The University of New South Wales

Sciences
Board of Studies in Science and Mathematics
Faculty of Biological Sciences
Faculty of Science

1987
Faculty Handbook
How to use this Handbook

The information in this book has been divided into nine parts.

**General Information** (pages 1-24) lists what you need to know about the University as a whole, introduces some of the services available and notes the most important rules and procedures. You should read this part in its entirety.

For further information about the University and its activities, see the University Calendar.

**Faculty Information.**

**Undergraduate Study** outlines the courses available in each school in the faculty.

**Undergraduate Study: Subject Descriptions** lists each subject offered by the schools in the faculty. The schools are listed numerically.

Information includes:
- Subject number, title and description
- Prerequisite, co-requisite and excluded subjects, where applicable
- Additional information about the subject such as credit value, class contact or teaching hours per week, sessions when taught

**Graduate Study** is about higher degrees.

**Graduate Study: Subject Descriptions** lists each subject offered by the schools in the faculty. The schools are listed numerically.

Information included is as for **Undergraduate Study: Subject Descriptions**, above.

**Conditions for the Award of Higher Degrees.**

**Scholarships and Prizes** available at undergraduate and graduate level in the faculty.

**Staff list.**

For detailed reference, see the list of Contents.
The University of New South Wales
PO Box 1 Kensington NSW Australia 2033 Phone 697 2222

Sciences
Board of Studies in Science and Mathematics
Faculty of Biological Sciences
Faculty of Science

1987 Faculty Handbook
Subjects, courses and any arrangements for courses including staff allocated, as stated in the Calendar or any Handbook or any other publication, announcement or advice of the University, are an expression of intent only and are not to be taken as a firm offer or undertaking. The University reserves the right to discontinue or vary such subjects, courses, arrangements or staff allocations at any time without notice.

Information in this Handbook has been brought up to date as at 14 July 1986, but may be amended without notice by the University Council.

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General Information

To obtain the maximum benefit from your studies you should make an effort to learn what facilities the University offers, to investigate the best methods of study and to discover as much as possible about the course for which you are enrolled.

This Handbook has been specially designed as a detailed source of reference for you in all matters related to your Faculty. This General Information Section is intended to help you put the Faculty into perspective with the University as a whole, to introduce you to some of the services available to students and to note some of the most important rules and procedures.

For fuller details about some aspects of the University and its activities you might need to consult the University Calendar.

Some people who can help you

If you are experiencing difficulties in adjusting to the requirements of the University you will probably need advice. The best people to talk to on matters relating to progress in studies are your tutors and lecturers. If your problem lies outside this area there are many other people with specialized knowledge and skills who may be able to help you.

The Student Services staff, located on the ground floor of the Chancellery, will help those students who need advice and who have problems but who do not seem to be provided for by the other organizations and services mentioned. As well as dealing with general enquiries the staff is especially concerned with the problems of overseas, Aboriginal, and physically handicapped and disabled students. Enquire at Room G19, phone 3114.

The Senior Assistant Registrar (Student Administration), Ms Judith Tonkin, is located on the ground floor of the Chancellery. For particular enquiries regarding illness and other matters affecting performance in examinations and assessment, graduation ceremonies, release of examination results and variations to enrolment programs, phone 3102 or 3097.

The Assistant Registrar (Undergraduate Office), Mr John Beauchamp, is located on the ground floor of the Chancellery. General inquiries should be directed to 3095.

The Senior Administrative Officer (Examinations), Mr John Grigg, is located on the ground floor of the Chancellery. Enquiries regarding examinations, including examination timetables and clash of examinations should be directed to 3088.

The Adviser for Prospective Students, Mrs Fay Lindsay, is located with the Careers and Employment Section and is

Note: All phone numbers below are University extension numbers. If you are outside the University, dial 697 2222 and ask for the extension. Alternatively you may dial 697 and then the extension number. This prefix should only be used when you are certain of the extension that you require as callers using 697 cannot be transferred to any other number.
available for personal interview. For an appointment phone 5434.

The Careers and Employment Section is located in Hut E15c at the foot of Basser Steps. Enquiries should be directed to 5430.

The Off-campus Housing Service is located in Room G19 in the Chancellery. For assistance in obtaining suitable accommodation phone 3116.

Student Loans enquiries should be directed to Room G19 in the Chancellery, phone 3115.

The Student Health Unit is located in Hut E15b at the foot of Basser Steps. The Director is Dr Geoffrey Hansen. For medical aid phone 5427, 5426 or 5425.

The Student Counselling and Research Unit is located at the foot of Basser Steps. Dr Pat Cleary is the Head of the Unit. For assistance with educational or vocational problems ring 5418 or 5422 for an appointment.

The University Librarian is Mr Allan Horton. Library enquiries should be directed to 2686.

The Chaplaincy Centre is located in Hut E15a at the foot of Basser Steps.

The Students’ Union has two offices on campus. One is located at the back of the Library Lawn (between the Chancellery and the Morven Brown Building), where the SU President, Education Vice President, Education Officer, Clubs and Societies Secretary and Postgraduate Officer are available to discuss student problems. The other is on the second floor of the Squarehouse, where the Secretary/Treasurer, Women’s Officer, Overseas Student Director, the full-time Solicitor, Tharunka and Campuswide provide information and student services.

Cashier’s Hours The University Cashier’s office is open from 9.30 am to 1.00 pm and from 2.00 pm to 4.30 pm, Monday to Friday. It is open for additional periods at the beginning of Session 1. Consult noticeboards for details.

1987

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Faculty of Medicine

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| Term 2 (9 weeks) | 6 April to 10 May |
| May Recess: 11 May to 17 May |
| 18 May to 14 June |
| Term 3 (9 weeks) | 22 June to 23 August |
| August Recess: 24 August to 30 August |
| Term 4 (10 weeks) | 31 August to 8 November |

Third and Fourth Years

| Term 1 (8 weeks) | 19 January to 15 March |
| Term 2 (8 weeks) | 23 March to 17 May |
| Term 3 (8 weeks) | 25 May to 19 July |
| Term 4 (8 weeks) | 27 July to 20 September |
| Term 5 (8 weeks) | 28 September to 22 November |

Fifth Year

| Term 1 (8 weeks) | 19 January to 15 March |
| Term 2 (8 weeks) | 23 March to 17 May |
| Term 3 (8 weeks) | 25 May to 19 July |
| Term 4 (8 weeks) | 27 July to 20 September |
| Term 5 (8 weeks) | 28 September to 22 November |

Australian Graduate School of Management

| Term 1 (10 weeks) | 2 March to 8 May |
| Term 2 (10 weeks) | 1 June to 7 August |
| Term 3 (10 weeks) | 31 August to 7 November |

University College/Australian Defence Force Academy

| Session 1 | 2 March to 3 May |
|           | May Recess: 4 May to 17 May |
|           | 18 May to 19 June |
|           | Midyear Recess: 20 June to 12 July |
| Examinations | 22 June to 10 July |

Calendar of Dates

The Academic Year

The academic year is divided into two sessions, each containing 14 weeks for teaching. There is a recess of six weeks between the two sessions and there are short recesses of one week within each of the sessions.

Session 1 commences on the first Monday of March.
Session 2
(13 weeks)

Examinations
26 October to 13 November

January

Thursday 1
Public Holiday — New Year’s Day

Monday 5
List of graduands in Medicine for February Graduation Ceremony published in The Sydney Morning Herald

Friday 9
Last day for acceptance of applications by office of the Admissions Section for transfer to another undergraduate course within the University

Monday 12
Last day for applications for review of results of assessment

Monday 26
Public Holiday — Australia Day

February

Monday 2
Enrolment period begins for second and later year undergraduate students and graduate students enrolled in formal courses

Tuesday 3
Enrolment period begins for new undergraduate students and undergraduate students repeating first year

Tuesday 24
Last day for undergraduate students who have completed requirements for pass degrees to advise the Registrar they are proceeding to an honours degree or do not wish to take out the degree for which they have applied for any other reason

March

Monday 2
Session 1 begins — all courses except Medicine III, IV and V

Wednesday 4
List of graduands for April/May ceremonies and 1984 prizewinners published in The Sydney Morning Herald

Monday 9
Last day for notification of correction of details published in The Sydney Morning Herald on 4 March concerning April/May graduation ceremonies

Friday 13
Last day for acceptance of enrolment by new undergraduate students and re-enrolling undergraduate students (late fee payable thereafter)

April

Thursday 16
Last day for undergraduate students to discontinue without failure subjects which extend over Session 1 only

Friday 17
Good Friday — Public Holiday

Saturday 18
Easter Saturday — Public Holiday

Monday 20
Easter Monday — Public Holiday

Saturday 25
Anzac Day — Public Holiday

Wednesday 29
Confirmation of Enrolment forms dispatched to all students

May

Friday 8
Last day for acceptance of corrected Confirmation of Enrolment forms

Monday 11
May Recess begins

Wednesday 13
Last day for undergraduate students completing requirements for degrees at the end of Session 1 to submit Application for Admission to Degree forms

Thursday 14
Publication of provisional timetable for June/July examinations

May Recess ends

Friday 22
Last day for students to advise of examination clashes

June

Tuesday 2
Publication of timetable for June/July examinations

Monday 8
Queen’s Birthday — Public Holiday

Session 1 ends

Study Recess begins

Study Recess ends

Midyear Recess begins

Examinations begin

July

Wednesday 8
Examinations end

Monday 20
Assessment results mailed to students
Calendar

Tuesday 21
Assessment results displayed on University noticeboards
To Friday 24 July: Students to amend enrolment programs following receipt of June examination results

Friday 16
Last day for students to advise of examination timetable clashes

Thursday 29
Publication of timetable for November examinations.

Sunday 26
Midyear Recess ends

Monday 27
Session 2 begins

November
Session 2 ends

Sunday 8
Study Recess begins

Monday 9
Study Recess ends

Sunday 15

Monday 16
Examinations begin

Tuesday 21
August Recess begins

Monday 24
Last day for students to discontinue without failure subjects which extend over the whole academic year

Monday 25
August Recess begins

Tuesday 25
Last day for undergraduate students who have completed requirements for pass degrees to advise the Registrar they are proceeding to an honours degree or do not wish to take out the degree for which they have applied for any other reason

Friday 25
Christmas Day — Public Holiday

Monday 28
Boxing Day — Public Holiday

Sunday 30
August Recess ends

September
Wednesday 2
List of graduands for October graduation ceremonies published in The Sydney Morning Herald

Monday 7
Last day for notification of correction of details published in The Sydney Morning Herald on 2 September concerning October graduation ceremonies

Tuesday 29
Last day to apply to UCAC for transfer to another tertiary institution in New South Wales

Friday 16
Examinations end

Monday 21
Assessment results mailed to students

Tuesday 22
Assessment results displayed on University noticeboards

Monday 28
Confirmation of Enrolment forms despatched to all students

October
Monday 5
Eight Hour Day — Public Holiday

Wednesday 7
Last day for acceptance of corrected Confirmation of Enrolment forms

Thursday 8
Publication of provisional examination timetable

Friday 9
Last day for applications from undergraduate students completing requirements for degrees at the end of Session 2 to submit applications for Admission to Degree forms

20 November
Examinations

1988

Faculties other than Medicine

Session 1
(14 weeks)
7 March to 15 May

May Recess: 16 May to 22 May
23 May to 19 June
Study Recess: 20 June to 26 June
Midyear Recess: 27 June to 31 July

Examinations
27 June to 13 July

Session 2
(14 weeks)
1 August to 28 August

August Recess: 29 August to 4 September
5 September to 13 November
Study Recess: 14 November to 20 November

Examinations
21 November to 9 December
Faculty of Medicine

First and Second Years
As for other faculties

Third and Fourth Years
Term 1 (10 weeks) 25 January to 3 April
Term 2 (9 weeks) 11 April to 15 May
May Recess: 16 May to 22 May
23 May to 19 June
Term 3 (9 weeks) 27 June to 28 August
August Recess: 29 August to 4 September
Term 4 (10 weeks) 5 September to 13 November

Fifth Year
Term 1 (8 weeks) 25 January to 20 March
Term 2 (8 weeks) 28 March to 22 May
Term 3 (8 weeks) 30 May to 24 July
Term 4 (8 weeks) 1 August to 25 September
Term 5 (8 weeks) 5 October to 27 November

University Academy
College/Australian Defence Force

Session 1 (14 weeks)
Session 1 begins — all courses except Medicine III, IV and V

Examinations
Session 2 (13 weeks)
Examinations

Australian Graduate School of Management
Term 1 (10 weeks) 7 March to 13 May
Term 2 (10 weeks) 6 June to 12 August
Term 3 (10 weeks) 5 September to 11 November

January
Friday 1
Public Holiday (New Year)

Friday 8
Last day for acceptance of applications by office of the Admissions Section for transfer to another undergraduate course within the University

Monday 11
Last day for applications for review of results of annual examinations

Tuesday 26
Australia Day — Public Holiday

February
Monday 1
Enrolment period begins for second and later year undergraduate students and graduate students enrolled in formal courses

March
Monday 7
Session 1 begins — all courses except Medicine III, IV and V

April
Friday 1 to
Monday 4
Easter — Public Holiday

Monday 25
Anzac Day — Public Holiday

Organization of the University

The University of New South Wales was first incorporated by an Act of Parliament in 1949, under the name of the New South Wales University of Technology.

In 1986 the University had 18,950 students and over 4,050 staff who worked in more than eighty buildings.

Arms of the University of New South Wales

The arms of the University are reproduced on the front cover of this handbook. The arms were granted by the College of Heralds in London, on 3 March 1952, and the heraldic description is as follows:

'Argent on a Cross Gules a Lion passant guardant between four Mullets of eight points Or a Chief Sable charged with an open Book proper thereon the word SCIENTIA in letters also Sable. The lion and the four stars of the Southern Cross on the Cross of St George have reference to the State of New South Wales which brought the University into being; the open book with SCIENTIA across its page reminds us of its original purpose. Beneath the shield is the motto 'Manu et Mente', ('with Hand and Mind') which is the motto of the Sydney Technical College, from which the University has developed. The motto is not an integral part of the Grant of Arms and could be changed at will; but it was the opinion of the University Council that the relationship with the parent institution should in some way be recorded.'

The University Colours

The colours of the University are black and gold.

The Council

The chief governing body of the University is the Council which has the responsibility of making all major decisions regarding its policy, conduct and welfare.

The Council consists of 29 members including parliamentary and ex officio members, members elected by the staff, students and graduates of the University and some appointed by the Minister for Education.

The Council meets at least five times per year and its members also serve on special committees dealing with, for example, academic matters, finance, buildings and equipment, personnel matters, student affairs and public relations.

The Chairman of the Council is the Chancellor, the Hon. Mr Justice Samuels.
The Professorial Board

The Professorial Board is one of the two chief academic bodies within the University and includes all the professors from the various faculties, non-professorial Heads of Schools and Chairmen of Faculty, and several ex-officio and appointed members. It deliberates on all questions such as matriculation requirements, the content of courses, the arrangement of syllabuses, the appointment of examiners and the conditions for graduate degrees. Its recommendations on matters of major policy are presented to Council for its consideration and adoption.

The Faculties/Boards of Studies

The executive head of a faculty or board of studies is the dean, with the exception of the Australian Graduate School of Management, where the executive head is the director. Members of each faculty or board meet regularly to consider matters pertaining to their own areas of teaching and research, the result of their deliberations being then submitted to the Professorial Board.

The term ‘faculty’ is used in two distinct senses in the University. Sometimes it is used to refer to the group of schools comprising the faculty, and at others to the deliberative body of academic members of the Schools within the faculty.

The ten faculties are Applied Science, Architecture, Arts, Biological Sciences, Commerce, Engineering, Law, Medicine, Professional Studies and Science. In addition, the Board of Studies of the Australian Graduate School of Management (AGSM), the Board of Studies in General Education and the Academic Board of the University College, Australian Defence Force Academy fulfil a function similar to that of the faculties. The Board of Studies in Science and Mathematics, which was established to facilitate the joint academic administration of the Science and Mathematics degree course by the faculties of Biological Sciences and Science, considers and reports to the Professorial Board on all matters relating to studies, lectures and examinations in the undergraduate courses offered by the Faculties of Biological Science and Science.

The Schools

Subjects come under the control of the individual schools (e.g. the School of Chemistry, the School of Accountancy). The head of the school in which you are studying is the person in this academic structure with whom you will be most directly concerned.

Executive Officers

As chief executive officer of the University, the Vice-Chancellor and Principal, Professor Michael Birt, is charged with managing and supervising the administrative, financial and other activities of the University. He is assisted in this task by two Pro-Vice-Chancellors, together with the Deans and the two heads of the administrative divisions.

General Administration

The administrative work of the University is divided between the Deputy Principal (Administration) who is responsible for registrarial, property and staffing matters and the Deputy Principal (Planning and Information) who is responsible for planning information and analysis, finance and the provision of computing services.

Student Representation on Council and Faculties/Boards

Three members of the University Council may be students elected by students. All students who are not full-time members of staff are eligible to stand for a two-year term of office. The students who are elected to the Council are eligible for election to the committees of Council.

Students proceeding to a degree or a graduate diploma may elect members for appointment by the Council to their faculty or board of studies. Elections are for a one-year term of office.

Open Faculty/Board Meetings

If you wish you may attend a faculty or board meeting. You should seek advice at the office of the faculty whose meeting you wish to attend.

Award of the University Medal

The University may award a bronze medal to undergraduate students who have achieved highly distinguished merit throughout their degree course.

Identification of Subjects by Numbers

For information concerning the identifying number of each subject taught in each faculty as well as the full list of identifying numbers and subjects taught in the University, turn to the first page of the section Subject Descriptions. This list is also published in the Calendar.

Textbook Lists

Textbook lists are issued early in the year and are available from School and Faculty offices for re-enrolling students and from the Unisearch House Enrolment Centre for first year students.

Textbook Costs and Course-Related Costs

Students should allow quite a substantial sum for textbooks. This can vary from $250 to $600 per year depending on the course taken. These figures are based on the cost of new books. The Students’ Union operates a secondhand bookshop.

Information about special equipment costs, accommodation charges and cost of subsistence on excursions, field work, etc, and for hospital residence (medical students) is available from individual schools.

Co-operative Bookshop

Membership is open to all members of the community, on initial payment of a fee of $12, refundable after 2 years.

General Studies Program

Almost all undergraduates in faculties other than Arts and Law are required to complete a General Studies program. The Department of General Studies within the Board of Studies in General Education publishes its own Handbook which is available free of charge. All enquiries about General Studies should
be made to the General Studies Office, Room G56, Morven Brown Building, phone 2436.

