to program 1400 and Course 3971.
The law and practice of the taxation of income under the Income Tax Assessment Act 1936 (Commonwealth) including the concepts of income and allowable deductions; alienation of income; taxation of partnership, trusts and corporation; tax avoidance and evasion. Capital taxes. Introduction to stamp duties, payroll tax, land tax and sales tax. Tax policy.

Marine Science

Marine Science Level II

MSCI2001
Introductory Marine Science
Staff Contact: Dr P. Dixon
U1 S1 or S2 HPW4
Note/s: Fieldwork in Midyear Recess.
Ocean basins, sediments, properties of seawater, ocean circulation, coasts and coastal processes. Marine biology and ecology, primary and secondary productivity.

MSCI2051
Coral Reefs: Environment and Ecology
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.

Marine Science level III

MSCI3001
Physical Oceanography
Staff Contact: Dr P. Dixon
U1 S2 HPW4
Prerequisite: MATH1032 or MATH1042
Note/s: Laboratory and fieldwork.
The physical properties and motions of the oceans, and their measurement, oceanographic instrumentation. The design of small and large scale ocean experiments.

Marine Science level IV

MSCI4003/MSCI4009
Marine Science 4 (Honours)
Staff Contact: Dr P. Dixon
U10 F
Prerequisites: Completion of program 6831, 6832, 6833 or 6834 including 6 Level III units.
The Category C General Education requirements are met within the Honours program by seminars, an essay and participation in discussion groups.

Mathematics

1. Many subjects 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 grades higher than Distinction are only awarded in the ordinary level in exceptional circumstances.

2. Students proposing to proceed to Year 4 (Honours) in a Mathematics program may be required to take some of their Mathematics subjects at higher level. However, students should not think that the higher level subjects are intended only for those in honours programs. Any student with the ability to undertake higher subjects benefits from so doing.

Mathematics Level I

Students whose course or program require them to take Mathematics subjects in later years must take the standard first year subject MATH1032 Mathematics 1 or its higher equivalent MATH1042 Higher Mathematics 1. The higher version covers all of the material in MATH1032, often at greater depth, and is 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 pair of subjects MATH1011 General Mathematics 1B and MATH1021 General Mathematics 1C. However, students who select this subject should weigh seriously the implications of their choice because no further mathematical subjects are normally available. A student with meritorious performance in MATH1021 may be permitted to proceed to a certain limited number of Year 2 subjects intended for biologists and chemical engineers. The single subject MATH1011 is also available to students seeking a prerequisite for MATH1032.
The subject MATH1081 Discrete Mathematics is an additional Level 1 subject designed for students in Computer Science or Mathematics programs.

The subjects MATH1051 Mathematics 1F and MATH1090 Discrete Mathematics for Electrical Engineers are restricted to students in the Optometry and Electrical Engineering courses respectively.

MATH1011
General Mathematics 1B
Staff Contact: School of Mathematics First Year Office
U1 S1 HPW6
Prerequisites: HSC exam score range required: 2 unit Mathematics (60-100) or 2 and 3 unit Mathematics (1-150) or 3 and 4 unit Mathematics (1-200). (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. These numbers may vary from year to year.)
Note/s: Excluded MATH1032, MATH1042, ECON2200, ECON2201, ECON2202.

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
U1 S2 HPW6
Prerequisite: MATH1011
Note/s: Excluded MATH1032, MATH1042, ECON2200, ECON2201, ECON2202.

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.

MATH1032
Mathematics 1
Staff Contact: School of Mathematics First Year Office
U2 F HPW6
Prerequisites: HSC exam score range required: 2 unit Mathematics (67-100)(from 1995 this will be 90-100) or 2 and 3 unit Mathematics (100-150) or 3 and 4 unit Mathematics (100-200) or MATH1011 (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. These numbers may vary from year to year.)
Note/s: Excluded MATH1011, MATH1021, MATH1042, ECON2200, ECON2201, ECON2202.

Calculus, analysis, analytic geometry, linear algebra, an introduction to abstract algebra, elementary computing.

MATH1042
Higher Mathematics 1
Staff Contact: School of Mathematics First Year Office
U2 F HPW6
Prerequisites: HSC exam score range required: 3 unit Mathematics (145-150) or 4 unit Mathematics (186-200) (these numbers may vary from year to year.)
Note/s: Excluded MATH1011, MATH1021, MATH1032, ECON2200, ECON2201, ECON2202.

As for MATH1032 but in greater depth.

MATH1051
Mathematics 1F
Staff Contact: School Office
U1 S1 HPW6
Prerequisite: 3 unit HSC Mathematics
Note/s: Excluded MATH1011, MATH1021, MATH1032, MATH1042. Restricted to course 3950.
Complex numbers, vectors and vector geometry, matrices and matrix algebra. Functions, continuity and differentiability, integration, introduction to differential equations and series of functions.

MATH1061
Introductory Applied Computing
Staff Contact: School of Mathematics First Year Office
U1 HPW6
Prerequisites: As for MATH1011
Corequisites: MATH1021 or MATH1032 or MATH1042
Notes: Excluded any subject offered by the School of Computer Science and Engineering. Not offered in 1994.
The major components of a computer, software vs hardware. The role of computers, history, range of available hardware and software, computing issues and standards. The operating systems DOS and UNIX, files and text editors, networks and communications. An overview of spreadsheets, databases, graphics and other software packages. Structured programming in the high level language C, covering a variety of data types, efficiency, language standards, and libraries of functions and subprograms. Mathematical applications from a wide variety of areas.

MATH1081
Discrete Mathematics
Staff Contact: School of Mathematics First Year Office
U1 S1 or S2 HPW6
Prerequisites: As for MATH1011
Corequisites: MATH1032 or MATH1042
Note/s: Excluded MATH1090.

MATH1090
Discrete Mathematics for Electrical Engineers
Staff Contact: School of Mathematics First Year Office
S1 HPW3
Corequisite: MATH1032 or MATH1042
Note/s: Excluded MATH1081. Restricted to Combined degree course 3725.
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.
Mathematics Level II
The subject MATH2009 Engineering Mathematics 2 is a
servicing subject for some Engineering and Applied
Science courses and is not available for students in the
Science course. The subject MATH2021 is available for
students in the Science course who wish to take only one
unit of mathematics at Level II. It may be followed only by
the Level III subject MATH3021 Mathematics 3.

MATH2009
Engineering Mathematics 2
Staff Contact: School Office
F HPW4
Prerequisite: MATH1032
Note/s: Restricted to Combined degree courses 3681,
3730.
Differential equations, use of Laplace transforms, solutions
by series; partial differential equations and their solution for
selected physical problems, use of Fourier series;
introduction to numerical methods; matrices and their
application to theory of linear equations, eigenvalues and
their numerical evaluation; vector algebra and solid
geometry; multiple integrals; introduction to vector field
theory.

MATH2021
Mathematics 2
Staff Contact: School Office
U 1 F HPW2
Prerequisite: MATH1021(CR) or MATH1032
Note/s: Mathematics MATH2021 is included for students
desiring to attempt only one Level II Mathematics unit. If
other Level II units in Pure Mathematics or Applied
Mathematics are taken, MATH2021 Mathematics is not
counted.
Differential equations, use of Laplace transforms, solutions
by series; partial differential equations and their solution for
selected physical problems, use of Fourier series; multiple
integrals, matrices and their application to theory of linear
equations, eigenvalues; introduction to numerical methods.

Applied Mathematics Level II
MATH2100
Vector Calculus
Staff Contact: School Office
U 5 S 1 or S2 HPW2.5
Prerequisite: MATH1032 or MATH1042
Note/s: Excluded MATH2110.
Properties of vectors and vector fields; divergence,
gradient, curl of a vector; line, surface, and volume
integrals. Gauss and Stokes’ theorems. Curvilinear
co-ordinates.

MATH2110
Higher Vector Analysis
Staff Contact: School Office
U 5 S 1 HPW2.5
Prerequisite: MATH1032 or MATH1042, each with a mark
of at least 70
Note/s: Excluded MATH2100.
As for MATH2100 but in greater depth.

MATH2120
Mathematical Methods for Differential Equations
Staff Contact: School Office
U 5 S 1 or S2 HPW2.5
Prerequisite: MATH1032 or MATH1042
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 equations, separation of variables
methods, applications of Bessel functions and Legendre
polynomials.

MATH2130
Higher Mathematical Methods for Differential
Equations
Staff Contact: School Office
U 5 S 2 HPW2.5
Prerequisite: MATH1032 or MATH1042, 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
U 5 S 1 HPW2
Prerequisite: MATH1032 or MATH1042
Corequisite: 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
U 5 S 2 HPW2
Prerequisite: MATH2160
Modelling and solution techniques for optimisation
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
U 5 S 2 HPW2
Prerequisite: MATH1032 or MATH1042
Corequisite: 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
U.5 S2 HPW2
Prerequisite: MATH1032 or MATH1042
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.

MATH2301
Mathematical Computing A
Staff Contact: School Office
U1 S1 HPW4
Prerequisite: MATH1032 or MATH1042
Structured programming in FORTRAN, errors in representing real numbers and their effect on calculations, mathematical algorithms based on polynomial approximations.

Pure Mathematics Level II

MATH2400
Finite Mathematics
Staff Contact: School Office
U.5 S1 HPW5
Prerequisite: MATH1032 or MATH1042
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
U.5 S2 HPW2
Prerequisite: MATH1032 or MATH1042
Note/s: MATH1081 Discrete Mathematics is recommended.
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
U.5 S1 or S2 HPW5 or F HPW2.5
Prerequisite: MATH1032 or MATH1042
Note/s: Excluded MATH2601.

MATH2510
Real Analysis
Staff Contact: School Office
U.5 S1 or S2 HPW2.5
Prerequisite: MATH1032 or MATH1042
Note/s: Excluded MATH2610.
Multiple integrals, partial differentiation. Analysis of real valued functions of one and several variables.

MATH2520
Complex Analysis
Staff Contact: School Office
U.5 S1 or S2 HPW2.5
Prerequisite: MATH1032 or MATH1042
Note/s: Excluded MATH2620.
Analytic functions, Taylor and Laurent series, integrals. Cauchy's theorem, residues, evaluation of certain real integrals.

MATH2601
Higher Linear Algebra
Staff Contact: School Office
U1 S1 HPW5
Prerequisite: MATH1032 or MATH1042, each with a mark of at least 70
Note/s: Excluded MATH2501.
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
U.5 S1 HPW2.5
Prerequisite: MATH1032 or MATH1042, each with a mark of at least 70
Note/s: Excluded MATH2510.
As for MATH2510 but in greater depth.

MATH2620
Higher Complex Analysis
Staff Contact: School Office
U.5 S1 or S2 HPW2.5
Prerequisite: MATH1032 or MATH1042, each with a mark of at least 70
Note/s: Excluded MATH2520.
As for MATH2520 but in greater depth.

Statistics Level II

The subjects MATH2819, MATH2829, MATH2839, MATH2849, MATH2859 and MATH2869 are not available to Science students unless specified as part of a program. The subject MATH2841 Statistics SS is available for Science students who wish to take only one unit of statistics at Level II. It can be followed only by the Level III subjects MATH3870 and MATH3880.
MATH2801
Probability and Random Variables
Staff Contact: School Office
U1 S1 HPW4
Prerequisite: MATH1021 (CR) or MATH1032 or MATH1042
Note/s: Excluded MATH2819, MATH2841, MATH2901, BIOS2041.
Probability, random variables, standard discrete and continuous distributions, multivariate distributions, transformations, random sampling, sampling distributions, limit theorems.

MATH2810
Statistical Computing and Simulation
Staff Contact: School Office
U.5 S1 HPW2
Prerequisite: MATH1021 (CR) or MATH1032 or MATH1042
Corequisite: MATH2801
Note/s: Excluded MATH2910.
Introduction to APL, random variables, univariate transformations, simulation of random variables, APL programming, integer value random variables, random walks theory and simulation, introduction to Markov chains.

MATH2819
Statistics SA
Staff Contact: School Office
U1 F HPW2
Prerequisite: MATH1021 or MATH1032
Note/s: Excluded to Science students in programs 6832, 6833 and course 3950.
Probability, random variables, independence. Binomial, Poisson and normal distributions, transformations to normality, estimation of mean and variance, confidence intervals, tests of hypotheses, contingency tables, two sample tests of location, simple and multiple linear regression, analysis of variance for simple models.

MATH2821
Basic Inference
Staff Contact: School Office
U1 S2 HPW4
Prerequisite: MATH2801
Note/s: Excluded MATH2921, MATH2841, MATH2819, BIOS2041.
Point estimation: general theory, estimation by moments, maximum likelihood, interval estimation with general theory and application, hypothesis testing using Neyman Pearson theory, linear regression and prediction, analysis of variance.

MATH2829
Statistics SU
Staff Contact: School Office
S1 HPW3
Prerequisite: MATH1032 or MATH1042
Note/s: Not available to Science students.
Introduction to probability theory, random variables and distribution functions, sampling distributions, including those of t, $\chi^2$ and F. Estimation procedures, including confidence interval estimation with an emphasis on least squares and surveying problems, and computer based exercises.

MATH2830
Nonparametric Statistical Inference
Staff Contact: School Office
U.5 S2 HPW2
Prerequisite: MATH2801
Corequisite: MATH2821
Note/s: Excluded MATH2930.
Order statistics, exact and approximate distributions, multinomial distributions, goodness of fit, contingency tables, one-sample and two-sample estimation and inference problems.

MATH2839
Statistics SM
Staff Contact: School Office
U1 F HPW2
Prerequisites: MATH1021 (CR) or MATH1032 or MATH1042
Note/s: Excluded MATH2819, MATH2801, MATH2821, MATH2901, MATH2921. Restricted to combined degree course 3681.
Introduction to probability theory, with finite, discrete and continuous sample spaces. Random variables: the standard elementary distributions including the binomial, Poisson and normal distributions. Sampling distributions: with emphasis on those derived from the normal distribution: t, $\chi^2$ and F. Estimation of parameters: the methods of moments and maximum likelihood and confidence interval estimation. The standard tests of statistical hypotheses, and, where appropriate, the powers of such tests. An introduction to regression and the bivariate normal distribution.

MATH2841
Statistics SS
Staff Contact: School Office
U1 F HPW2
Prerequisites: MATH1021 (CR) or MATH1032 or MATH1042
Note/s: Excluded MATH2801, MATH2821, MATH2901, MATH2921, MATH2819, BIOS2041.
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 $\chi^2$, 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.

MATH2849
Statistics SE1
Staff Contact: School Office
S2 HPW2
Prerequisite: MATH1032 or MATH1042
Note/s: Not available to Science students.
Introduction to probability theory, random variables and distribution functions; the binomial, Poisson and normal distributions in particular. Standard sampling distributions including those of $\chi^2$, t and F.
MATH2859  
Statistics SE2  
Staff Contact: School Office  
S1 HPW2  
Prerequisite: MATH1032 or MATH1042  
Note/s: Not available to Science students.


MATH2869  
Statistics SC  
Staff Contact: School Office  
S1 HPW2  
Prerequisite: MATH1032 or MATH1042  
Note/s: Not available to Science students.


MATH2901  
Higher Probability and Random Variables  
Staff Contact: School Office  
U1 S1 HPW4  
Prerequisite: MATH1032 or MATH1042  
Note/s: Excluded MATH2801, MATH2841, MATH2819, BIOS2041.

As for MATH2801 but in greater depth.

MATH2910  
Higher Statistical Computing and Simulation  
Staff Contact: School Office  
U.5 S1 HPW4  
Prerequisite: MATH1032 or MATH1042  
Corequisite: MATH2901  
Note/s: Excluded MATH2810.

As for MATH2810 but in greater depth.

MATH2921  
Higher Basic Inference  
Staff Contact: School Office  
U1 S2 HPW4  
Prerequisite: MATH2901  
Note/s: Excluded MATH2821, MATH2841, MATH2819, BIOS2041.

As for MATH2821 but in greater depth.

MATH2930  
Higher Nonparametric Statistical Inference  
Staff Contact: School Office  
U.5 S2 HPW2  
Prerequisite: MATH2901  
Corequisite: MATH2921  
Note/s: Excluded MATH2830.

As for MATH2830 but in greater depth.

Mathematics Level III

Students considering proceeding to Year 4 (Honours) in one of the Mathematics programs should consult with the relevant Department before making a final choice of Level III subjects.

Skill in practical numerical computing is highly recommended for students majoring in applied mathematics, and hence students are encouraged to take MATH2301, or an equivalent subject, if they have not already done so.

The subject MATH3021 Mathematics 3 is the only Level III Mathematics subject available for Science students who have previously taken MATH2021.

MATH3021  
Mathematics 3  
Staff Contact: School Office  
U1 F HPW2  
Prerequisite: MATH2021  
Note/s: Excluded any other Level III in Pure Mathematics or Applied Mathematics except for MATH3261.

Vector calculus; special functions; convolution theorem and applications; complex variable theory; Fourier integrals; Laplace transforms with application to ordinary and partial differential equations.

Applied Mathematics Level III

Before attempting any Level III Applied Mathematics subject a student must have completed at least 2 units of Level II Mathematics including the prerequisites specified below.

The subject MATH3141 is not available to Science students.

Usually only two of the advanced subjects MATH3110, MATH3130, MATH3170 and MATH3250 are offered in one year.

MATH3101  
Numerical Analysis  
Staff Contact: School Office  
U1 S1 HPW4  
Note/s: Excluded MATH3141.

Analysis of some common numerical methods. Iterative methods for solving nonlinear equations; interpolation using polynomials, splines and trigonometric functions; leastsquares approximation and orthogonal functions; numerical differentiation and integration; extrapolation; finite difference methods for initial value problems for ordinary differential equations; iterative techniques for large systems of linear equations.

MATH3110  
Advanced Numerical Analysis  
Staff Contact: School Office  
U.5 S2 HPW2  
Prerequisites: A weighted average mark of at least 70 in 2 units of Level II Mathematics  
Note/s: it is highly recommended that MATH3101 be taken concurrently.

Development and analysis of numerical methods for the computational solutions of mathematical problems. One or more topics selected from: computational methods for partial differential equations including finite element methods, finite difference methods, spectral methods, multi-grid methods; computational methods for matrix problems including iterative methods and preconditioners, leastsquares problems and singular value decomposition;
orthogonality for matrix and polynomial problems, algorithms for parallel computers.

**MATH3121**

**Mathematical Methods**

*Staff Contact: School Office*

U1 S1 HPW4

*Prerequisites: MATH2120, MATH2520*

*Note/s: Excluded MATH3141, MATH3150.*


**MATH3130**

**Advanced Mathematical Methods**

*Staff Contact: School Office*

U.5 S1 HPW2

*Prerequisites: A weighted average mark of at least 70 in MATH2120, MATH2520 and one further unit of Level II Mathematics*

*Note/s: It is highly recommended that MATH3121 be taken concurrently.*

Fundamental methods for solution of problems in applied mathematics, physics and engineering. One or more topics selected from: asymptotic and perturbation techniques, singularity analysis, nonlinear waves, solitons, bifurcation theory, chaotic dynamics.

**MATH3141**

**Electrical Engineering Mathematics 3**

*Numerical and Mathematical Methods*

*Staff Contact: School Office*

S2 HPW3.5

*Prerequisites: MATH2100, MATH2501, MATH2510*

*Note/s: Excluded MATH2120, MATH2130, MATH3101. Not available to Science Students.*


**MATH3150**

**Transform Methods**

*Staff Contact: School Office*

U.5 S2 HPW2

*Prerequisite: MATH2520*


**MATH3161**

**Optimisation Methods**

*Staff Contact: School Office*

U1 S1 HPW4

*Prerequisites: MATH2501, and either MATH2100 or MATH2510*

Development, analysis and application of methods for optimisation problems. Theory of multivariable optimisation; including necessary and sufficient optimality conditions, stationary points, Lagrange multipliers, Kuhn-Tucker conditions, convexity and duality. Numerical methods for one dimensional minimisation, unconstrained multivariable minimisation (including steepest descent, Newton, quasi-Newton and conjugate gradient methods) and constrained multi-variable minimisation (including linear programming and quadratic programming).

**MATH3170**

**Advanced Optimisation**

*Staff Contact: School Office*

U1 S2 HPW4

*Prerequisites: A weighted average mark of at least 70 in MATH2501 and one further unit of Level II Mathematics including MATH2100 or MATH2510*

*Note/s: It is highly recommended that MATH3161 be taken concurrently.*

Development, analysis and application of methods for optimisation problems. One or more topics from: Combinatorial optimisation, network flows, complexity, convex programming, non-smooth optimisation, duality, complementary problems, minimax theory, game theory, stochastic optimisation, new approaches to linear programming.

**MATH3181**

**Optimal Control**

*Staff Contact: School Office*

U1 S2 HPW4

*Prerequisite: 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*

U1 S2 HPW4

*Prerequisite: MATH2120 or MATH3540*

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*

U1 S1 HPW4

*Prerequisites: MATH2100, MATH2120*
The mathematical modelling and theory of problems arising in the flow of fluids. Cartesian tensors, kinematics, mass conservation, vorticity, Navier-Stokes equation. Topics from inviscid and viscous fluid flow, gas dynamics, sound waves, water waves.

MATH3250
Advanced Fluid Dynamics
Staff Contact: School Office
U.5 S2 HPW2
Prerequisites: A weighted average mark of at least 70 in MATH2100, MATH2120 and one further unit of Level II Mathematics
Note/s: It is highly recommended that MATH3241 be taken concurrently.

The mathematical modelling and theory of problems arising in the flow of fluids. One or more topics from atmosphere-ocean dynamics, climate modelling, hydrodynamic stability, turbulence, environmental fluid dynamics, computational methods.

MATH3261
Oceanography
Staff Contact: School Office
U1 S2 HPW4
Prerequisites: MATH2021 or both MATH2100 and MATH2120


MATH3301
Mathematical Computing B
Staff Contact: School Office
U1 S2 HPW4
Prerequisites: MATH2120, MATH2301

The design and use of computer programs to solve practical mathematical problems. Matrix computations and use of existing mathematical software packages, plus case studies from applications involving numerical integration, differential equations, symbolic algebra, and vector and parallel computers.

Pure Mathematics Level III

Before attempting any Level III Pure Mathematics subject students must have completed at least two units of Level II Mathematics including the prerequisites specified below. For higher subjects the average performance of the above two units should be at distinction level. Subject to the approval of the Head of Department, this may be relaxed. Students wishing to enrol in Level III Higher Pure Mathematics subjects should consult with the Pure Mathematics Department before enrolling. The subjects MATH3680, MATH3740 and MATH3780 normally are offered only in even numbered years and the subjects MATH3670, MATH3730 and MATH3770 only in odd numbered years.

MATH3400
Logic and Computability
Staff Contact: School Office
U.5 S1 HPW2

The propositional calculus its completeness and consistency; Turing machines; unsolvable problems; computability and Church’s thesis; Godel’s incompleteness theorems.

MATH3420
Information, Codes and Ciphers
Staff Contact: School Office
U.5 S2 HPW2

Introduction to discrete information theory (including Shannon’s theorems), error-correcting codes and cryptography.

MATH3430
Symbolic Computing
Staff Contact: School Office
U.5 S2 HPW2
Note/s: MATH2400 Finite 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.

MATH3500
Group Theory
Staff Contact: School Office
U.5 S2 HPW2
Note/s: Excluded MATH2601 (before 1992), MATH3710.

Mathematical systems, groups, determination of small groups, homomorphisms and normal subgroups.

MATH3510
Geometry
Staff Contact: School Office
U.5 S2 HPW2

Elementary concepts of Euclidean, affine and projective geometries.

MATH3520
Number Theory
Staff Contact: School Office
U.5 S1 or S2 HPW2

Introduction to algebraic structures. Euclidean domains, primes and irreducibles, factorisation. Diophantine equations, polynomial congruences, arithmetic functions, primitive roots, quadratic residues, quadratic reciprocity, sums of squares.

MATH3530
Combinatorial Topology
Staff Contact: School Office
U.5 S1 HPW2

Elementary combinatorial topology of surfaces.
MATH3540  
Ordinary Differential Equations  
Staff Contact: School Office  
U.5 S1 or S2 HPW2  
Prerequisite: MATH2501  
Note/s: Excluded MATH3640 (from 1992). 
The initial value problem: existence, uniqueness, continuation, and dependence on initial conditions and parameters. The Gronwall inequality, linear systems, variation of parameters formula, plane autonomous systems, Poincaré space, Poincaré-Bendixson theory. Stability of linear and almost linear systems, Lyapunov's second method.

MATH3550  
Partial Differential Equations  
Staff Contact: School Office  
U.5 S2 HPW2  
Prerequisites: MATH2501, MATH2520  
Corequisites: MATH3540 or MATH3640  
Note/s: Excluded MATH3650 (from 1992). 

MATH3560  
History of Mathematics  
Staff Contact: School Office  
U.5 S2 HPW2  
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  
U.5 S1 HPW2  
Note/s: Excluded MATH3610. 

MATH3580  
Differential Geometry  
Staff Contact: School Office  
U.5 SS HPW2  
Prerequisite: MATH2510  
Curves and surfaces in space. Gaussian curvature, Gauss theorem. Gauss-Bonnet theorem.

MATH3610  
Higher Real Analysis  
Staff Contact: School Office  
U.5 S1 HPW2  
Prerequisite: MATH2610 or MATH2510(CR)  
Note/s: Excluded MATH3570, MATH3601. 

MATH3620  
Higher Functional Analysis  
Staff Contact: School Office  
U.5 S2 HPW2  
Prerequisites: MATH2501(CR) or MATH3610, MATH2601  
Note/s: Excluded MATH3601. 

MATH3630  
Higher Integration and Mathematical Probability  
Staff Contact: School Office  
U.5 S2 HPW2  
Prerequisite: MATH2601 or MATH2501(CR)  
Note/s: Excluded MATH3540. 
As for MATH3540 but in greater depth.

MATH3640  
Higher Ordinary Differential Equations  
Staff Contact: School Office  
U.5 S1 HPW2  
Prerequisite: MATH2601 or MATH2501(CR)  
Note/s: Excluded MATH3540. 
As for MATH3540 but in greater depth.

MATH3650  
Higher Partial Differential Equations  
Staff Contact: School Office  
U.5 S2 HPW2  
Prerequisite: MATH2610 or MATH2510(CR), MATH2620 or MATH2520(CR)  
Corequisite: MATH3640  
Note/s: Excluded MATH3550, MATH3660 (before 1992). 
As for MATH3550, but in greater depth.

MATH3670  
Higher Set Theory and Topology  
Staff Contact: School Office  
U.5 S1 HPW2  
Corequisite: MATH3610  
Note/s: Excluded MATH3730 (before 1992). This subject is offered in odd numbered years only. 
Set theory, axiom of choice, ordinals and cardinals, topological spaces, compactness, quotient topologies.

MATH3680  
Higher Complex Analysis  
Staff Contact: School Office  
U.5 S1 HPW2  
Prerequisite: MATH2620 or MATH2520 (CR)  
Note/s: Excluded MATH3610 is recommended. Excluded MATH3630 (before 1992). This subject 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
U.5 S1 HPW2
Prerequisite: MATH2501(CR) or MATH2601
Note/s: Excluded MATH3500, MATH3710 and MATH3720 (both before 1992).
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
U.5 S2 HPW2
Prerequisite: MATH3710
Note/s: Excluded MATH3720 (before 1992).
Galois theory, additional group theory, representations and characters of finite groups.

MATH3730
Higher Advanced Algebra
Staff Contact: School Office
U.5 S2 HPW2
Prerequisite: MATH3710
Note/s: Excluded MATH3710 (before 1992). This subject offered in odd numbered years only.
Topics from rings; commutative rings; factorisation theory; modules; associative and Lie algebras; Wedderburn theory; category theory.

MATH3740
Higher Number Theory
Staff Contact: School Office
U.5 S2 HPW2
Note/s: Excluded MATH3520, MATH3610 (before 1992).
This subject 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
U.5 S1 HPW2
Prerequisites: MATH2501(CR) or MATH2601, MATH2510(CR) or MATH2610
Note/s: Excluded MATH3530, MATH3580, MATH3750 (before 1992).
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
U.5 S2 HPW2
Prerequisite: MATH3760
Note/s: Excluded MATH3760 (before 1992) This subject offered in odd numbered years only.

MATH3870
Regression Analysis
Staff Contact: School Office
U.5 S1 HPW4
Prerequisite: MATH2821 or MATH2501
Note/s: Excluded MATH3870, MATH3920.
Finite population sampling theory illustrated by mean estimation; simple random, stratified, cluster, systematic, multi-stage and ratio sampling, sampling proportional to size.

MATH3880
Applied Stochastic Processes
Staff Contact: School Office
U.5 S2 HPW2
Prerequisite: MATH2821, MATH3811
Note/s: Excluded MATH3870, MATH3930.
Principles of good experimental design. Completely randomised experiments, randomised complete block designs. Latin square designs. Contrasts and multiple
comparisons. Analysis of factorial experiments. Random effects models.

MATH3840
Statistical Inference
Staff Contact: School Office
U.5 S2 HPW2
Prerequisite: MATH2821
Note/s: Excluded MATH3940.

Uniformly minimum variance unbiased estimation. Cramer-Rao inequality, Lehman-Scheffe theorem. Monotone likelihood ratio distributions and uniformly most powerful unbiased tests. Generalised likelihood ratio tests, exact tests and large samples tests. Bayesian point estimation, interval estimation and hypothesis testing.

MATH3850
Nonparametric Methods
Staff Contact: School Office
U.5 S2 HPW2
Prerequisites: MATH2830, MATH2821
Note/s: Excluded MATH3950.


MATH3861
Statistical Computation
Staff Contact: School Office
U1 S2 HPW4
Prerequisites: MATH2821 or MATH2921, MATH2810 or MATH2910

Array and sequential processing in APL. Standard statistical operations and their efficient coding. Simulation of random variables and stochastic processes. Efficient coding of survey data. Modular package construction, and the use of packages eg STATAPL, IDAP, INSTAPAK, SPSS, GLIM, GENSTAT, MINITAB, SAS, BMD. A project, to construct a small package consistent with general specifications and with safeguards against common errors.

MATH3870
Regression Analysis and Experimental Design
Staff Contact: School Office
U.5 S1 HPW2
Prerequisite: MATH2821 or MATH2841 or approved equivalent
Note/s: Excluded MATH3811, MATH3830, MATH3911 MATH3930.


MATH3880
Applied Stochastic Processes
Staff Contact: School Office
U.5 S2 HPW2
Prerequisite: MATH2841 or MATH2801 or MATH2901 or approved equivalent
Note/s: Excluded MATH3801, MATH3901.

An introduction to processes in discrete and continuous time Markov chains and Markov processes, branching processes, time series with moving average models.

MATH3901
Higher Stochastic Processes
Staff Contact: School Office
U1 S1 HPW4.5
Prerequisites: MATH2501, MATH2510, MATH2901
Note/s: Excluded MATH3801, MATH3880.

As for MATH3801 but in greater depth.

MATH3911
Higher Linear Models
Staff Contact: School Office
U1 S1 HPW4.5
Prerequisites: MATH2921, MATH2501, MATH2510
Note/s: Excluded MATH3811, MATH3870.

As for MATH3811 but in greater depth.

MATH3920
Higher Sample Survey Theory
Staff Contact: School Office
U.5 S2 HPW2
Prerequisite: MATH2921
Note/s: Excluded MATH3820.

As for MATH3820 but in greater depth.

MATH3930
Higher Design and Analysis of Experiments
Staff Contact: School Office
U.5 S2 HPW2
Prerequisites: MATH2921, MATH3911
Note/s: Excluded MATH3830, MATH3870.

As for MATH3830 but in greater depth.

MATH3940
Higher Statistical Inference
Staff Contact: School Office
U.5 S2 HPW2
Prerequisite: MATH2921
Note/s: Excluded MATH3840.

As for MATH3840 but in greater depth.

MATH3950
Higher Nonparametric Methods
Staff Contact: School Office
U.5 S2 HPW2
Prerequisites: MATH2921, MATH2930
Note/s: Excluded MATH3850.

As for MATH3850 but in greater depth.

MATH3971
Higher Probability Theory
Staff Contact: School Office
U1 Not offered in 1994 HPW4
Prerequisites: MATH2901, MATH2501, MATH2510.


MATH3980
Higher Statistics Project
Staff Contact: School Office
U.5 F HPW
Prerequisites: MATH2901, MATH2921
Corequisites: At least four units from Level III Statistics.
Mathematics Level IV

To enter Level IV Mathematics students must have completed the first three years of one of the programs 1000, 1006, 1060, 1061 or 6810 with an appropriate set of Level III subjects. Some higher Mathematics subjects should normally be included at Levels II and III. Students must discuss their Level III selection of subjects with the department concerned.

MATH4003/4004
Mathematics and Computer Science Honours
Staff Contact: School Office
U10 F
Prerequisites: 7 Level III units including at least three from Computer Science; students should discuss their Year 3 program in the Department concerned.

Undergraduate thesis in Applied Mathematics or Pure Mathematics together with advanced lecture courses, half selected from MATH4103/4603, and half selected from Computer Science.

The Category C General Education requirement is met by the 56 hour subject The Role of Mathematics in Society which is part of the Honours program.

MATH4103/MATH4104
Applied Mathematics 4 (Honours)
U10 F
Prerequisites: Completion of program 1000 or 6810 including 6 Level III units (some Higher Mathematics subjects should normally be included at Levels II and III in order to enter Level IV Mathematics: students should discuss their Year 3 program in Department concerned.)

Skill in practical numerical computing is highly recommended for students taking this subject. Those students who have not already taken a suitable computing subject may be required to take a short bridging course.

Undergraduate thesis together with advanced lecture courses. Includes advanced mathematical methods for applied mathematics, advanced optimisation, 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, microhydrodynamics, and analytical and numerical solution of partial differential equations. May also include advanced lectures given by other Departments or Schools.

The Category C General Education requirement is met by the 56 hour subject The Role of Mathematics in Society which is part of the Honours program.

MATH4603/MATH4604
Pure Mathematics 4 (Honours)
U10 F
Prerequisites: completion of program 1000 including 6 Level III units (some Higher Mathematics subjects should normally be included at Level II and III in order to enter Level IV Mathematics: students should discuss their Year 3 program in Department concerned.)

Undergraduate thesis together with advanced lectures on topics chosen from fields of current interest in Pure Mathematics. May also include advanced lectures given by other Departments or Schools.

The Category C General Education requirement is met by the 56 hour subject The Role of Mathematics in Society which is part of the Honours program.

MATH4903/MATH4904
Theory of Statistics 4 (Honours)
U10 F
Prerequisites: Completion of program 1006 including 6 Level III units.


The Category C General Education requirement is met by the 56 hour subject The Role of Mathematics in Society which is part of the Honours program.

Materials Science and Engineering

Materials Science and Engineering Level II

MATS1002
Microstructural Analysis
Staff Contact: Dr P. Kraul<lis
U.5 S2 L1 T2
Note/s: Restricted to Combined degree course 3681.


MATS1072
Physics of Materials
Staff Contact: Dr A.K. Heiiier
U.5 S1 L2 T1
Prerequisite: PHYS1002
Note/s: Restricted to Combined degree course 3681.

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, covalent bond; crystal structures, properties. Ionic bond, force models, properties.

MATS1253
Ferrous Alloys
Staff Contact: Dr P. Kraul<lis
U.5 S1 L1 T2
Note/s: Restricted to Combined degree course 3681.

properties of ordinary cast irons, including grey, white, mottled, malleable and ductile irons.

MATS8193
Origins of Microstructure (units 1, 2 & 3)
Notes: Restricted to Combined degree course 3681.

Unit 1: Phase Equilibria
Staff Contact: Dr A.G. Crosky
S1 L1 T1

Unit 2: Diffusion
Staff Contact: Dr A.K. Hellier
S1 L1 T1

Unit 3: Metallography and Phase Equilibrium Laboratory
Staff Contact: Dr A.G. Crosky
S1 T3

MATS9520
Engineering Materials
Staff Contact: Dr A.G. Crosky
U.5 S1 L2 T1
Note/s: Restricted to Combined degree course 3681.
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, fatigue modes of failure in service; corrosion. Metal forming by casting and wrought processes. Phase equilibria of alloys; microstructural control by thermo-mechanical processing and application to commercial engineering materials. Laboratory and tutorial work includes experiments on cast and recrystallised structures, ferrous and non-ferrous microstructures and fracture and failure analysis.

Materials Science and Engineering Level III

MATS1042
Crystallography and XRay Diffraction
Staff Contact: Dr P. Munroe
U.5 S1 L2 T2
Note/s: Restricted to Combined degree course 3681.

MATS1083
Non Ferrous Alloys
Staff Contact: Dr P. Krauklis
U.5 S2 L1 T2
Note/s: Restricted to Combined degree course 3681.

MATS1263
Alloy Steels
Staff Contact: Dr P. Krauklis
U.5 S2 L1 T1
Note/s: Restricted to Combined degree course 3681.

MATS9193
Origins of Microstructure (Units 2 and 4)
Note/s: Restricted to Combined degree course 3681.

Unit 2: Diffusion
Staff Contact: Dr A.K. Hellier
S1 L1 T1

Unit 4: Phase transformations
Staff Contact: Dr B. Gleson
S2 L2 T1

MATS7223 (Units 1,2,3 & 4)
Mechanical Behaviour of Materials
Note/s: Restricted to Combined degree course 3681.

Unit 1: Deformation
Staff Contact: Dr B. Gleson
S1 L2
Atomic and molecular description of deformation. Introduction to dislocation theory and its application to mechanical properties. Chain dynamics under stress.

Unit 2: Fractographic analysis
Staff Contact: Dr A.G. Crosky
S2 L1 T1
Classification of macroscopic and microscopic fracture mechanisms. Initiation and propagation of ductile, brittle, fatigue, creep, 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 3: Deformation and strengthening mechanisms
Staff Contact: Dr B. Gleeson
S2 L1 T1
Strengthening mechanisms, creep, fracture, grain size dependence of strength. Introduction to generation of deformation and recrystallization textures. Measurements of age-hardening, activation energy of strain ageing.

Unit 4: Metal forming processes
Staff Contact: Dr A.G. Crosky
S1 L1 T1

MATS9323
Mechanical Behaviour of Materials
Note/s: Restricted to Combined degree course 3681.

Unit 1: Deformation
Staff Contact: Dr P. Munroe
S1 L2
Atomic and molecular description of deformation. Introduction to dislocation theory and its application to mechanical properties. Chain dynamics under stress.

Unit 2: Fractographic analysis
Staff Contact: Dr A.G. Crosky
S2 L2 T1
Classification of macroscopic and microscopic fracture mechanisms. Initiation and propagation of ductile, brittle, fatigue, creep, 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 3: Deformation and strengthening mechanisms
Staff Contact: Dr B. Gleeson
S2 L1 T1
Strengthening mechanisms, creep, fracture, grain size dependence of strength. Introduction to generation of deformation and recrystallization textures. Measurements of age-hardening, activation energy of strain ageing.

Mechanical and Manufacturing Engineering

Mechanical and Manufacturing Engineering
Level I
MANF1110
Manufacturing Technology
Staff Contact: Dr P. Mathew
U.5 S2 HPW3
Corequisites: MECH1100, MECH1300, MECH1400


MECH0160
Introductory Engineering Design and Drawing Practices
Staff Contact: A/Prof A.E. Churches
U.5 S1 L3 T2
Introduction to Engineering Design: Intended specifically for electrical engineering students and is to be taken in conjunction with MECH0360. Introduction to engineering design: Engineering method, problem identification, creative thinking, mathematical modelling; computer-aided design; materials and processes; communication of ideas; the place of engineering in society. Introduction to drawing practice: Graphic communication. First and third angle orthographic projection. Descriptive geometry fundamentals. Mechanical drawing practice and interpretation. Pictorial views. Theory of computer-aided drafting. Electrical drawing practice.

MECH0360
Introductory Engineering Mechanics
Staff Contact: A/Prof J.E. Baker
U.5 S1 L2 T1
Prerequisites: HSC Exam Score Required: 2 unit Science (Physics) 53-100, or 3 unit Science 90-150, or 4 unit Science multistrand 1-50, or 2 unit Industrial Arts (Engineering Science) 53-100, or 3 unit Industrial Arts (Engineering Science) 1-50
Note/s: Excluded MECH0330, MECH1300, MECH0440. Intended specifically for electrical engineering students, and is to be taken in conjunction with MECH0160.


MECH1100
Mechanical Engineering Design 1
Staff Contact: A/Prof A.E. Churches
U.5 S2 HPW2
Corequisite: MECH0100
Note/s: Restricted to Combined degree course 3681.

Introduction to hardware. Studies of a range of engineering components, considering: what they do, how they do it, how they were made, the range of possible forms for each item, why each item has its particular form. Design philosophy. Design as the formulation and implementation of practical ways of fulfilling needs, including: recognising the need, generalising the question, considering a range of solutions, selecting a short-list, analysing the selected range, making a final choice. Commercial philosophy. Impetus for design, market competition, significance of innovation, intellectual property, financing, manufacturing, marketing, etc.
MECH1110
Graphical Analysis and Communications
Staff Contact: Mr. A. J. Barratt
S2 L1 T2
Note/s: Excluded MECH0130, MECH0160.
Freehand sketching of machine components, standard drawing methods, orthogonal projections and sections for analysis and communication, dimensions, tolerances and conventional symbols. Computer graphics modelling of components, assembly and production of detail rawings.

MECH1300
Engineering Mechanics 1
Staff Contact: Dr. K. Zarrabi
U.5 S1 or S2 L2 T2
Prerequisites: As for MECH0360
Note/s: Excluded MECH0330, MECH0360. Restricted to combined degree course 3681. Students who wish to enrol in this subject in courses other than the full-time courses in Aerospace Engineering, Electrical Engineering, Manufacturing Management, Mechanical Engineering and Naval Architecture can make up for the lack of the prerequisite by work taken in Physics in the first half of Year 1.

MECH1400
Mechanics of Solids 1
Staff Contact: Dr. M. Chowdhury
U.5 S1 or S2 L2 T1
Corequisite: MECH1300 or MECH0360 or MECH0330 or MECH0440
Note/s: Restricted to Combined degree course 3681.
Stress and strain, internal forces. Bars under axial loading. Stresses and deformation due to bending. Strain energy. Flexibility and stiffness. Stress and deformation due to torsion. Helical springs.

MECH1500
Computing 1M
Staff Contact: Dr. R. A. Willgoss
U.5 S2 HPW3
Note/s: Restricted to Combined degree course 3681.
Introduction: history, applications, hardware, software, a model of a computer system, editors, operating systems. Program design and development: programming objectives, data structures, algorithms, symbolic names, translation of algorithms, steps in programming, programming style, syntax charts, errors and debugging. Data: data types, declarations, input, output, file control. Programming constructs: arithmetic expressions, assignment, relational and logical expressions, selection, iteration, intrinsic functions, statement functions, subprograms, common communication. Applications using existing programs: sorting, word processing, graphics and plotting, simultaneous linear algebraic equations. The computer language employed in this subject is FORTRAN.

Mechanical and Manufacturing Engineering
Level II

MECH2300
Engineering Mechanics 2A
Staff Contact: Dr. S.S. Leong
U.5 S1 or S2 HPW2
Corequisite: MECH2300
Note/s: Restricted to Combined degree course 3681.
Kinetics of systems of particles; plane steady mass flow. Plane kinematics and kinetics of rigid bodies: motion of inertia; motion relative to translating and rotating frames of reference, equations of motion; work and energy, impulse and momentum. Virtual work for static and dynamic systems. Kinematics and kinetics of simple mechanisms.

MECH2310
Engineering Mechanics 2B
Staff Contact: J.M. Challen
U.5 S1 or S2 HPW2
Corequisite: MECH2300
Note/s: Restricted to Combined degree course 3681.

MECH2401
Mechanics of Solids 2A
Staff Contact: Dr. H.L. Stark
S1 L1 T1
Prerequisite: MATH1032 or MATH1042
Corequisite: MECH1400
Note/s: Excluded MATH2400
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 boly resulting from volume change and from distortion. Yield Criteria.

MECH2402
Mechanics of Solids 2B
Staff Contact: Dr. H. L. Stark
S2 L1.5 T2
Prerequisite: MECH2401
Note/s: Excluded MATH2400

MECH2500
Fluid Mechanics 1
Staff Contact: Prof. G. Morrison
F L1 T1
Prerequisites: MATH1032 or MATH1042, PHYS1919

MECH2700
Thermodynamics I
Staff Contact: A/Prof E. Leonardi
F L1 T1
Prerequisite: MATH1032 or MATH1042, PHYS1919


Medicine

MDCN8001
Principles of Medicine for Optometry Students
Staff Contact: A/Prof L. Simons (St Vincent's Hospital)
F HPW1
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

Microbiology and Immunology Level II Subjects

MICR2201
Introductory Microbiology
Staff Contact: Dr I. Couperwhite
U1 S1 HPW6
This introduction to microbiology is offered as a single unit elective. However, the subject is mandatory for students wishing to major in program 4400 Microbiology and Immunology. Students with no previous knowledge of biology can do this subject. A brief bridging course is available for students in this category.

MICR2011
Microbiology 1
Staff Contact: Prof S. Kjelleberg
U1 S2 HPW6
Prerequisites: BIOS1011, BIOS1021, MICR2201
Corequisites: BI OC2312 and BIOS2021

This unit is for students majoring in microbiology and who wish to enlarge their knowledge and skills in microbiology beyond those obtained in Introductory Microbiology or equivalent units at other institutions.


Microbiology and Immunology Level III

MICR3021
Microbial Genetics
Staff Contact: Prof A. Lee
U1 S1 HPW6
Prerequisites: BIOS2021, BIOC2312 and MICR2011
Note/s: Excluded BIOT3031.

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 genetics of nitrogen fixation.

MICR3041
Immunology I
Staff Contact: Prof G. Jackson
U1 S1 HPW6
Prerequisite: BIOC2312

Basic immunology and immunological techniques. Topics include innate and adaptive immunity, development of the immune system, induction and expression of the immune response, structure and function of antibodies, antigen-antibody reactions, the major histocompatibility complex, aspects of immunology in disease. ANAT2211 Histology 1 at Level II is strongly recommended for students doing Immunology I.

MICR3051
Immunology 2
Staff Contact: Dr A. Collins
U1 S2 HPW6
Prerequisite: MICR3041

Advanced immunology. Major topics include antigen epitope analysis, processing and presentation, lymphocyte biology, immunogenetics of the molecules of recognition, cytokines, immune regulation, the mucosal immune system, immunity to infectious diseases, vaccine development and clinical immunology.

MICR3061
Animal Virology
Staff Contact: Dr S. Hazell
U1 S2 HPW6
Prerequisite: MICR2011

Major topics include virus structure, classification and replication. A number of human diseases are discussed in the contexts of disease producing mechanisms and associated virus-host interactions, the persistence, transfer and control of virus infections in the community and of laboratory diagnosis of virus diseases.
Optometry

Optometry subjects are restricted to course 3950 and are listed in the course outline. For further information on Optometry subjects consult the School.

OPTM1201
Ocular and Visual Science I
Staff Contact: Mr G. Dick

OPTM1202
Clinical Optometry I
Staff Contact: Prof B. Holden
Lectures and practical assignments in visual acuity, keratometry, auto-refraction, visual fields, tonometry and colour vision, frame selection, facial fitting, insertion and removal of contact lenses.

OPTM1203
Physical and Geometrical Optics
Staff Contact: A/Prof D. Crewther

OPTM1204
Dispensing
Staff Contact: Mr I. Robinson
Mechanical optics and optical dispensing. Practical assignments in spectacle frame measurements, frame materials, basic fociometry, basic lens layout, lens glazing, frame adjustments.

OPTM1205
Measurement of Light and Colour
Staff Contact: A/Prof S. Dain

OPTM2106
Pathology for Optometry Students
Staff Contact: Prof B. Collin
Prerequisites: BIOS1011
Corequisites: PHPH2122
An introduction to the basic disease processes associated with trauma, acute and chronic inflammation, repair, regeneration, haemorrhage, thrombosis, embolism, ischaemia, infarction, degeneration, hyperplasia,
hypertrophy, atrophy, metaplasia, neoplasia, carcinogenesis and aging.

OPTM2107
Microbiology for Optometry Students
Staff Contact: Dr P. Anderton
Prerequisites: BIOS1011, OPTM2106
Corequisites: OPTM2107


OPTM2208
Diagnosis of Ocular Disease
Staff Contact: Prof B. Collin
Prerequisites: OPTM2106, OPTM2107
Corequisites: OPTM2302, OPTM2301

An introductory course on the aetiology, pathology, signs, symptoms, prognosis and management of diseases of the eyelids, cornea, conjunctiva, iris, ciliary body, choroid, retina, optic nerve, lens, vitreous, lacrimal apparatus, sclera and orbit. Additional topics include glaucoma and lesions of the visual pathways.

OPTM2301
Ocular and Visual Science II
Staff Contact: Dr P. Anderton
Prerequisites: BIOS1011, CHEM1809
Corequisite: PHPH2122

Provides familiarity with the structure and function of the human visual system. Topics include: the embryology of the eye; structure and function in the anterior eye; the orbit; extrinsic and intrinsic muscles; lens and accommodation; lids, glands and conjunctiva; intraocular pressure; the pupil; neural structure and function of the retina and visual pathways; vegetative retinal physiology; control of eye movements; physiology of colour and light perception.

OPTM2302
Clinical Optometry II
Staff Contact: Dr B. Junghans
Prerequisite: OPTM1202

Refraction, aetiology and treatment of ametropia, objective and subjective refraction, prescribing visual aids. Binocular vision: sensory and motor aspects: Orthoptics: Convergence/accommodation anomalies, strabismus, amblyopia. Contact lenses: contact lens design and manufacture, fitting techniques, care and maintenance. Interviewing and communication skills. Practical assignments in ophthalmoscopy, biomicroscopy, tonometry, visual fields, refraction, colour vision tests, assessment of binocular vision and strabismus.

OPTM2303
Spectacle Lens and Optical Systems
Staff Contact: Mr G. Dick
Prerequisites: OPTM1201, OPTM1203


Optics of intra-ocular implants and corneal refractive surgery.

OPTM3208
Diagnosis and Management of Ocular Disease
Staff Contact: Prof B. Collin
Prerequisites: OPTM2106, OPTM2107, OPTM2208
Corequisites: OPTM3301, OPTM3302, OPTM3309

An advanced study of the diagnosis, prognosis and management of specific diseases of the eyelids, cornea, conjunctiva, iris, ciliary body, choroid, retina, optic nerve, lens, vitreous, lacrimal apparatus, sclera and orbit. Additional topics include congenital abnormalities, glaucoma, lesions of the visual pathways, ocular manifestations of systemic disease and ocular side effects of therapeutic agents.

OPTM3301
Visual Science III
Staff Contact: Dr P. Anderton
Prerequisites: OPTM2301

Visual Psychophysics: Spatial and temporal effects in vision, form, motion, colour and depth processing; accommodation/convergence relationships; visual perception. Visual neuroscience: Relationship between structure and function in the retina and visual pathways; visual development, neural plasticity and critical periods; ocular motility; visuo-motor coordination; mechanisms underlying visual psychophysics; Neuro-ophthalmology. Applied Visual Science: Visual performance; lighting design.

OPTM3302
Clinical Optometry III
Staff Contact: Dr J. Klein
Prerequisites: OPTM2301, OPTM2302, OPTM2303, OPTM2106, OPTM2107, OPTM2208, PSYC2116
Corequisites: OPTM3301, OPTM3302, OPTM3309


OPTM3309
Ocular Science III
Staff Contact: Dr D. O'Leary
Prerequisites: OPTM2301

Anatomy and Physiology of the eye and adnexae: Aqueous secretion and drainage; maintenance of intraocular pressure; corneal metabolism and hydration; lacrimal secretion and drainage; crystalline lens and transparency; retinal metabolism, blood supply. Pathophysiology: glaucoma; presbyopia; effects of radiation; response to injury and disease; age related changes.
OPTM4301
Visual Science IV
Staff Contact: A/Prof D. Crewther
Prerequisite: OPTM3301
Physiology, anatomy and psychophysics of parallel processing of visual functions; After effects, apparent motion, illusions and constancies; Object recognition and primitives; Neural control mechanisms in accommodation, eye movements, fixation and attention; Comparative neuroscience of the visual system; Origins of visually evoked electric and magnetic fields; Visual proprioception; Visually directed activities; Visual control of eye growth; Plasticity and abnormalities of visual development.

OPTM4302
Clinical Optometry IV
Staff Contact: Mr D. O'Leary
Prerequisite: OPTM3301, OPTM3302, OPTM3208, OPTM3309, PSYC2116
Corequisite: OPTM4301, OPTM3410, OPTM4311, MDCN8001
Public Health Optometry, epidemiology, legal aspects, analysis of the work environment. Clinical experience: Diagnosis, management and treatment of ocular and visual conditions and diseases. Students will examine patients in the optometry clinic in the following areas: primary care, colour vision, low vision, children's vision, vision training, contact lenses and sports vision, as well as participating in patient review clinics.

OPTM4310
Research Project
Staff Contact: Dr D. O'Leary
Prerequisite: MATH2819, OPTM3301, OPTM3302, OPTM3309, OPTM3208
Under the supervision of academic staff, students will design and carry out a small research project.

OPTM4311
Current Issues in Optometry and Visual Science
Staff Contact: A/Prof S. Dain
Prerequisite: OPTM3301, OPTM3302, OPTM3309
Corequisite: OPTM4301, OPTM4302
Critical analysis of significant recent publications in the fields of Optometry and Visual Science. This will be treated in a forum where conflicting ideas on these topics will be presented and analysed by the students.

OPTM4312
Optometry and the Professional Environment
Staff Contact: Mr D. Pye

OPTM9041
Clinical Optometry
Staff Contact: Mr D. Pye
Prerequisites: OPTM9031, OPTM9032, OPTM9034
Students are required to examine patients in the Optometry Clinic, to diagnose their problems and to prescribe optical aids, orthoptic treatment or other management or referral as required. They also work in special clinics, including orthoptics, colour vision, low vision, children's vision and contact lenses, and participate in patient review clinics.

OPTM9042
Optometry B
Staff Contact: A/Prof S. Dain
Prerequisites: OPTM9031, OPTM9032, OPTM9033, OPTM9034
Public health optometry: contact lens fitting; pharmacology for optometrists; paediatric optometry; colour vision; advanced physiological optics; current issues and research; legal aspects; projects.

OPTM9043
Optometry and the Professional Environment
Staff Contact: Mr D. Pye

Pathology

Pathology Level III
PATH3201
Basic and Applied Pathology
Staff Contact: A/Prof C. Howlett
Prerequisites: ANAT2211, ANAT2111, PHPH2112 or equivalent

Lectures, tutorials and practical class demonstrations. Includes exposition of the basic classification of pathological processes, study of the processes of cell and tissue degeneration, acute and chronic inflammation, vascular disease, including thrombosis, embolism, ischaemia and infarction. Coverage of the processes of healing and regeneration with specific reference to healing of skin wounds and the healing of fractures. Aberrations of cell growth used to introduce the subject of neoplasia and carcinogenesis. Exposure to examples of specific disease entities of general practical importance exemplifying the basic or fundamental processes such as appendicitis, pneumonia, bone diseases, arthritis, pulmonary and myocardial infarction as well as lung, alimentary and cerebral tumours. Correlation of pathological processes with development of specific clinical syndromes.