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**Student Services and Activities**

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**Accommodation**

**Residential Colleges**

There are seven residential colleges on campus. Each college offers accommodation in a distinctive environment which varies from college to college, as do facilities and fees. A brief description of each college is given below, and further information may be obtained directly from the individual colleges. In addition to basic residence fees, most colleges make minor additional charges for such items as registration fees, caution money or power charges. Intending students should lodge applications before the end of October in the year prior to the one in which they seek admission. Most colleges require a personal interview as part of the application procedure.

**The Kensington Colleges**

The Kensington Colleges comprise Basser College, Goldstein College and Philip Baxter College. They house 423 men and women students, as well as tutorial and administrative staff members. College life is maintained in an atmosphere which emphasises co-operation, academic purpose and mutual respect. Apply in writing to the Master, PO Box 24, Kensington, NSW 2033.

**International House**

International House accommodates 154 male or female students from Australia and up to thirty other countries. Generally about 30 disciplines are represented. College life is multicultural and multidisciplinary. Eight tutors are available to help students. Apply in writing to the Warden, International House, PO Box 1, Kensington, NSW 2033.

**New College**

New College is an Anglican college and it provides accommodation (with all meals) for 210 graduates and undergraduates, without regard to race, religion, or sex. The College, which has its own resident tutors and a Senior Resident Academic Fellow, sponsors a wide range of activities for staff and students of the University and encourages inter-disciplinary discussion. Apply to the Master, New College, Anzac Parade, Kensington 2033 (telephone 662 6066).

**Shalom College**

Shalom College is a Jewish residential college. It provides accommodation for 86 men and women students. Non-resident membership is available to students who wish to avail themselves of the Kosher dining room and tutorial facilities. Fees are payable on a session basis. Conferences are catered for, particularly with Kosher requirements. Rates are available on application. Apply in writing to the Master, Shalom College, the University of New South Wales, PO Box 1, Kensington, NSW 2033.

**Warrane College**

Warrane College offers accommodation for 180 men of all ages, backgrounds and beliefs. Excellent study conditions and a comprehensive tutorial program are features of College life. These are set in the context of a wide range of cultural, social, spiritual and sporting activities in a friendly and open atmosphere. Non-resident membership of the College is available. Opus Dei, a prelature of the Catholic Church, is responsible for the spiritual care of the College. Enquiries: The Master, Warrane College, PO Box 123 Kensington 2033. Telephone (02) 662 6199.

**Creston Residence**

Creston Residence offers accommodation to 25 undergraduate and graduate women students. Activities and tutorials are open to non-resident students. The activities of a spiritual nature are entrusted to Opus Dei, a personal prelature of the Catholic Church. Enquiries: 36 High Street, Randwick 2031. Telephone (02) 398 5693.

**Other Accommodation**

**Off-campus Accommodation**

Students requiring other than College accommodation may seek assistance in Room G19, the Chancellery, in obtaining suitable accommodation in the way of rooms with cooking facilities, flats, houses, share flats, etc. Extensive listings of all varieties of housing are kept up-to-date throughout the year and during vacations. Accommodation in the immediate vicinity of the University is not usually easy to find at short notice, and is expensive.

No appointment is necessary but there may be some delay in February and March. The Housing staff are always happy to discuss any aspect of accommodation.

**Associations, Clubs and Societies**

**The Sports Association**

The Sports Association is a student organization within the University which caters for a variety of sports for both men and women. In December 1952 the University Council approved the establishment of the Sports Association, which then consisted of five clubs. As the University has grown the Association has expanded, and it now includes thirty-seven clubs.

The Association office is situated in the Link Building, B6, lower campus, and can be contacted on extension 4880. The control of the Association is vested in the General Committee which includes delegates from all the clubs.

Membership is compulsory for all registered students, and the annual fee is as set out later, in Rules and Procedures, Enrolment Procedures and Fees Schedules, section 15. Fees. Membership is also open to all members of staff and graduates of the University on payment of a fee as prescribed in the By-laws of the Association. All members are...
invited to take part in any of the activities arranged by the Association, and to make use of the University's sporting and recreational facilities.

The Association is affiliated with the Australian Universities Sports Association (AUSA) which is the controlling body for sport in all Australian universities.

Australian Armed Services

The University maintains links with the Royal Australian Navy, the Australian Army Reserve and the Royal Australian Air Force, and opportunities exist for student participation in their activities.

Chaplaincy Centre

The University Chapel

The University provides a small chapel for the use of all faiths. In its temporary housing it is located in Hut E15a near the Chemistry Building. The chapel is available for services of worship by arrangement with the full-time chaplains. At other times it is available for private meditation to all members of the University.

Chaplaincy Service

A Chaplaincy Service is available within the University of New South Wales for the benefit of students and staff.

The service offers fellowship, personal counselling and guidance, together with leadership and biblical and doctrinal studies and in worship. The chaplains maintain close liaison with student religious societies.

The chaplains are located in Hut E15a at the foot of Basser steps, which also contains the temporary chapel.

Student Services

The Student Services staff, located on the ground floor of the Chancellery, will help those students who have problems and need advice but who do not seem to be provided for by the other organizations and services mentioned. As well as dealing with those enquiries and with off-campus housing and student loan matters, they are especially concerned with the problems of physically handicapped and disabled students, overseas students, and aboriginal students.

All enquiries should be made either at Room G19 or by telephoning 697 3111.

Sport and Recreation Section

The Sport and Recreation Section provides a recreational program for students and staff at the Physical Education and Recreation Centre. The Centre consists of eight squash courts, seven tennis courts, a main building, a 50-metre indoor heated swimming pool and a new three-storey 'Link Building'. The main building has a large gymnasium and practice rooms for fencing, table tennis, judo, weight-lifting, karate and jazz ballet, also a physical fitness testing room. The 'Link Building' between the gymnasium and squash courts provides three additional training rooms on the upper floors and administrative and control functions at ground floor level. The recreational program includes intramurals, teaching/coaching, camps. The Centre is located on the lower campus adjacent to High Street. The Supervisor of Physical Recreation may be contacted by telephoning 697 4884.

Physical Education and Recreation Centre

The Sport and Recreation Section provides a recreational program for students and staff at the Physical Education and Recreation Centre. The Centre consists of eight squash courts, seven tennis courts, a main building, a 50-metre indoor heated swimming pool and a new three-storey 'Link Building'. The main building has a large gymnasium and practice rooms for fencing, table tennis, judo, weight-lifting, karate and jazz ballet, also a physical fitness testing room. The 'Link Building' between the gymnasium and squash courts provides three additional training rooms on the upper floors and administrative and control functions at ground floor level. The recreational program includes intramurals, teaching/coaching, camps. The Centre is located on the lower campus adjacent to High Street. The Supervisor of Physical Recreation may be contacted by telephoning 697 4884.

Student Counselling and Research Unit

The Student Counselling and Research Unit provides counselling services to students, prospective students, parents and other concerned persons.

Together with the Careers and Employment Section, the unit is located in the huts near the foot of Basser Steps (access from College Road or Engineering Road).

Appointments are offered throughout the academic year and during recesses between 8 am and 5 pm on week days (up to 6 pm on some evenings). A 'walk-in' service for short interviews is available between 9 am and 5 pm. Appointments may be made by telephoning 697 5418 between 9.00 am and 5.00 pm.

Counsellors offer assistance in planning, decision-making, problem solving, social and emotional development, and dealing with grievances. Group programs on such topics as study, tutorial and examination skills, stress management, communicating, and self-confidence are offered each session. Brochures are available from the receptionist.

Careers and Employment Section

The Careers and Employment Section provides careers advice and assistance in finding employment.

Assistance with careers and permanent employment opportunities includes: the regular mailing of a Job Vacancy Bulletin to
registered students and graduates, a Library, and a Campus Interview Program in which final year students have the opportunity to speak to employers regarding employment prospects.

Assistance is also provided in obtaining course-related employment during long vacations as required by undergraduates in Engineering and Applied Science.

Together with the Student Counselling and Research Unit, this section is located in the huts near the foot of Basser Steps (access from College Road or Engineering Road).

For further information, telephone 697 5430.

### Student Health Unit

A student health clinic and first aid centre is situated within the University. The medical service although therapeutic is not intended to replace private or community health services. Thus, where chronic or continuing conditions are revealed or suspected the student may be referred to a private practitioner or to an appropriate hospital. The health service is not responsible for fees incurred in these instances. The service is confidential and students are encouraged to attend for advice on matters pertaining to health.

The service is available to all enrolled students by appointment, free of charge, between 9 am and 5 pm Mondays to Fridays. For staff members, immunizations are available, and first aid service in the case of injury or illness on the campus.

The centre is located in Hut E15b on the northern side of the campus in College Road at the foot of the Basser Steps.

Appointments may be made by calling at the centre or by telephoning 697 5425, 697 5426 or 697 5427 during the above hours.

The Family Planning Association of NSW conducts clinics at the Student Health Unit and at the adjacent Prince of Wales Hospital which are available for both staff and students. Appointments may be made for the Student Health Unit clinic by telephoning 588 2833 or for the Prince of Wales Hospital clinics by telephoning 399 0111.

### The Students' Union

The Students' Union was formed in 1952 as an organization, duly recognized by the University Council, to represent the student body and to provide a central organization for the administration of student activities. In the words of its constitution 'The Students' Union is formed for the purpose of advancing the interests of University men and women, facilitating their general scientific and technical education, and fostering a University spirit among them'.

The Students' Union affords a recognized means of communication between the student body and the University administration, and represents its members in all matters affecting their interests. It aims to promote the cultural, educational and recreational life of the University and to encourage a permanent interest among graduates in the life and progress of student activities within the University. The Students' Union also makes representations to government and other bodies outside the University on behalf of its members.

Membership of the Students' Union is compulsory for all registered students of the University; the annual subscription for full- and part-time students is set out later, in Rules and Procedures, Enrolment and Procedures and Fees Schedules, section 15. Fees. Only those persons who were enrolled as Life Members prior to January 1 1965, shall retain such membership.

The Students' Union is governed by a Council consisting in the main of elected student representatives from the various faculties of the University. There are also representatives of the University Council, Life Members, the Staff Association and the Sports Association. The Council is elected annually in May-June.

The Students' Union has three full-time officers who are elected each year by popular ballot. They are the President, who is mainly the political figure-head of the Union; the Secretary/Treasurer, who organizes the smooth operation of the SU offices; keeps the membership rolls up to date, and oversees the financial operations; and the Women's Officer who represents women on campus and formulates maintains and co-ordinates the Students' Union policy on women's affairs.

Other officers are the Education Vice-President, who works towards the implementation of Students' Union education policy; the Education Officer concerned with helping students with problems relating to TEAS, Show-Cause and other matters relevant to their courses; the Vice-President who ensures the efficient running of CASOC; and the Director of Overseas Students who deals with specific problems these students may encounter while in Australia.

The activities in which the Students' Union is involved include:

1. Publication of the Student Paper Tharunka.
2. Production of the student video program Campuswide.
3. A free legal service run by a qualified lawyer employed by the Students' Union Council.
4. The Secondhand Bookshop for cheap texts.
5. A child care centre, House at Pooh Corner.
6. CASOC (Clubs and Societies on Campus) which provides money from the SU for affiliated clubs and societies on campus.
7. A video service with access for students to equipment and advice.
8. A notice board for casual job vacancies.
9. Organization of orientation for new students.

The SU has two offices on campus. One is located at the back of the Library Lawn (between the Chancellery and the Morven Brown Building), where the SU President, Education Vice-President, Education Officer, Clubs and Societies Secretary and Postgraduate Officer are available to discuss student problems. The other is on the Second Floor of the Squarehouse (above the bar) at the bottom end of campus, where the Secretary/Treasurer, Women's Officer, Overseas Student Director, the full-time Solicitor, Tharunka and Campuswide provide information and student services.

### The University Library

The University libraries are mostly situated on the upper campus. The library buildings house the Social Sciences and
Humanities Library on Level 4, the Physical Sciences Library on Level 7 and the Law Library on Level 8. The undergraduate collection is on Levels 3 and 4. The Biomedical Library is in the western end of the Mathews Building and is closely associated with libraries in the teaching hospitals of the University.

For details consult Faculty Information in the relevant Faculty Handbook.

There are also library services at other centres:
- The Water Reference Library situated at Manly Vale (telephone 948 0261) which is closely associated with the Physical Sciences Library.
- The library at the Australian Defence Force Academy, ACT, serving the Faculty of Military Studies.

Each library provides reference and lending services to staff and students and each of the libraries on the Kensington campus is open throughout the year during the day and evening periods. The exact hours of opening vary during the course of the academic year. For recorded hours of opening telephone 697 2687.

Staff and students normally use a machine-readable identification card to borrow from the University libraries.

The University Union

The University Union provides the amenities which students, staff and graduates require in their daily University life and thus facilitates their knowing and understanding one another through associations outside the lecture room, the library and other places of work.

The Union is housed in a range of buildings across the campus, principal among which are the Roundhouse, the Blockhouse and the Squarehouse located near the Anzac Parade entrance to the University. Membership of the Union is compulsory for all registered students and is open to all members of staff and graduates of the University.

The control of the Union is vested in the Board of Management whose Chief Executive Officer is the Warden.

The Union operates a licensed Bar and twelve Food Service points on the campus, providing services ranging from take-away snacks and cafeteria-type meals to an à la carte restaurant operation.

Shops run directly by the Union are the Logo Shop (university-crested gifts, mementoes and clothing), two newsagency/stationery shops, one stationery shop specializing in architecture requisites and an ice cream/confectionery shop. Other facilities operating within buildings occupied by the Union are banks, a credit union agency, hairdressers and a beauty salon, barber, delicatessen, casual clothing shop, pharmacy, dentist, optical dispensing and travel services.

Showers, meeting, games, music practice, reading, craft and dark rooms are provided as well as a Student Resource Area where photocopying, screen printing, stencil cutting and typewriter services and equipment hire are available.

The Union’s cultural activities program encompasses creative leisure classes, lunch hour concerts and films, market days and exhibitions.

Further information on Union programs, activities and services is provided in the Annual Union Handbook and in the Creative Leisure Classes and Activities brochures published each session.

Student Membership of Faculties and Boards of Studies

The provisions for the appointment of student members to faculties and boards of studies, stated by resolutions of Council of 9 May 1977, 16 January 1978 and 9 July 1984 are:

1. A person who is not a student of the University shall be ineligible to be appointed as a member of a faculty under these rules.

For the purposes of these rules ‘student’ means a person who is enrolled as a candidate proceeding to a degree or diploma of the University.

2. Each faculty shall recommend to the Professorial Board for consideration and recommendation to the Council the number, or the formula for determining the number, of students eligible to be appointed as members of that faculty and may at any time recommend changes in such matters.

3. Each faculty may recommend to the Professorial Board for consideration and recommendation to the Council the creation of distinct and separate electorates for the appointment of students as members and may at any time recommend changes in such matters.

4. All elections referred to in this resolution shall be conducted annually by the Registrar or his nominee, who shall be the Returning Officer, in accordance with the provisions of this resolution and any other relevant resolution of the Council, on such a day, being either a day in April or a day in October, and at such places and during such hours and using such election machinery and method of counting as shall be agreed upon between the Registrar or his nominee and the Chairman of the relevant faculty.

5. Elections shall be by personal voting except that students registered as external students and those students not on campus because of course requirements shall be entitled to vote by post and shall be enabled to do so. The Registrar or his nominee in consultation with Chairman of the relevant faculty shall determine which students are so entitled.

6. The successful candidates in any election shall be appointed to their respective faculties by the Registrar or his nominee.

7. A person elected to be a member of a faculty under the provisions of this resolution shall be entitled to such membership for a term of twelve months either from the date of the declaration of the election result or from such other date as shall be agreed between the Registrar or his nominee and the Chairman of the relevant faculty so that such membership of a faculty shall not be retained on ceasing to be a student enrolled in the faculty which entitled election except that:

(1) a person who has ceased to be so enrolled by reason of having completed the course requirements between the time of election and the close of the period for which elected shall retain such membership for the full period, and
(2) a student who has been granted leave of absence from the University in order to carry out the duties of an appointment as a full-time salaried officer of the University Union, the Students' Union, or the Sports Association shall while occupying the office in question be deemed to be a student for the purpose of this resolution and shall retain such membership for the full period.

8. When a casual vacancy in the membership of a faculty occurs either by resignation or by virtue of the provisions of section 7, above the Registrar shall submit to Council for consideration for appointment to the vacancy for the remainder of the period of membership the name of the candidate if any who polled the greatest number of votes of the unsuccessful candidates at the most recent election in the relevant electorate.

9. That where a casual vacancy occurring in student membership of faculties or boards of studies cannot be filled within the provisions of section 8, above, the executive committee of any faculty or board of studies be empowered to nominate to the Vice-Chancellor a student or students for consideration of appointment by Council.

10. Any student enrolled at the date on which the nominations close for a course leading to a degree or diploma awarded in a faculty shall be entitled to be nominated for, to be elected for, and to vote in an election for, membership of that faculty in such electorates as may be provided for under section 3, above.

11. Any student enrolled at the date on which nominations close for a course leading to degrees or diplomas awarded by several faculties shall be eligible in any year to be nominated for, to be elected for, and to vote in an election for, membership of each such faculty in such electorates as may be provided for under section 3, above, provided that such a student shall not in any year be nominated for, be elected for, or vote in an election for, membership of a faculty unless enrolled in a subject controlled by that faculty in that year.

12. Any student enrolled at the date on which nominations close for a course which contains a General Studies component shall be entitled to be nominated for, to be elected for, and to vote in an election for, membership of the Board of Studies in General Education in such electorates as may be provided for under section 3, above.

13. Any student enrolled at the date on which nominations close for the Science and Mathematics course (3970) shall be eligible to be nominated for, to be elected for, and to vote in an election for, membership of the Board of Studies in Science and Mathematics in such electorates as may be provided for under section 3, above.

14. In the interpretation of these provisions the expression 'faculty' includes 'boards of studies'.

Electorates
Electorates for student membership of faculties and boards of studies were defined by Council resolution.

Faculty of Applied Science
Five members elected by and from the students of the Faculty.

Faculty of Architecture
Four members elected by and from the students of the Faculty.

Faculty of Arts
Six members elected by and from the students of the Faculty.

Faculty of Biological Sciences
(1) Two members elected by and from the graduate students of the Faculty.
(2) One member elected by and from the undergraduates of the Faculty.