Pathology Level IV
PATH0005/PATH0006
Pathology (Honours)
Staff Contact: Prof A. Lykke
Prerequisites: completion of program 7000 including 6 Level III units
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 two Level I subjects:

Each of these has 1-unit value. They can be taken separately, and students can gain Upper Level status in Philosophy (qualify to enrol in Upper Level subjects) by passing in only one. However, students enrolling in one will normally enrol in both, and students wishing to major in Philosophy must do so.

PHIL1006
Introductory Philosophy A
Staff Contact: Philip Cam, Convenor
U1 C6 S1 HPW3
Note/s: Excluded 52.103.
A team-taught introduction to philosophical thought and issues through study of traditional and contemporary discussions of three topic areas: the nature of argument, ethics and political philosophy, and philosophy of mind.

PHIL1007
Introductory Philosophy B
Staff Contact: Neil Harpley, Convenor
U1 C6 S2 HPW3
Note/s: Excluded 52.104.
This subject is independent from Introductory Philosophy A, but structured in the same way. Students may enrol in both subjects or in either subject without the other. This subject is a further team-taught introduction to philosophy. In 1993, the topic areas included science and religion, questions of freedom and Freud on the self.

Value of Upper Level Subjects in Philosophy
All Upper Level subjects are full units.

Specialisation In Philosophy
Students majoring in Philosophy must complete, in addition to PHIL1006 and PHIL1007 (Introductory Philosophy A and Introductory Philosophy B), the equivalent of six full point Upper Level (II/III) units. Of these, at least four units must be chosen from List A, which includes subjects in Logic, Philosophy of Mind, Philosophy of Science, and areas of History of Philosophy relevant to those subject areas. Students normally take the equivalent of two Level II/III units in Year 2, and the equivalent of four Level II/III units in Year 3. Subject to the approval of the School, which considers the individual subjects nominated by a student and the student's overall program in Philosophy, a student may be permitted to count up to one unit offered outside the School toward specialisation in Philosophy.

List A
PHIL2106 Logic
PHIL2107 Advanced Philosophy of Science
PHIL2108 Ways of Reasoning
PHIL2116 Scientific Method
PHIL2117 Philosophical Logic
PHIL2206 Contemporary Philosophy of Mind
PHIL2207 Issues in the Philosophy of Psychology
PHIL2216 Human Nature and Human Understanding: the Empiricist Approach
PHIL2217 Personal Identity
PHIL2218 Philosophical Foundations of Artificial Intelligence
PHIL2219 Topics in Philosophy of Language
PHIL2226 Twentieth Century Analytic Philosophy
PHIL2227 Hume, Leibniz, Kant: Themes in Metaphysics
PHIL2308 Reason and the Passions: Descartes, Spinoza and Hume
PHIL2417 Relativism: Cognitive and Moral
PHIL2518 Greek Philosophy: Issues in Ethics and Epistemology
PHIL3106 PreHonours Seminar

The remaining two units are to be chosen from other Upper Level Philosophy subjects.

Level II/III

Some Upper Level subjects deal with particular philosophical topics; others can be taken in sequence to give more sustained treatments of larger areas. Students may select freely among these, subject to stipulations regarding prerequisites. They are welcome to seek advice and further information from the School.

In certain circumstances the prerequisites specified for subjects may be waived; for example, in the case of students who have already studied similar material, or who wish to take isolated subjects relevant to another discipline. Students who feel they have a case for a concession of this kind should consult the School.

Honours Entry Requirements
Students intending to proceed to the award of an Honours degree in Philosophy must normally complete years 13 of programs 5200 (Philosophy) or 5262 (Philosophy of Science) with an average of at least 70% in their Philosophy subjects, including at least one Distinction result; plus PHIL3106 (Pre-Honours Seminar). Subject to the approval of the School, which considers the individual subjects nominated by a student and the student's overall program in Philosophy, a student may be permitted to count up to one unit offered outside the School toward satisfying the Honours entry requirements. Students contemplating Honours are urged to seek advice from the School early in their course.

Philosophy Level II/III

Notes: 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 subject. 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 8 Philosophy units.
PHIL2106
Logic
Staff Contact: Stephen Hetherington
U1 C6 S1 HPW3
Prerequisite: Any Level 1 subject
Note/s: Excluded 52.2030 and 52.2031, 52.220, MATH3400.

This subject 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.

PHIL2107
Advanced Philosophy of Science
Staff Contact:
U1 C6 S2 HPW3
Prerequisite: Upper Level status in Philosophy, or contact School
Note/s: Excluded 52.304. Might not be offered in 1994 - consult School.

Explores some current issues in the philosophy of the sciences and includes discussion of the role of experiment in science; the cognitive status of theories; explanation; inter-theoretical reduction; reductionism; models and metaphors; the issues of scientific realism and anti-realisms.

PHIL2108
Ways of Reasoning
Staff Contact: San MacColl
U1 C6 S2 HPW3
Prerequisite: Upper level status in Philosophy

Material for this subject is drawn from everyday sources, such as newspapers, books and advertisements, and including television. Deals with the nature of argument, fallacies, reasoning and the role of reasoning. From studying the structure of arguments students will be able to improve their critical skills and the presentation of their own arguments.

Assessment: Three short assignments and one 2000 word essay.

PHIL2109
Metaphysics (Realisms)
Staff Contact: Stephen Hetherington
U1 C6 S2 HPW3
Prerequisite: Upper Level status in Philosophy

Examines several classic metaphysical questions, each of which concerns some kind of realism. (i) Realism in general (ii) Realism about *universals* (iii) Modal realism: (iv) Realism about *persons*. We will think about truth, about the relation between the general and the particular, about whether this is the only possible world, about whether individuals have essences - and even about whether there are non-existent objects.

PHIL2116
Scientific Method
Staff Contact: Michaelis Michael
U1 C6 S1 HPW3
Prerequisite: Upper Level status in Philosophy, or contact School
Note/s: Excluded 52.2140.

Science has a serious claim to being the major cultural force shaping our world-view. The aim of this subject is to enable us to understand better our own view about science by tracing their historical development. Examines, in some depth, the conceptions of science to be found in the writings of Aristotle, Descartes, various Positivists, and some more recent philosophers, with a view to understanding how their conceptions of science and their conceptions of which questions philosophers should ask about science differ from each other and from our own.

PHIL2117
Philosophical Logic
U1 C6 S2 HPW3
Prerequisite: PHIL2106 or equivalent, or contact School
Note/s: Might not be offered in 1994 - consult School

Explores some current issues in the philosophy of the sciences and includes discussion of the role of experiment in science; the cognitive status of theories; explanation; inter-theoretical reduction; reductionism; models and metaphors; the issues of scientific realism and anti-realisms.

PHIL2206
Contemporary Philosophy of Mind
Staff Contact: Philip Cam
U1 C6 S1 HPW3
Prerequisite: Upper Level status in Philosophy
Note/s: Excluded 52.2002, 52.250.

An introduction to some major issues in the field. There are three topics: (1) On relating the Mental to the Physical; (2) Alternative Approaches to the Psychology of Belief and Desire; and (3) The Psychology of Experience and Consciousness.

PHIL2207
Issues in the Philosophy of Psychology
U1 C6 S2 HPW3
Prerequisite: Upper Level in Philosophy or PSYC1002
Note/s: Excluded 52.2003, 52.251.

Philosophical issues in theoretical psychology, drawn from philosophical and psychological writings on personal identity, consciousness and self-knowledge, perceptual illusions, processing systems, psychology and brain science.

PHIL2208
Epistemology (Scepticisms)
Staff Contact: Stephen Hetherington
U1 C6 S1 HPW3
Prerequisite: Upper Level status in Philosophy

All of us acknowledge that there are things we do not know. But such humility can turn into perplexity when we encounter epistemological sceptics. A sceptic typically denies us either vast amounts of knowledge or justification of some select, but extremely everyday, sorts of apparent knowledge or justification. In short, sceptics argue for surprising denials of knowledge or justification. Examines some historically prominent sceptical ways of thinking, which 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: Stephen Hetherington
U1 C6 S2 HPW3
Prerequisite: Upper Level status in Philosophy

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 subject 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.

PHIL2216
Human Nature and Human Understanding: the Empiricist Approach
Staff Contact: Neil Harpley
U1 C6 S1 HPW3
Prerequisite: Upper Level status in Philosophy
Note/s: Excluded 52.2130, 52.2170, 52.231.

The traditional empiricists — Locke, Berkeley and Hume — developed a substantial framework for theories concerning human nature and particularly for the consideration of issues arising in the attempt to explain our perception and knowledge of the world. The empiricist approach to these matters was revived and became dominant in the first half of this century. Concentrates on the traditional empiricists and looks at the continuation of discussion of some of their major concerns in modern empiricism.

PHIL2217
Personal Identity
Staff Contact: Neil Harpley
U1 C6 S1 HPW3
Prerequisite: Upper Level status in Philosophy
Note/s: Excluded 52.2180, 52.232.

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: Phillip Staines
U1 C6 S2 HPW3
Prerequisite: Upper Level status in Philosophy
Note/s: Excluded 52.2026.

Artificial Intelligence: an examination of its assumptions, history, goals, achievements and prospects.

PHIL2219
Topics in Philosophy of Language
U1 C6 S1 HPW3
Prerequisite: Upper Level status in Philosophy
Note/s: Might not be offered in 1994 - consult School.

The subject is divided into two parts. Part I 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 II 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
U1 C6 S2 HPW3
Prerequisite: Upper Level status in Philosophy
Note/s: Might not be offered in 1994 - consult School

As well as asking how modern Anglo-American philosophy is different from its predecessors, we also look at ways in which its ideas and concerns are continuous with those of other epochs and traditions. Readings include selections from Frege, Russell, Wittgenstein, Quine, Kripke, Putnam. Themes include: the rejection of Hegelian idealism, atomism and holism, the influence of empiricism, the revival of Platonism through philosophy of mathematics, ideas about existence and ontology, the revival of Aristotelian essentialism, the return to a sort of idealism. No prior familiarity with these writers will be assumed. Moreover, we steer clear of papers that make heavy use of formal logic.

PHIL2227
Hume, Leibniz, Kant: Themes in Metaphysics
U1 C6 S1 HPW3
Prerequisite: Upper Level status in Philosophy
Note/s: Might not be offered in 1994 - consult School

Examines the writings of Hume, Leibniz and Kant on some central issues in metaphysics, which include: the nature of causality, the existence of the external world, what we can know about the world a priori, the nature of space and time, the self. Our concern is first, to understand their views on these topics, second, to explore how their views are historically and conceptually connected and third, to try to assess their views. Required readings are almost exclusively from primary sources.

PHIL2308
Reason and the Passions: Descartes, Spinoza and Hume
Staff Contact: Genevieve Lloyd
U1 C6 S2 HPW3
Prerequisite: Upper Level status in Philosophy
Note/s: Excluded 52.2021, 52.2024, 52.215.

Philosophical distinctions between reason and the passions, and the role that philosophers have given — or denied — reason in understanding and controlling the passions. The reason-passion distinction is discussed in relation to other distinctions between — mind and body, theoretical and practical reason, interests and passions, male and female; and also in relation to contemporary attitudes to rationality.
PHIL2309
The Heritage of Hegel: The Concept of Experience
Staff Contact: Lisabeth During
U1 C6 S2 HPW3
Prerequisite: Upper Level status in Philosophy
Note/s: Excluded 52.221, 52.3025 in 1988.
In his book The Phenomenology of Mind, Heidegger declares that philosophy is not an escape from experience but a form of experience. The life of consciousness is continuous from the simplest bodily reflex to the most sophisticated scientific or cultural reflection. With the Phenomenology as our central reading, we look at different writers since Hegel who demand that philosophic thinking bring itself closer to the texture and qualities of lived experience. Discussion will cover Hegel's predecessors as well as opponents and admirers.

PHIL2316
Philosophy of Religion
U1 C6 S2 HPW3
Prerequisite: Upper Level status in Philosophy
Note/s: Might not be offered in 1994 - consult School.
A discussion of some main topics in the philosophy of religion (the question of God, religious language, the problem of evil, mysticism and faith) which are considered via two influential approaches: that of analytic philosophy and phenomenology/hermeneutics.

PHIL2407
Contemporary European Philosophy: Intensities
Staff Contact: Lisabeth During
U1 C6 S2 HPW3
Prerequisite: Upper Level status in Philosophy
Note/s: Excluded 60.014, EURO2400.
An introduction to the 'philosophy' of some influential contemporary thinkers whose relation to philosophy is contested. Readings are drawn from the work of Freud, Kristeva, Benjamin, Breton, Lyotard, Adorno, Bataille, Derrida, Artaud, and Deleuze. Discussion focuses on ideas of rationality, civilisation, experience, and violence.

PHIL2409
Speaking through the Body: Feminism, Psychoanalysis, Literature
Staff Contact: Lisabeth During
U1 C6 S1 HPW3
Prerequisite: Upper Level status in Philosophy
How natural is sex anyway? Do we act the parts of masculine and feminine or do they act us? The language of the body is 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 discussed include: transvestitism and gender ambivalence; alternatives to heterosexuality; relations between femininity 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: San MacColl
U1 C6 S1 HPW3
Prerequisite: Upper Level status in Philosophy
Covers the work of Foucault, with attention to his continuation of a tradition founded in Nietzsche, and his view of the role of philosophy in contemporary life. Begins with the analysis of discourse ('Orders of Discourse'), the account of thought in the classical age (The Order of Things), the shift from archaeology to genealogy, the inseparability of power/knowledge (e.g. Discipline and Punish) and finishes with the way a subject is socially and ethically constituted at different times (The History of Sexuality).

PHIL2417
Relativism: Cognitive and Moral
U1 C6 S2 HPW3
Prerequisite: Upper Level status in Philosophy, or contact School
Note/s: Not offered in 1994.
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 one 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
U1 C6 S1 HPW3
Prerequisite: Upper Level status in Philosophy
Note/s: Might not be offered in 1994 - consult School
An examination of a range of current ethical issues involved in topics such as abortion, surrogacy, foetal tissue research, euthanasia, AIDS.

PHIL2506
Classical Political Philosophy
Staff Contact: Stephen Cohen
U1 C6 S1 HPW3
Prerequisite: Upper Level status in Philosophy
Note/s: Excluded 52.203, 52.2050, 52.240.
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.

PHIL2507
The Ethics of Plato and Aristotle
Staff Contact: Stephen Cohen
U1 C6 S1 HPW3
Prerequisite: Upper Level status in Philosophy
Theories in Moral Philosophy
Staff Contact: Stephen Cohen
U1 C6 S2 HPW3
Prerequisite: Upper Level status in Philosophy
Note/s: Excluded 52.523, 52.2230, 52.5232, 52.243.
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.

Philosophy of Law
Staff Contact: Stephen Cohen
U1 C6 S2 HPW3
Prerequisite: Upper Level status in Philosophy
Note/s: Excluded 52.105, 52.2150, 52.241.
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.

Philosophical Foundations of Marx's Thought
U1 C6 HPW3
Prerequisite: Upper Level status in Philosophy
Note/s: Not offered in 1994. Excluded 52.373, 52.219.

Philosophy and Gender
U1 C6 S2 HPW3
Prerequisite: Upper Level status in Philosophy
Note/s: Excluded 52.216. Might not be offered in 1994 - consult school.
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.
Assessment: Two essays of 2,000 words each.

Greek Philosophy: Issues in Ethics and Epistemology
Staff Contact: Genevieve Lloyd, San MacColl
U1 C6 S2 HPW3
Prerequisite: Upper Level status in Philosophy
Note/s: Excluded 52.2040, 52.2220, 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.

Introduction to Chinese Philosophy
U1 C6 S2 HPW3
Prerequisite: Upper Level Status - students must be in Year 2 or later of university study.
Note/s: Might not be offered in 1994 - Consult School.
Aims to introduce the philosophical concepts and theories of traditional China and to introduce recent Western discussion on the subject of Chinese philosophy. Deals with the major philosophical debates of ancient China and with some issues from later periods. In passing, the subject also deals with the 'Chinese worldview' and attempts to clarify popular notions like 'Confucianism', 'the Tao' or 'the philosophy of the Book of Changes'. It represents Chinese philosophy as a complex discipline which has tackled similar issues to those tackled in the West, and has developed comparable means of analysis and argument.

Aesthetics
Staff Contact: Genevieve Lloyd
U1 C6 S2 HPW3
Prerequisite: Upper Level status in Philosophy
Note/s: Might not be offered in 1994 - Consult School. Excluded 52.273, 52.2260.
Emphasis is placed on the visual arts, although the subject also deals with literature and film. Topics include: realism and representation; the dialectics of tradition and innovation; the idea of aesthetic experience; the sexuality of art and the observer.
Assessment: To be decided in consultation with the class.

Philosophy and Literature
Staff Contact: Genevieve Lloyd
U1 C6 S2 HPW3
Prerequisite: Upper Level status in Philosophy
Note/s: Not offered in 1994.

Seminar A
U1 C6 S1 HPW3
Note/s: Might not be offered in 1994 - Consult School.
Admission by permission, based on a student's performance in Upper Level subjects. Topics vary and are influenced by student requests. Students are invited to approach any member of staff about the possibility of particular seminar topics.

Seminar B
U1 C6 S2 HPW3
Note/s: Might not be offered in 1994 - Consult School.
Admission by permission, based on a student's performance in Upper Level subjects. Topics vary and are influenced by student requests. Students are invited to approach any member of staff about the possibility of particular seminar topics.

Reading Option
U1 C6 S1 or S2 HPW3
Students wishing to do work in an area not covered by an existing subject or seminar may apply to the School to take a reading option. Not more than one such subject 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.

Philosophy Level III
Notes: Level III Status in Philosophy consists of having an overall standard of credit or higher in 8 Philosophy units.
PHIL3106
Pre-Honours Seminar
Staff Contact: Lisabeth During/Convenor
U1 C6 S2 HPW3
Prerequisite: 30 credit points in Philosophy with overall standard of Credit or higher

A subject 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

PHIL4000/PHIL4050
Philosophy Honours (Research)
Staff Contact: Genevieve Lloyd, Neil Harpley/Coordinators
U10 F
Prerequisites: Completion of program 5200, 5262 or 5206 including 7 Level III units

The Honours Year consists of writing a research thesis under supervision and two seminar courses.

PHIL4050
Philosophy Honours (Research) P/T
Staff Contact: Genevieve Lloyd, Neil Harpley/Coordinators
U10 F
Prerequisites: Completion of program 5200, 5262 or 5206 including 7 Level III units

PHIL4500
Combined Philosophy Honours (Research) F/T
Staff Contact: Genevieve Lloyd, Neil Harpley/Coordinators
U10 F
Prerequisites: Completion of program 5200, 5262 or 5206 including 7 Level III units

PHIL4550
Combined Philosophy Honours (Research) P/T
Staff Contact: Genevieve Lloyd, Neil Harpley/Coordinators
U10 F
Prerequisites: Completion of program 5200, 5262 or 5206 including 7 Level III units

Students contemplating Honours are urged to seek advice from the School on their program early in their course.

The Category C General Education requirements will be met within the Honours Program by seminars and a statement.

Elective Syllabus

Those students enrolled in a physics program in the Science Course, and who have achieved a satisfactory performance in Session 1, may elect to take the following option for Session 2.

QUANTUM AND LASER 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; tests of Planetary atmospheres.

PHYS1022
Physics 1 For Health and Life Scientists
Staff Contact: First Year Director
U2 F HPW6
Corequisites: MATH1011 and MATH1021 or MATH1032.

Principally for students majoring in the life and health sciences disciplines. Topics at an introductory level.

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, ions and ionic conduction, magnetism and electromagnetic induction, alternating current, atomic nature of matter, X-rays, the nucleus and radio-activity, geometrical optics, optical instruments, wave optics, microscopes and their uses.

PHYS1601
Computer Applications in Experimental Science 1
Staff Contact: First Year Director
U1 S1 or S2 HPW6
Corequisites: PHYS1002 or PHYS1022, MATH1032
Notes: Excluded PHYS1611.

An introduction to the internal structure, operating and interfacing of computers. Binary and digital electronic logic; logic control devices; bus communication structures;
instruction execution in a processor; machine language code and instruction sets; interfaces and interaction schemes between processor and the outside world.

**PHYS1611**  
**Laboratory Computers in Physical Science**  
*Staff Contact: First Year Director*  
U1 HPW6  
*Corequisites: MATH1011 and MATH1021 or MATH1032 and PHYS1002 or PHYS1022*  
*Note/s: Excluded programs 0600. Not offered in 1994.*

**PHYS1999**  
**Physics I (Optometry)**  
*Staff Contact: First Year Director*  
U1 S1 HPW6  
*Note/s: Restricted to course 3950.*  

**Physics Level II Subjects**

*Notes: Where mathematics subjects are specified as prerequisites or as co-requisites, the higher levels of such subjects are acceptable and preferable. Students are also advised that other subjects may be acceptable equivalent prerequisites or co-requisites to those listed, eg Unit PHYS2989 of course 3640 may be acceptable in place of PHYS2021. Enquiry should be made to the School of Physics.*

**PHYS2001**  
**Mechanics, and Computational Physics**  
*Staff Contact: Executive Assistant*  
U1 S1 HPW4  
*Prerequisites: PHYS1002, MATH1032.*  
*Corequisite: MATH2100*  
*Note/s: Excluded PHYS2999.*

Harmonic motion, systems of particles, central force problems. Lagrange's equations, coupled oscillations, travelling waves, pulses, energy and momentum transfer, computer operating systems, introduction to FORTRAN; libraries and software packages, use of computers to solve problems in physics.

**PHYS2011**  
**Electromagnetism and Thermal Physics**  
*Staff Contact: Executive Assistant*  
U1 S2 HPW4  
*Prerequisites: PHYS1002, MATH1032.*  
*Corequisites: MATH2100*  
*Note/s: Excluded PHYS2999.*

Electric field strength and potential, Gauss' law, Poisson's and Laplace's equations, capacitance, dielectrics and polarisation, magnetism, electro-magnetic induction, Maxwell's equations, electromagnetic waves. Laws of thermodynamics, kinetic theory, microscopic processes, entropy, solid state defects, Helmholtz and Gibbs functions, Maxwell's relations, phase diagrams, chemical and electrochemical potential.

**PHYS2021**  
**Quantum Physics and Relativity**  
*Staff Contact: Executive Assistant*  
U1 F HPW2  
*Prerequisites: PHYS1002, MATH1032*  
*Note/s: Excluded PHYS2989.*


**PHYS2031**  
**Laboratory**  
*Staff Contact: Executive Assistant*  
U1 F HPW3  
*Prerequisites: PHYS1002, MATH1032*  
*Note/s: Excluded PHYS2920.*

Experimental investigations in a range of areas: x-ray diffraction, work function, semiconductor bandgap. Hall effect, carrier lifetimes, nuclear magnetic resonance, magnetic properties and electrostatics. Electronics bench experiments and tutorials on diodes, transistors, operational amplifiers, power supplies and digital electronics.

**PHYS2160**  
**Astronomy**  
*Staff Contact: Executive Assistant*  
U.5 S2 HPW2  
*Prerequisite: PHYS1002*  
Galaxies, the distance scale, large structure of the universe, galaxy evolution, the very early universe.

**PHYS2410**  
**Introductory Biophysics**  
*Staff Contact: Executive Assistant*  
U.5 S2 HPW2  
*Prerequisite: PHYS1002 or PHYS1022.*


**PHYS2500**  
**Methods In Mathematical Physics**  
U.5 HPW2  
*Prerequisites: PHYS1002, MATH1032.*  
*Corequisites: MATH2100, MATH2120, MATH2510*  
*Note/s: Not offered in 1994.*

**PHYS2601**  
**Computer Applications in Experimental Science 2**  
*Staff Contact: Executive Assistant*  
U1 S1 HPW5  
*Prerequisite: 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 beyond the computer's capabilities.
PHYS2810
Introductory Atmospheric Science
Staff Contact: Executive Assistant
U.5 S1 HPW2
Prerequisites: PHYS1002 or PHYS1022, MATH1032
Note/s: Excluded PHYS3180.
Introduction to the properties and problems of the atmosphere: composition and structure, thermodynamics and stability, solar and terrestrial radiation, ozone layer, equations of motion and their consequences, physical basis of climate and climate change.

PHYS2820
Introductory Meteorology
Staff Contact: Executive Assistant
U.5 S2 HPW3
Corequisite: PHYS2810
Note/s: Not offered in 1994.

Physics Level III Subjects
Notes: See notes for Physics Level II subjects.

PHYS3010
Quantum Mechanics
Staff Contact: Executive Assistant
U.5 S1 HPW2
Prerequisites: PHYS2021
Corequisite: MATH2120
Fundamental principles, harmonic oscillator systems, spherically symmetric systems, angular momentum, hydrogen atom, perturbation theory, variational methods, identical particles, quantum theory of atoms.

PHYS3021
Statistical Mechanics and Solid State Physics
Staff Contact: Executive Assistant
U1 S1 HPW4
Prerequisites: MATH2120, PHYS2011, PHYS2021
Canonical distribution, paramagnetism, Einstein solid, ideal gas, equipartition, grand canonical ensemble, chemical potential, phase equilibria, Fermi and Bose statistics, Bose condensation, blackbody radiation. Crystal structure, bonding, lattice dynamics, phonons, free-electron models of metals, band theory, point defects, dislocations.

PHYS3030
Electromagnetism
Staff Contact: Executive Assistant
U.5 S1 HPW2
Prerequisites: PHYS2011, MATH2100, MATH2120
Electromagnetic fields; Maxwell's equations, Poynting theorem, electromagnetic potentials, electromagnetic waves. Reflection and transmission, Fresnel equations, waveguides, radiation fields, dipoles and antenna theory.

PHYS3041
Experimental Physics A
Staff Contact: Executive Assistant
U1 F HPW4
Prerequisite: PHYS2031.
Basic experimental techniques and analysis of results in the following areas: electricity, magnetism, diffraction optics including X-ray and electron diffraction, solid state physics, nuclear physics, atomic physics and spectroscopy, vacuum systems.

PHYS3050
Nuclear Physics
Staff Contact: Executive Assistant
U.5 S2 HPW2
Corequisite: PHYS3010
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
U.5 S2 HPW2
Prerequisite: PHYS1002
Corequisite: MATH2120
Review of geometrical optics, including ray tracing, aberrations and optical instruments: physical optics, including Fresnel and Fraunhofer diffraction, transfer functions, coherence, and auto and cross correlation: applications of optics, including fibre optics, lasers and holography.

PHYS3110
Experimental Physics B1
Staff Contact: Executive Assistant
U.5 S1 HPW4
Prerequisite: PHYS2031
Selected experiments and projects. Advanced experimental techniques and open ended projects in the areas covered in PHYS3041 Experimental Physics 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
U.5 S2 HPW4
Prerequisite: PHYS2031
As for PHYS3110 Experimental Physics B1.

PHYS3160
Astrophysics
Staff Contact: Executive Assistant
U.5 S2 HPW2
Prerequisite: PHYS2021

PHYS3310
Physics of Solid State Devices
Staff Contact: Executive Assistant
U.5 S2 HPW2
Prerequisite: PHYS2021
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
U.5 S2 HPW2
Corequisite: PHYS3021
Superconductivity, Meissner-Ochsenfeld effect, entropy, thermodynamics and relevant theories, Josephson junctions. Amorphous materials, preparation, magnetic properties, bandgaps, dangling bonds and ESR, mobility edge, solar cells. Polymers, structure, bonding, relaxation phenomena, electrical breakdown, liquid crystals.

PHYS3410
Biophysics
Staff Contact: Executive Assistant
U.5 S2 HPW2
Prerequisites: PHYS2011, PHYS2410

PHYS3510
Advanced Mechanics, Fields and Chaos
Staff Contact: Executive Assistant
U.5 S1 HPW2
Prerequisites: PHYS2001, MATH2100, MATH2510
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.

PHYS3530
Advanced Quantum Mechanics
Staff Contact: Executive Assistant
U.5 S2 HPW2
Corequisite: PHYS3010
Formal structure, Hilbert space, Dirac notation, matrix diagonalization. Equations of motion, Schroedinger, Heisenberg and interaction pictures. Relativistic quantum mechanics, Klein-Gordon and Dirac equation, antiparticles. Introduction to group theory, representations, Lie algebras, rotation group, SU(2) and SU(3), quarks.