Faculty of Commerce
One member for each 500 students elected by and from the students of the Faculty, with a minimum number of three members, including where possible at least one candidate registered for an undergraduate degree and at least one candidate registered for a graduate degree or diploma.

Faculty of Engineering
(1) Two members elected by and from the undergraduates of the School of Civil Engineering.
(2) Two members elected by and from the undergraduates of the School of Electrical Engineering and Computer Science.
(3) Two members elected by and from the undergraduates of the School of Mechanical and Industrial Engineering.
(4) Two members elected by and from the undergraduates of the School of Surveying.
(5) Two members elected by and from the graduate students of the Faculty.

Faculty of Law
One student member for every 200 registered students (or fraction thereof) or one student member for every ten full-time teachers on the Faculty (or fraction thereof), whichever is the greater, elected by and from the students of the Faculty.

Faculty of Medicine
(1) One member elected by and from the undergraduates in Year 1 of the Medicine course.
(2) One member elected by and from the undergraduates in Year 2 of the Medicine course.
(3) One member elected by and from the undergraduates in Year 3 of the Medicine course.
(4) One member elected by and from the undergraduates in Year 4 of the Medicine course and those students enrolled in the course leading to the award of the degree of BMedSc.
(5) One member elected by and from the undergraduates in Year 5 of the Medicine course and the graduate students of the Faculty.

Faculty of Professional Studies
(1) One member elected by and from the undergraduates in the School of Education.
(2) One member elected by and from the undergraduates in the School of Health Administration.
(3) One member elected by and from the undergraduates in the School of Social Work.
Financial Assistance to Students

Tertiary Education Assistance Scheme
Under this scheme, which is financed by the Commonwealth Government, assistance is available for full-time study in approved courses, to students who are not bonded and who are permanent residents of Australia, subject to a means test on a non-competitive basis. The allowances paid are unlikely to be sufficient, even at the maximum rate, for all the living expenses of a student. Family help and/or income from vacation or spare-time work would also be needed.

Students in the following types of university courses are eligible for assistance:
- Undergraduate and graduate bachelor degree courses;
- Graduate diplomas;
- Approved combined bachelor degree courses;
- Masters qualifying courses (one year).

The rates of allowance and conditions for eligibility are set out in a booklet obtainable from the Commonwealth Department of Education.

It is most important that students advise the TEAS office if at any time they change or discontinue their study programs, as their eligibility for benefits might be affected.

Other Financial Assistance
In addition to the Tertiary Education Assistance Scheme financed by the Australian Government the following forms of assistance are available:

1. Deferment of Payment of Fees
   Deferments may be granted for a short period, usually one month, without the imposition of a late fee penalty, provided the deferment is requested prior to the due date for fee payments.

2. Short Term Cash Loans
   Donations from various sources have made funds available for urgent cash loans not exceeding $100. These loans are normally repayable within one month.

3. The Commonwealth Government has made funds available to the University to provide loans to students in financial difficulty. The loans are to provide for living allowances and other approved expenses associated with attendance at university. Students are required to enter into a formal agreement with the University to repay the loan. The University is unable to provide from the fund amounts large enough for all or even a major part of the living expenses of a student.

   Students who are in extremely difficult financial circumstances may apply for assistance by way of a grant. In order to qualify for a grant a student must generally show that the financial difficulty has arisen from exceptional misfortune. Grants are rarely made.

   The University has also been the recipient of donations from the Arthur T. George Foundation, started by Sir Arthur George and his family, for the endowment of a student loan fund.

   In all cases assistance is limited to students with reasonable academic records and whose financial circumstances warrant assistance.
Enquiries about all forms of financial assistance should be made at the office of Student Services, Room G19, the Chancellery.

**Financial Assistance to Aboriginal Students**

Financial assistance is available to help Aboriginal students from the Commonwealth Government's Aboriginal Study Grant Scheme. Furthermore, Aboriginal students may apply for loans from the Student Loan Funds.

The University has also received a generous bequest from the estate of the late Alice Brooks Gange for the education of Australian aborigines within the University. Under the terms of this bequest, the Vice-Chancellor approved the establishment of a Centre for Aboriginal Students. This Centre, which began operating in 1985, provides support for Aboriginal students who are enrolled in the University and who wish to use the Centre and its resources. The Centre has a Resident Supervisor.

All enquiries relating to these matters should be made at the office of Student Services, Room G19, the Chancellery.

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**Rules and Procedures**

The University, in common with other large organizations, has established rules and procedures which are designed for the benefit of all members of the University. In some cases there are penalties (e.g., fines or exclusion from examinations) for non-compliance. Any student who, after carefully reading the rules set out in the following pages, requires further information on their application should seek further advice, in the first instance, at the Student Enquiry Counter in the North Wing of the Chancellery Building.

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**General Conduct**

The University has not considered it necessary to formulate a detailed code of rules relating to the general conduct of students. Enrolment as a student of the University, however, involves an undertaking to observe the regulations, by-laws and rules of the University, and to pay due regard to any instructions given by any officer of the University.

**Appeals**

Section 5(c) of Chapter III of the By-laws provides that 'Any person affected by a decision of any member of the Professorial Board (other than the Vice-Chancellor) in respect of breach of discipline or misconduct may appeal to the Vice-Chancellor, and in the case of disciplinary action by the Vice-Chancellor, whether on appeal or otherwise, to the Council'.

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**Admission and Enrolment**

The Student Enquiry Counter, located near the Cashier in the Chancellery on the upper campus, provides information for students on admission requirements, undergraduate and graduate courses and enrolment procedures. Faculty handbooks and the Calendar may be purchased from the Cashier. The Enquiry Counter is open from 9 am to 1 pm and 2 pm to 5 pm, Monday to Friday. During enrolment it is also open on some evenings.

Information may be obtained here about admission to first year undergraduate courses, special admission, admission with advanced standing and admission on overseas qualifications. Applications are also received from students who wish to transfer from one course to another, resume their studies after an absence of twelve months or more, or seek any concession in relation to a course in which they are enrolled.

Applications for admission to undergraduate courses from students who do not satisfy the requirements for admission (see section on Admission Requirements) are referred by the Admissions Section to the Admissions Committee of the Professorial Board.

It is essential that the closing dates for lodgement of applications are adhered to. For further details see the section on Enrolment Procedures and Fees.

Students wishing to enrol as higher degree candidates should first consult the Head of the School in which they wish to study. An application is then lodged on a standard form and the Postgraduate Section, after obtaining a recommendation from the Head of School, refers the application to the appropriate Faculty or Board of Studies Higher Degree Committee.

An Adviser for Prospective Students, Mrs Fay Lindsay, is located in the huts near the foot of Basser Steps (access from Engineering Road), and is available for personal interview with those who require additional information about the University.

**First Year Entry**

Those seeking entry to first year courses in one or more of twenty-four tertiary institutions in the State including all universities are required to lodge a single application form with the Universities and Colleges Admissions Centre (GPO Box 7049, Sydney 2001). On the application form provision is made for applicants to indicate preferences for courses available in any one of the seven universities and the other tertiary institutions. Students are notified individually of the result of their applications and provided with information regarding the procedures to be followed in order to accept the offer of a place at this university. Enrolment is completed at the Enrolment Bureau, UniSearch House, 221 Anzac Parade, Kensington.

**Deferment of First Year Enrolment**

Students who have received an offer of a place may request deferment of enrolment for one year and will usually receive permission providing they do not enrol at another tertiary institution in that year.

First year students who enrol and subsequently discontinue without failure their whole course will be permitted to re-enrol the following year providing they do not enrol at another tertiary institution. They must confirm their intention to re-enrol by lodging an application with the Universities and Colleges Admissions Centre.

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**Admission Requirements**

A candidate for any degree of Bachelor of the University must have qualified for matriculation.
In addition, candidates must be selected before being permitted to enrol in a course. In 1987 it is necessary for the University to limit the number of students enrolling in all undergraduate courses.

**Matriculated student**

A candidate who has satisfied the conditions for matriculation and for admission to a course of study shall be classed as a "matriculated student of the University", after enrolment.

A person who has satisfactorily met the conditions for admission may be provided with a statement to that effect.

**Special entry to the University**

Special provisions apply to Aboriginal students, to older students and to those who may have suffered educational disadvantage.

For details see after Supplementary Provision for Matriculation in the following section.

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**Enrolment Procedures and Fees Schedules 1987**

1. **Introduction**

All students, except those enrolling in graduate research degree courses (see sections 5. and 6. below), must lodge an authorized enrolment form with the Cashier either on the day the enrolling officer signs the form or on the day any required General Studies electives are approved.

All students, except those enrolling in graduate research degree courses and those exempted as set out in section 17. below, should on that day also either pay the required fees or lodge an enrolment voucher or other appropriate authority.

Such vouchers and authorities are generally issued by the NSW Department of Education and the NSW Public Service. They are not always issued in time and students who expect to receive an enrolment voucher or other appropriate authority but have not done so should pay the student activities fees and arrange a refund later. Such vouchers and authorities are not the responsibility of the University and their late receipt is not to be assumed as automatically exempting a student from the requirements of enrolling and paying fees.

If a student is unable to pay the fees the enrolment form must still be lodged with the Cashier and the student will be issued with a 'nil' receipt. The student is then indebted to the University and must pay the fees by the end of the second week of the session for which enrolment is being effected.

Penalties apply if fees are paid after the time allowed (see section 16. below) unless the student has obtained an extension of time (see section 13. below) in which to pay fees from the Student Enquiry Counter, the Chancellery. Such an application must be made before the fee is due. Payment may be made through the mail, in which case it is important that the student number be given accurately. Cash should not be sent through the mail.

2. **New Undergraduate Enrolments**

Persons who are applying for entry in 1987 must lodge an application for selection with the Universities and Colleges Admissions Centre, GPO Box 7049, Sydney 2001, by 1 October 1986.

Those who are selected will be required to complete enrolment at a specified time before the start of Session 1. Compulsory student activities fees should be paid on the day.

In special circumstances, however, and provided class places are still available, students may be allowed to complete enrolment after the prescribed time.

Application forms and details of the application procedures may be obtained from the Student Enquiries Counter, Ground Floor, North Wing of the Chancellery Building.

3. **Re-enrolment**

See also sections 4., 6. and 7. below.

Students who are continuing courses (or returning after approved leave of absence) should enrol in accordance with the procedures set out in the current Enrolment Procedures booklet, available from the Student Enquiry Counter in the Chancellery and from School offices. Undergraduate students who have completed part of a course and have been absent without leave need to apply for entry through the Universities and Colleges Admissions Centre, GPO Box 7049, Sydney 2001, by 1 October 1986.

First year students who enrol and subsequently discontinue without failure their whole course will be permitted to re-enrol the following year providing they do not enrol at another tertiary institution. They must confirm their intention to re-enrol by lodging an application with the Universities and Colleges Admissions Centre.

4. **Restrictions Upon Re-enrolling**

Students who in 1986 have infringed the rules governing re-enrolment should not attempt to re-enrol in 1987 but should follow the written instructions they will receive from the Registrar in December 1986.

5. **New Research Students**

Students enrolling for the first time in graduate research degree courses will be advised by letter concerning the method of enrolment. Enrolment other than in accordance with the procedure set out in this letter will incur a penalty (see section 16. below).

6. **Re-enrolling Research Students**

Students undertaking research degree courses (course codes 0-2999) will be re-enrolled automatically each year and sent an account for any fees due.

7. **Submission of Project Report**

Students undertaking formal masters degree courses (course codes 8000-9999) who at the commencement of Session 1 have completed all the work for a degree or diploma except for the submission of the relevant project report are required to re-enrol by the end of the second week of Session 1. Completion of enrolment after that time will incur a penalty (see section 16. below).

Information about possible student activities fees exemption is set out in section 17. (10) below.
8. Enrolments by Miscellaneous Students

Enrolments by Miscellaneous students are governed by the following rules:

(1) Enrolment in a particular subject or subjects as a miscellaneous student — ie as a student not proceeding to a degree or diploma — may be permitted provided that in every case the Head of School offering the subject considers that the student will benefit from the enrolment and provided also that accommodation is available and that the enrolment does not prevent a place in that subject being available to a student proceeding to a degree or diploma.

(2) A student who is under exclusion from any subject in the University may not enrol as a miscellaneous student in that subject.

(3) A student who is under exclusion from any course in the University may not enrol in any subject which forms a compulsory component of the course from which the student is excluded.

(4) A student who is subsequently admitted to a course of the University for which any subjects completed as a miscellaneous student form a part may receive standing for those subjects.

(5) There are quota restrictions on the number of students allowed to enrol as miscellaneous, irrespective of whether they have approval from the Head of School. Applicants with written Head of School approval may be permitted to enrol providing there are places available in the quotas.

(6) As a general rule the University does not permit miscellaneous students to enrol in first year undergraduate subjects. Enquiries concerning eligibility for enrolment may be made at the Student Enquiry Counter, the Chancellery (telephone 697 3095).

9. Final Dates for Completion of Enrolment

No enrolments for courses extending over the whole year or for Session 1 only will be accepted from students after the end of the second week of Session 1 (13 March 1987) except with the express approval of the Registrar and the Heads of the Schools concerned. No enrolments for courses in Session 2 only will be accepted after the end of the second week of Session 2 (7 August 1987) except with the express approval of the Registrar and the Heads of the Schools concerned.

10. Student Card — Conditions of Issue

All students enrolled in degree or diploma courses or as miscellaneous students are issued with a University of New South Wales Student Card. All students are issued with cards on their initial enrolment.

The number appearing on the card below the student’s name is the student registration number used in the University’s records. This number should be quoted in all correspondence.

(1) The card must be carried at the University and shown on request. It must be presented when borrowing from the University libraries, when using Library facilities and when applying for concessions.

(2) The card is not transferable.

(3) The student to whom the card has been issued must notify the Circulation Department of the Library of its loss or theft. Failure to do so may result in the cardholder being held responsible for items issued on the card after its loss or theft.

(4) The card is valid only for the period of enrolment as indicated on the receipt issued by the Cashier at enrolment each year.

(5) The cardholder accepts responsibility for all Library books issued on his/her card and agrees to return books by the due date.

(6) If the card is damaged or becomes otherwise unusable, it is the cardholder’s responsibility to seek replacement.

(7) The card always remains the property of the University and must be returned to it when the holder leaves the University.

11. Payment of Fees

The fees and charges which are payable include those charges raised to finance the expenses incurred in operating activities such as the University Union, the Students’ Union, the Sports Association, and the Physical Education and Recreation Centre. Penalty payments are also incurred if a student fails to complete procedures as required. Charges may also be payable, sometimes in the form of a deposit, for the hiring of kits of equipment in certain subjects. Accommodation charges, costs of subsistence on excursions, field work etc, and for hospital residence (medical students) are payable in appropriate circumstances.

12. Assisted Students

Scholarship holders and sponsored students who have not received an enrolment voucher or appropriate letter of authority from their sponsor at the time when they are enrolling should pay their own fees and a refund will be made when the enrolment voucher or letter of authority is subsequently lodged with the Cashier.

Those unable to pay their own fees in these circumstances can apply for an extension of time (see section 13, below) in which to pay. Such an application must be made before the fees are due.

13. Extension of Time

Students who are unable to pay fees by the due date may apply for an extension of time, which may be granted in extenuating circumstances. Such applications must be made, in writing, before the due date and lodged at the Student Enquiry Counter, the Chancellery.

14. Failure to Pay Fees and Other Debts

Students who fail to pay prescribed fees or charges or are otherwise indebted to the University and who fail either to make a satisfactory settlement of indebtedness upon receipt of due notice or to receive a special exemption cease to be entitled to the use of University facilities. Such students are not permitted to enrol for a further session, to attend classes or examinations, or to be granted any official credentials. In the case of students enrolled for Session 1 only or for both Sessions 1 and 2 this disbarment applies if any portion of fees is outstanding after the end of the eighth week of Session 1 (24 April 1987). In the case of students enrolled for Session 2 only this disbarment applies if any portion of fees is outstanding after the end of the sixth week of Session 2 (11 September 1987).

In special cases the Registrar may grant exemption from the disqualification referred to in the preceding paragraph upon
15. Fees

Fees and penalties quoted are current at the time of publication but may be amended by the University without notice.

Administration Charge $250

University Union Entrance Fee
Payable on first enrolment $43
Students enrolling for only one session must pay the full University Union entrance fee.

Student Activities Fees
All students (with the exceptions set out in section 17. below) are required to pay the following fees if enrolling for a program involving two sessions. Those enrolling for only one session will pay the full University Union Entrance Fee, if applicable, and one-half of any other fees due.

Students who consider themselves eligible for life membership of the University Union, or the Sports Association, should make enquiries about the matter at the offices of those bodies.

Students often seek exemption from some or all of the student activities fees for reasons other than those set out in section 17. below. It is stressed that the fees charged are a contribution by students towards services and amenities for the University community (both now and in the future) and exemption from them cannot be claimed because a student is unable or unwilling to make use of some of those services or amenities.

Student Activities Fees are adjusted annually by a system of indexation and those set out below have been approved for 1997.

University Union annual subscription $123
Sports Association annual subscription $30
Students’ Union Annual Subscription
Students enrolling in full-time courses $37
Students enrolling in part-time courses or as miscellaneous students $30
Miscellaneous Fund annual fee $43

This fee is used to finance expenses generally of a capital nature relating to student activities and amenities. Funds are allocated for projects recommended by the Student Affairs Committee and approved by the University Council.

Special Examination Fees
Examinations conducted in special circumstances for each subject $20
Review of examination results for each subject $20

Other Charges
In addition to the fees outlined above and depending on the subject being taken, students may be required to make a payment for equipment; money so paid is, in general, refunded if the equipment is returned in satisfactory condition.

16. Penalties

(1) Failure to lodge enrolment form according to enrolment procedure $20
(2) Payment of fees after end of second week of session $20
(3) Payment of fees after end of fourth week of session $40

Penalties (1) and (2) or (1) and (3) may accumulate.

17. Exemptions — fees

Students often seek exemption from the fees for reasons other than those set out below. It is stressed that the fees charged are a contribution by students towards services and amenities for the University community (both now and in the future) and exemption from them cannot be claimed because a student is unable or unwilling to make use of some of those services or amenities.

(1) Life members of the University Union, the Sports Association, and Students’ Union are exempt from the relevant fee or fees.

Students who consider themselves eligible for life membership of the University Union or the Sports Association should make enquiries about the matter at the offices of those bodies.

(2) Students enrolled in courses classified as External are exempt from all Student Activities Fees and the University Union Entrance Fee.

(3) Students enrolled in courses at the University College (Australian Defence Force Academy) are exempt from the Student Activities Fees and the University Union Entrance Fee in section 15. above but shall pay such other fees and charges as the Council may from time to time determine.

(4) University Union fees and subscriptions may be waived by the Registrar for students enrolled in graduate courses in which the formal academic requirements are undertaken at a part of the University away from the Kensington campus.

(5) Students who while enrolled at and attending another university (or other tertiary institution as approved by the Vice-Chancellor) in a degree or diploma course are given approval to enrol at the University of New South Wales but only as miscellaneous students for subjects to be credited towards the degrees or diplomas for which they are enrolled elsewhere are exempt from all Student Activities Fees and the University Union Entrance Fee.

Institutions approved are: Australian Film and Television School, New South Wales Institute of Technology, Sydney College of Advanced Education and Sydney College of Chiropractic.

(6) Undergraduate students of a recognized university outside Australia who attend the University of New South Wales with the permission of the head of the appropriate school or department to take part as miscellaneous students in an academic program relevant to their regular studies and approved by the authorities of their own institution are exempt from all Student Activities Fees and the University Union Entrance Fee.

(7) Graduate students not in attendance at the University and who are enrolling in a project only other than for the first time, are exempt from all Student Activities Fees.
(8) Graduate students resubmitting a thesis or project only are exempt from all Student Activities Fees.

(9) All Student Activities Fees, for one or more sessions, may be waived by the Registrar for students who are given formal permission to pursue their studies at another institution for one or more sessions.

(10) Graduate students who have completed all the work for a qualification at the commencement of session, except for the submission of the relevant thesis or project report, may be exempted from the payment of Student Activities Fees by the Registrar on production of an appropriate statement signed by the relevant Supervisor or Head of School.

(11) Students enrolled in a session or sessions devoted entirely to training or experience away from the campus and its associated laboratories, the teaching hospitals, centres, institutes and field stations are exempt from all Student Activities Fees for that session or sessions.

(12) Students whose registration is cancelled or suspended by the University shall receive refunds of fees paid in accordance with the provisions of section 18. (5) below except that a refund of one half of the fees shall be made if such cancellation or suspension takes place between the end of the fourth week of Session 1 and the end of the fourth week of Session 2.

18. Variations in Enrolment (including Withdrawal)

(1) Students wishing to vary an enrolment program must make application on the Variation of Enrolment form available from the appropriate Course Authority and the Student Enquiry Counter.

(2) Students withdrawing from courses (and see also information about withdrawal from subjects below) are required to notify the Registrar in writing or complete the withdrawal form available from the Student Enquiry Counter. In some cases such students will be entitled to fee refunds (see (5) below).

(3) Enrolment in additional subjects

Applications for enrolment in additional subjects must be submitted by:

13 March 1987 for Session 1 only and whole year subjects;
7 August 1987 for Session 2 only subjects.

(4) Withdrawal from subjects

Applications to withdraw from subjects may be submitted throughout the year but applications lodged after the following dates will result in students being regarded as having failed the subjects concerned, except in special circumstances:

(a) for one session subjects, the end of the seventh week of that session (16 April or 16 September).

(b) for whole year subjects, the end of the second week of Session 2 (7 August).

(5) Withdrawal from Course

First year students who enrol and subsequently discontinue without failure their whole course will be permitted to re-enrol the following year providing they do not enrol at another tertiary institution. They must confirm their intention to re-enrol by lodging an application with the Universities and Colleges Admissions Centre.

(6) Refunds - Student Activities Fees

Whether or not a student’s withdrawal entails academic penalties (covered in item (4) above) there are rules governing Student Activities Fees refunds in the case of complete withdrawal from a course as follows:

(a) If notice of withdrawal from a course is received before the first day of Session 1, a refund of all Student Activities Fees paid will be made.

(b) If notice of withdrawal is received on or after the first day of Session 1, a partial refund of the University Union Entrance Fee will be made on the following basis: any person who has paid the entrance fee in any year and who withdraws from membership of the University Union after the commencement of Session 1 in the same year, or who does not re-enrol in the immediately succeeding year, must confirm their intention to re-enrol by lodging a refund application and the Registrar will acknowledge each application for a variation in enrolment (including withdrawals from subjects) as follows:

(a) variations lodged before the Friday of the seventh week of each session (17 April or 18 September) will be acknowledged by the Registrar to a student unable to notify the Registrar in writing by the times required provided evidence is supplied that the student has ceased attendance by those times.

(7) Acknowledgements

The Registrar will acknowledge each application for a variation in enrolment (including withdrawals from subjects) as follows:

(a) variations lodged before the Friday of the seventh week of each session (17 April or 18 September) will be acknowledged by the Registrar to a student unable to notify the Registrar in writing by the times required provided evidence is supplied that the student has ceased attendance by those times.

(b) variations lodged after those dates will be acknowledged by letter.

(c) withdrawals from a course are acknowledged individually whenever they are lodged.

(8) It is emphasized that failure to attend for any assessment procedure, or to lodge any material stipulated as part of an assessment procedure, in any subject in which a student is enrolled will be regarded as failure in that assessment procedure unless written approval to withdraw from the subject without failure has been obtained from the Registrar.

19. Exemption – Membership

The Registrar is empowered to grant exemption from membership of any or all of the University Union, the Students’ Union...
and the Sports Association to students who have a genuine conscientious objection to such membership, subject to payment of the prescribed fees to the Miscellaneous Fund.

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**Leave of Absence**

Leave of absence from an undergraduate course of study may be granted to students other than those in the first year of a course. Leave of absence has generally been restricted to one year but in special circumstances two years have been granted. To apply for such leave of absence, a letter should be submitted to the Registrar immediately following the release of annual examination results and must include the student's full name, registration number, the course and stage in which enrolled in the previous year and, most important, the reason why leave is being sought. The letter advising the result of the application will provide details about how to re-enrol.

Higher degree and graduate diploma candidates may apply for suspension of enrolment under similar conditions.

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**Undergraduate Course Transfers**

Students wishing to transfer from one course to another must complete and submit an application form, obtainable from the Student Enquiry Counter, the Chancellery, by Friday 9 January 1987.

Students whose applications to transfer are successful, and who are transferring from one school to another are required to comply with the enrolment procedure laid down for new students with advanced standing. Students transferring from one course to another within the same school are required to attend the appropriate enrolment session for the course to which they have approval to transfer.

Students must present the approval to transfer to the enrolling officer, and those who have not received advice regarding their application to transfer before the date on which they are required to enrol should check with the office of the Admissions Section.

Students should also advise the enrolling officer in the school in which they were enrolled in 1986 of their intention to transfer.

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**Admission with Advanced Standing**

Any persons who make application to register as a candidate for any degree or other award granted by the University may be admitted to the course of study leading to such degree or award with such standing on the basis of previous attainments as may be determined by the Professorial Board provided that:

1. the Board shall not grant such standing under these rules as is inconsistent with the rules governing progression to such degree or award as are operative at the time the application is determined;

2. where students transfer from another university such students shall not in general be granted standing in this University which is superior to what they have in the University from which they transfer;

3. the standing granted by the Board in the case of any application based on any degree/s or other awards already held by the applicants, shall not be such as will permit them to qualify for the degree or award for which they seek to register without completing the courses of instruction and passing the examinations in at least those subjects comprising the later half of the course, save that where such a program of studies would involve them repeating courses of instruction in which the Board deems them to have already qualified, the Board may prescribe an alternative program of studies in lieu thereof;

4. the standing granted by the Board in the case of any application based on partial completion of the requirements for any degree or other award of another institution shall not be such as will permit the applicants to qualify for the degree or award for which they seek to register by satisfactory completion of a program of study deemed by the Board to be less than that required of students in full-time attendance in the final year of the course in which the applicants seek to register;

5. the standing granted by the Board in the case of any application based on the partial completion of the requirements for any degree or other award of the University may be such as to give full credit in the course to which the applicants seek to transfer for work done in the course from which they transfer.

Where the identity between the requirements for any award of the University already held and that of any other award of the University is such that the requirements outstanding for the second award are less than half the requirements of that award, students who merely complete such outstanding requirements shall not thereby be entitled to receive the second award but shall be entitled to receive a statement over the hand of the Registrar in appropriate terms.

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**Resumption of Courses**

Students who have had a leave of absence for twelve months and wish to resume their course should follow the instructions about re-enrolling given in the letter granting leave of absence. If these instructions are not fully understood or have been lost, students should contact the office of the Admissions Section before November in the year preceding the one in which they wish to resume their course.

If students have not obtained leave of absence from their course and have not been enrolled in the course over the past twelve months or more, they should apply for admission to the course through the Universities and Colleges Admissions Centre before 1 October in the year preceding that in which they wish to resume studies.

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**Examinations**

Examinations are held in June/July and in November/December.

**Timetables**

Provisional timetables indicating the dates and times of examinations are posted on the University noticeboards in May and
October. Students must advise the Examinations Section (the Chancellery) of any clash in examinations.

Final timetables indicating the dates, times, locations, and authorized materials are available for students two weeks before the end of each session.

Misreading of the timetable is not an acceptable excuse for failure to attend any examination.

Assessment of Course Progress
In the assessment of a student's progress in a course, consideration may be given to work in laboratory and class exercises and to any term or other tests given throughout the year as well as to the results of written examinations.

Examination Results
Assessment result advices include the final composite marks students achieve in subjects taken that session.

Grading of Passes
Passes are graded as follows:

- **High Distinction**: an outstanding performance
- **Distinction**: a superior performance
- **Credit**: a good performance
- **Pass**: an acceptable level of performance
- **Satisfactory**: satisfactory completion of a subject for which graded passes are not available

Pass Conceded
A pass conceded may be granted provided that the overall performance is considered to warrant such a concession. A pass conceded in a subject will allow progression to another subject for which the former subject is a prerequisite.

Pass Terminating
A pass terminating may be granted provided that the overall performance is considered to warrant such a concession. A pass terminating does not allow progression to another subject for which the former subject is a prerequisite.

Availability of Results
Final examination results will be posted to a student's term address, or vacation address if requested. Forms requesting that results be posted to a vacation address and change of address forms are obtainable at the Student Enquiry Counter, the Chancellery. Forms can be accepted up to Friday 3 July for Session 1 results and Friday 4 December for Session 2 and whole year results. Results are also posted on School noticeboards and in the University Library. Results on noticeboards are listed by Student Registration Number.

No examination results are given by telephone.

Review of Results
A student may make application to the Registrar for the review of a result. The application form, accompanied by an appropriate fee, must be submitted not later than fifteen working days after the date of issue of the Notification of Result of Assessment form.

In reviewing a result, the subject authorities shall ensure that all components of the assessment have been assessed and a mark assigned.

A review of a result is not a detailed reassessment of a student's standard of knowledge and understanding of, and skills in, the subject. It is rather a search for arithmetic error in arriving at the composite mark and for gross and obvious error in assignment of marks in components of the final composite mark.

When a change in grade is recommended, the application fee will be refunded by the Registrar.

Special Consideration
Students who believe that their performance in a subject, either during session or in an examination, has been adversely affected by sickness or any other reason should inform the Registrar and ask for special consideration in the determination of their standing.

Such requests should be made as soon as practicable after the occurrence and in any event no more than seven days after the final examination in a subject.

When submitting a request for special consideration students should provide all possible supporting evidence (e.g., medical certificates) together with their registration number and enrolment details.

Physical Disabilities
Students suffering from a physical disability which puts them at a disadvantage in written examinations should advise the Officer-in-Charge, Examinations Section (Ground Floor, the Chancellery) immediately their disability is known. If necessary, special arrangements will be made to meet the student's requirements.

Students who are permanently disabled and need to make special arrangements for their examinations, should contact the Examinations Section as soon as the final timetable becomes available.

Use of Computers and Electronic Calculators
The use of computers or electronic calculators may be permitted in examinations conducted within the University. Computers and electronic calculators which are authorized by the University for this purpose must be **hand-held, internally powered, and silent**. Computers are distinguished from electronic calculators for this purpose by the existence of a full alphabetic keyboard on them. Computers are not permitted in examinations for which an electronic calculator has been specified. When an electronic calculator is permitted in an examination, any programmable memory on it must be cleared prior to entering an examination room.

The University does not provide computers or electronic calculators of the kind described in this rule for use in examinations although some schools may make them available in special circumstances.

Examinations Held Away from the Campus
Except in the case of students enrolled on external courses, examinations will not be permitted away from the campus unless the candidate is engaged on compulsory industrial training. Candidates must advise the Officer-in-Charge, Examinations Section, immediately the details of the industrial training are known. Special forms for this purpose are available at the Student Enquiry Counter in the north wing of the Chancellery.
Arrival at Examinations
Examination Rooms will be open to students twenty-five minutes before the commencement of the examination. Candidates are required to be in their places at least fifteen minutes before the commencement to hear announcements.

Reading the Examination Paper
The examination paper will be available for reading ten minutes before the instruction is given to commence writing.

Use of Linguistic Dictionaries
The answers in all examinations and in all work submitted must be in English unless otherwise directed. Students may apply for permission to use standard linguistic dictionaries in the presentation of written work for assessment. Such applications should be made in writing to the Officer-in-charge, Examinations Section not later than 14 days prior to the need to use the linguistic dictionary.

Academic Misconduct
Students are reminded that the University regards academic misconduct as a very serious matter. Students found guilty of academic misconduct are usually excluded from the University for two years. Because of the circumstances in individual cases the period of exclusion can range from one session to permanent exclusion from the University.

The following are some of the actions which have resulted in students being found guilty of academic misconduct in recent years:
1. taking unauthorized materials into an examination;
2. submitting work for assessment knowing it to be the work of another person;
3. improperly obtaining prior knowledge of an examination paper and using that knowledge in the examination.
4. failing to acknowledge the source of material in an assignment.

Conduct of Examinations
Examinations are conducted in accordance with the following rules and procedure:
1. Candidates are required to obey any instruction given by an examination supervisor for the proper conduct of the examination.
2. Candidates are required to be in their places in the examination room not less than fifteen minutes before the time for commencement.
3. No bag, writing paper, blotting paper, manuscript or book, other than specified material, is to be brought into the examination room.
4. Candidates shall not be admitted to an examination after thirty minutes from the time of commencement of the examination.
5. Candidates shall not be permitted to leave the examination room before the expiry of thirty minutes from the time the examination commences.
6. Candidates shall not be re-admitted to the examination room after they have left it unless, during the full period of their absence, they have been under approved supervision.
7. Candidates shall not by any improper means obtain, or endeavour to obtain, assistance in their work, give, or endeavour to give, assistance to any other candidate, or commit any breach of good order.
8. All answers must be in English unless otherwise stated. Foreign students who have the written approval of the Registrar may use standard linguistic dictionaries.
9. Smoking is not permitted during the course of examinations.
10. A candidate who commits any infringement of the rules governing examinations is liable to disqualification at the particular examination, to immediate expulsion from the examination room and to such further penalty as may be determined in accordance with the By-laws.

Writing in Examinations
Candidates are permitted to take pens, pencils and erasers into the examination room but are advised that all answers must be written in ink. Except where expressly required, pencils may be used only for drawing, sketching or graphical work.

Acknowledgement of Sources
Students are expected to acknowledge the source of ideas and expressions used in submitted work. To provide adequate documentation is not only an indication of academic honesty but also a courtesy enabling the marker to consult sources with ease. Failure to do so may constitute plagiarism, which is subject to a charge of academic misconduct.

Further Assessment
In special circumstances further assessment including assessment or further assessment on medical or compassionate grounds may be granted.

Further assessment may be given by the subject authority at his or her discretion at any time prior to the meeting of the relevant faculty assessment committee (normally the fourth week of the Midyear Recess and the second week of December). Further assessment may also be awarded at the faculty assessment committee and students affected may need to be free to undertake that further assessment in the last week in the Midyear Recess and in the period up to the end of the second week in January; students should consult their subject authority for details of further assessment immediately their results are known.

Restriction upon Students Re-enrolling
The University Council has adopted the following rules governing re-enrolment with the object of requiring students with a record of failure to show cause why they should be allowed to re-enrol and retain valuable class places.

First Year Rule
1. Students enrolled in the first year of any undergraduate course of study in the University shall be required to show cause why they should be allowed to continue the course if they do not pass the minimum number of subjects, units or credits prescribed for this purpose by the relevant faculty or board of studies.

The prescribed minimum for each undergraduate course may be found in Schedule A below; the schedule may be varied from time to time by the Professorial Board.
The first year rule does not apply to students who discontinue without failure all Session 2 and whole-year subjects.

**Repealed Failure Rule**

2. Students shall be required to show cause why they should be allowed to repeat a subject which they have failed more than once. Where the subject is prescribed as part of the course they shall also be required to show cause why they should be allowed to continue that course.

**General Rule**

3. (1) Students shall be required to show cause why they should be allowed to continue their course if the assessment committee of the faculty or board of studies so decides on the basis of previous failures in that subject or in a related subject. Where the subject is prescribed as part of the course they shall also be required to show cause why they should be allowed to continue that course.

(2) Students shall be required to show cause why they should be allowed to continue their course if the assessment committee of the faculty or board of studies so decides on the basis of their academic record.

4. (1) Students who infringe the provisions of Rules 1 or 2 at the end of Session 1 of any year will be allowed to repeat the subject(s) (if offered) and/or continue the course in Session 2 of that year, subject to the rules of progression in the course.

(2) Such students will be required to show cause at the end of the year, except that students who infringe Rule 2 at the end of Session 1, and repeat the subjects in question in Session 2, and pass them, will not be required to show cause on account of any such subjects.

**Exemption from Rules by Faculties**

5. (1) A faculty or board of studies assessment committee may, in special circumstances, exempt students from some or all of the provisions of Rules 1 and 2.

(2) Such students will not be required to show cause under such provisions and will be notified accordingly by the Registrar.

**Showing Cause**

6. (1) Students wishing to show cause must apply for special permission to re-enrol. Application should be made on the form available from the Registrar and must be lodged with the Registrar by the dates published annually by the Registrar. A late application may be accepted at the discretion of the University.

(2) Each application shall be considered by the Admissions and Re-enrolment Committee of the relevant faculty or board of studies which shall determine whether the cause shown is adequate to justify the granting of permission to re-enrol.

**Appeal**

7. (1) Students who are excluded by the Admissions and Re-enrolment Committee from a course and/or subject under the provisions of the Rules will have their applications to re-enrol reconsidered automatically by the Re-enrolment Committee of the Professorial Board.

(2) Students whose exclusion is upheld by the Re-enrolment Committee may appeal to an Appeal Committee constituted by Council for this purpose with the following membership:

A Pro-Vice-Chancellor, nominated by the Vice-Chancellor who shall be Chairman.