PHYS3550
General Relativity
Staff Contact: Executive Assistant
U.5 S2 HPW2
Prerequisites: PHYS2021, MATH2510, MATH2100
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.

PHYS3560
Relativistic Electrodynamics and Plasma Physics
Staff Contact: Executive Assistant
U.5 S2 HPW2
Prerequisites: PHYS2021, MATH2510
Corequisite: PHYS3030
Relativistic transformations of electric and magnetic quantities, covariant formulation of electrodynamics, fourvectors, generation of electromagnetic fields by accelerated charges. Motion of charged particles in fields, bulk motions of a plasma, magnetic confinement and the pinch effect, waves in a plasma.

PHYS3601
Computer Applications in Instrumentation
Staff Contact: Executive Assistant
U1 S2 HPW5
Prerequisite: PHYS2601
Developments in computer architecture and hardware such as digital signal processors, parallel computing architectures, neural networks etc; computers and microcontrollers in instrumentation and control applications. Seminars on architecture, instrumentation and control. Projects on peripheral and standalone systems.

PHYS3610
Computational Physics
Staff Contact: Executive Assistant
U.5 S2 HPW3
Prerequisites: PHYS2001, PHYS2021, MATH2120
Use of computers in solving and visualising physical problems, including applications of least squares techniques, quantum mechanical eigenvalues and boundary value problems (Woods Saxon potential, Poisson's equation, heat conduction) and simulation techniques (phase transitions, molecular dynamics, chaos and stability).

PHYS3620
Computer Based Signal Processing
Staff Contact: Executive Assistant
U.5 S2 HPW3
Prerequisites: PHYS2031, MATH2120
Note/s: Excluded ELEC4042.
Measurement and sampling; noise power spectra; signalto noise improvement using digital techniques: digital filters, auto- and cross- correlation, methods based on Fourier transformation; system response including transfer functions, convolution, image enhancement.

PHYS3630
Electronics
Staff Contact: Executive Assistant
U.5 S1 HPW3
Prerequisite: PHYS2031

PHYS3710
Lasers and Applications
Staff Contact: Executive Assistant
U.5 S1 HPW2
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
U.5 S1 HPW2
Note/s: Offered in even-numbered years only.
Introduction to non-linear optics, second harmonic generation, parametric amplification, phase matching, optical bistability, modulation of light, types of optical detectors including thermal detectors, photomultipliers and semiconductor detectors.

PHYS3760
Laser and Optoelectronics Laboratory
Staff Contact: Executive Assistant
U.5 S2 HPW4
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.

PHYS3810
Applications of Radiation
Staff Contact: Executive Assistant
U.5 S2 HPW2
Corequisite: PHYS3030
Radiation laws, equation of transfer, absorption, emission and scattering of light by molecules and particles, multiple scattering, solution of multiple scattering problems, thermal transfer, band models, applications to planetary atmospheres, remote sensing, climate.

Physics Level IV

PHYS4103/PHYS4113
Physics 4 (Honours)
Staff Contact: Prof D Haneman
U.10 F
Prerequisites: Completion of program 0100 including 7 Level III units, or 0161 including 6 Level III units
Note/s: For the combined Physics/Geology honours see entry under Board of Studies in Science and Mathematics.
Honours programs consist of advanced lecture units and project work. Students normally undertake two separate projects during the year, in different research areas. All students take units in quantum mechanics, statistical mechanics and solid state physics. Four additional units are chosen from topics such as astronomy, atomic and molecular spectroscopy, condensed matter physics, experimental methods, biophysics, quantum field theory and quantum theory of solids.
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.

PHYS4411
Medical Physics
Staff Contact: Dr M. Bellby
U.1 F HPW2
Prerequisite: PHYS2021
Radiotherapy: radiation sources, interactions of radiation with the body, radiation detection and measurement. Dosimetry and radiotherapy planning. Radioisotopes, brachytherapy.

PHYS4413
Medical Physics Projects
Staff Contact: Dr M. Bellby
U.3 F 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.

PHYS1909
Astronomy
Staff Contact: First Year Director
An overview of Astronomy from the solar system to the stars and galaxies. Includes: exploring our solar system, the search for other solar systems; stars, their properties, evolution to pulsars, neutron stars and black holes; galaxies, radio galaxies and quasars; the expanding universe and cosmology.

PHYS1919
Physics 1 (Mechanical Engineering)
Staff Contact: First Year Director

PHYS1929
Physics 1 (Surveying)
Staff Contact: First Year Director

PHYS1939
Physics 1 (Building and Industrial Design)
Staff Contact: First Year Director
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.

**PHYS1969**

**Physics 1 (Electrical Engineering)**

*Staff Contact: First Year Director*

Electrostatics, magnetostatics in vacuum, ferromagnetism, electromagnetic induction. Vectors, kinematics, particle dynamics, work and energy, the conservation of energy, conservation of linear momentum, rotational kinematics and dynamics, simple harmonic motion, gravitation. Temperature, heat and the first law of thermodynamics, kinetic theory of gases. Waves in elastic media, sound waves, interference, diffraction, grating and spectra, polarisation. Relativity, quantum physics, wave nature of matter.

**PHYS1989**

**Physics 1 (Civil Engineering)**

*Staff Contact: First Year Director*

For students in the School of Civil Engineering.


**PHYS2920**

**Electronics (Applied Science)**

*Staff Contact: Executive Assistant*

U.5 S1 HPW3

*Prerequisite:* PHYS1022 or PHYS1002

*Note/s:* Excluded PHYS2031, PHYS2630.

The application of electronics to other disciplines. Includes principles of circuit theory; amplifiers, their specification and application, transducers; electronic instrumentation; industrial data acquisition.

**PHYS2959**

**Introduction to Semiconductor Physics (Computer Engineering)**

*Staff Contact: Executive Assistant*

Structural properties of solids; free electrons in metals; introductory quantum physics; band theory; semiconductor in equilibrium.

**PHYS2969**

**Physics of Measurement (Surveying)**

*Staff Contact: Executive Assistant*

Resolution, accuracy and sensitivity of instruments. Errors of observation; transducers; electrical noise; mechanical design of apparatus; optical instruments, optical fibres; photometry; analogue-to-digital conversion and digital instruments. Measurements of very large and very small quantities.

**PHYS2979**

**Electromagnetic Theory**

*Staff Contact: Executive Assistant*


**PHYS2989**

**Solid State Physics (Electrical Engineering)**

*Staff Contact: Executive Assistant*

The concepts of waves and particles, introductory quantum mechanics, atomic structure, optical spectra and atomic structure, structural properties of solids, band theory and its applications, uniform electronic semiconductors in equilibrium, excess carriers in semiconductors.

**PHYS2999**

**Mechanics and Thermal Physics (Electrical Engineering)**

*Staff Contact: Executive Assistant*

Particle mechanics, harmonic motion, central force problems, systems of particles, Lagrange's equations with applications, coupled oscillations, wave equation. Thermodynamic laws, entropy, kinetic theory, M-B distribution, microscopic processes, Maxwell's relations, chemical potential, phase diagrams, multicomponent systems, electrochemical potential, statistics of defects in solids.

**Physiology and Pharmacology**

**Physiology and Pharmacology Level II**

*Notes:* Normal prerequisites for the courses in Physiology may be waived by the Head of School for students with a good academic record.

**PHPH2112**

**Physiology 1**

*Staff Contact: Dr J. W. Morley*

U2 F HPW6

*Prerequisites:* BIOS1021, CHEM1002 or CHEM1101 and CHEM1201, or a credit level pass in CHEM1302 or CHEM1401 and CHEM1501, MATH1032 or MATH1042 or MATH1011 and MATH1021

*Corequisites:* BIOC2312 or BIOC2372

*Note/s:* Students intending to major in Physiology and/or Pharmacology should note Physiology 2 prerequisites. From 1994, student numbers in Physiology 1 will be limited and entry to the course will be allocated on academic merit.

Introduces fundamental physiological principles, dealing first with basic cellular function in terms of chemical and physical principles, and with the operation of the various specialised systems in the body, eg, the cardiovascular system, the respiratory system, the gastrointestinal system, the endocrine system, the nervous system. 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 program.
PHPH2122
Principles of Physiology (Optometry)
Staff Contact: Dr J. W. Morley
U2 F HPW6
Note/s: Restricted to course 3950.

Covers the same general areas of physiology as Physiology 1. Principles of Physiology is taken only by students enrolled in the BOptom degree course.

Physiology and Pharmacology Level III

PHPH3114
Physiology 2
Staff Contact: Prof M.J. Rowe
U4 F HPW12
Prerequisites: PHPH2112, BIOC2312, BIOC2372
Note/s: From 1995, student numbers in Physiology 2 will be limited and entry to the course will be allocated on academic merit.

A major subject offered in Year 3, providing a more advanced study in physiology. Laboratory experiments which illustrate physiological principles and introduce research techniques. Orientated towards major research interests of the School, the subject is divided into several sections which may be available in special circumstances as separate 1 and 2 unit Level III subjects, including Membrane Biology, Neurophysiology and Organ Physiology, details of which are given below.

PHPH3121
Membrane Biology
Staff Contact: A/Prof P.H. Barry
U1 S1 HPW6
Prerequisites: Normally as for PHPH3114 but may be studied only with permission of the Head of School.
Note/s: From 1995, student numbers in this subject will be limited and entry to the course will be allocated on academic merit.

The properties of cell membranes, generation of potentials, permeation of ions, solutes and water across membranes, single channel measurements, unstirred layer effects, generation of electrical signals in nerve and muscle cells produced by ion movements, transmission of information between cells and mechanisms in renal physiology. Stress on modern research techniques and on a critical examination of appropriate classical papers.

PHPH3131
Neurophysiology
Staff Contact: Prof M.J. Rowe
U1 S1 HPW6
Prerequisites: Normally as for PHPH3114 but may be studied only with permission of the Head of School.
Note/s: From 1995, student numbers in this subject will be limited and entry to the course will be allocated on academic merit.

The neural mechanisms in sensation and the control of posture and movement. Includes segments on neural control of cardiorespiratory function; transmitters and neuromodulators; neural mechanisms in certain higher functions, e.g. language and memory; nervous system plasticity; computer applications in neuroscience. Experimental work introduces the student to electrophysiological and other neuroscience research techniques.

PHPH3142
Organ Physiology
Staff Contact: A/Prof M. A. Perry
U2 S2 HPW12
Prerequisites: Normally as for PHPH3114 but may be studied only with permission of the Head of School.
Note/s: From 1995, student numbers in this subject will be limited and entry to the course will be allocated on academic merit.

An advanced coverage of aspects of cardiovascular, respiratory, renal, fetal exercise and gastrointestinal physiology. Emphasis on the function and control of each organ and system. Extensive practical component involving mammalian (including human) preparations.

Physiology and Pharmacology Level IV

PHPH4218/PHPH4224
Physiology 4 (Honours)
Staff Contact: Dr D. Garlick
U10 F HPW10
Prerequisites: Completion of program 7300 including 7 Level III units 4 of which must be Physiology 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 a General Education program which consists of a core program of seminars, an essay and participation in discussion groups.

PHPH4258/PHPH4264
Pharmacology (Honours)
Staff Contact: Dr D. Garlick
U10 F HPW10
Prerequisites: 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 a General Education program which consists of a core program of seminars, an essay and participation in discussion groups.
Psychiatry

Psychiatry Level II

PSCY2201
Human Behaviour
Staff Contact: Dr C. Mason
U1 F HPW3
Note/s: Restricted to Combined degree course 3820.
Staff Contact: Dr C. Mason
S1 HPW3 S2 HPW3
Objectives: To provide students with key concepts in the five main topic areas and demonstrate the practical application of these concepts in medical practice. The five main topic areas are: research methods in behavioural sciences, psychology in relation to medicine, sociology in relation to medicine, bioethics and human sexuality. Students are thus encouraged to develop an understanding of human behaviour as the result of the complex interaction of a number of factors so that they are more likely to appreciate and respect their patients and colleagues as persons. Taught in both sessions. Didactic material and some case material is presented in lectures and the tutorial program is structured to consolidate this information, frequently using discussion of specific case examples. Emphasis is placed on developing skills in clear professional communication, with feedback on written assignments, tutorial presentations, and encouragement to use visual aids in presentations. Specific topics covered include: risk behaviours; anxiety; stigma; social class and health; the sexual response and how it changes across the lifespan; and a range of bioethical topics including human and animal experimentation, euthanasia, the doctor and the state.

A handbook for the course is produced each session and may be borrowed from the Biomedical Library Closed Reserve or purchased from the School of Psychiatry.

Assessment: In Session 1, assessment consists of two written examinations, a tutorial assignment, and a tutorial presentation. In Session 2, students are required to write a major essay on Bioethics, present a tutorial paper and sit a final written examination.

Psychology

Psychology Level I Subject

PSYC1002
Psychology 1
Staff Contact: Dr D. Burnham
U2 F HPW5
Note/s: A high proficiency in English is necessary to pass this subject. Excluded GENS4620, GENS5050.

Introduces the content and methods of psychology as a basic science, with emphasis on the biological and social bases of behaviour, relationship to the environment, and individual differences. Training in the methods of psychological enquiry, and in the use of elementary statistical procedures.

Credit is given for participating in various School-approved research studies for up to six hours during the year. An alternative is available.

Psychology Level II Subjects

Notes: Students may not enrol in more than four Level II Psychology units.

PSYC2001
Research Methods 2
Staff Contact: Dr K. Llewellyn
U1 S1 HPW4
Prerequisite: PSYC1002 Advanced Pass (a mark of 55 or greater)

General introduction to the analysis of data by means of inferential statistics ($z$, $t$ and chi square). Issues in the use of statistics (power, robustness, multiple tests). 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.

PSYC2011
Psychological Assessment
Staff Contact: Dr S. Andrews
U1 S2 HPW4
Prerequisite: PSYC2001

Principles and techniques of psychological measurement. Types of tests and issues relevant to their construction, administration and interpretation in decisions about selection and classification.

PSYC2021
Attention, Memory and Thought
Staff Contact: Dr H. Stanislaw
U1 S2 HPW4
Prerequisite: PSYC1002 Advanced Pass (a mark of 55 or greater)

Introduces the fundamental principles of human cognition underlying pattern recognition, selective attention, memory storage and retrieval, and reasoning and problem-solving. Applications are considered.

PSYC2031
Personality and Social Psychology
Staff Contact: Prof J. Forgas
U1 S1 HPW4
Prerequisite: PSYC1002 Advanced Pass (a mark of 55 or greater)

1. Models of personality and their method of study, personality development and links with social behaviour. 2. Social behaviour and the processes of verbal and nonverbal communication, person perception and interpersonal relationships in particular.
PSYC2042  
Psychology 2A  
Staff Contact: A/Prof B. Hesketh  
U2 F HPW4  
Prerequisite: PSYC1002 Advanced Pass (a mark of 55 or greater)  
Corequisites: PSYC2001, PSYC2011, PSYC2021 and PSYC2031  
Note/s: Restricted to course 3431.  
Introduction to several areas of professional practice in psychology and the roles of psychologists in these areas, e.g. developmental disabilities, and psychology and the law. Discussion of topical issues in the science and practice of psychology.

PSYC2051  
Human Development  
Staff Contact: Dr D. Burnham  
U1 S1 HPW4  
Prerequisite: PSYC1002  
Note/s: Excluded PSYC2116, PSYC3111.  
The physical, perceptual, cognitive, and psychosocial development of the human from genetic and pre-natal influences through to old age.

Psychology Level III Subjects

Notes: Students may not enrol in more than three Level III Psychology units unless PSYC2001 Research Methods 2 has been passed.  
Students may not enrol in more than six Level III Psychology units unless PSYC3001 Research Methods 3A has been passed.  
Students may not enrol in more than eight Level III Psychology units.  
Not all Level III Psychology units will necessarily be offered in each year.

PSYC3001  
Research Methods 3A  
Staff Contact: Dr K. Bird  
U1 S1 HPW4  
Prerequisite: PSYC2001  
Analysis of variance for single factor and multifactor designs. Test procedures for planned and post-hoc contrasts defined on parameters of fixed and mixed models. General principles of experimental design.

PSCY3011  
Research Methods 3B  
Staff Contact: Dr K. Bird  
U1 S2 HPW4  
Prerequisite: PSYC3001  
Multivariate statistics and computing. Data analysis using the SPSS and PSY computer programs; their statistical basis.

PSYC3021  
Perception  
Staff Contact: Dr K. Llewellyn  
U1 S2 HPW4  
Prerequisites: PSYC2001 and either PSYC2021 or PSYC2031  
The study of the sensory basis of perception; the study of perception as an adaptive process by which individuals are able to correctly apprehend the external environment and localise themselves within it; the study of perceptual development in infants and young children.

PSYC3031  
Behavioural Neuroscience  
Staff Contact: A/Prof E. J. Kehoe  
U1 S1 HPW4  
Prerequisites: PSYC2001 and either PSYC2021 or PSYC2031  
An examination of brain-behaviour relationships with emphasis on contemporary models of the neural bases of learning, memory and motivation. Topics may include classical and operant conditioning, neuropharmacology, the neural basis of feeding and its disorders, invertebrate and vertebrate models of learning, amnesias and theories of normal memory.

PSYC3041  
Learning  
Staff Contact: A/Prof R. F. Westbrook  
U1 S2 HPW4  
Prerequisite: PSYC3001  
The conditions which promote learning, the contents of learning and the mechanisms by which learning is deployed in action. Emphasises the distinction between specialised and general-purpose learning abilities.

PSYC3051  
Physiological Psychology  
Staff Contact: Dr J. Cranney  
U1 S2 HPW4  
Prerequisite: PSYC3031  
The neural control of behaviour with special emphasis on cerebral localisation of function in humans. Clinical conditions are considered to the extent that they illuminate mechanisms of brain control or they relate to theorising about brain function.

PSYC3061  
Perceptual Theory  
U1 HPW4  
Prerequisite: PSYC3021  
Note/s: Not offered in 1994.  
Some major theoretical influences in perception, beginning with a historical view and then considering the different perspectives represented by Helmholtz, Gestalt psychology, and Gibson; the influence of computer vision (especially Marr) and the modern revolution in knowledge of the physiology of the visual system.

PSYC3071  
Abnormal Psychology  
Staff Contact: Dr S. Andrews  
U1 S1 HPW4  
Prerequisite: PSYC2001  
Descriptive psychopathology; symptomatology and diagnostic features of schizophrenia, organic brain syndromes, affective disorders, neurotic disorders, psychopathy, sexual aberrations, and addictions.

PSYC3081  
Experimental Psychopathology  
U1 HPW4  
Prerequisite: PSYC3071  
Note/s: Not offered in 1994.
An examination of the aetiology and mechanisms of behavioural disorders in the light of experimental research and theory construction. Major topics include: aetiology and mechanisms of schizophrenia, affective disorders; psychophysiological disorders, anxiety, depression, addictive behaviours and amnesia.

PSYC3091
Counselling and Evaluation
Staff Contact: Dr G. Huon
U1 S2 HPW4
Prerequisites: PSYC2001 and PSYC2011
Current theoretical perspectives and related empirical findings, the "generic variables", and methodological procedures used to evaluate the outcome in counselling psychology.

PSYC3101
Individual Differences
Staff Contact: Dr G. Huon
U1 S2 HPW4
Prerequisites: PSYC2011 and PSYC2031
Measurement and assessment of intelligence, psychometric assessment of personality, cognitive and affective aspects of personality, the authoritarian personality, achievement motivation, socio-biological models and critique.

PSYC3111
Development Psychology
Staff Contact: Dr D. Burnham
U1 S1 HPW4
Prerequisites: PSYC2001 and either PSYC2021 or PSYC2031
Note/s: Excluded PSYC2051, PSYC2116.
Issues, methods, and theories in developmental psychology; the development of infants, toddlers, school children, and adolescents with reference to significant cognitive and social events in each of these periods.

PSYC3121
Social Psychology
Staff Contact: Dr M. Frank
U1 S2 HPW4
Prerequisites: PSYC2001 and PSYC2031
Note/s: Excluded PSYC3131.
Human sociability, affiliation and attraction, the development of interpersonal relationships, social influence processes, conformity, obedience, leadership, interaction in groups, affective influences on social cognition and behaviour.

PSYC3131
Cross-Cultural Social Behaviour
Staff Contact: A/Prof S. Bochner
U1 S1 HPW4
Prerequisites: PSYC2001 and PSYC2031
Note/s: Excluded PSYC3121.
The social psychology of intergroup relations or contact between culturally diverse individuals and groups. Includes intercultural communication, intergroup conflict and its resolution, culture learning and orientation programs, and cross-cultural social skills training. Illustration by studies of overseas students, migrants, international business persons, and other individuals exposed to second-culture influences.

PSYC3141
Behaviour in Organizations
Staff Contact: A/Prof B. Hesketh
U1 S2 HPW4
Prerequisites: PSYC2001 and PSYC2031
Industrial and organizational psychology, job analysis, selection, motivation, management strategies, job design and a systems analytic approach to organizations, training, selection, work satisfaction and organizational climate.

PSYC3151
Cognition and Skill
Staff Contact: A/Prof J. Taplin
U1 S1 HPW4
Prerequisites: PSYC2001 and PSYC2021
Cognitive processes underlying skilled behaviour. Topics include detection and discrimination, the representation of knowledge, artificial intelligence, and the basis of expertise in skilled performance.

PSYC3161
Language and Its Development
Staff Contact: Dr M. Taft
U1 S2 HPW4
Prerequisites: PSYC2001 and PSYC2021
Note/s: Excluded PSYC3121.
How language is acquired and used in reading, writing, speech comprehension and speech production. Language dysfunction and bilingualism.

PSYC3171
Recent Developments In Experimental Psychology
U1 HPW4
Prerequisites: PSYC2001 and PSYC2021
Note/s: Not offered in 1994.
An occasional elective dealing with recent developments in experimental psychology.

PSYC3181
Issues in Applied Psychology
U1 HPW4
Prerequisites: PSYC2001 and PSYC2011
Note/s: Not offered in 1994.
An occasional elective dealing with issues in applied psychology. Topics may include psychology and the law, career choice and development, stress, forensic psychology and field versus laboratory research.

PSYC3191
Computer Science and Psychology
Staff Contact: Dr H. Stanislaw
U1 S2 HPW5
Prerequisites: COMP1011, COMP3411, PSYC2001 and PSYC2021
Investigates the burgeoning relationships between cognitive psychology and computer science. Topics include parallel distributed processing models of learning, memory and perception; processes of reasoning, logic and decision making; human expertise and expert systems.
Psychology Level IV Subjects

PSYC4003  
Psychology 4 (Thesis/Course 3431)  
Staff Contact: Dr H. Stanislaw  
U10 F  
Prerequisites: PSYC2001, PSYC2011, PSYC2021, PSYC2031, PSYC2042, and 8 Level III Psychology units including PSYC3001, PSYC3011, PSYC3021 and PSYC3031 with an average of at least 65%

Psychology 4 in the BSc(Psychol) degree course. A supervised research thesis and course work to be determined in consultation with the Head of School.

The Category C General Education requirements are met by components of a number of compulsory subjects in the course and particularly by PSYC2042.

PSYC4013  
Psychology 4 (Course 3431)  
Staff Contact: Dr H. Stanislaw  
U10 F  
Prerequisites: PSYC2001, PSYC2011, PSYC2021, PSYC2031, PSYC2042, and 8 Level III Psychology units including PSYC3001, PSYC3021 and PSYC3031

Psychology 4 in the BSc(Psychol) degree course. Course work and a supervised group research project to be determined in consultation with the Head of School.

The Category C General Education requirements are met by components of a number of compulsory subjects in the course and particularly by PSYC2042.

PSYC4023  
Psychology 4 (Thesis) Honours  
Staff Contact: Dr H. Stanislaw  
U10 F  
Prerequisites: Completion of program 1200 or 1206 including 8 Level III units

Psychology 4 in the Arts, and the Science and Mathematics degree courses. A supervised research thesis and course work to be determined in consultation with the Head of School.

The Category C General Education requirements are met by components of a number of compulsory subjects in the course and the 56 hour subject 'History and Ethics/Professional Issues', which forms part of Year 4 program.

PSYC4033  
Psychology 4 Honours  
U10 F  
Prerequisites: Completion of program 1200 including 8 Level III units  
Note/s: Not offered in 1994.

Psychology 4 in the Arts, and the Science and Mathematics degree courses. Coursework and a supervised group research project to be determined in consultation with the Head of School.

The Category C General Education requirements are met by components of a number of compulsory subjects in the course and the 56 hour subject 'History and Ethics/Professional Issues', which forms part of Year 4 program.

PSYC4043  
Computer Science and Psychology 4 (Honours)  
Staff Contact: Dr H. Stanislaw  
U10 F  
Prerequisites: Completion of program 1206 including 8 Level III units

Combined Honours in Computer Science and Psychology. The Category C General Education requirements are met by components of a number of compulsory subjects in the course and the 56 hour subject 'History and Ethics/Professional Issues', which forms part of Year 4 program.

Servicing Subjects

These are subjects taught within courses offered by other faculties.

PSYC2106  
Psychology (Industrial Relations)  
HPW3  
Note/s: Not offered in 1994.

Problems and limitations affecting social research in industry. Critical review of American research from Hawthorne to Herzberg and of British research from Tavistock and Trist to Emery in Australia. Conflict and organic theories of organization and related theories of motivation and morale. The use of library resources. Practice in the skills and discipline required to obtain and evaluate empirical evidence in this field. Recent developments under the heading of 'participation' and democracy in industry.

For further information see the Faculty of Commerce and Economics handbook.

PSYC2116  
Human Development (Optometry)  
Staff Contact: Dr D. Burnham  
S1 HPW3  
Note/s: Restricted to Course 3950. Excluded PSYC2051, PSYC3111.

Historical background and schools of psychology; current approaches to psychology; introduction to statistics and statistical inference; human development, including introduction to issues and methods in developmental psychology, and investigation of the physical, perceptual, cognitive, and psychosocial development of the human through the life span.

PSYC3506  
Psychology for Optometrical Practice  
Staff Contact: Dr S. McDonald  
S2 HPW3  
Prerequisite: PSYC2116  
Note/s: Restricted to Course 3950.

Areas of psychology relevant to optometrical practice. Abnormal psychology: concepts of normality and abnormality, symptoms of various mental disorder, eye movement dysfunctions, referral; psychological testing: standardisation, norms, types of test, validity, reliability, selection/diagnosis; neuropsychology: general deficits due to brain damage and those with visual implications, referral; developmental disability: diagnosis, assessment, prevalence and distribution, association with other
disabilities, e.g. visual; reading difficulties: causes, assessment and treatment approaches.

Science and Technology Studies

The School of Science and Technology Studies (S&TS) offers subjects in two streams: History and Philosophy of Science and Technology; and Science, Technology, and Society. The subjects in the two streams are designated by two different subject codes (HPST and SCTS). The codes are intended to help students to establish a coherent grouping of subjects when constructing their programs. However, any combination of HPST or SCTS subjects is permissible, subject to the relevant prerequisites or co-requisites. Entrance to most Level II/III subjects is possible without having studied Level 1 HPST or SCTS subjects.

Science and Technology Studies Level I

Students undertaking subjects in Science and Technology Studies supplement class contact hours by study in the Library. Only two Level 1 units may be counted towards course 3970.

HPST1106
Myth, Megalith, and Cosmos
Staff Contact: Randall Albury
U1 S1 HPW3
Note/s: Excluded 62.111.

A general introduction to the history and philosophy of science. Provides a background to HPST1107, From the Closed World to the Infinite Universe, but is a self-contained subject in its own right. Examines the evidence for scientific knowledge in prehistoric cultures, the astronomy and cosmology of the ancient Near East civilisations, and the development of earlier Greek scientific thought.

Assessment: 2 short essays, 2 tests, tutorials.

HPST1107
From the Closed World to the Infinite Universe
Staff Contact: Guy Freeland
U1 S2 HPW3
Note/s: Excluded 62.211.

A general introduction to the history and philosophy of science. Follows on from HPST1106, Myth, Megalith, and Cosmos, but constitutes a self-contained subject in its own right without prerequisites. Examines the momentous transition from the ancient/medieval model of a closed world to modern cosmological theory.

Assessment: 2 short essays, 2 tests, tutorials.

HPST1108
Science: Good, Bad, and Bogus: An Introduction to the Philosophy of Science
Staff Contact: David Oldroyd
U1 S2 HPW3

What is science? What are its distinctive characteristics as a form of inquiry? Why are astrology and 'creationism' widely considered to be pseudosciences? A critical consideration of the claims of astrology, psychoanalysis, parapsychology, and creation science provides a vehicle for raising central questions concerning the nature of science.

Assessment: Essay, tutorials, class tests.

SCTS1106
Science, Technology, and Social Change
Staff Contact: David Miller
U1 S1 HPW3
Note/s: Excluded 62.110.

Relations between science, technology, and society in the 20th century. Theories of technological design and change. Examination of controversies including: pollution protection; nuclear energy; and genetic engineering. The control of technology. Technology assessment. The nature of public involvement in decisions about scientific and technological development.

Assessment: Essay, tutorials, class tests.

SCTS1107
Understanding Technological Controversy
Staff Contact: David Miller
U1 S2 HPW3
Prerequisite: SCTS1001 or 62.101
Note/s: Excluded 62.103.

The lecture series examines scientific and technical controversies in general; how they arise, how they are conducted, how and why they are resolved or remain unresolved. The tutorials are devoted to supervised group work on issues of concern to students in the areas of the environment, energy, genetic engineering, and communication technologies.

Assessment: Essay, test, individual tutorial and group work.

Science and Technology Studies Level II/III

HPST2106
The Scientific Theory
Staff Contact: Guy Freeland
U1 S1 HPW3
Prerequisite: Completion of at least 4 Level 1 Science units
Note/s: Excluded 62.032.

A critical examination of the scientific theory, its origins, nature and nurture, with particular reference to selected historical examples chosen from both the physical and biological sciences. Topics include the structure of scientific revolutions; scientific explanation; relationships between theory and observation; the function of models; the principles of theory establishment and rejection.

Assessment: One essay, two tests, tutorials.

HPST2107
The Darwinian Revolution
Staff Contact: David Oldroyd
U1 S2 HPW3
Prerequisite: As for HPST2106
Note/s: Excluded 62.104.

Scientific, philosophical, and social antecedents and consequences of Darwin's theory of evolution. The prevailing ideas in biology in the 18th and early 19th centuries. Classification; Lamarck; the design argument; Malthus; age of the Earth; Darwin's life and work; Mendel. The impact of evolutionary ideas in such fields such as religion, political theory, philosophy, psychology,
anthropology, and sociology; Social Darwinism; racism. Sociobiology.

Assessment: One essay, two tests, tutorials.

**HPST2108**  
**History of Medicine**  
*Staff Contact: Randall Albury*  
U1 S1 HPW3  
*Prerequisite:* As for HPST2106  
*Note/s:* Excluded 62.043, 62.109, 26.568.

Development of theory and practice in Western medicine from Hippocratic times to the 20th century. 'Bedside' medicine from antiquity to the French Revolution; 'Hospital' medicine in the early 19th century; 'Laboratory' medicine in the late 19th century; 'Technological' medicine in the 20th century, with particular emphasis on the social role of modern medicine.

**HPST2109**  
**Computers, Brains, and Minds: Foundations of Cognitive Science**  
*Staff Contact: Peter Slezak*  
U1 S1 HPW3  
*Prerequisite:* As for HPST2106  
*Note/s:* Excluded 62.554.

Introduction to contemporary discussions of the mind, thought, intelligence, and consciousness. Stress on the recent revolutionary developments in the computer simulation of thought or 'artificial intelligence' and linguistics. Can computers think? Is the brain a machine? Exploration of theories, methods, and philosophical issues.

Assessment: Essay, class tests, tutorials.

**HPST2116**  
**History of the Philosophy and Methodology of Science**  
*Staff Contact: Guy Freeland*  
U1 S2 HPW3  
*Prerequisite:* As for HPST2106  
*Note/s:* Excluded 62.543, 62.551, 62.561, 62.215U, 62.216U. Not recommended for students without some background in philosophy or HPST.

A survey of the history of ideas about the nature and method of science, considering such issues as Aristotelianism, rationalism and empiricism, Kantianism, positivism, pragmatism, conventionalism, falsificationism, realism, and instrumentalism.

Assessment: Essays, tutorials.

**HPST2117**  
**Production, Power, and People: The Social History of Technology in the 18th and 19th Centuries**  
*Staff Contact: Nessy Allen*  
U1 S2 HPW3  
*Prerequisite:* As for HPST2106  

The history of technology in its social and cultural context, with special emphasis on the Industrial Revolution. Technology and its effects on human beings; the professionalisation of engineering; the spread of industrialisation and the Second Industrial Revolution. Emphasis on the social and economic effects of the interactions of technology and society.

Assessment: Essay, tutorials, two tests.

**HPST2118**  
**Body, Mind, and Soul: The History and Philosophy of Psychology**  
*Staff Contact: Peter Slezak*  
U1 S1 HPW3  
*Prerequisite:* As for HPST2106  

The development of ideas concerning the nature of mind and its relation to the body. Topics include the immortality of the soul; division of mind and body; the dispute over innate ideas; behaviourism; psychoanalysis; experimental psychology and the 'cognitive revolution'; minds as machines and the question of whether computers can think.

Assessment: Essay, tutorial assessment, tests.

**HPST2119**  
**Philosophy of the Social Sciences: Issues and Topics**  
*Staff Contact: Peter Slezak*  
U1 S1 HPW3  
*Prerequisite:* As for HPST2106  
*Note/s:* Not offered in 1994.

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.

Assessment: Essay, tutorials, two class tests.

**HPST3106**  
**The Discovery of Time**  
*Staff Contact: Guy Freeland*  
U1 S1 HPW3  
*Prerequisite:* As for HPST2106  
*Note/s:* Excluded 62.103.

The history of time, from Antiquity through the Twentieth Century. Clocks and other instruments for the measurement of time; civil and religious calendars; concepts of time; philosophy and theology of time; conceptions of history and progress; the cognition of time; the age of the Earth and the antiquity of humanity. Time and the development of modern science.

Assessment: Essay, tutorials, two class tests.

**HPST3107**  
**Relations Between Science and the Arts**  
*Staff Contact: School Office*  
U1 S1 HPW3  
*Note/s:* Not offered in 1994.

The relationship between science, technology, and the visual arts in the history of Western culture.

**HPST3108**  
**Deity and Mother Earth**  
*Staff Contact: Guy Freeland*  
U1 S2 HPW3  
*Prerequisite:* As for HPST2106  
*Note/s:* Excluded 62.062.

Conceptions of deity, from earliest time to the present, in relation to changing notions of sexuality and generation.
and the place of human beings in relation to their environment and the cosmos; the roles of the sexes within different cultures. The Earth Mother Goddess. The environmentalist movement; the Gaia hypothesis.

Assessment: Essay, two tests, tutorials.

HPST3117
Philosophical Problems in Evolutionary Biology
Staff Contact: David Oldroyd
U1 S2 HPW3
Prerequisite or Corequisite: HPST2106 or HPST2107, or permission of lecturer
Current controversies in evolutionary theory with consideration of topics such as essentialism and population thinking, falsifiability of the principle of natural selection, group selection controversy, sociobiology, problems in classification and cladism, the neutral theory of evolution and the role of chance, punctuated equilibrium theory, the origin of life, creation 'science', origins of human beings.
Assessment: Essay(s), seminar presentation(s).

HPST3118
Reading Option in History and Philosophy of Science
Staff Contact: Randall Albury
U1 S1 or S2 HPW3
Prerequisite: As for HPST2106 or permission of Head of School
Students wishing to work in an area not covered by an existing subject may apply to the School to take a reading option. Approval of a program for a reading option will depend on its suitability, and the availability of a staff member to undertake supervision.

SCTS2106
Scientific Knowledge and Political Power
Staff Contact: School Office
U1 S1 HPW3
Prerequisite: As for HPST2106
An introduction to the political dimensions of 20th-century science. Topics include growth of expenditure on science in the twentieth century; science and politics; science and economic growth; the science-technology relationship; approaches to science policy; critiques of the role of science in contemporary society.

SCTS2107
The Sociology of Science and Technology
Staff Contact: David Miller
U1 S2 HPW3
Prerequisite: As for HPST2106
Note/s: Excluded 62.062.
An examination of the communal nature of scientific and technological activities which will include: an historical survey of the development of scientific and engineering professions; the internal working of scientific communities; scientific communication; the reward system; fraud; disciplines and specialities in science and engineering.
Assessment: Essays, tutorials.

SCTS2108
Information Technology, Politics and Policies
Staff Contact: School Office
U1 S1 HPW3
Prerequisite: As for SCTS1106 or completion of at least 4 Level I science units.
Note/s: Subject not offered in 1994.
Key issues for 'info-tech' society, including social policies and the future of work and education; mass media and telecommunications in the electronic age; commercialisation and shifting patterns of trade in the world economy; deregulation and the role of 'info-tech' in global restructuring.

SCTS2109
The New Biotechnologies and their Social Context
Staff Contact: School Office
U1 S2 HPW3
Prerequisite: SCTS1106, or by permission of the Head of School for Year 3 and 4 students in the biological sciences.
Note/s: Subject not offered in 1994. Excluded 62.245.
The social implications of the new technologies, including recombinant DNA techniques, genetic manipulation of animals, and test-tube babies. The present achievements and likely future developments of the new genetic and reproductive technologies, together with detailed discussions of the social, ethical, and political implications of these developments.

SCTS2116
Technological Change and Economic Development
Staff Contact: George Bindon
U1 S1 HPW3
Prerequisite: Completion of at least 4 Level 1 science units including SCTS1106; or permission of Head of School
Ideas about technological change and its relationships to economic development. Rise of the industrial estate; emergence of the "post-modern"/"post-industrial" state; Reich's 'global web'; metropolitan centres and the periphery; collapse of Soviet empire; emergence of 'Asia-Pacific rim' and implications of this for Australia.
Assessment: Class contributions, assignments, tests.

SCTS2117
The Challenge of Managing and Measuring Science and Technology
Staff Contact: George Bindon
U1 S2 HPW3
Prerequisite: Completion of at least 4 Level 1 science units including SCTS1106; or permission of Head of School
Note/s: Not offered in 1994.
Assessment: Class contributions, assignments, tests.

SCTS3020
The Social Construction of the Environment: Botany Bay and the Sydney Region
Staff Contact: Gavan McDonell
U1 S2 HPW2
Prerequisite: Three subjects from the following: GEOG1051, GEOG2081, GEOG2102, GEOG3211, GEOG3062, GEOG3042, HPST3108, SCTS3106, SCTS3109, SCTS3116
Provides an interdisciplinary framework for the interpretation of the ways in which human environments
have been socially constructed. This will be done in the particular context of Botany Bay and the Sydney Region. Emerging environmental issues at the regional, national, and global levels will be identified and examined in the light of geographic, historical, sociological, economic, political, and urban change and development. Prospects and processes for intervention will be examined. Each student will complete a research project.

Assessment: Group project, assignment, seminar summaries, class participation.

SCTS3106
Technology, Sustainable Development, and the Third World
Staff Contact: John Merson
U1 S1 HPW3
Prerequisite: As for HPST2106
Note/s: Excluded 62.082.
Sustainable development, along with the technological and social changes that are involved in achieving it, both at a national and global level. The course 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.
Assessment: Essay, tutorials.

SCTS3107
Women and Science
Staff Contact: Nessy Allen
U1 S1 HPW2
Prerequisite: As for HPST2106
A series of seminars on: the constraints and opportunities facing women scientists; an historical survey of women scientists, including some eminent Australians; the philosophical issues and implications for social policy raised by women's participation in science.
Assessment: Seminar presentations, essays, class participation.

SCTS3108
Technological Development in 20th-Century Australia
Staff Contact: School Office
U1 S2 HPW3
Prerequisite: As for SCTS1106
The historical development of technology in Australia during the 20th century, with focus on three key dimensions: linkage between scientific research, industrial development, and economic growth; technological change and its impact on Australian society; the distinctive feature of Australia’s geopolitical situation.

SCTS3109
Society, Technological Hazards, and Environmental Management
Staff Contact: Gavan McDonell
U1 S1 HPW3
Prerequisite: SCTS1106 or completion of at least 4 Level 1 science units
Concerns over risks 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.
Assessment: Essays, tests, tutorials.

SCTS3116
The Political Economy of Energy and Sustainable Development
Staff Contact: Gavan McDonell
U1 S2 HPW3
Prerequisite: As for SCTS3109
Note/s: Excluded 62.222U.
Energy, force, work, and power; social construction of energy use; the 'energy' crisis; energy use and climate change; introduction to environmental economics; institutional power and market arrangements for energy; environmental management. international relations and issues in energy use and control.
Assessment: Essays, tests, tutorials.

SCST3117
Technology, Globalization, and the Role of the State
Staff Contact: School Office
U1 S2 HPW3
Prerequisite: Completion of at least 2 SCTS units
Note/s: Subject not offered in 1994. Excluded 62.3003.
An analysis of the interaction between technology, economic growth, and the internationalism of industry; the growing pressure on the State to adopt an increasingly interventionist role.

SCTS3119
Reading Option in Science and Technology Studies
Staff Contact: Randall Albury
U1 S1 or S2 HPW3
Prerequisite: As for HPST2106, or permission of Head of School
Students wishing to work in an area not covered by an existing subject may apply to the School to take a reading option. Approval of a program for a reading option will depend on its suitability, and the availability of a staff member to undertake supervision.

Science and Technology Studies Level IV Honours Program

SCTS4106
Science and Technology Studies (Honours)
Staff Contact: John Merson or Head of School
U1 S1 or S2 HPW3
Prerequisite: Completion of program 6200 including 7 Level II/III units with an average grade of credit or better
In the Honours Program, candidates are required to present a thesis and to complete coursework as approved by the Head of School.
The Category C General Education requirements are met within the Honours program.
Wool and Animal Science

Wool and Animal Science Level II

WOOL3803
Genetics 1
Staff Contact: A/Prof J. James
U1 F L2 T1
Note/s: Restricted to Program 6840


Wool and Animal Science Level III

WOOL3901
Biostatistics 1
Staff Contact: A/Prof J. James
U1 S1 L2 T2
Prerequisite: MATH2819 or BIOS2041
Note/s: Restricted to program 6840

Design and analysis of comparative experiments, for continuous and discrete random variables. Analysis of variance for fixed, mixed and random models. Linear regression and correlation. Multiple comparison methods.

WOOL4813
Genetics 2
Staff Contact: A/Prof J. James
U1 F L2 T2
Prerequisite: WOOL3803
Note/s: Restricted to program 6840.

Faculty of Biological and Behavioural Sciences

Dean: Professor W J O'Sullivan
The Schools of the Faculty of Biological and Behavioural Sciences offer facilities for students to proceed to the award of a Graduate Diploma, the award of a master degree by research and the award of the degree of Doctor of Philosophy; and the award of a master degree by course work in Psychology (8251 and 8252) and in Biotechnology (8042).

Faculty of Science

Dean: Professor A R Hyland
The Schools of the Faculty of Science supervise the graduate diploma courses Food and Drug analysis (5510), Physical Oceanography (5530) and Physics (5515 and 5516). The Schools of the Faculty also offer facilities for students to proceed to the award of masters degrees in Chemistry (8770 and 8780), Mathematics (8740), Optometry (8760) and Statistics (8750), masters degrees by research and to the award of Doctor of Philosophy.

Students completing undergraduate science degrees which include an appropriate mix of subjects may qualify for admission to higher degree programs in Faculties other than Biological and Behavioural Sciences and Science.

Enrolment Procedures

All students re-enrolling in 1994 or enrolling in graduate courses should contact the Postgraduate Section for enrolment details.

Faculty of Biological and Behavioural Sciences

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 in the Faculty of Applied Science) offers a Graduate Diploma in Biotechnology and a Masters degree course in Biotechnology by formal study, and the School of Psychology offers Master of Psychology (Applied) and Master of Psychology (Clinical) degree courses.
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 subject 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 subjects:

- BIOC4318 Biochemistry Honours (Full-time)
- BIOC4618 Biochemistry Honours (Part-time)
- BIOS4013 Biological Science Honours (Full-time)
- BIOS4019 Biological Science Honours (Part-time)
- BIOS4023 Botany Honours (Full-time)
- BIOS4029 Botany Honours (Part-time)
- MICR4013 Microbiology and Immunology Honours (Full-time)
- MICR4023 Microbiology and Immunology Honours (Part-time)
- PSYC4023 Psychology 4 (Thesis) Honours
- PSYC4033 Psychology 4 (Honours)
- BIOS4033 Zoology Honours (Full-time)
- BIOS4039 Zoology Honours (Part-time)

The qualifying program is graded in the usual way, and in appropriate cases the results are expressed as a grading equivalent to Honours.

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 subjects:

- BIOC6308 Biochemistry
- BIOS9917 Biological Science
- BIOS9943 Botany
- MICR6043 Microbiology
- PSYC6000 Psychology
- BIOS9945 Zoology

The results in alternative qualifying subjects 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. It is intended primarily as an advanced training program for graduates from overseas universities who wish to obtain specialised training in particular areas of biological and behavioural science. The expectation is that for suitably qualified students, the course would allow entrance to a higher degree program (MSc or PhD) provided suitable supervision and facilities were available. The course is also available to graduates of Australian universities who have not done an Honours course 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 course 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.

Brief descriptions of the courses currently offered within the Schools of the Faculty of Biological and Behavioural Sciences and in the Department of Biotechnology follow.

School of Biochemistry and Molecular Genetics

5345
Biochemistry Graduate Diploma Course
Full-time

Graduate Diploma
GradDip

Staff Contact: School Office

The course 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, e.g. 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 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, plant biochemistry and the study of naturally occurring toxins.

School of Biological Science

5350
Biological Science Graduate Diploma Course
Full-time

Graduate Diploma
GradDip

Staff Contact: School Office

The course 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 Microbiology and Immunology

5355
Microbiology and Immunology Graduate Diploma Course
Full-time

Graduate Diploma
GradDip

Staff Contact: School Office

The structure of the course 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, environmental microbiology, immunology, medical bacteriology or animal 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, nitrogen fixation, the pathogenesis of intestinal and gastroduodenal infection, the immunology of the intestinal tract.

School of Psychology

5330
Psychology Graduate Diploma Course
Full-time

Graduate Diploma
GradDip

Staff Contact: J. Taplin

This one year course 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 course are then admitted to a higher degree program, provided suitable supervision and facilities are available.

The course comprises formal teaching in an approved set of subjects 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 experimental psychology, social psychology, clinical psychology, behavioural neuroscience and industrial/occupational psychology. Particular attention within each of these programs is paid to the interrelationship between scientific theory and the practical application of psychological knowledge.

Department of Biotechnology

5015
Biotechnology Graduate Diploma Course
Full-time or Part-time

Graduate Diploma
GradDip

Staff Contact: School Office
The graduate diploma course 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 co-requisite.

Under normal circumstances, students whose previous training has included a substantial component of biotechnology are not admitted to the course.

The course comprises study of undergraduate and graduate formal subjects, plus extensive laboratory training in biotechnology.

The diploma is awarded after one year's full-time study, consisting of an average of 18 hours per week, or two years part time study, consisting of an average of 9 hours per week. The program includes the listed obligatory subjects plus sufficient of the listed elective subjects to meet the hours of study required. The electives include subjects 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 subject to approval by the Head of School.

Obligatory Subjects

BIOT3011 Biotechnology A
BIOT3021 Biotechnology B
BIOT5013 Practical Biotechnology

Elective Subjects

BIOT3031 Microbial Genetics
BIOT3061 Monoclonal Antibody and Genetic Techniques in Biotechnology
BIOT8010 Graduate Seminars
BIOT7100 Biological Principles
BIOT7110 Bioengineering Principles
Other suitable electives from the Department of Food Science and Technology and/or other Schools.

Masters Degrees

School of Psychology

Head of School: Professor K. M. McConkey
Senior Administrative Officer: Mr T. Clulow

The School offers courses leading to the award of the degrees of Master of Psychology (Applied) and Master of Psychology (Clinical).

8252

Master of Psychology (Applied) Degree Course
Full-time or Part-time

Master of Psychology (Applied)
MPsychol(Applied)

The Master of Psychology (Applied) degree course is aimed at providing psychology graduates with a postgraduate qualification which will equip them to make a distinctive contribution in work and other organizations. The emphasis of the program will be on developing applied research skills that integrate theory and practice. When combined with their undergraduate training and the required work experience, this program will equip psychologists with an understanding of organizational, social and cultural influences on behaviour. They will be able to apply this understanding to many problems through a critical, empirical orientation based on experimental methods, measurement and statistics.
Areas of specialization include Industrial and Organizational Psychology, Vocational Psychology, Ergonomics and psychological aspects of Occupational Health.

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.

Applicants who do not satisfy the above entrance requirements may be admitted to the program. Such admissions will be based on an assessment of the applicant's knowledge, experience and occupation. Some additional qualifying subjects may be required of those who are admitted under this provision.

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 (ie 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).

Assessment of student performance is by sessional examinations, class tests, seminar papers and a research thesis.

The course consists of a 22 hour core program, a thesis, a 10 hour elective program, and professional practice component.

Subjects from other graduate degrees, including the Master of Psychology (Clinical) degree, may be included in the elective program with the permission of the School concerned and the Head of the School of Psychology.

Year 1

*Core Program*

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>PSYC7000</td>
<td>Research and Evaluation Methods</td>
</tr>
<tr>
<td>PSYC7001</td>
<td>Psychological Assessment 1</td>
</tr>
<tr>
<td>PSYC7002</td>
<td>Psychological Assessment 2</td>
</tr>
<tr>
<td>PSYC7100</td>
<td>Industrial and Organizational Psychology 1</td>
</tr>
<tr>
<td>PSYC7101</td>
<td>Industrial and Organizational Psychology 2</td>
</tr>
<tr>
<td>PSYC7102</td>
<td>Psychological Principles of Training</td>
</tr>
<tr>
<td>PSYC7104</td>
<td>Applied Cognitive Psychology 1</td>
</tr>
<tr>
<td>PSYC7105</td>
<td>Professional Practice (Applied) 1</td>
</tr>
<tr>
<td>PSYC7106</td>
<td>Graduate Colloquium (Applied)</td>
</tr>
<tr>
<td>PSYC7109</td>
<td>Principles of Ergonomics</td>
</tr>
</tbody>
</table>

Year 2

*Core Program*

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>PSYC7004</td>
<td>Professional and Ethical Issues</td>
</tr>
<tr>
<td>PSYC7105</td>
<td>Professional Practice (Applied)</td>
</tr>
<tr>
<td>PSYC7108</td>
<td>Research Thesis (Applied)</td>
</tr>
</tbody>
</table>

*Elective program*

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSYC7110</td>
<td>Advanced Ergonomics</td>
</tr>
<tr>
<td>PSYC7111</td>
<td>Cross-cultural Perspectives in Applied Psychology</td>
</tr>
<tr>
<td>PSYC7112</td>
<td>Vocational Psychology</td>
</tr>
<tr>
<td>PSYC7113</td>
<td>Special Topic</td>
</tr>
<tr>
<td>PSYC7114</td>
<td>Graduate and Applied Seminars</td>
</tr>
<tr>
<td>PSYC7209</td>
<td>Developmental Disabilities</td>
</tr>
<tr>
<td>PSYC7210</td>
<td>Human Neuropsychology</td>
</tr>
<tr>
<td>PSYC7220</td>
<td>Health Psychology</td>
</tr>
</tbody>
</table>

*Note:* Part-time students normally are expected to take half the full-time program in any one session.

8251

Master of Psychology (Clinical) Degree Course

Full-time or Part-time

Master of Psychology (Clinical)

MPsychol(Clinical)

This course is designed to provide professional training at an advanced level for honours graduates in psychology.

The normal entrance requirements are:

1. a degree of Bachelor, with Honours Class 1 or Class 2 in Psychology;
2. completion of a research thesis or research project in the Honours fourth year;
and

3. completion of approved courses in learning, perception and cognition, physiological psychology, psychological statistics, psychometrics and abnormal psychology, or in such other fields as may be prescribed by the Head of the School.

Selection of students is based on academic qualifications and suitability for the course. It may be necessary to limit the number of new enrolments in any year.

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 coursework program.

To qualify for the degree, students must satisfy the examiners in respect of their academic attainments, and their skill and competence in relevant aspects of practical professional work.

The course consists of lectures, seminars, demonstrations and practical work, supervised clinical and community work, and a research thesis.

The major aims of the course are: 1. to acquaint students with the issues, findings and problems of contemporary clinical and community psychology, and 2. to equip them with basic clinical skills and techniques. A total of 760 hours of supervised clinical practice must be completed.

Assessment of student performance is by sessional examinations, class tests, seminar papers and a research thesis.

It should be noted that the course extends over two calendar years and not just four academic sessions with vacation breaks.

Year 1

<table>
<thead>
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<td>Psychological Assessment 2</td>
</tr>
<tr>
<td>PSYC7003</td>
<td>Graduate Colloquium</td>
</tr>
<tr>
<td>PSYC7203</td>
<td>Theory and Research in Psychopathology</td>
</tr>
<tr>
<td>PSYC7204</td>
<td>Child Clinical Psychology</td>
</tr>
<tr>
<td>PSYC7209</td>
<td>Developmental Disabilities</td>
</tr>
<tr>
<td>PSYC7210</td>
<td>Human Neuropsychology</td>
</tr>
<tr>
<td>PSYC7212</td>
<td>Experimental Clinical Psychology 1</td>
</tr>
<tr>
<td>PSYC7213</td>
<td>Experimental Clinical Psychology 2</td>
</tr>
<tr>
<td>PSYC7216</td>
<td>Professional Practice (Clinical) 1</td>
</tr>
<tr>
<td>PSYC7217</td>
<td>Professional Practice (Clinical) 2</td>
</tr>
<tr>
<td>PSYC7221</td>
<td>Special Topics offered occasionally as a substitute for Graduate Colloquium.</td>
</tr>
</tbody>
</table>

Year 2

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSYC7004</td>
<td>Professional and Ethical Issues</td>
</tr>
<tr>
<td>PSYC7206</td>
<td>Research Thesis (Clinical)*</td>
</tr>
<tr>
<td>PSYC7214</td>
<td>Experimental Clinical Psychology 3</td>
</tr>
<tr>
<td>PSYC7215</td>
<td>Experimental Clinical Psychology 4</td>
</tr>
<tr>
<td>PSYC7218</td>
<td>Professional Practice (Clinical) 3</td>
</tr>
<tr>
<td>PSYC7219</td>
<td>Professional Practice (Clinical) 4</td>
</tr>
<tr>
<td>PSYC7220</td>
<td>Health Psychology</td>
</tr>
</tbody>
</table>

*Contributes approximately 25 per cent to the overall grading for the degree.

Note/s: Part-time students normally are expected to take half the full-time program in any one session.

Department of Biotechnology

Biotechnology Degree Course

The Department also offers a formal graduate course at the Masters degree level (Master of Applied Science in Biotechnology). 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 Higher Degrees set out later in this handbook.
The course 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.

To qualify for the degree students must satisfy the examiners in the prescribed examinations, which include the submission and assessment of a report on the specified project.

8042
Biotechnology Degree Course
Full-time or Part-time

Master of Applied Science
MAppSc


Faculty of Science

Facilities are available in each of the schools for research leading to the award of the higher degrees of Master of Science and Doctor of Philosophy.