The Chairman of the Professorial Board, or if its Chairman is unable to serve, a member of the Professorial Board, nominated by the Chairman of the Professorial Board, or when the Chairman of the Professorial Board is unable to make a nomination, nominated by the Vice-Chairman.

One of the category of members of the Council elected by the graduates of the University, nominated by the Vice-Chancellor.

The decision of the Committee shall be final.

(3) The notification to students of a decision which has been upheld by the Re-enrolment Committee of the Professorial Board to exclude them from re-enrolling in a course and/or subject shall indicate that they may appeal against that decision to the Appeal Committee. The appeal must be lodged with the Registrar within fourteen days of the date of notification of exclusion; in special circumstances a late appeal may be accepted at the discretion of the chairman of the Appeal Committee. In lodging such an appeal with the Registrar students should provide a complete statement of all grounds on which the appeal is based.

(4) The Appeal Committee shall determine appeals after consideration of each appellant's academic record, application for special permission to re-enrol, and stated grounds of appeal. In particular circumstances, the Appeal Committee may require students to appear in person.

**Exclusion**

8. (1) Students who are required to show cause under the provisions of Rules 1 or 3, and either do not attempt to show cause or do not receive special permission to re-enrol from the Admissions and Re-enrolment Committee (or the Re-enrolment Committee on appeal) shall be excluded, for a period not in excess of two years, from re-enrolling in the subjects and courses on account of which they were required to show cause. Where the subjects failed are prescribed as part of any other course (or courses) they shall not be allowed to enrol in any such course.

(2) Students required to show cause under the provisions of Rule 2 who either do not attempt to show cause or do not receive special permission to re-enrol from the Admissions and Re-enrolment Committee (or the Re-enrolment Committee on appeal) shall be excluded, for a period not in excess of two years, from re-enrolling in any subject they have failed twice. Where the subjects failed are prescribed as part of a course they shall also be excluded from that course. Where the subjects failed are prescribed as part of any other course (or courses) they shall not be allowed to enrol in any such course.

**Re-admission after Exclusion**

9. (1) Excluded students may apply for re-admission after the period of exclusion has expired.

(2) (a) Applications for re-admission to a course should be made to the Universities and Colleges Admissions Centre before the closing date for normal applications in the year prior to that in which re-admission is sought. Such applications will be considered by the Admissions and Re-enrolment Committee of the relevant faculty or board of studies.

(b) Applications for re-admission to a subject should be made to the Registrar before 30 November in the year prior to that in
which re-admission is sought. Such applications will be consid-
ered by the relevant subject authority.

(3) Applications should include evidence that the circumstan-
ces which were deemed to operate against satisfactory per-
formance at the time of exclusion are no longer operative or are 
reduced in intensity and/or evidence of action taken (including 
enrolment in course/s) to improve capacity to resume studies.

(4) Students whose applications for re-admission to a course or
subject are unsuccessful (see 9. (2) (a), (b) respectively) will be 
invited to appeal to the Re-Enrolment Committee of the Profes-
sorial Board. The decision of the Re-Enrolment Committee will 
be final.

10. Students who fail a subject at the examinations in any year 
or session and re-enrol in the same course in the following year 
or session must include in their programs of studies for that year 
or session the subject which they failed. This requirement 
will not be applicable if the subject is not offered the following year 
or session, is not a compulsory component of a particular course, 
or if there is some other cause which is acceptable to the Pro-
fessorial Board, for not immediately repeating the failed subject.

Restrictions and Definitions
11. (1) These rules do not apply to students enrolled in pro-
grams leading to a higher degree or graduate diploma.

(2) A subject is defined as a unit of instruction identified by a 
distinctive subject number.

Schedule A

(See First Year Rule 1. above)

Where the minimum requirement is half the program, this is 
defined as half the sum of the unit values of all the subjects in a 
student’s program.

<table>
<thead>
<tr>
<th>Faculty/Board of Studies</th>
<th>Minimum Requirement</th>
<th>Course</th>
<th>Unit Values (UV)</th>
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<tr>
<td>Applied Science</td>
<td>Half the program</td>
<td>3000-3220</td>
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<td>3275, 3330</td>
<td></td>
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<tr>
<td></td>
<td></td>
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</tr>
<tr>
<td>Architecture</td>
<td>Half the program</td>
<td>3275, 3330</td>
<td></td>
</tr>
<tr>
<td>Arts</td>
<td>18 Level I credit points*</td>
<td>3400-3420</td>
<td></td>
</tr>
<tr>
<td>Biological Sciences</td>
<td>4 units</td>
<td>3431</td>
<td></td>
</tr>
<tr>
<td>Science</td>
<td>Half the program</td>
<td>3950-3951</td>
<td></td>
</tr>
<tr>
<td>Science and Mathematics</td>
<td>2 units</td>
<td>3970</td>
<td></td>
</tr>
<tr>
<td>University College</td>
<td>Half the program</td>
<td>BA, BSc</td>
<td></td>
</tr>
</tbody>
</table>
| University College (Aus-
  tralian Defence program |
  Force Academy)          |                     | BE |  |

Faculty/Board of Studies

Minimum Requirement

Course

Unit Values (UV)

Commerce

Three subjects 3490-3595 FT in both sessions

Two subjects 3490-3595 PT in either session

Engineering

Half the program 3610-3612

5.061: UV 0

program 3660-3662

One-session

including 3680-3682

subjects: UV 1

Physics I or 3700-3702

Two-session

Mathematics I

subjects: UV 2

Half the program

3620, 3730

All subjects: UV equal to the allocated hours*

Statistics or Mathematics I

Half the program

3640, 3720-3725

One-session

subjects: UV 1

Physics I or

Two-session

Mathematics I

subjects: UV 2

Half the program

3740, 3760

One-session

subjects: UV 1

Two-session

subjects: UV 2

Law

Half the program 4710-4790

One-session

subjects: UV 1

90.741: UV 0

All other two-

session subjects:

UV 2

Medicine

Half the program 3800

80.010: UV 3

81.001: UV 3

81.002: UV 6

70.001: UV 4

One General

Studies elective: UV 1

Professional Studies

Half the program 4030, 4040

All subjects: UV 1

4070-4080

All subjects: appropriate UV*

One General

Studies elective: UV 1

Science

Half the program 3950-3951

All subjects: appropriate UV*

One General

Studies elective: UV 1

Science and Mathematics

2 units 3970

All subjects: appropriate UV*

One General

Studies elective: UV 1

University College

BA, BSc

All subjects: UV 1

BE

All subjects: appropriate weighted mark*
Admission to Degree or Diploma

Students whose current program will enable them to complete all requirements for the degree or diploma, including industrial training where necessary, should lodge with the Registrar the form Application for Admission to Degree/Diploma and return it to the Registrar by the second Monday in May for the October ceremonies, and the second Friday in October for all other ceremonies. The forms are available from the Student Enquiry Counter in the north wing of the Chancellery.

Students who have indicated on their enrolment form that they are potential graduands are forwarded an application form with their Confirmation of Enrolment Program notice in September (or, in the case of students who expect to satisfy requirements at the end of Session 1, with the form issued in April). Students who do not complete an application form will not graduate; students who do not return their application form by the due date will graduate at a later series of ceremonies.

Students enrolled in courses 3400, 3910, 3970, 8080, 8220, and 8240 who have completed an application form to graduate at the pass level and who then decide to proceed to an honours year should advise the Registrar, in writing before September for those completing requirements at the end of Session 1, or before March for those completing requirements at the end of Session 2.

A list of graduands in Medicine who have applied for their degree is published in The Sydney Morning Herald in January.

A list of graduands other than Medicine who have applied for their degree/diploma and who expect to graduate in April/May the following year is published in The Sydney Morning Herald on the first Wednesday in March.

A list of graduands other than Medicine who have applied for their degree/diploma and who expect to graduate in October is published in The Sydney Morning Herald on the first Wednesday in September.

The Student Records and Scholarships Office of the Department of the Registrar should be notified as soon as possible of any change of address. Failure to do this could lead to important correspondence (including results of assessment) going astray. The University cannot accept responsibility if official communications fail to reach students who have not given notice of their change of address. Change of Address Advice forms are available at Faculty and School offices and from the Student Enquiry Counter in the north wing of the Chancellery.

Attendance at Classes

Students are expected to be regular and punctual in attendance at all classes in the subjects in which they are enrolled. All applications for exemption from attendance at classes of any kind must be made in writing to the Registrar.

In the case of illness or of absence for some other unavoidable cause students may be excused by the Registrar for non-attendance at classes for a period of not more than one month or, on the recommendation of the Dean of the appropriate faculty, for a longer period.

Absence from Classes

Explanations of absences from classes, or requests for permission to be absent from forthcoming classes, should be addressed to the Registrar and, where applicable, be accompanied by a medical certificate. If examinations or other forms of assessment have been missed, this should be stated in the application.

If students attend less than eighty per cent of their possible classes they may be refused final assessment.

Student Records

Confirmation of Enrolment Program notices are sent to all students in April and September. It is not necessary to return these forms unless any of the information recorded is incorrect. If amendments need to be made, students should contact the appropriate course office.

Release of Information to Third Parties

The University treats results of assessment and information it receives from a student as confidential and will not reveal such information to third parties without the permission of the student except at the discretion of senior officers in circumstances considered of benefit to the student and when it is either impossible or impracticable to gain the student’s prior permission. This happens rarely. This policy is considered so important that it often involves officers of the University in very difficult situations, for example, when they must refuse to reveal the address of a student to parents or other relatives.

In spite of the policy, all students should be aware that students’ addresses are eagerly sought by various commercial agents and that subterfuges of various kinds can be used to obtain them. From time to time, for example, people claiming to be from the University telephone students or their families and ask for information (usually another student’s address) which is often given, unsuspectingly. There is evidence that this is a technique used by some commercial agents.

It would be generally helpful if students (and their families and friends) are cautious in revealing information, making it a practice to ask the name, position, and telephone extension of any caller claiming to be from the University and, if suspicious, returning the call to the extension given.

Change of Address

The Student Records and Scholarships Office of the Department of the Registrar should be notified as soon as possible of any change of address. Failure to do this could lead to important correspondence (including results of assessment) going astray. The University cannot accept responsibility if official communications fail to reach students who have not given notice of their change of address. Change of Address Advice forms are available at Faculty and School offices and from the Student Enquiry Counter in the north wing of the Chancellery.
All communications from the University will be sent to the Session or Term address except when arrangements are made otherwise in the case of results of assessment (see Examinations: Availability of Results, earlier in this section). Change of Address Advice forms will be accepted up to Friday 4 December, except for final-year students wishing to change their Application for Admission for Degree/Diploma form. Changes to this form will be accepted up to a date four weeks before the student’s graduation ceremony.

Ownership of Students’ Work

The University reserves the right to retain at its own discretion the original or one copy of any drawings, models, designs, plans and specifications, essays, theses or other work executed by students as part of their courses, or submitted for any award or competition conducted by the University.

Notices

Official University notices are displayed on the noticeboards and students are expected to be acquainted with the notices which concern them. These boards are in the Biological Sciences Building, the Mathews Building, the Chancellery (lower ground floor), Central Lecture Block, Dalton Building (Chemistry), Main Building (Physics and Mining) and in the Western Grounds Area.

Parking within the University Grounds

A limited amount of parking is available on campus. Copies of the University’s parking rules may be obtained on application to Room 240, the Chancellery.

Academic Dress

Information about the University’s academic dress requirements may be obtained from the Ceremonials Section, Room LG2, the Chancellery (phone extension 3112).

Further Information

Lost Property
All enquiries concerning lost property should be made to the Superintendent (Patrol and Cleaning Services) on extension 3460 or to the Lost Property Office at the Union.

The Calendar
Please consult the Calendar for a more detailed account of the information contained in this section.
Introduction to the Sciences Handbook

This handbook has been designed to assist understanding of the academic activities of three inter-related groups within the university, namely the Board of Studies in Science and Mathematics, the Faculty of Biological Sciences and the Faculty of Science. The Board is responsible for the undergraduate studies of students majoring in disciplines associated with the two faculties and several schools from other faculties. The regulations governing the award of the degree of Bachelor of Science form a substantial part of the handbook. Other parts include details of the Science component of the combined degrees, Science/Law, Science/Civil Engineering, Science/Electrical Engineering, Science/Aeronautical Engineering, Science/Industrial Engineering, Science/Mechanical Engineering, Science/Naval Architecture, Science/Medicine, Science/Optometry, and of the two concurrent courses in Mathematics Education and Science Education.

Several specialist courses of study, also leading to the award of the degree of Bachelor of Science, are offered by the two faculties and the regulations covering these are given under the separate faculty sections. In addition the two faculties make available facilities to proceed to higher degrees and the conditions under which these awards are made are listed under the sections devoted to graduate study.

In the last part of the handbook there are brief statements of the syllabuses for units prescribed in the various regulations.
Faculty Information

Some People Who Can Help You

If you require advice about enrolment, degree requirements, progression within courses or any other general matters related to the Board, contact one of the following:

Ms K. Irvine, Administrative Assistant
Dr B. J. Burn, Co-ordinator of Studies in Science and Mathematics
Room LG06, Biological Sciences Building

For information regarding particular courses, advice may be obtained from staff members listed in the Introduction to each of the sections related to the Board, the Faculty of Biological Sciences and the Faculty of Science, later in this handbook.

Enrolment Procedures

- Faculty of Biological Sciences
- Faculty of Science
- Board of Studies in Science and Mathematics

All students re-enrolling in 1987 or enrolling in graduate courses should obtain a copy of the free booklet Enrolment Procedures 1987 available from Course Administration Offices and the Admissions Office. This booklet provides detailed information on enrolment procedures and fees, enrolment timetables by Faculty and course, enrolment in miscellaneous subjects, locations and hours of Cashiers and late enrolments.

The subject timetable for the Science and Mathematics Course (Course 3970) is available in late October/early November from the Science and Mathematics Course Office, Room LG06, Biological Sciences Building. All re-enrolling students should collect one of these timetables along with a preliminary enrolment form (SM87). The preliminary enrolment form is to be completed and returned to the Science and Mathematics Office by the end of the first week in January.

Sciences Library Facilities

Although any of the University Libraries may meet specific needs, staff and students of the Faculty of Biological Sciences are served mainly by the Biomedical Library and the undergraduate collection while those of the Faculty of Science are served mainly by the Physical Sciences Library. The undergraduate collection and services are useful to students from both faculties.
Student Clubs and Societies

Students have the opportunity of joining a wide range of clubs and societies. Many of these are affiliated with the Students' Union. There are numerous religious, social and cultural clubs and also many sporting clubs which are affiliated with the Sports Association.

Clubs and societies seeking to use the name of the University in their title, or seeking University recognition, must submit their constitutions either to the Students' Union or the Sports Association if they wish to be affiliated with either of these bodies, or to the Registrar for approval by the University Council.

The Psychological Society

The Psychological Society aims to provide activities both educational and social for students of psychology, and, more generally, to act as an intermediary body between students of different years, and staff.

The Society organizes a variety of activities including staff-student functions, informal discussions, film showings, and occasional talks and seminars. An activities fee enables the Society to meet any of the finances needed to support its functions.

Statistical Society of Australia: New South Wales Branch

The Branch offers student membership to undergraduates who are following a recognized course of study which includes Statistics. The subscription for a student member is $15 per annum with a $4 rebate if paid before 1 March.

The Branch holds about four general meetings each year at the end of which two talks, one theoretical and the other applied, are given on the one topic. The Branch conducts a Research Section, and membership of this group is open to members of the Branch free of charge. Each year the Branch also conducts a symposium for the study and discussion of particular statistical techniques or of statistical methods in a specialized field; symposia are open to members at reduced rates.

Members of the Branch receive The Australian Journal of Statistics, which is published three times a year by the Statistical Society of Australia, together with the Society's Newsletter.

Applications and requests for further information should be sent to the Hon. Secretary, Dr S. H. Huxham, School of Mathematical Sciences, N.S.W.I.T., P.O. Box 123, Broadway, NSW 2006.
Undergraduate Study:
Board of Studies in
Science and Mathematics
Board of Studies in Science and Mathematics

Introduction

The Science and Mathematics Course (3970) leads to the Bachelor of Science Degree on the completion of a three year program or a four year program chosen from specific programs approved by the Board of Studies in Science and Mathematics.

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 multi-disciplinary.

All students in the Science and Mathematics Course must enrol in two units of first year Mathematics; either Mathematics I or Higher Mathematics I or General Mathematics. Care must be taken in making the choice as, in general, General Mathematics considerably limits the choice of units in following years.

Most Schools and Departments do not offer a full range of Level III units in the evening. Those concerned are marked below with t.

Students seeking general advice should contact the Board of Studies in Science and Mathematics Office (Room LG06, Biological Sciences Building, map reference D25) and for advice in specific disciplines should contact the representative of the relevant School as listed below:

- First Year Biology Unit Dr B. Fox
- School of Anatomy Dr D. J. Tracey
- Department of Applied Geology Mr G. J. Baldwin
- School of Biochemistry Mrs J. Gibbons
- Department of Biotechnology Associate Professor N. W. Dunn
- School of Botany Dr R. J. King
- School of Chemistry Dr D. S. Alderdice
- Dr T. J. V. Findlay (Year 1)
- Associate Professor M. A. Long (Year 2)
- Dr P. R. Haddad (Year 4)
- Dr A. E. Stark
- School of Community Medicine Dr P. W. Baker
- School of Electrical Engineering and Computer Science Dr J. Dodson
- Department of Applied Geology Dr D. Miller
- School of History and Philosophy of Science
- School of Mathematics Associate Professor A. H. Low (Year 1)
- Miss M. Potter
- School of Mechanical and Industrial Engineering Dr P. Dixon
- Associate Professor E. J. Hahn
- School of Microbiology Dr E. Hazel
- School of Philosophy Mr P. C. Gibbons
The Board of Studies in Science and Mathematics includes all members of the Faculty of Biological Sciences* and the Faculty of Science* and some members of specific Schools in other faculties contributing to the Science and Mathematics Course: Chemical Engineering and Industrial Chemistry, Geography, Mines (Applied Science); History and Philosophy of Science, Philosophy (Arts); Accountancy, Economics (Commerce); Electrical Engineering and Computer Science, Mechanical and Industrial Engineering, Surveying (Engineering); Anatomy, Community Medicine, Physiology and Pharmacology (Medicine); Education (Professional Studies); and the Department of General Studies (Board of Studies in General Education).

The Dean is the Dean of the Faculty of Biological Sciences, Professor A. J. Wicken.