The following formal courses leading to graduate awards are also offered:

School of Mathematics: Graduate Diploma (in Physical Oceanography)
School of Optometry: Master of Optometry
School of Chemistry: Master of Chemistry, Graduate Diploma (in Food and Drug Analysis)
School of Mathematics: Master of Mathematics, Master of Statistics
School of Physics: Graduate Diploma in Physics, Graduate Diploma in Physics Research Techniques

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 course 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 course 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.

The manner of presentation and examination of reports of projects undertaken as part of formal courses shall be determined by the Head of the School.

The conditions governing these higher degrees are set out later in this handbook.
Graduate Diplomas

School of Chemistry

5510
Food and Drug Analysis Graduate Diploma Course
Full-time or Part-time

Diploma in Food and Drug Analysis
DipFDA

Staff Contact: A/Prof G. Crank

According to demand, the course may be available on a full-time basis over one year or on a part-time basis over two years.

The course in food and drug analysis is designed to provide systematic training at an advanced level for chemists who wish to extend their acquaintance with analytical techniques, and thus is suitable for those who may wish to practice as public analysts. It is also suitable for those who wish to work in the food or pharmaceutical industry. The prime aim is to present discussions of the principles and design of analytical methods which are therefore presented on a comparative basis.

It is considered that the techniques involved in the handling of foods and drugs together with those discussed in the ancillary subjects of the course provide a firm basis of approach to many other fields of chemistry.

Intending students are referred to the conditions for the award of graduate diplomas set out elsewhere in this handbook.

Year 1*
CHEM7125  Food and Drugs 1
CHEM7115  Treatment of Analytical Data
CHEM7425  Instrumental Techniques in Food and Drug Analysis

Year 2*
CHEM7225  Food and Drugs 2
CHEM7325  Toxicology, Occupational and Public Health
MICR2201  Introductory Microbiology
or
CHEM7555  Project Work in Food and Drug Chemistry

*Full-time students take Years 1 and 2 in the one year.

School of Mathematics

5530
Physical Oceanography Graduate Diploma Course
Full-time or Part-time

Graduate Diploma
GradDip

Staff Contact: Prof J. Middleton

This graduate diploma is intended to train graduates in the physical sciences or engineering in the basic techniques of physical oceanography.

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 28 credits for completion, consists of a major project OCEA5115 worth 50% of the total accreditation for the program, the remaining 50 being comprised as indicated below.

1. Compulsory Subjects
   - OCEA5115 Experimental Project
   - OCEA5125 Geophysical Fluid Dynamics
   - OCEA5135 Instrumentation
   - OCEA5145 Applied Data Analysis

2. Elective Subjects
   - REMO9580 Image Analysis in Remote Sensing
   - REMO9581 Microwave Remote Sensing
   - CIVL9835 Coastal Engineering 1
   - CIVL9836 Coastal Engineering 2
   - CIVL9863 Estuarine Hydraulics
   - GEOG9150 Remote Sensing Applications
   - OCEA5155 Theoretical Project

Appropriate existing subjects within mathematics, physics or engineering chosen on the basis of individual background.

Here 1 credit is defined as being 1 hour per week for one session. The course may be taken over one year full-time or two years part-time.

School of Physics

5515
Physics Graduate Diploma Course
Full-time or Part-time

Graduate Diploma in Physics
GradDipPhys

Staff Contact: A/Prof G. J. Bowden

The Graduate Diploma in Physics offers an advanced training program for graduates from overseas universities who wish to obtain specialized training in physics. The course is also available to graduates from Australian universities who have not done an Honours course and who wish to pursue postgraduate study in physics. Students qualified to enrol in the Honours course would be expected to do so rather than to enrol in the GradDipPhys. For suitably qualified students, the expectation is that the course would allow entrance to higher degree programs provided suitable supervision and facilities were available.

The GradDipPhys will be offered with course work and research project requirement similar to Physics Level IV, with substitutions if required to be approved by the School Postgraduate Committee. The course involves two sessions full-time study or four sessions part-time study comprising a total of at least 140 hours of lectures, plus a single research project over the period of study or two different research projects, one in each half of the period of study. All students normally take courses in quantum mechanics, statistical mechanics and solid state physics. Other lecture courses and the research projects are offered in general areas of physics including astrophysics, biophysics, condensed matter physics and theoretical physics.
Physics Research Techniques Graduate Diploma Course
Full-time or Part-time

Graduate Diploma in Physics
GradDipPhysResTech

Staff Contact: A/Prof G. J. Bowden

The Graduate Diploma in Physics Research Techniques offers an advanced training program for graduates from overseas universities who wish to obtain specialized training in research techniques in physics. The Diploma would not normally provide sufficient qualification for direct entry to a higher degree program but could do so if a special choice of study were chosen by a suitably qualified student. The course involves two sessions full-time study or four sessions part-time study comprising (for full-time enrolment) approximately 14 class contact hours per week at Level III/IV, averaged over two sessions, plus a research project and a literature review. All students normally take courses in quantum mechanics, statistical mechanics and solid state physics. Other lecture courses and the research projects are offered in general areas of physics including astrophysics, biophysics, condensed matter physics and theoretical physics.

School of Chemistry

Head of School: Professor D. B. Hibbert

Director of Graduate Studies: A/Prof G. Crank (contactable via Chemistry Academic Office)

The School of Chemistry offers a Master of Chemistry degree course in Food and Drug Chemistry which is suitable for students wishing to obtain advanced specialised knowledge in these topics. The normal entry qualification is a good Honours degree or equivalent qualification, or lesser qualification together with significant scientific experience. Other conditions may be required to undertake a qualifying programme.

Master of Chemistry (Food and Drug Chemistry)

This course involves an advanced study of the chemistry, stability, mode of action where applicable, and analysis of food constituents, food additives, and selected drugs. The program may be taken either full-time or part-time. In addition to formal, examinable lecture courses and laboratory instruction, the program involves a short research project supervised by a member of the academic staff. Entry into this program is excluded in the case of applicants who have completed the Graduate Diploma in Food and Drug Analysis (Course 5510)

Lecture/Laboratory Courses
1. Food and Drugs 1
2. Treatment of Analytical Data
3. Instrumental Techniques in Food and Drug Analysis
4. Food and Drugs 2
5. Toxicology, Occupational and Public Health
6. Introductory Microbiology or Project Work in Food and Drug Chemistry

The lecture time for the whole course is 160 hours. An additional 392 hours is spent by students in formal laboratory work.

Research project

A short research project undertaken over approximately 4 months full-time (400 hours laboratory work) is selected in relation to the combined interests of the student and the supervisor.
School of Mathematics

Head of School: Professor C. Sutherland
Director of Graduate Studies: A/Prof A. Dooley

The School offers graduate courses leading to the award of the degrees of Master of Mathematics (MMath) and Master of Statistics (MStats). The School also offers the pass degree of MA. For further details see the Faculty of Arts Handbook.

8740
Master of Mathematics Degree Course
Full-time or Part-time

Master of Mathematics
MMath

The Master of Mathematics degree course is intended for honours graduates in pure or applied mathematics, but others may be admitted after completing a qualifying course. The course may be completed in one year of full-time or two years of part-time study. The course 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. 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 two of these courses graduate courses offered either within or outside the School of Mathematics. Students are also required to participate in relevant departmental seminars. In addition, students are 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. It is anticipated that students spend three hours per week for two sessions on their project. 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.

8750
Master of Statistics Degree Course
Full-time or Part-time

Master of Statistics-
MStats

The Master of Statistics Course covers a wide range of statistical theory and practice and provides advanced training for practising statisticians. The course may be completed in two years of full-time or four 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 a maximum of half the course. The conditions for the award of the degree are set out elsewhere in this handbook.

The academic requirement for the degree is 40 credits. Unless otherwise noted, all subjects listed below are 2 credits each.

Each candidate's program of study must be approved by the Head of the School.

Compulsory Subjects (offered every year)

MATH5815   Experimental Design 1
MATH5835   Stochastic Processes
MATH5855   Multivariate Analysis 1
MATH5905   Statistical Inference
MATH5925   Project (10 credits)
MATH5935   Statistical Consulting (4 credits)
Elective Subjects (offered every second year)

MATH5806  Applied Regression Analysis
MATH5816  Mathematics of Security Markets 2 (Prerequisite: MATH5965)
MATH5825  Experimental Design 2
MATH5845  Time Series
MATH5855  Multivariate Analysis 2
MATH5875  Sample Survey Design
MATH5885  Sequential Analysis
MATH5895  NonParametric Methods
MATH5915  Special Topic A*
MATH5945  Discrete Distributions
MATH5955  Statistical Quality Control
MATH5965  Mathematics of Security Markets 1
MATH5975  Economic Quality Control Models (Prerequisite: MATH5955)
MATH5985  Industrial Designs (Prerequisite: MATH5815)

Up to 10 credits may be taken in graduate subjects offered by other Departments or Schools within the University, subject to the approval of the Head of School. Such subjects include:

CIVL9403  Theory of Land Use/Transport Interaction
CIVL9405  Urban Transport Planning Practice
CIVL9417  Transport and Traffic Flow Theory
CMED8201  Population Genetics
CMED8202  Human Genetic Analysis
ECON3204  Econometrics B
MANF9330  Simulation in Operations Research
MATH3161  Optimisation Methods
MATH3181  Optimal Control
MNGT0331  Business Forecasting
MNGT0332  Total Quality Management
MNGT0336  Applications of Statistics in Finance and Accounting

* To be arranged: eg biological statistics, further work on order statistics, population statistics, nonlinear programming.

* The School is currently revising some aspects of these courses. Intending students should consult the School for details.

School of Optometry

Head of School: Dr D. J. O'Leary

The School offers a formal graduate course leading to the award of the degree of Master of Optometry (MOptom). This course comprises 9 elective graduate subjects. The 9 elective graduate subjects offered are 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 course may be completed in one year of full-time study, or (to meet the needs of practising optometrists) in two or three years of part-time study. The course provides advanced training in clinical and theoretical aspects of optometry, with opportunities for specialization in fields such as contact lenses, occupational optometry, and orthoptics. Conditions for admission and for the award of the degree of Master of Optometry are set out in this handbook.

8760
Master of Optometry Degree Course
Full-time or Part-time

Master of Optometry
MOptom

Four elective graduate subjects chosen from the list below
Elective Graduate Subjects

OPTM8001 Advanced Clinical Optometry
OPTM8002 Advanced Physiological Optics
OPTM8003 Behavioural Optometry
OPTM8004 Advanced Contact Lens Studies
OPTM8005 Advanced Contact Lens Practice
OPTM8006 Occupational Optometry
OPTM8007 Clinical Photography
OPTM8008 Project
OPTM8009 Ocular Therapy

Centre for Advanced Numerical Computation in Engineering and Science

Director: Professor C.A.J. 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 Masters and PhD programs, carries out both fundamental and applied research through developing and using computer codes, provides short courses for industry-based engineers and scientists and organizes 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. The following subjects are offered through the Centre:

ANCE8001 Computational Mathematics 3
ANCE8002 Supercomputing Techniques 3
ANCE8101 Graphical Interfaces and Scientific Visualization Techniques 3
ANCE8102 Mesh Generation 3
ANCE8103 Fundamental Applied Computation 3
ANCE8104 Advanced Computational Algorithms 3
ANCE9105 Computational Techniques for Fluid Dynamics 3
ANCE8205 Computational Models for Coastal and Inland Waters 3
ANCE8207 Advanced Computational Science 3

Detailed information is given under Computational Science.
Graduate Study

Descriptions of all subjects are presented in alphanumeric order within organizational 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.

Anatomy

ANAT5151
Introductory Functional Anatomy
Staff Contact: Head of School

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 musculo-skeletal system, central and peripheral nervous systems, circulatory, respiratory, gastrointestinal, endocrine and urogenital systems.

ANAT6411
Neuroanatomy
Staff Contact: Head of School

Prerequisites: ANAT2211, ANAT2111
Note/s: This subject is identical in content as ANAT3411 Neuroanatomy 1 and is offered jointly with that subject.

Nerve cells and glial cells, cytoarchitecture of brain and spinal cord. Functional anatomy of sensory and motor processing, and higher cerebral functions such as language and emotions. Blood supply of the central nervous system, cerebrospinal fluid and membranous coverings. Comparative anatomy of the brain.

Biochemistry

BIOC6308
Alternative Higher Degree Qualifying Program
Staff Contact: Prof I Dawes

Similar in content and standard to BIOC4318 Biochemistry Honours but designed specifically for students who cannot regularly attend the University.

Biological Science

BIOS3014
Ecological Studies in Arid Lands Management
Staff Contact: Dr D Croft
S2 L2 T4

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 Program
Staff Contact: Prof M Archer

Similar in content and standard to BIOS4013 Biological Science Honours but designed specifically for students who cannot regularly attend the University.

BIOS9943
Alternative Higher Degree Qualifying Program
Staff Contact: Prof M Archer

Similar in content and standard to BIOS4023 Botany Honours but designed specifically for students who cannot regularly attend the University.
BIOS9945
Alternative Higher Degree Qualifying Program
Staff Contact: Prof M Archer
Similar in content and standard to BIOS4033 Zoology Honours but designed specifically for students who cannot regularly attend the University.

Biomedical Engineering

BIOM9012
Biomedical Statistics
Staff Contact: Dr R Odell
U4 S2 L3 T1

Biotechnology

BIOT3011
Biotechnology A
Staff Contact: Prof N Dunn
S1 L3 T3
Prerequisite: BIOC2312
The basic principles involved in the operation of microbial processes on an industrial scale. Includes: the selection, maintenance and improvement of microorganisms; 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; scale-up of microbial processes; air and media sterilization; the harvesting, purification and standardization of products; the principles involved in microbial processes for chemical, pharmaceutical and food production, microbial waste treatment and environmental control. The laboratory component includes manipulation of microorganisms, laboratory-scale fermenter operation, microbial enzyme isolation, visits to industrial fermentation plants and industrial seminars.

BIOT3021
Biotechnology B
Staff Contact: Prof P Rogers
S2 L2 T4
Prerequisite: BIOT3011
Application of principles of biotechnology to the analysis and design of microbial processes of industrial relevance (antibiotics, microbial enzymes, single cell protein from carbohydrates and hydrocarbons, fermented foods and beverages, amino acids and vitamins, microbial polysaccharides, activated sludge and photosynthetic processes for waste treatment, microbial leaching of lowgrade minerals). Emphasis on quantitative approach: mass and heat balance calculations, kinetic and thermodynamic analysis, detailed equipment design and specification, process design and layout, process simulation, plant location, application of optimization 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, and a design project.

BIOT3031
Microbial Genetics
Staff Contact: Dr S Delaney
S1 L2 T4
Prerequisites: BIOS2011, BIOS2021, BIOC2312 and MICR2201
Note/s: Excluded MICR3021.
This unit is suitable for students majoring in Microbiology, Biochemistry, Biotechnology or Genetics. It deals with major aspects of the genetics of bacteriophage, bacteria and yeasts. Topics include plasmids and transposable genetic elements, gene transfer, mutagenesis and DNA repair, mutants, bacteriophage genetics, gene cloning (vectors, recombinant DNA techniques) and genetics of nitrogen fixation.

BIOT3061
Monoclonal Antibody and Genetic Techniques in Biotechnology
Staff Contact: Dr S Mahler
S2 L2 T4
Prerequisite: BIOC2312
Recent developments in biotechnology have resulted in techniques which are widely applied in industrial, clinical, veterinary, agricultural and research laboratories. Many of these techniques have resulted from the development of monoclonal antibodies and the development of gene probes. The course includes: antibody structure; production of monoclonal antibodies, cell fusion, hybridoma selection, culture techniques, purification; analytical techniques employing monoclonal antibodies (RIA, ELISA); therapeutic application of antibodies, immunotoxins; gene probes; restriction fragment length polymorphisms (RFLP); gene probes for disease detection, identification of bacteria and viruses; forensic application of DNA fingerprinting. Tutorial and practical work to complement the lectures.

BIOT5013
Practical Biotechnology
Staff Contact: Department Office
F T6
Illustration, demonstration and operation of laboratory-scale and pilot-scale equipment. Visits to appropriate industries. Experimental project or critical review.

BIOT7043
Biotechnology Project (Major)
Staff Contact: Department Office
F T8
An experimental or technical investigation or design project in the general field of biotechnology.
BIOT7051
Applied Genetics
Staff Contact: Prof N Dunn
S2 L2 T3
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 parasexual cycles. The use of these techniques in strain construction.


BIOT7061
Peptide and Protein Technology
Staff Contact: Dr S Mahler
S2 L2 T3
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 Gray
S2 L2 T3
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 recDNA guidelines; downstream processing, design and operation; instrumentation and control; use of computer-linked systems; mathematical simulation.


BIOT7081
Environmental Biotechnology
Staff Contact: Dr J Madgwick
S1 L2 T3
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 Cellular Physiology
Staff Contact: Department Office
S1 L2 T3
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.

BIOT7010
Reading List in Biotechnology (Microbiology)
Staff Contact: Prof N Dunn
S1 or S2 T3

BIOT7020
Reading List in Biotechnology (Biochemistry)
Staff Contact: Prof N Dunn
S1 or S2 T3

BIOT7100
Biological Principles
Staff Contact: Dr S Delaney
S1 L3

BIOT7110
Bioengineering Principles
Staff Contact: Department Office
S1 L3
A subject designed to provide an introductory course for students in the MApSc Biotech program who have not previously undertaken any bioengineering 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.

Lamina 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 Minor
Staff Contact: Department Office
F T4
A small experimental or design project, or an extensive literature review and analysis of a selected topic in biotechnology.

BIOT8010
Graduate Seminars
Staff Contact: Department Office
F T2

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Chemistry

CHEM7115
Treatment of Analytical Data
Staff Contact: Professor D B Hibbert
F L1
Errors of measurement, the treatment, interpretation and comparison of sets of measurements, associated data and problems involving analysis of variance. Topics: description of sets of measurements, tests of significance, associated data, linear regression analysis; analysis of variance; biological assays, bacteriological counts, sampling problems.

CHEM7125
Food and Drugs 1
Staff Contact: A/Prof G Crank
S1 L3 T3
This unit covers the basic chemistry of food constituents and the appropriate methods of analysis of food constituents. Materials covered include monosaccharides, oligosaccharides, polysaccharides, food gums, proteins and enzymes, oils and fats, vitamins, plant pigments and food colouring matter, essential oils and food flavouring agents, preservatives and food additives.

CHEM7225
Food and Drugs 2
Staff Contact: A/Prof G Crank
F L1 T3
This unit is concerned with the chemistry and analysis of common drugs such as antibiotics, sulphonamides, analgesics, barbiturates etc. Special techniques in drug analysis are studied, e.g. affinity chromatography, immunofluorimetry, immunosays, radioimmunoassays, ELISA, HPLC using special phases, chiral columns, ISRP columns, hypercarb columns; capillary gas chromatography, flash chromatography. Further work on the chemistry and analysis of preservatives.

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CHEM7325
Toxicology, Occupational and Public Health
Staff Contact: A/Prof G Crank
F L1 T3
Important classes of toxic materials found in the environment; treatment of pesticide residues, industrial chemicals of various types, toxic gases, mould metabolites and bacterial toxins occurring in food, carcinogenic substances, toxic metals etc. Effects of these substances on living organisms, particularly people. Practical work: pesticide residue analysis, blood and urine analysis, gas sampling and analysis, trace metal determination and experiments on the animal metabolism of toxic substances.

CHEM7425
Instrumental Techniques in Food and Drug Analysis
Staff Contact: A/Prof G Crank
S2 L2 T4
Principles involved in modern instrumental techniques; detailed application and interpretation of results. UV-visible spectroscopy, Raman, IR and NIR spectroscopy; phosphorescence and fluorescence methods, mass spectroscopy, high and low resolution NMR spectroscopy. Qualitative and quantitative application of instrumental analysis to foods and drugs.

CHEM7555
Project Work in Food and Drug Chemistry
Staff Contact: A/Prof G Crank
Short laboratory projects and/or literature assignments in selected topics of Food, Drug and Biological Chemistry, including laboratory synthesis of drugs, analysis of drug mixtures, stability of drugs, synthesis and characterization of food additives, analysis of natural and synthetic food flavours etc. Computerized methods of searching the chemical literature, use of computer graphics to study molecular properties.

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Civil Engineering

CIVL9403
Theory of Land Use Transport Interaction
Staff Contact: Dr S.E Samuels
U3 SS
Note/s: Not offered in 1994.
Theoretical aspects of land use transport planning. Basic concepts, data collection methods, systems models and equation of state function (behavioural, optimising). Introduction to land use-transport modelling (land use, generation, distribution, modal assignment, network assignment, evaluation). Planning methodologies (short, medium, long-term; action planning, strategic planning; local, urban, regional, national).
CIVL9405
Urban Transport Planning Practice
*Staff Contact: Dr S.E Samuels*
U3 SS
*Note/s: Not offered in 1994.*
Analytical techniques for urban land use/transport planning practice. Planning methodology: traffic generation, trip distribution, modal-choice, traffic assignment, evaluation. Land use forecasting; calibration and verification of behavioural models, application of mathematical programming models, case studies, public transport problems.

CIVL9417
Transport and Traffic Flow Theory
*Staff Contact: Dr S.E Samuels*
U3 F
*Note/s: Not offered in 1994.*
Analysis of deterministic and stochastic models of the traffic stream. Topics include: definition and measurement of traffic stream parameters; space and time distribution of speed; overtaking models and the moving observer method; fundamental diagram of traffic; car following theory; headway and counting distributions; introduction to queuing theory; simulation techniques; signalised and unsignalised intersections.

CIVL9835
Coastal Engineering 1
*Staff Contact: A/Prof R. Cox*
U3 S1 (Will be taught Wed. 1800-2100)
Theory of periodic waves as applied to tides and wind generated waves in water of varying depths. Wave and tide prediction.

CIVL9836
Coastal Engineering 2
*Staff Contact: A/Prof R. Cox*
U3 SS
Wave forces on structures, shore processes and beach erosion. Estuarine hydraulics, wave and tide modes.

CIVL9863
Estuarine Hydraulics
*Staff Contact: Prof D. L. Wilkinson*
U3 Not Offered in 1994, however CIVL9862 Flunial Hydraulics is being offered in S1

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Computational Science

ANCE8002
Supercomputing Techniques
*Staff Contact: CANCES*
C3 S1 HPW3
For understanding and efficiently using vector and parallel supercomputers for contemporary computational engineering and scientific applications.

ANCE8003
Project (MComputationalSc Degree)
*Staff Contact: CANCES*
C12
Case study experience to give the student practice in applying the techniques learnt in specific subjects towards solving or computationally analyzing practical problems.

ANCE8101
Graphical Interfaces and Scientific Visualization Techniques
C3 SS HPW3
Case study usage of typical graphics systems and packages. Introduction to advanced data manipulation and presentation: videos, physical process evolution. Usage for error assessment. Relationship to post-processing.

ANCE8102
Mesh Generation
*Staff Contact: CANCES*
C3 SS 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: CANCES*
C3 SS HPW3
Basic computational skills for candidates with limited previous training, structured to provide an appropriate foundation for the core subjects.

ANCE8104
Advanced Computational Algorithms
*Staff Contact: CANCES*
C3 SS 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.

ANCE9105
Computational Techniques for Fluid Dynamics
*Staff Contact: CANCES*
C3 SS HPW3
General and specific computational techniques for fluid flow behaviour occurring in industrial, geophysical and chemical processes etc.
Computational Models for Coastal and Inland Waters  
Staff Contact: CANCES  
C3 SS HPW3  

Advanced Computational Science  
Staff Contact: CANCES  
C3 SS HPW3  
Special topics taught by visitors or UNSW staff.

Economics  
Initial contact for these units should be directly with the School of Economics Office.

ECON3204  
Econometrics B  
Staff Contact: Prof N Kakwani  
U2 S2 L2 T1  
Prerequisites: ECON3203 or MATH3811 or MATH3911  
A theoretical treatment of further topics in single equation econometric modelling, including econometric specification tests, the Box-Cox transformation, dynamic models with auto-correlated errors, and nonlinear regression. Seemingly unrelated regressions. Simultaneous equation identification. Estimation and prediction. An overview of model-building, with illustrations from literature.

ECON5114  
Microeconomics  
Staff Contact: Dr C Freedman  
S3 HPW3  
Microeconomic theory and applications including consumer behaviour and the theory of demand; costs, production and the theory of the firm price determination under competition, monopolistic and oligopolistic markets; investment and technology; wages, and the distribution of income; welfare, economic efficiency and public policy.

ECON5125  
Macroeconomics  
Staff Contact: Dr M Monadjemi  
S3 HPW3  
Overview of the macroeconomy; determination of aggregate income, interest rate and employment in closed and open economies; theories of inflation; inflation and unemployment policy; monetarist and Keynesian controversies.

Geography  
GEOG9150  
Remote Sensing Applications  
Staff Contact: Drs A Skidmore and Q Zhou, Mr A. Evans  
U3 S1 L1 T2  
The application of remotelysensed data and information in the description, classification and assessment of earth resources and environmental conditions. Different types of remote sensing data and imagery, their attributes, acquisition and uses. Relevance of remotesensing data and imagery to a range of applications, including assessment of conditions of terrain, soils and surface materials, multitemporal monitoring and inventory of rangelands, croplands and forests; rural and urban land use assessment; surveillance of surface water resources and sedimentation; appraisal of changes in coastal zone. Use of remote sensing in environmental management and in environmental impact assessment.

GEOG9290  
Image Analysis in Remote Sensing  
Staff Contact: Mr A Evans or Dr A Skidmore  
U3 S1 L2 T1  
Techniques for extracting information from satellite imagery including image enhancement and rectification techniques, classification and feature recognition, statistical methods, and related procedures. Emphasis is on applications relating to vegetation cover and natural resource management. Practical work will be undertaken using the ERDAS image processing software.

Mathematics  
MATH5105  
Numerical Analysis of Differential Equations  
Staff Contact: School of Mathematics Office  

MATH5110  
Advanced Numerical Analysis  
Staff Contact: School of Mathematics Office  
Development and analysis of numerical methods for the computational solution of mathematical problems.

MATH5115  
Topics in Numerical Analysis  
Staff Contact: School of Mathematics Office  
A selection of topics from finite element methods, boundary element methods, approximation theory, integral equations and iterative techniques for matrix problems.
MATH5130
Advanced Mathematical Methods
Staff Contact: School of Mathematics Office
Fundamental methods for solution of problems in applied mathematics, physics and engineering

MATH5155
Discrete Optimization
Staff Contact: School of Mathematics Office
Analysis, solution and application of optimization problems where the variables may change continuously. Topics selected from: integer programming, network flows, scheduling problems, complexity theory, matroid theory, polyhedral combinations, and other areas of operations research.

MATH5165
Continuous Optimization
Staff Contact: School of Mathematics Office
Analysis, solution and application of optimization problems where the variables may change continuously. Topics selected from: nonlinear programming, convex optimization, nonsmooth analysis and optimization, variational inequalities and complementary problems, infinite-dimensional optimization, stochastic optimization, and numerical optimization.

MATH5170
Advanced Optimization
Staff Contact: School of Mathematics Office
Development, analysis and application of methods for optimization problems.

MATH5175
Topics in Optimization and Optimal Control
Staff Contact: School of Mathematics Office
Special topics in the analysis, solution and application of optimization and optimal control problems.

MATH5185
Topics in Modern Applied Mathematics A
Staff Contact: School of Mathematics Office
A selection of topics from optimization, optimal control and numerical analysis not offered in other graduate subjects.

MATH5205
Nonlinear Analysis
Staff Contact: School of Mathematics Office
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
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
Special topics in boundary layer theory, turbulent flows, stability theory, waves, viscous flows and computational techniques.

MATH5250
Advanced Fluid Dynamics
Staff Contact: School of Mathematics Office
The mathematical modelling and theory of problems arising in the flow of fluids.