The Chairman is Professor H. J. Goldsmid.

The Co-ordinator of Studies in Science and Mathematics is Dr B. J. Burn. The Administrative Assistant is Ms K. Irvine.

*See text of Introduction, on previous page.

†See Staff, listed later in this handbook.
Undergraduate Study: 3970 Science and Mathematics Course: General

Board of Studies in Science and Mathematics

3970
Science and Mathematics Course

The Science and Mathematics Course, which leads to the Bachelor of Science degree, is administered by the Board of Studies in Science and Mathematics and 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 multi-disciplinary.

Aims of the Science and Mathematics Course

The main aims of the Science and Mathematics Course, diverse and not necessarily exclusive, may be summarized as providing opportunities to students to prepare themselves for careers in:

- research
- technology
- science and mathematics education
- areas of management or public policy involving the use of science or mathematics.

Objectives of the Science and Mathematics Course

The important general objectives of most programs in the Science and Mathematics Course are:

1. To develop and sustain an interest in and knowledge of Science and Mathematics.
2. To develop a working knowledge of scientific methods of investigation and a favourable attitude towards them.
3. To 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. To develop an appreciation of scientific criteria and a concern for objectivity and precision.
5. To develop confidence and skill in formulating problems and in treating both qualitative and quantitative data.
6. To develop the ability and disposition to think logically, to communicate clearly by written and oral means, and to read critically and with understanding.
7. To develop the habit of seeking and recognizing relationships between phenomena, principles, theories, conceptual frameworks and problems.
8. To 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. To provide opportunities for the development of students' motivations and social maturity, and an awareness of their own capabilities in relation to a choice of career which will be fruitful to themselves and to society.
There is a wide range of programs in single and multi-disciplinary areas leading to a three year degree or a four year degree.

The Structure of the Science and Mathematics Course

The Science and Mathematics Course consists of a number of individual programs, based on units ranked as Level I, II, III, and IV with a unit size varying from 56-84 hours.

The terms Levels I, II, III do not necessarily refer to the years in which the unit must be studied. Units at the various levels may be taken in other years provided the prerequisites are met. Level II/III units have only Level I prerequisites.

The Bachelor of Science degree is awarded on completion of

- a three year program
- or
- a four year program

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.

- A student must select and be enrolled in one of the prescribed programs.
- A student may not undertake more than 8 Science units in any one year unless approval is given by the Co-ordinator or the Dean of the Board of Studies in Science and Mathematics.

With the exception of quota restricted programs and with approval of the Co-ordinator of Studies, a student may change from one selected program to another. 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 LG06 (Biological Sciences Building, map reference D25).

The programs listed are made up of a sequence of units. Where a choice of units is indicated within a program care must be taken to satisfy the requirements, such as prerequisites and co-requisites.

- A prerequisite unit is one which must be completed prior to enrolment in the unit for which it is prescribed.
- A co-requisite 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. In exceptional circumstances, on the recommendation of the head of the appropriate school, the Board of Studies in Science and Mathematics may waive or vary a particular prerequisite, co-requisite or exclusion.

- A single major is a program specifying only 4 Level III units in a discipline.
- A double major is a program specifying 4 Level III units of each of 2 disciplines or 8 Level III units in a single discipline.
- Upon sufficient cause being shown in a particular case or cases, the Board of Studies in Science and Mathematics may vary any of these rules.

The three year program

The three year program leading to the award of the pass degree consists of:

1. at least 23 units at Level I, II, III as specified in an individual program, with the following requirements:
   (1) not less than eight nor more than ten units may be from Level I;
   (2) two of the Level I units must be 10.001 Mathematics I, 10.011 Higher Mathematics I or 10.021B and 10.021C;
   (3) not less than four units from Level III or as specified in individual programs.

2. General Studies electives as specified in an individual program.

- In order to graduate a student must pass all the units specified in the program of his/her choice.

The four year program

The four year program, leading to an Honours Class I, II/1, II/2, III or pass degree consists of:

1. at least 23 units at Level I, II, III as specified in an individual program, with the following requirements:
   (1) not less than eight nor more than ten units may be from Level I;
   (2) two of the Level I units must be 10.001 Mathematics I, 10.011 Higher Mathematics I or 10.021B and 10.021C.
   (3) not less than eight units from Level III or as specified in an individual program.

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.

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 Table 3;

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 at the end of Year 3.

• In order to graduate a student must pass all the units specified in the program of his/her choice.

A person on whom the pass degree of Bachelor of Science of the University has been conferred may be admitted by the Board of Studies in Science and Mathematics, on the recommendation of the relevant Heads of Schools, to candidacy for an honours degree conversion program with credit for all units completed, if during his or her studies for the pass degree, he or she has satisfied the prerequisites for proceeding to honours level laid down by the School or Schools concerned.

### Workload

The expected maximum workload for students devoting most of their time to this course is four science units per session. This can only be exceeded in exceptional circumstances by students with a good academic record and requires the permission of the Co-ordinator 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.

### 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 (Course 3970) 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, such students 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 degree(s) or other award held by applicants, should not be such as will permit the applicants to qualify for the science degree, without completing the course of instruction and passing examinations in at least those subjects comprising the latter half of the 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 degree of the science and mathematics 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 (Course 3970).

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 requirement for any degree or award of the University may be such as to give full credit in the Science and Mathematics Course (Course 3970) for work done in the course from which the students transfer.

### Programs

Students are advised that it is not possible to complete their studies by attendance at evening classes alone.

Each program has a four-digit identifying number.

Most programs have been 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 pass degree only.

Students wishing to take a double major are warned that due to timetabling difficulties it may take longer than three years to complete degree requirements.

To progress through a program a student must meet all the prerequisites and co-requisites as detailed in Tables 1, 2 and 3.

The range of programs has been designed to cover a wide variety of needs in the various areas of science and mathematics:
such as Engineering a number of courses are available in which Physics is provided by programs 0100 and 0161 while in areas Studies in Science and Mathematics, professional training in fundamental and at the applied levels. Thus within the Board of Professional Training in Physics Program

0100 Physics

Including: Theoretical Physics
Applied Physics Biophysics Physics/Geology

0161 Physics/Computer Science

Courses

3170 Textile Physics
3611 Aeronautical Engineering with Physics
3661 Industrial Engineering with Physics
3681 Mechanical Engineering with Physics
3701 Naval Architecture with Physics
3725 Electrical Engineering with Physics
3730 Civil Engineering with Physics and Mathematics
4770 Law with Physics
5801 Education with Physics

These features are summarized in the following table:

<table>
<thead>
<tr>
<th>Professional Training in Physics</th>
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<tbody>
<tr>
<td>Program</td>
</tr>
<tr>
<td>0100 Physics</td>
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<tr>
<td>Including: Theoretical Physics</td>
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<tr>
<td>Applied Physics</td>
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<tr>
<td>Biophysics</td>
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<tr>
<td>Physics/Geology</td>
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<tr>
<td>0161 Physics/Computer Science</td>
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<tr>
<td>Physics in other Courses</td>
</tr>
<tr>
<td>Courses</td>
</tr>
<tr>
<td>3170 Textile Physics</td>
</tr>
<tr>
<td>3611 Aeronautical Engineering with Physics</td>
</tr>
<tr>
<td>3661 Industrial Engineering with Physics</td>
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<tr>
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</tr>
<tr>
<td>5801 Education with Physics</td>
</tr>
</tbody>
</table>

In addition to Course 3970 programs are also included for Courses 3611 (Science/Aeronautical Engineering), 3661 (Science/Industrial Engineering), 3681 (Science/Mechanical Engineering), 3701 (Science/Naval Architecture), 3725 (Science/Electrical Engineering), 3730 (Science/Civil Engineering), 3820 (Science/Medicine), 3951 (Science/Optometry), 4070 (Mathematics/Education), 4080 (Science/Education), 4770 (Science/Law).

Program 0100

1. It is suggested that the units chosen in Year 1 might comprise 6.611, 1.061, 2.121, 2.131.

2. Students wishing to proceed to Year 4 (Honours) must complete at least 7 Level III units. These will normally be taken from the Physics units on offer (unless the student is specializing in Biophysics or in Geology) and include at least one of 1.0533, 1.0543, 1.133, 1.763 for students majoring in Physics or in Applied Physics.

3. For the study of Applied Physics certain Level III units are strongly recommended. These are units of a more applied nature eg 1.133 Electronics.

4. For the study of Theoretical Physics, additional mathematics units are specified. Thus in Year 2 students should include unit 10.111A (or 10.121A) and in Year 3, unit 10.212D (or 10.222D). Certain Level III units of a theoretical nature, eg 1.1133 are also strongly recommended.

In addition to Course 3970 programs are also included for Courses 3611 (Science/Aeronautical Engineering), 3661 (Science/Industrial Engineering), 3681 (Science/Mechanical Engineering), 3701 (Science/Naval Architecture), 3725 (Science/Electrical Engineering), 3730 (Science/Civil Engineering), 3820 (Science/Medicine), 3951 (Science/Optometry), 4070 (Mathematics/Education), 4080 (Science/Education), 4770 (Science/Law).

Program 0100

1. It is suggested that the units chosen in Year 1 might comprise 6.611, 1.061, 2.121, 2.131.

2. Students wishing to proceed to Year 4 (Honours) must complete at least 7 Level III units. These will normally be taken from the Physics units on offer (unless the student is specializing in Biophysics or in Geology) and include at least one of 1.0533, 1.0543, 1.133, 1.763 for students majoring in Physics or in Applied Physics.

3. For the study of Applied Physics certain Level III units are strongly recommended. These are units of a more applied nature eg 1.133 Electronics.

4. For the study of Theoretical Physics, additional mathematics units are specified. Thus in Year 2 students should include unit 10.111A (or 10.121A) and in Year 3, unit 10.212D (or 10.222D). Certain Level III units of a theoretical nature, eg 1.1133 are also strongly recommended.
5. Arrangements exist to enable a joint major in Physics/Geology. Students are expected to include 2 units of Geology in Year 2 and 4 units of Geology in Year 3. The possibility of joint majors in other subjects (eg Mathematics or Chemistry) exists.

6. For the study of Biophysics, students are required to take Chemistry and Biology units in Year 1 and Biochemistry in Year 2 in addition to Physics units.

7. In addition to the above there are other areas of study of major interest. Thus an introduction to Astrophysics and Optics is available to students choosing the elective units 1.1633, 1.713, 1.763, 1.773 and the study of Condensed Matter (Solid State) Physics may be furthered by the inclusion of elective units such as 1.3133 and 1.3143.

8. In certain circumstances unit 1.002 may be deferred to Year 3.

Subject descriptions of the units may be found in another section of this handbook. As is to be expected, several of the elective units mentioned above reflect the research interests of the various Departments of this School. These are at present five in number: Applied Physics, Astrophysics and Optics, Biophysics, Condensed Matter Physics, Theoretical Physics.

Physics in other Courses
The previous page lists those courses which have been arranged with other schools. Several of these can lead to honours in Physics (eg 3725, 5801) so it must not be thought that the only avenue to specialization in Physics is via the professional programs 0100, etc.

Students should also be aware that prerequisites and co-requisites can be waived in certain cases, eg when it is judged that an equivalent study has been undertaken in some other combinations of units. The possibility also exists of relaxing the requirements of programs to allow a student to select a unit in which he or she has a special interest but which is not a recommended one in the program.

0100
Physics**

Year 1
1 001
1 001 or 10.111
Choose 4 Level I units from:**††
1. Table 1 and/or
2. Table 2 for program 0100

Year 2
1 002††, 1 012, 1 022, 1 032
10.0113*, 10.1114*, 10.2111*, 10.2112*
Choose 2 units from:**
1. Table 1 and/or
2. Table 2 for program 0100
1 General Studies elective

0161
Physics/Computer Science

Year 1†⊥
1 001, 1 061
6 611
10.001 or 10.011*
Choose 2 Level I units from Table I**

Year 2
1 012, 1 022, 1 032
6 621, 6 641
10.1113*, 10.1114*, 10.2111*, 10.2112*
Choose 1 unit from 1 062, 6 631†, 10.111A*
1 General Studies elective

Year 3
1 002, 1 0133, 1 023, 1 0333
Choose 2 further Level III Physics units
Choose 1 Level III Computer Science unit
Choose 2 units from:**
1. 1 062, 6 631†, 10.212A*, 10.212D*, 10.612
2. Level III Physics units
3. Level III Computer Science units
1 General Studies elective

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

Year 4 (Honours)**
Choose one of 1 104, 1 304, 1 504

*See footnote to program 0100.
**Students intending to proceed to Year 4 are required to choose appropriate units. This choice is determined by the requirements of program 0100. Students are required to consult the School of Physics.
†The unit 6.631 must be taken in Year 2 or Year 3, but students should bear in mind that this unit is a prerequisite for 6.632 and 6.633.
††Quota restrictions apply to most Level III Computer Science units. Students wishing to take these units should in Year 1 apply for entry to the Computing quota. Advice should be obtained from the office of the Board of Studies in Science and Mathematics.
Sciences

Geophysics
See program 2503

Recommended Double Majors
Physics/Geology
Physics and Science Policy Studies (See program 6200 for further details)

Chemistry

The School is divided into four departments (Physical, Organic, Inorganic and Nuclear, and Analytical) and a First Year Teaching unit. Each department contributes to first year teaching and offers specialty courses in its own area for the Science and Mathematics programs, and servicing to other faculties.

The study program 0200 offered by the School of Chemistry provides both a basic scientific education and a professional training in chemistry. Fundamental, applied, environmental and industrial aspects of chemistry are included. The program allows the study of chemistry to be combined with the study of another discipline, for example, physics, biochemistry, mathematics, or computer science, by suitable choice of units.

Suitable choice of units makes it possible to study chemistry as a co-major with another branch of science (eg geology, biochemistry, computer science, biotechnology, physiology) to an advanced level. A combination of Level III chemistry and mathematics units provides a useful basis for specialization in aspects of physical or theoretical chemistry whilst a combination of Level III chemistry and geology units is suitable for those who wish to specialize later in geochemistry. Level III chemistry and physiology units could form the basis of specialized studies of body chemistry.

Students wishing to undertake the maximum number of chemistry units should follow Program 0205 Pure and Applied Chemistry. This involves 14 chemistry units and is referred to as a double major in terms of the Science and Mathematics course.

It is designed for specialization in chemistry and should be selected by students who wish to devote their studies at Level III entirely to chemical topics.

The Chemistry programs are open to all students who have satisfied the requirement for entry into the Science and Mathematics course. However, those who have not studied sufficient science at school (see prerequisites under subject number) may be required to study a special introductory unit (2.111) before enrolling in the Level I Chemistry units (2.121, 2.131, 2.141) specified. The Level I subject 2.141 is designed specifically for students intending to major in Chemistry. It covers the same material, at a similar level to that in 2.121 and 2.131, but is a full year subject and the order of treatment of the topics is different.

The Chemistry programs have a first year of study which includes chemistry, physics, and mathematics, in common with many other programs, and an elective. It is in the choice of this elective that special care has to be given as an incorrect choice could exclude the combination of chemistry with another selected discipline at Level II or III, (eg omission of biology units would preclude taking biochemistry at Level II). Advice from the course advisors should be sought on this point.

The Chemistry programs lead to study at the Honours level (Level IV) and to graduate studies in chemistry. The usual introduction to research in Chemistry is in Level IV and at this level the student devotes the major part of the time to research under the direction of a member of staff as supervisor. A proportion of the time is taken up with formal course work. The Honours year (or its equivalent in qualifying studies) may be followed by a higher research degree. Further information about graduate courses is included in this handbook and in a booklet: Postgraduate Studies and Research in the School of Chemistry.
0200
Chemistry**

Year 1
1.001
2.121 and 2.131, or 2.141
10.001 or 10.011 or both 10.021B and 10.021C
Choose 2 Level I units from Table 1

Year 2*
2.102A, 2.102B, 2.102C, 2.102D
Choose 3 units from Table 1
2 General Studies electives

Year 3†
Choose 4 Level III Chemistry units of which at least 3 are from:
2.103A, 2.103B, 2.103C, 2.103D
Choose 4 units from Table 1

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

Year 4 (Honours)
2.004

*Students wishing to do a co-major of Chemistry with Geology or Biotechnology may apply for a variation of the specified units to the Programs Committee of the Board of Studies in Science and Mathematics.

**Students should read carefully the above descriptions relating to programs 0200 and 0205 and seek advice from the School of Chemistry regarding the choice of units.

†See footnote to program 6200.

Recommended Double Majors
Chemistry/Biochemistry
Chemistry/Biotechnology
Chemistry/Computer Science
Chemistry/Geology
Chemistry/Mathematics
Chemistry/Physics
Chemistry/Physiology
Chemistry/Science Policy Studies
(See program 6200 for further details)

0205
Pure and Applied Chemistry**

Year 1
1.001
2.121 and 2.131, or 2.141
10.001 or 10.011 or both 10.021B and 10.021C
Choose 2 Level I units from Table 1

Year 2
2.102A, 2.102B, 2.102C, 2.102D
Choose 3 units from Table 1
2 General Studies Electives

Year 3
2.103A, 2.103B, 2.103C, 2.103D
Choose 4 Level III Chemistry units

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

Year 4 (Honours)
2.004

**Students should read carefully the above descriptions relating to programs 0200 and 0205 and seek advice from the School of Chemistry regarding the choice of units.
Computer Science

Computer Science involves the study of the design, construction and uses of computer systems. It is concerned with the representation of data and data structures in computer systems and the design of algorithms for automatic manipulation of this information by programming languages and machine systems. It is very much concerned with the design and development of hardware and software tools by which computer applications may be developed, but not so much with the applications themselves. 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.

Graduates who major in Computer Science frequently find employment where the requirement is for an expert knowledge of computer systems rather than extensive experience in a particular application area. Potential employers include the computer manufacturers, consulting companies, specialist companies marketing computer hardware and software services, and many large organizations with major computing establishments.

All Science students with the appropriate Mathematics prerequisites have entry into all Year 1 and Year 2 Computer Science units. Resources limit the number of students who may enter. Students have entry into all Year 1 and Year 2 Computer Science units and thus undertake a substantial amount of computing. Programs available are Physics/Computer Science (0161) and Mathematics with Computer Science (1061). Students with very good academic records may be able to enrol in further Computer Science units by special permission from the Head of the Department of Computer Science.

There are many ways to study Computer Science and computer applications at this University, apart from the Science and Mathematics Course. Students may major in Computer Science as part of the 5 year combined degree programs in Electrical Engineering, Aeronautical Engineering, Industrial Engineering, Mechanical Engineering and Naval Architecture which leads to the award of the two degrees of BE and BSc (see under Courses 3725, 3611, 3661, 3681 and 3701 respectively and the Faculty of Engineering Handbook).