MATH5255
Waves
Staff Contact: School of Mathematics Office
Hyberbolic 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
The dynamics of largescale 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 atmosphere circulation forced by meridional heating (including Hadley Cells). Additional topics may include tropical circulation and El Nino, airsea exchange, climate change and the Greenhouse effect.

MATH5275
Topics in Modern Applied Mathematics B
Staff Contact: School of Mathematics Office
A selection of topics from dynamics, fluid mechanics and oceanography not offered in other graduate subjects.

MATH5285
Ocean Modelling
Staff Contact: School of Mathematics Office
Analytical and numerical modelling of ocean dynamics, and their interpretation. The course examines aspects of modelling of oceanic circulation using analytical and numerical modeling 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
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
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
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
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
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

MATH5435
Applied Algebraic Computation
Staff Contact: School of Mathematics Office
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

MATH5515
Topics in Analysis
Staff Contact: School of Mathematics Office

MATH5525
Topics in Geometry
Staff Contact: School of Mathematics Office

MATH5535
Topics in Number Theory
Staff Contact: School of Mathematics Office

MATH5605
Operator Theory
Staff Contact: School of Mathematics Office
Topics from: invariant subspaces, integral equations and Fredholm theory, functional calculus, decomposition theorems, Hankel and Toeplitz operators, operators on $H^p$ spaces, Ergodic theory, semigroups.

MATH5615
Banach and Operator Algebras
Staff Contact: School of Mathematics Office
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

MATH5635
Dynamical Systems
Staff Contact: School of Mathematics Office
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
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
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.

MATH5665
Algebraic Topology
Staff Contact: School of Mathematics Office

MATH5675
Set Theory and Topology
Staff Contact: School of Mathematics Office
Topics from: set theory, axiom of choice, ordinals and cardinals, topological spaces, compactness, quotient topologies.

MATH5685
Complex Analysis
Staff Contact: School of Mathematics Office
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
Topics from: Brownian motion, Itô calculus, Malliavin calculus, Girsanov's theorem, Clark's theorem, the HarrisonPliska model of option pricing.

MATH5705
Commutative Harmonic Analysis
Staff Contact: School of Mathematics Office
Topics from: Fourier series and integrals for \( T^n \) and \( \mathbb{R}^n \). Locally compact abelian groups, Pontrjagin duality, Plancherel Theory.

MATH5715
Non-Commutative Harmonic Analysis
Staff Contact: School of Mathematics Office
Topics from: Locally compact groups, Haar measure, homogeneous spaces. Convolution algebras, representations, irreducibility. Induced representations, Mackey theory. Compact groups, PeterWeyl theory. Nilpotent groups, Kirillov theory.

MATH5725
Lie Groups and Algebras
Staff Contact: School of Mathematics Office

MATH5735
Advanced Algebra
Staff Contact: School of Mathematics Office
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
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
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 representations.

MATH5765
Algebraic Geometry
Staff Contact: School of Mathematics Office
Topics from: algebraic curves; cohomology, Riemann-Roch theorem, elliptic curves, Jacobians. Classical projective geometry; quadrics, cubic surfaces, Grassmanians, Schubert calculus. Commutative algebra; modules, homological concepts, dimension.

MATH5775
Calculus on Manifolds
Staff Contact: School of Mathematics Office

MATH5785
Geometry
Staff Contact: School of Mathematics Office

Statistics

MATH5806
Applied Regression Analysis
Staff Contact: School of Mathematics Office
MATH5815  
Experimental Design 1  
Staff Contact: School of Mathematics Office  
U2  
Modified designs for fixed effects models. Incomplete and balanced incomplete block designs. Confounding and fractional replication. Randomization theory. Multiple comparisons.

MATH5816  
Mathematics of Security Markets 2  
Staff Contact: School of Mathematics Office  
Prerequisite: MATH5865  
More advanced applications of stochastic calculus to security markets.

MATH5825  
Experimental Design 2  
Staff Contact: School of Mathematics Office  
U2  
Extensive treatment of random and mixed models. Combinatorial structure of designs, crossover and lattice designs, response surfaces.

MATH5835  
Stochastic Processes  
Staff Contact: School of Mathematics Office  
U2  
Discrete and continuous time stochastic processes, trajectories, expected values and covariance functions. Discrete time martingales, random walks, optional stopping theorem, ruin problem. Poisson processes, Markov property, independent increments, waiting times, renewals, Gaussian processes, elementary properties, Brownian motion, barrier crossing problem, reflection principle.

MATH5845  
Time Series  
Staff Contact: School of Mathematics Office  
U2  

MATH5855  
Multivariate Analysis 1  
Staff Contact: School of Mathematics Office  
U2  
Likelihood ratio tests for means, variances and structure. Discriminant, principal component, canonical and factor analysis. Computing will feature prominently.

MATH5865  
Multivariate Analysis 2  
Staff Contact: School of Mathematics Office  
U2  
The general linear hypothesis and analysis of dispersion. Tests based on roots, distribution theory.

MATH5875  
Sample Survey Design  
Staff Contact: School of Mathematics Office  
U2  
Simple, stratified and systematic random sampling. Estimation of proportions, ratios, and sample sizes. Multistage sampling.

MATH5885  
Sequential Analysis  
Staff Contact: School of Mathematics Office  
U2  
The sequential probability ratio test OC and ASN functions. General theory of sequential tests. Sequential estimation.

MATH5895  
Non-Parametric Methods  
Staff Contact: School of Mathematics Office  
U2  

MATH5905  
Statistical Inference  
Staff Contact: School of Mathematics Office  
U2  
Decision theory. General theory of estimation and hypothesis testing.

MATH5915  
Medical Statistics  
Staff Contact: School of Mathematics Office  
Bioassay, generalised linear models, analysis of multivariate discrete data including loglinear model analysis of contingency tables, survival analysis, competing risks, hazard models for point processes.

MATH5925  
Project  
Staff Contact: School of Mathematics Office  
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  
This is a practical subject 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  

MATH5955  
Statistical Quality Control  
Staff Contact: School of Mathematics Office  
MATH5965  
Mathematics of Security Markets 1  
Staff Contact: School of Mathematics Office  
Derivative securities, forward and futures contracts, swaps.  
Option pricing using Black Scholes and binomial approaches. Stochastic models for asset dynamics, term structure of volatilities and interest rates. Introduction to Itô calculus, diffusion processes and stochastic differential equations.

MATH5975  
Economic Quality Control Models  
Staff Contact: School of Mathematics Office  
Prerequisite: MATH5955  
Economic designs of acceptance sampling plans. Economic designs of process control charts. Quality evaluation. Tolerance design and tolerancing. Taguchi’s on time quality control. Online process parameter design process improvement methods and preventive maintenance.

MATH5985  
Industrial Designs  
Staff Contact: School of Mathematics Office  
Prerequisite: MATH5815  

Servicing Subjects

These are subjects taught within courses offered by other faculties.

For further information regarding the following see the Faculty of Engineering Handbook.

MATH5045  
Advanced Mathematics for Electrical Engineers  
Staff Contact: School of Mathematics Office  
Boundary value problems in partial differential equations. Selected topics from complex variable analysis, integral transforms, and orthogonal functions and polynomials.

Medicine

CMED8201  
Population Genetics  
Staff Contact: Dr A Stark  
U2 S1 HPW5  
Prerequisite: One unit of statistical methods, or theory, as approved by the Head of School  
The genetic structure of populations: genetic relationships, mating systems (random and assortative mating, inbreeding, sexual selection), finite populations, systematic forces (selection, mutation, migration), genetic distance between populations, genetic load, stable populations, molecular population genetics, evolutionary trees; computer methods.

CMED8202  
Human Genetic Analysis  
Staff Contact: Dr A Stark  
U2 S2 HPW5  
Prerequisites: One unit of genetics and one unit of statistical methods, or theory, as approved by the Head of School  
Principles and methods of human genetics: design of surveys; estimation and applications of genic and genotypic frequencies, selective values, mutation and migration rates, coefficients of kinship, inbreeding and assortative mating, recombination fractions and heritabilities; segregation analysis; risks of recurrence of disease; consequences of human intervention; computer methods.

Microbiology and Immunology

MICR6043  
Alternative Higher Degree Qualifying Program  
Staff Contact: Prof A Lee  
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 Prof J Middleton.

OCEA5115  
Experimental Project in Physical Oceanography  
U14  
A report of an experimental project, including recording, preparation, analysis and interpretation of field or laboratory data.

OCEA5125  
Geophysical Fluid Dynamics  
U4  
Aspects of the physical features of the oceans. Includes ocean waves rotational and gravitational, tides, large scale
Optometry

Initial contact for these subjects should be directly with the School of Optometry. All units are full year courses.

OPTM8001 Advanced Clinical Optometry
HPW4
Clinical work on selected patients, with special emphasis on advanced techniques and new developments. Optometric examination procedures, including: external and internal examination of the eyes; visual functions; tonometry; objective optometry; evaluation of binocular functions; aniseikonia; subnormal vision; geriatric and pediatric optometry; the clinical application of electrophysiological techniques. Assessment of new instruments, methods and treatment.

OPTM8002 Advanced Physiological Optics
HPW4

OPTM8003 Behavioural Optometry
HPW4
An integrated subject, in which binocular vision and pleurooptics 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 oculomotor imbalance. Laboratory and clinical methods of measuring eye position and visual directions. The aetiologies, measurements and treatment of strabismus, anomalous correspondence, eccentric fixation amblyopia.

OPTM8004 Advanced Contact Lens Studies
HPW4

OPTM8005 Advanced Contact Lens Practice
HPW4
Examination, evaluation and aftercare of contact lens patients.

OPTM8006 Occupational Optometry
HPW4
OPTM8007
Clinical Photography
HPW4
Introduction to clinical photography, cameras and lens systems, colour films, black and white films and filters, apparatus and accessories. Patient preparation and positioning, backgrounds and foregrounds, lighting, the 'safer' method. Copying, slide making, macro-photography, microphotography. 'Invisible light' photography ultraviolet and infrared, photofluorography, speedlight techniques, fundus photography. Darkroom techniques, portable darkrooms. Quantitative photographic data analysis.

OPTM8008
Project
HPW8
This is an individual program where the student will have individual supervision in carrying out a clinical research project for which a thesis will be submitted on completion of the MOptom course.

OPTM8009
Ocular Therapy
HPW4
Pharmacology and clinical pharmacy, anterior segment disease, glaucoma systemic/medical considerations in eye core CPR in emergencies, advanced diagnostic techniques.

OPTM8007
Clinical Photography
HPW4
Introduction to clinical photography, cameras and lens systems, colour films, black and white films and filters, apparatus and accessories. Patient preparation and positioning, backgrounds and foregrounds, lighting, the 'safer' method. Copying, slide making, macro-photography, microphotography. 'Invisible light' photography ultraviolet and infrared, photofluorography, speedlight techniques, fundus photography. Darkroom techniques, portable darkrooms. Quantitative photographic data analysis.

PHYS7159
Acoustic Theory
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.

Psychology

PSYC6000
Alternative Higher Degree Qualifying Program
Staff Contact: A/Prof J Toplin
Refer to the School of Psychology for details.

PSYC7000
Research and Evaluation Methods
Staff Contact: Dr K Bird
S1 HPW2
Problems of experimental design in applied fields; measurement and scaling; analysis of change, including sequential analysis, and the application of the experimental methods to the individual cases. Design and evaluation of programs.

PSYC7001
Psychological Assessment 1
Staff Contact: Dr M Nicholas
S1 HPW3
A theoretical basis, background information and practical skills in methods of assessment typically used in clinical and industrial psychology. Theory and research on interviewing, introduction to DSM III, 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
S2 HPW2
Prerequisite: PSYC7001
The application of the principles of experimental psychology to problems of behavioural assessment in a wide variety of situations, eg organizational behaviour; lifestyle change; the management of behavioural disorders; institutional behavioural programs. Assessment procedures studied include: psychological tests, behavioural analysis and case history taking, psychophysiological and other objective measures.
Staff Contact: A/Prof E J Kefioe

Psychological Principles of Training
PSYC7102

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.

Staff Contact: A/Prof S Bochner

Cross-Cultural Perspective in Applied Psychology
PSYC7111

General issues in cross-cultural psychology; problems of conducting research in more than one cultural setting. Cross cultural organizational psychology including a comparative analysis of production systems. Culture training and orientation including programs aimed at...
GRADUATE STUDY  
preparing managers to become culturally mediating persons.

**PSYC7112**  
Vocational Psychology  
*Staff Contact: A/Prof B Hesketh*  
HPW2  
**Note/s:** Not offered in 1994.

Individual career counselling, decisionmaking and work adjustment throughout life, traditional and computerised approaches to occupational information and psychological testing; staff development; relationships between work, leisure, retirement and unemployment. Vocational problems of groups such as minorities and those with disabilities.

**PSYC7113**  
Special Topic  
*Staff Contact: A/Prof S Bochner*  
S1 or S2 HPW2

An occasional elective dealing with applications of some special field of psychology.

**PSYC7114**  
Graduate and Applied Seminars  
*Staff Contact: A/Prof S Bochner*  
S1 or S2 HPW1

A weekly seminar during which academic staff, graduate students and visitors from other institutions make presentations about the work they are doing.

**PSYC7203**  
Theory and Research in Psychopathology  
*Staff Contact: Dr P Lovibond*  
S1 HPW2

An illustration of theoretical principles and experimental strategies in research investigating the processes and mechanisms underlying psychological disturbance. Topics include the relationship between genetic and environmental factors in aetiology, the integration of laboratory and clinical evidence, and the status of biological, behavioural and cognitive theories of dysfunction.

**PSYC7204**  
Child Clinical Psychology  
*Staff Contact: Dr P Lovibond*  
S1 HPW3

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.

**PSYC7206**  
Research Thesis (Clinical)  
*Staff Contact: Prof K McConkey*  
S1 HPW3

A research thesis involving an investigation into some aspect of clinical or community psychology.

**PSYC7209**  
Developmental Disabilities and Disorders  
*Staff Contact: A/Prof J Taplin*  
S2 HPW2

An essentially practical subject focusing on childhood disorders, such as mental retardation, infantile autism, physical and sensory handicaps, specific learning difficulties, and hyperactivity. Methods of assessment include standardized tests of child development, behavioural checklists and interviews, and observation of present behaviour. Behavioural change procedures that may be effective in the treatment and management of the behavioural problems in question.

**PSYC7210**  
Human Neuropsychology  
*Staff Contact: Dr S McDonald*  
S2 HPW3

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.

**PSYC7211**  
Behavioural Medicine  
*Staff Contact: Dr M Nicholas*  
S2 HPW2

Theoretical and experimental foundations of behavioural medicine; assessment strategies; approaches to intervention/treatment; concepts of coping in behavioural medicine; pain and pain management; headaches and their behavioural management; medical rehabilitation; terminal illness; chronic illness; and AIDS.

**PSYC7212**  
Experimental Clinical Psychology 1  
*Staff Contact: Dr M Nicholas*  
S1 HPW4

**Note/s:** Excluded PSYC7200.

An introduction to clinical practice and deals with two serious psychological problems (mood disorders and obsessive compulsive disorder). Topics covered include: interviewing, diagnosis, mental state examination, case formulation, and introduction to treatments.

**Note/s:** The use of pharmacotherapy in relation to psychological problems will be covered in each of the Experimental Clinical Psychology subjects as appropriate.

**PSYC7213**  
Experimental Clinical Psychology 2  
*Staff Contact: Dr J C Clarke*  
S2 HPW4  
**Prerequisite:** PSYC7212  
**Note/s:** Excluded PSYC7200.

A continuation of the problem-oriented approach begun in PSYC7212 and deals with a number of common psychological problems and approaches to their treatment. Topics covered include: anxiety disorders, impulse control disorders, and psychoactive substance use disorders.

**PSYC7214**  
Experimental Clinical Psychology 3  
*Staff Contact: Dr M Nicholas*  
S1 HPW2  
**Prerequisite:** PSYC7213  
**Note/s:** Excluded PSYC7201

The assessment and management of schizophrenia, sexual disorders and personality disorders. Psychological rehabilitation, marital and family therapies.
PSYC7215
Experimental Clinical Psychology 4
Staff Contact: Dr J C Clarke
Prerequisite: PSYC7214
An examination of specialised areas of clinical practice, including the management of suicide, crisis management, sexual assault, and child abuse in adult mental health problems.

PSYC 7216
Professional Practice (Clinical) 1
Staff Contact: Dr M Nicholas
Prerequisite: PSYC7214
Note/s: Excluded PSYC7205
Attendance at weekly clinical meetings (1 hour) and skills training workshops (2 hours).

PSYC7217
Professional Practice (Clinical) 2
Staff Contact: Dr M Nicholas
Prerequisite: PSYC7214
Note/s: Excluded PSYC7205
Attendance at weekly clinical meetings (1 hour) and skills training workshops (2 hours), and supervised work with clients in the School Clinic (80 hours for session).

PSYC7218
Professional Practice (Clinical) 3
Staff Contact: Dr M Nicholas
Prerequisite: PSYC7217
Note/s: 1. Excluded PSYC7205. 2. Students must complete three field placements, one must be at least 40 days while the other two are completed in at least 20 days.
Attendance at weekly clinical meetings (1 hour), supervised work with clients in the School Clinic and either a 40 day or two 20 day field placements (340 hours for session).

PSYC7219
Professional Practice (Clinical) 4
Staff Contact: Dr M Nicholas
Prerequisite: PSYC7218
Note/s: 1. Excluded PSYC7205. 2. Students must complete three field placements, one must be at least 40 days while the other two are completed in at least 20 days.
Attendance at weekly clinical meetings (1 hour), supervised work in the School Clinic and either a 40 day or two 20 day field placements (340 hours for session).

PSYC7220
Health Psychology
Staff Contact: Dr P Birrell
Prerequisite: PSYC7213
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
Special Topics
Staff Contact: School Office
Note/s: 1. Excluded PSYC7003. 2. To be offered occasionally and may be substituted for PSYC7003 by students enrolled in Course 8251. 3. Not offered in 1994.
An examination of special issues and topics in clinical psychology that relate to particular interests and expertise of staff and/or particular events occurring in clinical psychology nationally and internationally.

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

PSYC7300
Experimental Psychology in Cognitive Science
Staff Contact: A/Prof E J Kehoe
Prerequisite: PSYC7214
Note/s: 1. Excluded PSYC7003. 2. To be offered occasionally and may be substituted for PSYC7003 by students enrolled in Course 8251. 3. Not offered in 1994.
Theory of experimental psychology pertinent to cognitive science. Learning, memory, decision making, problem solving, perception, and language comprehension.

PSYC7301
Behavioural Neuroscience
Staff Contact: Prof G Paxinos
Prerequisite: PSYC7214
Note/s: 1. Excluded PSYC7003. 2. To be offered occasionally and may be substituted for PSYC7003 by students enrolled in Course 8251. 3. Not offered in 1994.
The neurophysiological substrates of learning, memory, perception and cognition. Introduction to the basic structure and physiology of the nervous system.

PSYC7302
Human Information Processing
Staff Contact: Dr M Taff
Prerequisite: PSYC7214
Note/s: 1. Excluded PSYC7003. 2. To be offered occasionally and may be substituted for PSYC7003 by students enrolled in Course 8251. 3. Not offered in 1994.
Human information processing: advanced topics in cognitive psychology with particular reference to temporal dynamics of attention, organization, integration and retrieval processes for sensory and linguistic information.

PSYC7303
Neuroscience: Human Neuropsychology
Staff Contact: Dr J Cranney
Prerequisite: PSYC7214
Note/s: 1. Excluded PSYC7003. 2. To be offered occasionally and may be substituted for PSYC7003 by students enrolled in Course 8251. 3. Not offered in 1994.
Advanced topics in the neurophysiology of human cognitive functioning, including consideration of the influence of brain disease and brain damage.

Remote Sensing
REM09581
Microwave Remote Sensing
Staff Contact: A/Prof B Forster
Note/s: 1. Excluded PSYC7003. 2. To be offered occasionally and may be substituted for PSYC7003 by students enrolled in Course 8251. 3. Not offered in 1994.
Use of passive and active radar microwave techniques in remote sensing of earth resources. Topics include; real and synthetic aperture radar systems; passive microwave
radiometry; energy surface interactions; interpretation of microwave image data: applications in agriculture, geology, oceanography and hydrology; issues in signal and image processing; characteristics of airborne and spaceborne microwave sensors.

Safety Science

SAFE9211
Introduction to Safety Engineering
Staff Contact: Dr R Rosen
U3
Assumed knowledge: SAFE9011 or PHYS1022
Note/s: Students with an engineering or physics background may take SAFE9213 which covers similar material.

The engineering improvement of potentially hazardous workplaces with reference to the following: basic safety practice; management of dangerous materials; fire and explosion; ventilation; noise control; radiation protection; electrical safety; biosafety; machine dangers and machine guarding; construction safety; transport safety; environmental safety; plant safety assessment.

SAFE9224
Principles of Ergonomics
Staff Contact: Dr K Kothiyal
C3
Assumed knowledge: SAFE9011 or PHYS1022
Note/s: A project forms a substantial proportion of the assessment for this subject.

Applied anatomy and kinesiology, anthropometry; application to workplace arrangement, seating and bench design, tool and equipment design, lifting techniques, consumer product and architectural design. Physiological and psychological aspects of work and fatigue; measurement of energy consumption, limits to energy expenditure at work, static muscular fatigue, boredom. Environment effects; natural and artificial lighting arrangements, problems of perception, colour, noise and vibration, heat and ventilation, thermal regulation in humans, criteria for comfort. Personmachine interfaces, displays, machine controls, reaction times, vigilance. Applications of ergonomics to occupational safety and health. Ergonomic research methodology.

SAFE9232
Introduction to Occupational Health and Safety Law
Staff Contact: Head of School
U3
The concept of law; the creation and interpretation of statutes; the judicial and court systems; locus standi; common law and equity; basic principles of legal liability (civil and criminal); basic principles of administrative law and the liability of the Crown; the common law of employment; statutory regulation of employment; compulsory arbitration of industrial disputes. Outline of occupational health, safety and compensation legislation of the Australian States. Actions under the common law.

SAFE9242
Effective Behaviour In Organizations
Staff Contact: Ms Dianne Gardner
C3

SAFE9244
Applied Ergonomics
Staff Contact: Mr Roger Hall
C3
Prerequisite: SAFE9224 at credit level or equivalent

Decision making, vigilance, effects of workload and stress, applications to screen-based equipment. Human error in relation to human/system interaction. Work systems: the systems approach, practical evaluation and redesign of work systems. Experimental methodology, experimental design in ergonomics, critical evaluation of the literature.

SAFE9433
Management of Dangerous Materials
Staff Contact: Dr Chris Winder
C3
Assumed knowledge: 1st year chemistry

This subject covers chemicals legislation, regulatory assessment of chemicals, chemical information (labels/MSDS), workplace management of chemical safety (workplace assessment, exposure control, storage of chemicals, personal protection, monitoring), emergency preparedness, pollution, management of hazardous wastes and disposal.

SAFE9553
Radiation Protection
Staff Contact: Dr Ronald Rosen
C3
Assumed knowledge: SAFE9211 or SAFE9213

Principles and practices of radiation protection for both ionising and nonionising radiation. Radiation physics, detection and measurement; background radiation; biological effects of radiation; dose limits; technical controls for radioactive sources and irradiating 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. Practical work and site visit.
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 full list of undergraduate courses and degrees offered see Table of Courses by Faculty (Undergraduate Study) in the Calendar.

The following is the list of higher degrees, graduate diplomas and graduate certificates of the University, together with the publication in which the conditions for the award appear.

Higher Degrees

For details of graduate degrees by research and course work, arranged in faculty order, see UNSW Courses (by faculty) in the Calendar.

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<td>Master of Science</td>
<td>MSc</td>
<td>Applied Science</td>
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<tr>
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<td>MSc</td>
<td>Built Environment</td>
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<tr>
<td>Master of Science (Industrial Design)</td>
<td>MSc(IndDes)</td>
<td>Built Environment</td>
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<td>Master of Science and Society</td>
<td>MSsoc</td>
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<td>ATAX</td>
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<td>MTP</td>
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<td>Graduate Diplomas</td>
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<td>AGSM</td>
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<td>Graduate Diploma</td>
<td>DipFDA</td>
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Graduate Certificates

GradCertPhilT  Arts and Social Sciences
GradCertHEd    Professional Studies

*Faculty of Science.
†Faculty of Biological and Behavioural Sciences.
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 organization 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 reexamination.
(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 at the further work 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 further examination as determined by the Committee within a period specified by it but not exceeding eighteen months.
(4) The Committee shall, after consideration of the examiners' reports and the results of any further work, 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 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 Chemistry (MChem), Master of Mathematics (MMath) and Master of Physics (MPhys)

1. The degree of Master of Chemistry or Master of Mathematics or Master of Physics by formal coursework may be awarded by the Council to a candidate who has satisfactorily completed a program or advanced study.

Qualifications

2. (1) A candidate for the degree shall have been awarded an appropriate four-year degree of Bachelor with Honours Class 2 or higher 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 (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 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 subjects 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 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 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 stage 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 Mathematics (MMath) Master of Physics (MPhysics)

See Master of Chemistry above for these degrees

Master of Optometry (MOptom)

1. The degree of Master of Optometry or Master of Physics by formal coursework may be awarded by the Council to a candidate who has satisfactorily completed a program or 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 (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 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 subjects 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 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 (Applied) (MPsychol(Applied)) and Master of Psychology (Clinical) (MPsycho(Clinical))

1. The degree of Master of Psychology (Applied) or Master of Psychology (Clinical) 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 Biological and Behavioural 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 by 1 November of the year before the year in which enrolment is to begin.

(2) A candidate for the degree shall be required to undertake such formal subjects 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 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 (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 subjects 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 eight 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 two sessions for a full-time candidate and four sessions for 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.

Fees
4. A candidate shall pay such fees as may be determined from time to time by the Council.
Graduate Diploma (GradDip or DipFDA)

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 subjects 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.
The scholarships and prizes listed below are available to students whose courses are listed in this book. Each faculty handbook contains in its Scholarships and Prizes section the scholarships and prizes available with that faculty. The General Information section of the Calendar contains a comprehensive list of scholarships and prizes offered throughout the University. Applicants should note that the awards and conditions are subject to review.

Key: V Value  T Year/s of Tenure  C Conditions

Scholarships

Undergraduate Scholarships

Listed below is an outline in summary form of undergraduate scholarships available to students. Full information may be obtained from the Student Centre located on the Lower Ground Floor of the Chancellery.

Unless otherwise indicated in footnotes, applications for the following scholarships should be made to the Registrar and Deputy Principal by 14 January each year. Please note that not all of these awards are available every year.

Sam Cracknell Memorial
V Up to $1500 pa payable in fortnightly instalments
T 1 year
C Prior completion of at least 2 years of a degree or diploma course and enrolment in a full-time course during the year of application; academic merit; participation in sport both directly and administratively; and financial need.

Girls Realm Guild
V Up to $1500 pa
T 1 year with the prospect of renewal subject to satisfactory progress and continued demonstration of need
C Available only to female students under 35 years of age who are permanent residents of Australia enrolling in any year of a full-time undergraduate course on the basis of academic merit and financial need.

General

Australian Development Corporation
V Tuition fees. Some students may be eligible for airfares and a stipend.
T Determined by normal course duration
C Information should be obtained from Australian Diplomatic Posts. Conditions and entitlements vary depending on the home country. The closing date is normally early in the year before the year of study.
W.S. and L.B. Robinson
V Up to $6500 pa
T 1 year renewable for the duration of the course subject to satisfactory progress
C Available only to students who have completed their schooling in Broken Hill or whose parents reside in Broken Hill; for a course related to the mining industry. Includes courses in mining engineering, geology, electrical and mechanical engineering, metallurgical process engineering, chemical engineering and science. Applications close 30 September each year. Apply directly to PO Box 460 Broken Hill NSW 2880.

Faculty of Science
V Up to $2000 pa
T 1 year renewable for the duration of the course, subject to satisfactory progress
C Permanent residents of Australia. Available to full-time students enrolled in one of the disciplines of the Faculty of Science.

Alumni Association
V Up to $1500 pa
T 1 year with the possibility of renewal
C Available to students enrolled in any year of a full-time course. Candidates must be the children of Alumni of the University of NSW and may be either permanent residents of Australia or international students.

BSSM

Esther Louise Buchwald Memorial Scholarship
V $500 pa
T 1 year
C Available only to a physically disabled student enrolled in any year of a course in the Board of Studies in Science and Mathematics.

Sporting Scholarships
V $2000 pa
T 1 year with possibility of renewal
C 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 an active member of a UNSW Sports Club. Apply directly to Sport and Recreation Section, The University of New South Wales, Kensington NSW 2052.

Chemistry
John Ragnar Anderson Memorial Bequest
V Up to $1500 pa
T 1 year with prospect of renewal
C Permanent residence in Australia and eligibility for admission to a full-time degree course in Chemistry

Mathematics
George Szekeres Award
V $200 pa
T 1 year
C Open to students entering the final year of the honours degree course in Pure Mathematics

Science
Faculty of Biological and Behavioural Sciences
V Up to $3000 pa
T 1 year renewable for the duration of the course, subject to satisfactory progress
C Permanent residents of Australia. Available to full-time students enrolled in one of the disciplines of the Faculty of Biological and Behavioural Sciences.

Optometry
OPSM/Gibb and Beeman
V Up to $2000 pa
T 1 year renewable for the duration of the course, subject to satisfactory progress
C Available to students under 21 years of age who are permanent residents of Australia enrolling in Year 2 of the full-time degree course in Optometry
The UNSW Co-op Program

The University of New South Wales has industry-linked education scholarships to the value of $9600 per annum in the following areas: Accounting (and Economics, Finance, Information Systems or Japanese Studies); Business Information Technology, Aerospace, Bioprocess, Ceramic, Chemical, Civil, Electrical, Environmental, Materials, Mechanical, Metallurgical, Mineral, Mining and Petroleum Engineering; Food Science and Technology, Industrial Chemistry, Manufacturing Management, Textile Management, Textile Technology, and Wool and Pastoral Science.

Graduate Scholarships

Listed below is an outline in summary form of Graduate Scholarships available to students. Application forms and further information are available from the Scholarships Unit and Student Centre, located on the Ground Floor of the Chancellery, unless an alternative contact address is provided. Normally applications become available four to six weeks before the closing date.

The following publications may also be of assistance: 1. Awards for Postgraduate Study in Australia and Awards for Postgraduate Study Overseas, published by the Graduate Careers Council of Australia. PO Box 28, Parkville, Victoria 3052;* 2. Study Abroad, published by UNESCO;* Details of overseas awards and exchanges administered by the Department of Employment, Education and Training can be obtained from: Awards and Exchanges Section, Department of Employment, Education and Training, PO Box 826, Woden, ACT 2606.

Where possible, the scholarships are listed in order of faculty. Applicants should note that the awards and conditions are subject to review.

*Available for reference in the University Library.

General

Australian Awards for Research in Asia (AARA)

- Duration: 3 to 12 months
- The awards are for postgraduate study or fieldwork in Cambodia, China, Hong Kong, India, Indonesia, Japan, Korea, Malaysia, Philippines, Singapore, Sri Lanka, Taiwan, Thailand and Vietnam. Applicants must be Australian citizens, or have Permanent Resident status, and have lived in Australia for the 12 months prior to the close of applications on 30 June.

Caltex National Scholarship for Women

- Value: $50,000 over two years
- Duration: Up to 2 years
- Applicants must be Australian citizens or have resided continuously in Australia for 5 years and have completed, or will complete, in 1994 an award from an Australian institution. Applicants may be proposing to undertake study in any discipline overseas. Application to the Honorary Secretary, Caltex National Scholarship, University by 17 September.

Kobe Steel Scholarship for Postgraduate Study at St Catherine’s College, Oxford University

- Value: £14,520
- Duration: Up to 2 years
- Applicants must be Australian nationals. Applications close on 31 October with Kobe Steel Australia P/L (Level 32 Gateway, 1 Macquarie Place, 2000).

University Postgraduate Research Scholarships

- Duration: 1-2 years for a Masters and 3-4 years for a PhD degree
- Living allowance of $14,474 pa. Other allowances may also be paid. Tax free.
- Applicants must be honours graduates or equivalent in the Medicine or Commerce faculties, or the University College, Australian Defence Force Academy. A limited number of scholarships are offered subject to the availability of funds. Information should be obtained from the Faculty office.

Australian Postgraduate Awards

- Duration: 1-2 years for a Masters and 3-4 years for a PhD degree
- Value: $11,687 to $18,679 (1993 rates). Other allowances may also be paid. Tax free.
- Applicants must be honours graduates or equivalent or scholars who will graduate in current academic year, and who are domiciled in Australia. Applications to Registrar by 31 October.

John Crawford Scholarship Scheme

- Value: Tuition fees. Some students may be eligible for air fares and a stipend.
- Duration: Determined by normal course duration
- Information should be obtained from Australian Diplomatic Posts. Conditions and entitlements vary depending on the home country.

Overseas Postgraduate Research Scholarships

- Value: Tuition fees only
- Duration: 2 years for a Masters and 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 to the Registrar by 30 September.

Australian American Educational Foundation Fulbright Award

- **V**: $11,500 pa and travel expenses
- **T**: 1 year, renewable
- **C**: Applicants must be graduates who are domiciled in Australia and wish to undertake research or study for a higher degree in America. Applications close 30 September with The Secretary, DEET, AAEF Travel Grants, PO Box 826, Woden, ACT 2606. Application forms are available from the Associate Registrar, University of Sydney, NSW 2006, telephone (02) 692 2222.

Australian Federation of University Women

- **V**: Amount varies, depending on award
- **T**: Up to 1 year
- **C**: Applicants must be female graduates who are members of the Australian Federation of University Women. Further enquiries may be directed to the Secretary of the Federation, (telephone (02) 232 5629).

Commonwealth Scholarship and Fellowship Plan

- **V**: Varies for each country. Generally covers travel, living, tuition fees, books and equipment, approved medical expenses. Marriage allowance may be payable.
- **T**: Usually 2 years, sometimes 3
- **C**: Applicants must be graduates who are Australian citizens and who are not older than 35 years of age. Tenable in Commonwealth countries other than Australia. Applications close with the Registrar in early October.

The English-Speaking Union (NSW Branch)

- **V**: $8000
- **T**: 1 year
- **C**: Applicants must be residents of NSW or ACT. Awarded to young graduates to further their studies outside Australia. Applications close mid-April with The Secretary, Ground Floor, School of Arts, 275c Pitt Street, Sydney, NSW 2000.

Frank Knox Memorial Stipend of Fellowships

- **V**: $US11,500 pa plus tuition fees
- **T**: up to 2 years tenable at Harvard University
- **C**: Applicants must be British subjects and Australian citizens, who are graduates or near graduates of an Australian university. Applications close with the Academic Registrar mid-October.

Robert Gordon Menzies Scholarship to Harvard

- **V**: Up to $US 25,000
- **T**: 1 year
- **C**: Tenable at Harvard University. Applicants must be Australian citizens and graduates of an Australian tertiary institution. Applications close 31 December with the Registrar, A.N.U., GPO Box 4, Canberra, ACT 2601

Gowrie Scholarship Trust Fund

- **V**: $6000 pa. Under special circumstances this may be increased.
- **T**: 2 years
- **C**: Applicants must be members of the Forces or children of members of the Forces who were on active service during the 1939–45 War. Applications close with the Academic Registrar by 31 October.

Harkness Fellowships of the Commonwealth Fund of New York

- **V**: Living and travel allowances, tuition and research expenses, health insurance, book and equipment and other allowances for travel and study in the USA
- **T**: 12 to 21 months
- **C**: Candidates must be Australian citizens and 1. Either members of the Commonwealth or a State Public Service or semi-government Authority. 2. Either staff or graduate students at an Australian university. 3. Individuals recommended for nomination by the Local Correspondents. The candidate will usually have an honours degree or equivalent, or an outstanding record of achievement, and be not more than 35 years of age. Applications close 30 September with the Academic Registrar. Forms available from Mr J. Larkin, Bureau of Agriculture and Resource Economics, GPO Box 1563, Canberra, ACT 2601.

The Packer, Shell and Barclays Scholarships to Cambridge University

- **V**: Living and travel allowances, tuition expenses
- **T**: 1-3 years
- **C**: Applicants must be Australian citizens who are honours graduates or equivalent, and under 26 years of age. Applications are available from The Secretary, Cambridge Commonwealth Trust, PO Box 252, Cambridge CB2 1TZ, England. The scholarship closes on 15 October.

The Rhodes Scholarship to Oxford University

- **V**: Approximately $15,000 pa and fees
- **T**: 2 years, may be extended for a third year
- **C**: Unmarried Australian citizens aged between 19 and 25 who have an honours degree or equivalent. Applications are available from The Secretary, Cambridge Commonwealth Trust, PO Box 252, Cambridge CB2 1TZ, England. The scholarship closes on 15 October.
Biological and Behavioural Sciences

John Clark Memorial Award in Psychology

V $1000
T 1 year
C Applicants must be enrolled in a graduate course in psychology undertaking research in an area concerned with the ongoing problems of the community, particularly the behaviour of the 'whole person' in a social milieu. Applications close 1 July with the Registrar.

National Heart Foundation
The National Health and Medical Research Council

V Up to $15,440 pa
T 1 year renewable
C Applications close 31 May with The Deputy Director, Medicine, NHF, PO Box 2, Woden, ACT 2606. An alternative closing date of 31 October applies to Postgraduate Science Research Scholarships to accommodate students currently in the final year leading to the award of the degree of Bachelor of Science at honours level.

Science

AAUW Educational Foundation Scholarships in Science for Women

V $US14,000
T 1 year
C Applicants should be intending to undertake full-time postgraduate study in Science (natural or physical) in the United States. Applications and complete details are available from the AAUW Educational Foundation (1111 Sixteenth St NW, Washington DC, 20036-4873). Applications close 1 December.

Arthritis Foundation Research Scholarships
See above under Medicine

Australian Telecommunications

V $9000 (tax free) intended as a supplement to other awards
T Up to 3 years for a PhD degree
C Applicants must be first class honours graduates or equivalent or scholars who will graduate with honours in the current academic year, who are Australian citizens or permanent residents. Preference will be given to applicants who are aged under 30 years as at 1 January. Applications close November 2 with ATERB, PO Box 76, Epping, NSW 2121.

Australian Institute of Nuclear Science and Engineering Student Scholarships

V Basic stipend $11,103 pa plus allowances and some University expenses
T 1-3 years
C Applicants must be honours graduates in Science or Engineering. At least one quarter of the period of tenure must be spent at the Institute at Lucas Heights, NSW. Applications close late October with the Registrar.

Contact Lens Society of Australia

V $2000 pa
C To enable a graduate in optometry, medicine, or other appropriate discipline to undertake the degree of Master of Science or PhD in the School of Optometry. Enquiries to Associate Professor B. Holden, School of Optometry.

Gordon Godfrey Scholarship in Theoretical Physics

V $1500 pa
T 1-3 years
C To enable a suitable graduate to undertake a research degree in Theoretical Physics. May be held concurrently with another award. Enquiries to School of Physics.

Lionel Murphy Australian Postgraduate Bicentennial Scholarship
See above under Law

Shell Scholarship in Science or Engineering

V Adequate funds for living allowance tuition and travel expenses
T 2 years, sometimes 3
C Applicants must be Australian citizens, under 25 years of age, with at least 5 years' domicile in Australia and who are completing the requirements for an honours degree in Science or Engineering. The successful candidate will attend a British university to pursue a higher degree. Applications close 30 September with Shell Australia, 140 Phillip Street, NSW 2000.
Prizes

Undergraduate University Prizes

The following information summarizes undergraduate prizes awarded by the University. Prizes which are not specific to any School are listed under General. All other prizes are listed under the Faculty or Schools in which they are awarded.

Information regarding the establishment of new prizes may be obtained from the Examinations Section located on the Ground Floor of the Chancellery.

General

The Sydney Technical College Union Award
V $400.00 and Bronze Medal
C Leadership in student affairs combined with marked academic proficiency by a graduand

The University of New South Wales Alumni Association Prize
V Statuette
C Achievement for community benefit by a student in the final or graduating year

The University of New South Wales Chemical Society Parke-Pope Prize
V $100.00
C The best performance in a subject selected by the Head of School

The University of New South Wales Chemical Society George Wright Prize
V $100.00
C The best performance in a subject selected by the Head of School

School of Chemistry

The Bosworth Prize in Physical Chemistry
V $200.00 and Bronze medal
C The best performance in CHEM3011 Physical Chemistry in the Bachelor of Science course

The Inglis Hudson Bequest
V $15.00
C The best performance in CHEM2021 Organic Chemistry

The Jeffery Bequest
V $100.00
C The best performance in CHEM2021 Organic Chemistry

The June Griffith Memorial Prize
V $60.00
C The best performance in CHEM1002 Chemistry 1 in the Bachelor of Science degree course

School of Mathematics

The Applied Mathematics Prize
V $50.00
C Excellence in level 111 Applied Mathematics subjects in a bachelor degree or diploma course

The C.H. Peck Prize
V $50.00
C The best performance in Year 2 Mathematics by a student proceeding to Year 3 in the School of Mathematics

The Coca-Cola Amatil Limited Prize
V $200.00
C The best performance in Theory of Statistics or Higher Theory of Statistics 111 subjects in a bachelor degree course
The Head of School’s Prize
V $50.00
C Excellence in four or more mathematics units in Year 11 in a bachelor degree or diploma course

The J.R. Holmes Prize
V $75.00
C 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 Science, Arts or Education degree courses

The Michael Mikhailvitch Erihman Award
V $750.00
C The best performance by a student enrolled in a Mathematics program, in examinations conducted by School of Mathematics in any one year

The Pure Mathematics Prize
V $50.00
C The best performance in Level 3 Pure Mathematics subjects by a student in a bachelor degree or diploma course

The Reuters Australia Pty Limited Prize
V $100.00
C Excellence in Higher Theory of Statistics 2 subjects in a bachelor degree course

The School of Mathematics Prize
V $50.00
C The best performance in basic Year 2 Higher Mathematics units by a student in a bachelor shared degree or diploma course

The School of Mathematics Prize
V $50.00
C Excellence in four or more Mathematics units by a student in Year 2 of a bachelor degree or diploma course

The Statistical Society of Australia (NSW Branch) Prize
V $100.00
C The best performance in Theory of Statistics subjects

The T.P.F & C Fourth Year Prize
V $200.00
C The best performance in the fourth year project by a student proceeding to the award of the degree of Bachelor of Science at honours level within the School of Mathematics

The T.P.F & C Third Year Prize
V $200.00
C The best performance in both MATH3610 Higher Real Analysis and MATH3620 Higher Functional Analysis or in MATH3181 Optimal Control

School of Optometry

The ACBO/Learning Frontiers Prize in Excellence In Binocular Vision
V $150.00
C The best performance in the Binocular Vision component of OPTM9042 Optometry B and OPTM9041 Clinical Optometry in the Bachelor of Optometry degree course

The Australian Optometrical Association Prize
V $200.00
C The best performance in a subject selected by the Head of School

The Bausch & Lomb Prize
V Plaque and Ray-Ban sunglasses valued at $300.00
C The best performance in the contact lens section of OPTM9041 Clinical Optometry in the Bachelor of Optometry degree course

The Eycon Lens Laboratories Pty Ltd Prize
V Trial fitting set of contact lenses
C The best essay or project on contact lenses in the Bachelor of Optometry degree course

The G Nissell & Company Australia Pty Ltd Prize
V Trial fitting set of contact lenses
C The best performance in the Contact Lens sections of OPTM9042 Optometry B and OPTM9041 Clinical Optometry in the Bachelor of Optometry degree course

The Hoya Lens Australia Pty Ltd Prize
V $250.00
C The best academic record in the Bachelor of Optometry degree course
The Hydron (Australia) Pty Ltd Prize
V $100.00
C The best performance in Year 4 of the Bachelor of Optometry degree course

The Hydron (Australia) Pty Ltd Prize
V $100.00
C The best performance in OPTM9042 Optometry B in the Bachelor of Optometry degree course

The Martin Wells Pty Ltd Prize
V $200.00
C The best performance in OPTM9021 Anatomy and Physiology of the Eye and Visual System in the Bachelor of Optometry degree course

The Martin Wells Pty Ltd Prize
V $200.00
C The best performance in OPTM9032 Diagnosis and Management of Ocular Disease in the Bachelor of Optometry degree course

The Martin Wells Pty Ltd Prize
V $200.00
C The best final year Essay in the Bachelor of Optometry degree course

The Optical Products Ltd Prize
V $100.00
C The best performance in a subject selected by the Head of School

The Optometrists Association of NSW Prize
V $100.00
C The best performance in a subject selected by the Head of School

The Optometry Vision Research Foundation
V $200.00
C The best research project in the final year of the Prize Bachelor of Optometry degree course

The Optometrists Association of NSW Prize
V $100.00
C The best performance in a subject selected by the Head of School

The Optyl (Australia) Pty Ltd Prize
V $100.00
C The best performance in the practical work of OPTM9034 Clinical Methods in the Bachelor of Optometry degree course

The Safilo Australia Prize
V $150.00
C The best performance in a subject selected by the Head of School

The Theo Kannis Prize for Clinical Optometry
V $250.00
C The best performance in OPTM9041 Clinical Optometry by a student in the Bachelor of Optometry degree course

School of Physics

The Australian Institute of Physics Prize
V $100.00 and one years membership of the Institute
C The highest aggregate in any 3 units from
• PHYS3010 Quantum Mechanics
• PHYS3050 Nuclear Physics
• PHYS3021 Statistical Mechanics & Solid State Physics
• PHYS3030 Electromagnetism
• PHYS360 Advanced Optics
• PHYS3041 Experimental Physics A
by a student in the Bachelor of Science degree course

The B L Turtle Memorial Astrophysics Prize
V $150.00
C The best performance in PHYS3160 Astrophysics by a student in the Bachelor of Science course

The Bob Dalglish Prize
V $100.00
C The best performance in a competition based on the use of microcomputers in PHYS1601 Computer Applications

The Bob Dalglish Prize
V $100.00
C The best performance in a project carried out within PHYS2601 Computer Applications

The Coherent Scientific Prize for Lasers, Optoelectronics & Applications
V $150.00
C The best performance in PHYS3710 Lasers and Applications or PHYS3720 Optoelectronics

The Gordon and Mabel Godfrey Award in Theoretical Physics 4
V $200.00
C Excellence in the Theoretical Physics subject PHYS4103 Physics 4 (Honours) in the Bachelor of Science degree course at honours level

The Gordon and Mabel Godfrey Prize in Theoretical Physics 3
V $200.00
C The best performance in a selection of Year 3 Theoretical Physics subjects chosen from PHYS3510, PHYS3530, PHYS3550, PHYS3560

The Head of School's Prize in Physics
V $50.00
C The best Year 4 Honours Thesis in Physics in the Bachelor of Science degree course

The Parameters Prize in Electronics
V $200.00
C Excellence in PHYS3630 Electronics or PHYS3041 Experimental Physics A and PHYS3760 Laser and Optoelectronics Technology Laboratory 1

The Physics Staff Prize for Physics 1
V $100.00
C The best performance in PHYS1002 Physics 1

The Physics Staff Prize for Physics 2
V $150.00
C The highest aggregate in
• PHYS2001 Mechanics and Computational,
• PHYS2011 Electromagnetism and Thermal Physics,
• PHYS2021 Quantum Physics and Relativity,
• PHYS2031 Laboratory
by a student in the Bachelor of Science degree course

The Physics Staff Prize for Physics Honours
V $200.00
C The best performance in the Physics Honours Year by a student in the Bachelor of Science degree course

The Spectra Physics Prize in Experimental Physics
V $400.00

C The best performance in PHYS3041 Experimental Physics A by a student in the Bachelor of Science course

The Spex Prize for Advanced Optics
V $150.00
C The best performance in PHYS3060 Advanced Optics by a student in the degree of Bachelor of Science course

School of Psychology

The Australian Psychological Society Prize
V $100.00
C The best performance in a Psychology 4 Honours subject selected by the Head of School

The Istvan Torikai Prize in Neuroscience
V $100.00
C The best performance by a fourth year honours student who completed a thesis in the field of Neuroscience in the Schools of Psychology or Anatomy or Physiology and Pharmacology

The Milon Buneta Prize
V $80.00
C The best performance in Year 2 of the Bachelor of Science degree course in Psychology

The Psychology Staff Prize
V $80.00
C The best performance in Year 2 Psychology by a student in the Bachelor of Science degree course in Psychology

Graduate University Prizes

The following information summarizes graduate prizes awarded by the University.

School of Optometry

The Hydron Contact Lens Prize
V Trial fitting set of contact lenses

C The best performance in OPTM8005 Advanced Contact Lens Theory and Practice in the Master of Optometry degree course

The Theo Kannis Prize for Advanced Clinical Optometry
V $250.00
C The best performance in OPTM8001 Advanced Clinical Optometry by a student in the Master of Optometry degree course.
### The University of New South Wales, Kensington Campus

#### Theatres
- Biomedical Theatres E27
- Central Lecture Block E19
- Chemistry Theatres (Dwyer, Mellor, Murphy, Nyholm, Smith) E12
- Classroom Block (Western Grounds) H3
- Fig Tree Theatre B14
- Jo Myers Studio D9
- Keith Burrows Theatre J14
- Mathews Theatres D23
- Parade Theatre E3
- Quadrangle Theatre E15
- Macauley Theatre (Main Building) K14
- Rex Vowels Theatre F17
- Science Theatre F13
- Sir John Clancy Auditorium C24
- Webster Theatre G15

#### Buildings

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<thead>
<tr>
<th>Building</th>
<th>Address</th>
<th>Notes</th>
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</thead>
<tbody>
<tr>
<td>Applied Science</td>
<td>E10</td>
<td>Built Environment</td>
</tr>
<tr>
<td>Barker Street Gatehouse</td>
<td>N11</td>
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<tr>
<td>Bassler College (Kensington)</td>
<td>C18</td>
<td>Central Store</td>
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<td>Central Store</td>
<td>B13</td>
<td>Chancellery C22</td>
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<td>Chancellery</td>
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<td>Chancellery (Faculty Office) C17</td>
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<td>Dalton (Chemistry)</td>
<td>F12</td>
<td>Link B6</td>
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<td>Goldstein College (Kensington)</td>
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<td>Maintenance Workshop B13</td>
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<td>Golf House</td>
<td>A27</td>
<td>Mathews F23</td>
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<td>Gymnasium</td>
<td>B5</td>
<td>Menzies Library E21</td>
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<td>International House</td>
<td>C6</td>
<td>Morven Brown (Arts) C20</td>
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<td>John Goodsell (Commerce and Economics)</td>
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<td>Newton J12</td>
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<td>Library (University)</td>
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<td>NIDA D2</td>
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<td>Parking Station H25</td>
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<td>Maintenance Workshop</td>
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<td>Parking Station N18</td>
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<td>Mathews</td>
<td>F23</td>
<td>Philip Baxter College (Kensington) D14</td>
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<td>Menzies Library</td>
<td>E21</td>
<td>Quadrangle E15</td>
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<tr>
<td>Morven Brown (Arts)</td>
<td>C20</td>
<td>Robert Heffron (Chemistry) E12</td>
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<td>New College</td>
<td>L6</td>
<td>Sam Cracknell Pavilion H8</td>
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<tr>
<td>Newton J12</td>
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<td>Samuels Building F26</td>
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<tr>
<td>NIDA</td>
<td>D2</td>
<td>Shalom College N9</td>
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<td>Parking Station</td>
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<td>Sir Robert Webster G14</td>
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<td>Parking Station</td>
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<td>Unisearch House L5</td>
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<td>University Union (Roundhouse) E6</td>
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<td>F26</td>
<td>Wallace Wurtz School of Medicine C27</td>
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<tr>
<td>Shalom College</td>
<td>N9</td>
<td>Warrane College M7</td>
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#### General

- Aboriginal Student Centre:
  - 47 Botany St, Randwick
- Accommodation (off-campus) E15
- Accounting E15
- Admissions C22
- Adviser for Prospective Students C22
- Alumni Relations: Pindari, 76 Wentworth St, Randwick
- Anatomy C27
- Applied Bioscience D26
- Applied Economic Research Centre F20
- Applied Geology F10
- Applied Science (Faculty Office) F10
- Archives, University E21
- Asian Social Sciences (Faculty Office) C20
- Asia-Australia Institute: 34 Botany St, Randwick
- Audio Visual Unit F20
- Australian Graduate School of Management G27
- Banking and Finance E15
- Biochemistry and Molecular Genetics D26
- Biological and Behavioural Sciences (Faculty Office) D26
- Biomedical Engineering F25
- Biomedical Library F23
- Biotechnology F25
- Built Environment (Faculty Office) H14
- Campus Services C22
- Cashier's Office C22
- Chaplains E4
- Chemical Engineering and Industrial Chemistry F10
- Chemistry E12
- Civil Engineering H20
- Co-op Bookshop E15
- Commerce and Economics (Faculty Office) E15
- Communications Law Centre C15
- Community Medicine D26
- Computer Science and Engineering E17
- Continuing Education Department F25
- Cornea and Contact Lens Research Unit: 22-32 King St, Randwick
- Economics F20
- Education Studies G2
- Educational Testing Centre E4
- Electrical Engineering G17
- Energy Research, Development & Information Centre F10
- Engineering (Faculty Office) K17
- English C20
- Examinations C22
- Fees Office C22
- Fibre Science and Technology G14
- Food Science and Technology B8
- French C20
- Geography K17
- German and Russian Studies C20
- Graduate School of the Built Environment H14
- Groundwater Management and Hydrogeology F10
- Health Service, University E15
- Health Services Management C22
- History C20
- House at Pooh Corner (Child Care) N8
- Human Resources G22
- Industrial Design G14
- Industrial Relations and Organizational Behaviour F20
- Information, Library & Archives Studies F23
- Information Systems E15
- Institute of Languages: 4 Francis St, Randwick
- International Student Centre F9
- IPACE Institute F23
- Japanese Economic and Management Studies E15
- Kanga's House (Child Care) O14
- Landscape Architecture K15
- Law (Faculty Office) F21
- Law Library F21
- Legal Studies & Taxation F20
- Liberal and General Studies C20
- Lost Property C22
- Marine Science D26
- Marketing F20
- Materials Science and Engineering E8
- Mathematics F23
- Mechanical and Manufacturing Engineering J17
- Medical Education C27
- Medicine (Faculty Office) B27
- Membrane and Separation Technology F10
- Microbiology and Immunology D26
- Mines K15
- Music and Music Education B11
- News Service C22
- Optometry J12
- Pathology C27
- Performing Arts B10
- Petroleum Engineering D12
- Philosophy C20
- Physics K15
- Physiology and Pharmacology C27
- Political Science C20
- Printing Section C22
- Professional Development Centre E15
- Professional Studies (Faculty Office) G2
- Property C22
- Psychology F23
- Publications Section C22
- Remote Sensing K17
- Safety Science B9
- Science (Faculty Office) E12
- Science and Technology Studies C20
- Social Science and Policy C20
- Social Policy Research Centre F25
- Social Work G2
- Sociology C20
- Spanish and Latin American Studies C20
- Sport and Recreation Centre B6
- Squash Courts B7
- Student Centre (off Library Lawn) C22
- Student Research Services:
  - Careers, Loans, Accommodation etc E15
  - Counselling E15
  - Students' Guild E15
  - Students' Union E15
- Surveying K17
- Swimming Pool B4
- Textile Technology G14
- Theatre and Film Studies B10
- Town Planning K15
- UNSW Press: 22-32 King St, Randwick
- WHO Regional Training Centre C27
- Wool and Animal Sciences G14
- Works and Maintenance B14A