Students may also major in Computer Science in the combined Science/Law degree course. A major sequence in Computer Science is also available in the Bachelor of Arts course (see the Faculty of Arts Handbook). Other courses and subjects which include computing and computing applications are available in other Schools, for example students may major in Computers and Information Systems in the Bachelor of Commerce degree course: see the Faculty of Commerce Handbook.

0600

Computer Science*

Year 1*
6.611
10.001 or 10.011
Choose 5 Level I units from:**
1. Table 1 and/or
2. The BA course and/or
3. Table 2 for program 0600

Year 2
6.621, 6.631, 6.641
Choose 5 units from:**
1. Table 1 and/or
2. The BA course and/or
3. Table 2 for program 0600
1 General Studies elective

Year 3
Choose 4 Level III Computer Science units
Choose 3 units from:**
1. Table 1 and/or
2. The BA course and/or
3. Table 2 for program 0600
1 General Studies elective

Students proposing to proceed to Year 4 (Honours) must complete 8 Level III units including 6.613, 6.632, 6.642 & 6.643.

Year 4 (Honours)
6.606

*In Year 1 students who have not gained direct entry to this program must enrol in program 0606. Enrolment in Year 2 is based on academic performance in Year 1.

**The program may include up to 8 units other than Computer Science units that are not in Table 1. Subjects chosen from the BA degree course are restricted to those offered by the following schools: Economics, English, French, German, History, Political Science, Russian, Sociology, Spanish and Latin American Studies and Theatre Studies. History and Philosophy of Science and Philosophy subjects are available in Table 1. Upper Level subjects from the School of Economics are restricted to all those in Economic History plus 15.046, 15.075, 15.263 and 15.273. (6 BA degree credit points at Level I or 4 credit points at Upper Level are equivalent to 1 unit.)

Computer Science/Physics

See program 0161 Physics/Computer Science
Computer Science/Mathematics/Statistics

See program 1061 Mathematics or Statistics/Computer Science

See also
1400 Information Systems

Mathematics

The School of Mathematics is divided into Departments of Pure Mathematics, Applied Mathematics and Statistics. The School provides courses at the Pass and Honours levels based on the above departments and in specified interdisciplinary programs such as Mathematics of Management. There is considerable overlap of interests and interaction between the departments; students in general will take units from more than one department.

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 more concerned with the problems themselves than with the sources from which they arise. Courses in the Department of Pure Mathematics are designed to provide the necessary equipment for those who intend to use 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 is concerned with the development of mathematics and mathematical models for understanding scientific phenomena, for the solution of technical and industrial problems, and for use in the social, economic and management sciences. Problems originate not only from the physical and engineering sciences, but also from such diverse areas as the biological sciences, computer science, the communication industry and commerce. Courses in Applied Mathematics are designed to provide basic mathematical and computational skills needed for a wide range of applications, to develop the capability to construct, analyse, and interpret mathematical models, and to encourage enthusiasm for the role of the mathematician in a variety of contexts.

The major research interests of the Department of Applied Mathematics are:

1. Optimization control theory and operations research, with applications in a wide range of areas.
2. Numerical analysis and mathematical computing.
3. Nonlinear dynamical systems.
4. Fluid dynamics, with a special interest in oceanographic and environmental applications.

The Department of Applied Mathematics offers training to graduate research level in each of these areas.

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. The department has strong interest in the areas of applied statistics, stochastic processes, biometry, inference, design of experiments, sequential analysis, discrete distributions, nonparametrics and statistical computing.
Programs of study

Program 1000 (Mathematics)

Within this program it is possible to major in Pure Mathematics, Applied Mathematics or to undertake a General Mathematics major with a mixture of Pure and Applied Mathematics and possibly some Statistics; it is also possible by extending the program to four years to undertake Honours in Pure Mathematics or Applied Mathematics. Students wishing to major or undertake Honours in Statistics should consult program 1006.

Pure Mathematics major

Any completed 1000 program will be deemed to be a major in Pure Mathematics if it has included the equivalent of four units made up of units and half units listed in Table 1 as Pure Mathematics Level III or Higher Pure Mathematics Level III.

It is strongly recommended that students choose, among the many optional mathematics units, those which are appropriate to their interest. In particular, 10.081 in Year 1 is recommended. Furthermore:

1. Pure Mathematics units relevant to the mathematical aspects of Computer Science are 10.1115 and 10.1116 in Year 2, and 10.1123 and 10.1521 in Year 3.
2. Pure Mathematics units relevant to mathematics teaching are 10.1111, 10.1112, 10.1124, 10.1127 and 10.1128 in Year 3, or their higher equivalents.
3. Pure Mathematics units relevant to the applications of mathematics in physics or engineering are 10.1125, 10.1126, 10.1128, 10.1522 and 10.1523 in Year 3.

Pure Mathematics Department staff will be happy to advise students on choices of units appropriate to their study goals.

Pure Mathematics Honours

Honours in Pure Mathematics is obtained by completing 10.123, for which the normal prerequisites are at least three Pure Mathematics III units (total value) at the Higher Level. However, students with a credit average in at least four Level III Mathematics units may also be considered for entry into Pure Mathematics 4. Usually, students doing Honours in Pure Mathematics do Higher level courses from Year 1 onwards.

Pure Mathematics Department staff will be happy to advise students on choices of units appropriate to their study goals.

Applied Mathematics major

Any completed 1000 program will be deemed to be a major in Applied Mathematics if it has included four units (total value) of units and half units listed in Table 1 as Level III Applied Mathematics (or their higher equivalent). When selecting optional units in program 1000, the following choice of mathematics courses (or their higher equivalent) are strongly recommended.

Year 2: At least two of 10.2113, 10.2115, 10.4111, 10.4112.

Year 3: At least three of 10.212A, 10.212B, 10.212D, 10.212L, 10.212M, 10.212N, 10.222C.

In addition, Applied Mathematics students are expected to select relevant units from other disciplines according to the particular applications of mathematics in which they are interested. The following choices are recommended in first year.

1. Applied mathematics for physical and engineering sciences or for theoretical oceanography and fluid mechanics: either 1.001 or 5.006 or both 5.010 and 5.020.
2. Applied mathematics for economic or management sciences: 14.501, 14.511, 15.001, 15.011. Note that if 14.501 and 14.511 are chosen then all four must be taken in first year and permission must be obtained through the Board of Studies office as there is a quota. For further details see program 6810.
3. Applied mathematics for social or biological sciences, choose at least two of the following groups:
   a. 17.031 and 17.041,
   b. 12.100,
   c. 1.001,
   d. 2.141 or both 2.121 and 2.131.

Applied Mathematics Department staff will be happy to advise students on choices of units appropriate to their study goals.

Applied Mathematics Honours

A student interested in taking an Honours degree in Applied Mathematics is advised to enrol in 10.011 in first year and complete at least one Level II and three Level III Higher Applied Mathematics units (total value). However, students who have obtained a credit average in at least four Level III Mathematics units (total value) may also be considered for entry into 10.223 Applied Mathematics 4.

Students are advised to select optional units according to the recommendations above for an Applied Mathematics major. Students should obtain a copy of recommended programs for Applied Mathematics from the School of Mathematics office before entering Year 2, and they are strongly encouraged to consult a staff member in Applied Mathematics regarding appropriate courses of study.

Program 1006 (Statistics)

Statistics Major

The completed 3 year program 1006 (Statistics) will be deemed to be a major in Statistics.

Statistics Honours

Honours in Statistics are obtained by completing 10.323, the prerequisite for which is the completion of 3 years of program 1006 (Statistics) with all corresponding Higher Statistics Level II and Level III units and preferably all Higher Mathematics Level I, II and III units.

Program 1061 (Mathematics or Statistics/Computer Science) will be of particular interest to students who wish to combine a Mathematics (or Statistics) major with a substantial amount of computing.
Program 6810 (Mathematics of Management) 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 is intended to train mathematicians with an interest in the application of mathematics to management science. The mathematics content is very solid indeed, amounting to a full mathematics degree. A student completing this course with a good record is 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.

Mathematics/Computer Science

See Computer Science/Mathematics

1000 Mathematics***

Students intending to proceed to the Honours year should take Higher Mathematics subjects throughout.

Year 1
10.001 or 10.011

Choose 6 Level I units from:*  
1. Table 1 and/or  
2. The BA course and/or  
3. Table 2 for program 1000

Year 2
10.111A, 10.1113, 10.1114, 10.2111, 10.2112

Choose 1 further Level II or III Mathematics unit  
Choose 4 units from:*  
1. Table 1 and/or  
2. The BA course and/or  
3. Table 2 for program 1000  
4 General Studies elective

Year 3
Choose 4 Level III Mathematics units (not 10.312F or 10.262A)  
Choose 3 units from:*  
1. Table 1 and/or  
2. The BA course and/or  
3. Table 2 for program 1000  
4 General Studies elective

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

Year 4 (Honours)
10.123 or 10.223*

*Not more than 8 units of this program may be from subjects not in Table 1. The BA degree subjects are limited to those offered by the following schools: Economics, English, French, German, History, Political Science, Russian, Sociology, Spanish and Latin American Studies and Theatre Studies. History and Philosophy of Science and Philosophy subjects are available in Table 1. Upper Level subjects from the School of Economics are restricted to all those in Economic History plus 15.062, 15.072, 15.263 and 15.273. (6 BA credit points at Level I or 4 credit points at Upper Level are equivalent to 1 unit.)

**Students proposing to take Honours in Pure or Applied Mathematics are advised to include at least three units of Level III Higher Mathematics units (total value) from the relevant department. However, students who have obtained a credit average in at least four Level III Mathematics units may also be considered for entry into Mathematics Honours.

***Students should read carefully the above description relating to program 1000 and seek advice from the School of Mathematics regarding the choice of units.

1006 Statistics

Students intending to proceed to the Honours year should take Higher Mathematics subjects throughout.

Year 1††
10.001 or 10.011

Choose 6 units from:*  
1. Table 1 and/or  
2. The BA course and/or  
3. Table 2 for program 1000

Year 2
10.111A, 10.1113, 10.1114, 10.2112, 10.311A, 10.311B, 10.3111, 10.3112

Choose 2½ units from:*  
1. Table 1 and/or  
2. The BA course and/or  
3. Table 2 for program 1000  
4 General Studies elective

Year 3
Choose 4 units from 10.312A, 10.312C, 10.322D, 10.312F, 10.3121, 10.3122, 10.3123, 10.3124

Choose 3 Level III Mathematics and/or Computer Science units  
1 General Studies elective

Students proposing to proceed to Year 4 (Honours) must complete 4 Higher Level III Statistics units including 10.3225.

Year 4 (Honours)
10.322

††See footnote to program 0161

1061 Mathematics or Statistics/Computer Science

Students intending to proceed to the Honours year should take Higher Mathematics subjects throughout.
Modern psychology is both a basic discipline and a field of professional practice. As a science, psychology is concerned with the study of both the more complex forms of behaviour, and associated mental processes. It seeks to understand the basic psychological processes such as learning, memory, perception and motivation; the biological basis of behaviour; the development and decline of behavioural capacities from infancy to old age; individual differences in behaviour; social influences on behaviour; and the collective behaviour of social groups. In addition, disorders of behaviour form an important part of the subject matter of psychology.

Program 1200 in the Science and Mathematics course leads to a major in Psychology after 3 years and to Honours after 4 years. Choice of support subjects will depend upon which facet of Psychology is of interest to the student. Suitable supporting subjects range from Anatomy, Physiology, Genetics of Behaviour to History and Philosophy of Science and Philosophy. If necessary students may contact the School for advice.

There is also a four year full-time professional science degree course (Course 3431) which is described in detail later in this handbook (see Faculty of Biological Sciences).

Students who wish to obtain qualifications that will allow them to practise psychology need to complete one of the above four year honours programs. The present minimum qualifications for membership of the Australian Psychological Society (the professional body of Australian psychologists) require a degree (with a major in psychology) and a fourth year of study of psychology, followed either by further graduate study or two years of supervised experience in some practical field of psychology. A professional qualification in psychology may lead to careers in research, teaching and applied fields such as personnel selection and management, vocational guidance, advertising and clinical practice.

1200
Psychology

Year 1	
10.001 or 10.011 or both 10.021B & 10.021C	
12.100
Choose 4 Level I units from:
1. Table 1 and/or
2. Table 2 for program 1200

Year 2*
12.200
Choose 2 units from:
12.201, 12.202, 12.204, 12.205
Choose 5 units from Table 1 (no more than 1 from Level II Psychology)
1 General Studies elective
Undergraduate Study: 3970 Science and Mathematics Course: Programs

**Year 3***
Choose 4 Level III Psychology units
Choose 3 units from Table 1
1 General Studies elective

**Year 4 (Honours)**
12.403 or 12.404

*Students intending to proceed to honours in Psychology must take 12.200, 12.201 and 12.202 in Year 2, together with 4 other units from Table 1 (a total of 7 units in Year 2). In Year 3 students must take 8 Level III Psychology units including 12.300 and 12.305 from Group A for 12.404 in Year 4. Additionally, students intending to take 12.403 in Year 4 are required to also include 12.301 from Group B.

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**Recommended Double Majors**
Psychology/Anatomy
Psychology/Physiology

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**Information Systems**

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

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**1400 Information Systems**

**Year 1***
6.611
10.001 or 10.011
Choose 5 Level I units from:
1. Table 1 and/or
2. Table 2 for program 1400

**Year 2**
6.621, 6.641
10.331 or 10.311A
Choose 1 unit from:
1. Table 1 or
2. Table 2 for program 1400
1 General Studies elective

**Year 3**
14.522, 14.605, 14.607, 14.608
Choose 3 units including at least one at Level III from:
1. Table 1 and/or
2. Table 2 for program 1400 and/or
3. 14.611
1 General Studies elective

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

**Year 4 (Honours)**
If 14.611 has not previously been taken this unit should replace 14.857.

*In Year 1 students must enrol in program 6806. Enrolment in Year 2 is based on academic performance in Year 1.
Geology and Geophysics

Programs in Geology and Geophysics are offered to the Board of Studies in Science and Mathematics by the Department of Applied Geology in the School of Mines. The School is part of the Faculty of Applied Science and the Department of Applied Geology is dedicated to teaching and research in resource geology as well as in the fundamentals of the science.

Geology is the study of the nature and evolution of the earth. 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 geologic 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 that are fundamental to the well-being of modern 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

After June 1986, the Australasian Institute of Mining and Metallurgy requires that its corporate members, including professional geologists, shall have completed a four year course. Students wishing to enter the geology profession should preferably undertake the four year Course 3000 Applied Geology in the Faculty of Applied Science that is specifically designed to meet the needs of a professional geologist. However, an identical course of study is available in the Science Faculty program 2500 by taking the three year program with a double major in Applied Geology and by achieving a standard that enables progression to the Year 4 program and graduation with Honours. Training of a professional geologist demands a thorough understanding of basic geological principles; accordingly, in the early part of the course students receive instruction in fundamental geological subjects. As with other science based disciplines, appropriate standards in Physics, Chemistry and Mathematics are also required. As the course progresses, increasing emphasis is placed on practical applications of geological principles to mineral and energy exploration and development and to engineering and environmental geology. Mineral and energy exploration techniques including geophysical and geophysical methods are also studied. 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 specialized research project.

Geophysics

Professional geophysicists work closely with geologists and, appropriately, studies of both disciplines are undertaken in the one school. Fundamental and applied geophysics are taught to geology students in program 2500 (and Course 3000), but students who intend to become professional geophysicists should take program 2503.

Single Major in Geology

Because Geology is a natural companion to other sciences, such as Chemistry (in Geochemistry), Botany and Zoology (in Palaeontology) and Geography, and of widespread interest to science in general, program 2500 is organized so that a single major in Geology may be acquired. Selected students who have completed such studies may undertake an honours degree that includes geological topics. Students interested in a combination of geology with another science should consult the Department of Applied Geology about recommended programs. Those who are specifically interested in combining Geology with Zoology and/or Botany should carefully read the following section.

Geology with Zoology and Botany

Geology and the Biological Sciences meet in a common field of study (Palaeontology) concerned with the evolution and environmental controls on the growth of ancient life forms. Palaeontologists may have an applied function, providing geologists with essential information about the relative ages and depositional environments of sedimentary rocks, particularly the strata with a potential to yield fossil fuels. Students intending to pursue this combination should take the subjects designated in footnote (*) to program 2500.

Geology in Marine Science

Students interested in marine sciences should consider program 6833 which is concerned with geological aspects of the marine environment.

Programs in Geology are also offered in the Combined Science/Civil Engineering course 3730, the Science Education course 4080 and the Combined Science/Law Course 4770.

2500

Geology

Year 1
1. 001
2. 141 or both 2.121 and 2.131
10.001 or 10.011 or both 10.021B & 10.021C
25.110, 25.120

Year 2
25.211, 25.212, 25.221

Choose at least 4½ units from:
1. 25.223, 25.2261 (compulsory for Double Major) and
2. Table 1 other than units offered by Applied Geology

1 General Studies elective
Year 3
25.311, 25.312
Choose at least 2 Applied Geology units from:
(Double Majors in Applied Geology must take all of these subjects)
Choose further units from Table 1 to give a total of 23 for the complete program*
1 General Studies elective

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

Year 4 (Honours)
Either
a. 25.434
or
b. for Double Major:
   25.410, 25.4101, 25.420
Choose one of the following sub-strands
25.412, 25.414, 25.415, 25.421
*Carefully read the description of program 2500 and seek advice from the Department of Applied Geology about the choice of units. Students following a combination of Applied Geology with Zoology and/or Botany are permitted in Year 1 to substitute the two Biology units, 17.031 & 17.041, for 1C01. In Year 2 they should take 43.111, 45.101, 45.201, 45.302 and 2 units chosen from 43.152, either 43.112, 43.172, 45.112, 45.121, 45.402.

2503
Geophysics

Year 1
1.001
2.141 or both 2.121 and 2.131
10.001 or 10.011
25.110, 25.120

Year 2
1.002, 1.012, 1.021, 1.032
10.2111, 10.2112
25.5212, 25.223, 25.2261
2 General Studies electives

Year 3
Choose 2 units from Level III Physics
Choose 2 units from:
1. Table 1 and/or
2. Table 2 for program 2503

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

Year 4 (Honours)
25.434

Recommended Double Majors
Geology/Botany and Zoology
Geology/Chemistry
Geology/Geography
Geology/Mathematics
Geology/Physics

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.

Program 2700 comprises a three-year structured sequence of substantive subjects in physical and human Geography, with particular emphasis on studies of the natural environment, as well as a grounding in basic analytical skills and techniques (eg statistical methods and computing, remote sensing and air photo interpretation, field and laboratory techniques) required for problem-solving and application. Because of its essentially interdisciplinary nature, a training in Geography is increasingly recognized as a relevant qualification for employment in a wide range of planning and conservation-related fields.

Considerable flexibility exists in program 2700 for students to combine subjects in Geography with those from cognate disciplines to suit individual interests and career aspirations. Studies in Geography with a co-major in other sciences, especially Geology and Botany, are encouraged. Details of particular courses of study and subject combinations offered within the program are available from the School Office.

2700
Geography

Year 1
10.001 or 10.011 or both 10.021B and 10.021C
27.819 and either 27.818 or both 27.010 and 27.030 Geography
Choose further Level I units from Table 1 to make a total of 8

Year 2
Choose 3 Level II Geography units
Choose 5 units from Table 1
1 General Studies elective

Year 3
Choose 4 Level III Geography units
Choose 3 units from Table 1
1 General Studies elective

Students proposing to proceed to Year 4 (Honours) must complete 8 Level III units and must have completed 27.050.

Year 4 (Honours)
27.844

Recommended Double Majors
Geography/Botany
Geography/Geology
Biochemistry

Biochemistry is the study of the chemistry of living organisms and is a key subject in biological studies. Initially, the approaches of chemistry were applied to biological systems, but now biochemistry has achieved its own techniques, approaches and body of knowledge and its ideas pervade the whole of biology. It, however, retains a molecular basis and is an ideal study for those interested in understanding and appreciating biological processes at the molecular rather than descriptive level. Biochemistry also represents a fundamental component of medical science and has an important role in many aspects of modern medicine.

Study of Biochemistry begins at Level II (41.101 Biochemistry) building on a base of Level I Chemistry and Biology. The material in this double unit introduces the basic concepts of the subject, describes biological molecules, and their interconversions in cells and tissues, the relationship between the structures and functions of enzymes, other proteins, hormones and biological membranes.

At Level III further double units (41.102A Biochemistry of Macromolecules and 41.102B Physiological Biochemistry) and a single unit (41.102E Molecular Biology of Higher Organisms) are offered at a more advanced level.

In Year 4, the Honours Course in Biochemistry (41.103 Biochemistry Honours) offers the opportunity for those students who have obtained above average results to carry out a research project under supervision and to receive training in the latest research techniques.

Program 4100 Biochemistry

The program outlined below leads to a single major in Biochemistry and also provides for a considerable choice of units offered by other Schools. It can be used as a framework to lead to co-majors with other disciplines, for example, microbiology, chemistry, physiology, biotechnology, zoology, botany or anatomy; other co-majors are possible. In arranging co-majors, the programs of the two relevant Schools should be consulted, especially if there is a possibility of proceeding to Year 4 (Honours). Program 4100 also can be followed to achieve a single major in biochemistry supported by one or two minor sequences — for example biochemistry with some chemistry and some microbiology or biochemistry with some physiology and some anatomy. The program also permits 5 Level III units of biochemistry to be taken rather than the minimum of 4 units. All of these combinations can serve as prerequisites for an Honours Year in biochemistry provided that passes are obtained in a total of 8 Level III units including above average results in Biochemistry.

Recommended Double Majors

Biochemistry/Biotechnology
Biochemistry/Botany
Biochemistry/Chemistry
Biochemistry/Microbiology
Biochemistry/Science Policy Studies
(for further details see program 6200)
Biochemistry/Zoology
Biotechnology

Biotechnology employs a body of multidisciplinary expertise directed towards the utilization and recycling of natural resources by controlled biological action, usually in a reactor. Its study provides an appreciation of the capabilities of biological systems and the skills required to maximize these capabilities on the industrial scale. Particular attention is given to: the selection of the appropriate systems and their maximization by genetic and/or enzyme tailoring; the design of biological reactors and their ancillary equipment; optimization and control of the processes. It is by these means that products are manufactured at ensured standards of quality. The products include certain foods and beverages, baker’s yeast, antibiotics, steroids, vaccines, enzymes, amino acids, nucleotides, vitamins, organic acids, alcohols, metals, plant growth regulators and insecticides. Specific mammalian proteins, such as insulin and growth hormone, are also produced by microorganisms which have been genetically engineered to contain the appropriate mammalian gene.

Students wishing to undertake training in biotechnology may do so by combining such training with a major in another relevant discipline, preferably biochemistry, microbiology or chemistry. The fourth (Honours) year includes further formal training as well as research in biotechnology. Alternatively, students with no previous training in biotechnology may undertake the biotechnology honours year, provided they have the necessary background training in biochemistry and microbiology; in such cases the Level III biotechnology units constitute the formal component.

4200

Biotechnology

Year 1
2.141 or both 2.121 and 2.131
10.001 or 10.011 or both 10.021B and 10.021C
17.031, 17.041
Choose 2 Level 1 units from Table 1

Year 2
41.101
Choose at least one of: 42.101, 44.101
Choose additional units from Table 1 to make a total of 7
2 General Studies electives

Year 3
42.102A, 42.102B
Choose 4 Level III units from a single discipline* in Table 1
Choose 2 units from Table 1
Students proposing to proceed to Year 4 (Honours) must complete 8 Level III units.

Year 4 (Honours)
42.103

Recommended Double Majors

Biotechnology/Biochemistry
Biotechnology/Chemistry
Biotechnology/Microbiology

*Recommended disciplines are Biochemistry, Chemistry, Microbiology
Botany

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

Botany may be taken as a major or a minor study in the Science and Mathematics Course (3970).

Microbiology

The discipline of 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 man, 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 the maintenance of soil fertility, and for the production of foods, beverages, pharmaceuticals (especially antibiotics), and other industrially important materials.

The program in Microbiology requires students to take basic courses in Chemistry, Mathematics and Biology in Year 1, as well as 41.101 Biochemistry in Year 2.

Recommended Double Majors

Botany/Biochemistry
Botany/Geography
Botany and Zoology/Geology
Botany/Microbiology
Botany/Zoology

Microbiology/Biochemistry
Microbiology/Biotechnology
Microbiology/Botany
**Zoology**

Zoology is built on the foundation of the first year units Biology A and B, Mathematics and Chemistry.

In their second year all Zoology students study Biometry, Invertebrate Zoology, Vertebrate Zoology and either General Ecology or Introductory Genetics or both. Students must also complete two Level II units of either Biochemistry or Chemistry or Mathematics or Physics. Other units are then chosen to make a total of seven or eight for the year. The areas from which these units are chosen will depend mainly on the student's interests. Examples of some of the units which are often chosen are Flowering Plants, Introductory Microbiology, Control Mechanisms, Organic Chemistry, Analytical Chemistry, Physiology and Mathematics. The choice of optional units is important because it determines which units may be included in the third year. Students are urged to seek advice from the school's student advisors at the end of Year 1 and Year 2.

A major in Zoology requires the study of at least 4 Level III Zoology units, three of which must be selected from Evolutionary Theory, Insects, Comparative Physiology and Animal Behaviour. The choice of other units in third year depends on students' interests. For instance those interested in Entomology would probably include Economic Zoology amongst their units; those interested in Ecology might include Population & Community Ecology, Marine Ecology and Vertebrate Zoogeography & Evolution; those interested in Animal Physiology would probably include Ecological Physiology. The additional units may be either chosen from those offered by the School of Zoology or by other schools. In all, seven or eight units are studied in third year to make a total of at least 23 units, as required by the regulations of the Science and Mathematics Course.

It is possible to study other disciplines as a co-major with Zoology e.g. Botany, Biochemistry, Mathematics, Marine Science, Anatomy, Physiology, Geography, Geology. In general, students completing a co-major with Zoology must satisfy the requirements of the Zoology program but some minor variations may be permitted when students include 4 Level III units from both Zoology and the co-major discipline. Students should consult the School about these prior to enrolment in Year 2.

For students who achieve above average results in their studies a fourth year (Honours) is available. The Honours year is made up of formal course work on Concepts in Biology plus a research project.

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**Year 2**

17.012 and/or 45.601  
45.101, 45.201, 45.301  
Choose 2 units from Table 1 from 1 of the following schools:  
Biochemistry, Chemistry, Physics, Mathematics  
Choose 1 or 2 units from Table 1 to give a total of 8  
1 General Studies elective

**Year 3**

Choose 3 units from 45.121, 45.122, 45.402 and either 45.132 or 45.142  
Choose 1 further Level III Zoology unit  
Choose 3 units from Table 1  
1 General Studies elective

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

**Year 4 (Honours)**

45.103

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**Recommended Double Majors**

Zoology/Anatomy  
Zoology/Biochemistry  
Zoology/Botany  
Zoology and Botany/Geology  
Zoology/Mathematics  
Zoology/Physiology

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**4500**

**Zoology**

**Year 1**

2.141 or both 2.121 and 2.131  
10.001 or 10.011 or both 10.021B and 10.021C  
17.031, 17.041  
Choose 2 Level I units from Table 1

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49
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. 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.

First Enrolment in Philosophy

There are two Level I subjects:

52.103 Introductory Philosophy A (Session 1)
52.104 Introductory Philosophy B (Session 2).

Each of these has one unit value. They can be taken separately, and a student can gain Level II status in Philosophy (i.e., qualify to enrol in Upper Level subjects) by passing in only one. However, students enrolling in one normally enrol in both, and students wishing to major in Philosophy must do so.

Value of Upper Level Subjects in Philosophy

With the exception of two subjects which each count as one science unit, all Level II/III subjects in Philosophy are half units, of which three together can be counted as two science units.

Major in Philosophy

Students majoring in Philosophy must take the equivalent of two Level II/III units in Year 2, and the equivalent of four Level II/III units in Year 3.

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. They are welcome to seek advice and further information from the School.

In certain circumstances the prerequisite specified for units or half-units may be waived; for example, in the case of students who have already studied similar material, or who wish to take isolated units or half-units relevant to another discipline. Students who feel they have a case for a concession of this kind should consult the School.

5200
Philosophy

Year 1
10.001 or 10.011 or both 10.021B and 10.021C  Mathematics
52.103, 52.104  Philosophy
Choose 4 Level I units from Table 1

Year 2
Choose 2 Philosophy units*
Choose 5 units from Table 1
1 General Studies elective

*Due to the extra library work required in the preparation of essays, a combination of 3 half unit Philosophy subjects count as the equivalent of 2 Science units.
History and Philosophy of Science

Students may take units within the School of History and Philosophy of Science leading to the award of pass or honours degrees in History and Philosophy of Science, or to the award of an honours degree in Science Studies.

Units in HPS are quite different from ordinary science subjects. They involve thinking about science, from historical, philosophical and sociological perspectives. They consider the historical development of the various sciences, but not merely as the series of intellectual steps leading to the present state of scientific knowledge. Rather, the history of science is seen in relation to cultural history and to forces of social change, and to the parallel development of philosophical thought.

Philosophical problems engendered by science are also discussed, and considerable attention is given to the social structure of science and the ways in which science and technology fit into modern society, both in industrial and developing countries.

Units in the sequence leading to honours in Science Studies are intended for students wishing to qualify themselves as science policy advisers. Training is provided therefore in both social studies of science and science policy theory and practice.

Broadly speaking, students wishing to make their careers in areas related to HPS or Science Policy (for example, museum work, science journalism, tertiary teaching, government administration, etc) will need to pursue their studies at graduate level, but there are some career opportunities for those who have bachelor degrees only.

Some students may wish to take a small number of HPS subjects, where their programs allow sufficient flexibility, as complements to their usual experimentally-based science subjects.

The School of History and Philosophy of Science offers a coursework program leading to the degree of Master of Science and Society, and research degrees at the Master and Doctoral level may also be undertaken. Interested students should enquire at the School.

The Pass Degree

The program offered by the School of History and Philosophy of Science gives students a wide range of options from which to choose in studying the historical, philosophical and social aspects of science and technology. Students intending to complete the pass degree are required to take eight HPS units, of which three are prescribed and five are elective. The remaining units in this program may be chosen from those listed in Table I, which allows sufficient flexibility for the completion of a second major in a scientific discipline, if this is desired. Students wishing to enquire about such a double major within program 6200 are invited to contact the School of HPS and the relevant second School for further information.

The Honours Degree

Students intending to proceed to an honours degree in HPS may choose from two alternative fourth year programs: 62.014 History and Philosophy of Science Honours, focusing on the intellectual history of science and the philosophy of science; or 62.024 Science Studies Honours, focusing on the social history of science and science policy studies. For entry to 62.014 a student must complete the first three years of program 6200 with marks that result in an average of Credit or better in the eight HPS units included. For entry to 62.024 a student must complete a more specialized sequence within program 6200, as prescribed in the footnote to that program, again with an average result of Credit or better in the eight HPS units included. In either case, the three-year program leading to honours entry offers sufficient scope for the completion of a second major in a scientific field, if this is desired. Such a double major is particularly appropriate for a program leading to honours-level work in science policy studies; however all students intending to complete an honours degree within program 6200 are invited to contact the School of HPS and the relevant second School for further information regarding combined major sequences.

6200 History and Philosophy of Science/Science Studies

The Honours Degree

Students intending to proceed to an honours degree in HPS may choose from two alternative fourth year programs: 62.014 History and Philosophy of Science Honours, focusing on the intellectual history of science and the philosophy of science; or 62.024 Science Studies Honours, focusing on the social history of science and science policy studies. For entry to 62.014 a student must complete the first three years of program 6200 with marks that result in an average of Credit or better in the eight HPS units included. For entry to 62.024 a student must complete a more specialized sequence within program 6200, as prescribed in the footnote to that program, again with an average result of Credit or better in the eight HPS units included. In either case, the three-year program leading to honours entry offers sufficient scope for the completion of a second major in a scientific field, if this is desired. Such a double major is particularly appropriate for a program leading to honours-level work in science policy studies; however all students intending to complete an honours degree within program 6200 are invited to contact the School of HPS and the relevant second School for further information regarding combined major sequences.

Recommended Double Majors

History and Philosophy of Science/Anatomy
History and Philosophy of Science/Botany
History and Philosophy of Science/Geology
History and Philosophy of Science/Zoology
Science Policy Studies/Biochemistry*
Science Policy Studies/Chemistry*
Science Policy Studies/Physics*

*See footnote to program 6200.
Board of Studies in Science and Mathematics

6801
For Anatomy Programs

Year 1
10.001 or 10.011 or both 10.021B and 10.021C    \textit{Mathematics}
17.031, 17.041 \textit{Biology}
Choose 4 appropriate Level I units from Table 1

Enrolment in Year 2 of program 7000 is based on academic performance in Year 1. Students should select the units specified in the program they wish to pursue in Year 2.

Students may obtain advice from the Office of the Board of Studies in Science and Mathematics in the Mathews Building.

6806
For Computer Science Programs

Year 1
10.001 or 10.011    \textit{Mathematics}
6.611 \textit{Computing}
Choose 5 units from:
1. Table 1 &/or
2. The BA course** &/or
3. Table 2 for program 6806**

**In Year 1 students must enrol in program 6806. Enrolment in Year 2 of program 0600 and 1400 is based on academic performance in Year 1. Students may obtain advice from the office of the Board of Studies in Science and Mathematics in the Mathews Building.

6810
Mathematics of Management*†

Year 1
10.001 or 10.011**    \textit{Mathematics}
14.501, 14.511 \textit{Accounting}
15.001, 15.011 \textit{Economics}
Choose 2 Level I units from:
1. Table 1 or
2. Table 2 for program 6810

Year 2
10.111A, 10.1113, 10.1114, 10.2111, 10.2112
10.2113, 10.2115, 10.311A
14.522, 14.602
Choose 1 unit from: 14.542, 14.603, 14.613, 15.042
1 General Studies elective

Year 3
14.583
Choose 2 units from: 10.212A, 10.412D, 10.212L, 10.212M, 10.311B, 10.312A
Choose 2 further Level III Mathematics units

*Enrolment in this program requires the approval of the Chairman of the Board of Studies in Science and Mathematics and the head of the School of Accountancy.

**Throughout this program Mathematics subjects can be replaced by the corresponding Higher Mathematics subject.

†For details see preamble to Mathematics programs.
The Marine Science programs are designed to provide opportunities for students to specialize in selected areas of marine science, yet ensure that they receive an adequate exposure to other pertinent disciplines within this broad field. The programs have been constructed from subjects currently available in the faculties of Science, Biological Sciences and Applied Science. Introductory Marine Science is a subject common to all these programs, and unique to them, having been designed for Marine Science programs.

All students in the Marine Science programs must select one major sequence from the following options: 6831 Physical Oceanography; 6832 Biological Oceanography, 6833 Earth Science Oceanography and 6834 Environmental Chemistry. In addition, all students must select two minor sequences from the Physical, Biological, Earth Science, and Chemical minor sequences offered. A minor sequence in the same area as that selected for the major sequence is excluded.

**Physical Oceanography** includes units of basic and advanced Mathematics and Physics, as well as units in 10.412A Dynamical and Physical Oceanography and 10.4112 Hydrodynamics.

**Biological Oceanography** includes basic Mathematics, Chemistry and Biology as well as advanced courses in 43.172 Phylogeny and Marine Botany, 45.201 Invertebrate Zoology, 43.172 Phycology and Marine Botany, 45.112 Marine Ecology and 44.101 Introductory Microbiology. Further options include 17.012 General Ecology, 10.331 Statistics and 41.101 Biochemistry.


**Environmental Chemistry** includes basic Chemistry and Mathematics, and 2.002A Physical Chemistry, 2.002D Analytical Chemistry, 2.043A Environmental Chemistry and 2.003D Instrumental Analysis.

All programs offer some optional units to allow students a degree of freedom of choice of subjects. A fourth (Honours) year in Marine Science is available in all programs.

### 6831 Marine Science (Physical Oceanography)

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Physics</th>
<th>Computing</th>
<th>Mathematics</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.001</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.041 or 6.611</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.001 or 10.011</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Choose 2 units from 1 of the strands:
1. 2.141 or both 2.121 and 2.131 or Chemistry
2. 17.031, 17.041 or Biology
3. 25.110, 25.120 or Geology
10.081 or choose 1 further unit from the above strands

### Year 2

10.1113, 10.1114, 10.2111, 10.2112
1.002
68.302
Continue the strand chosen in Year 1:
1. 2.102A or Mathematics
2. at least 1 unit from: 17.012, 45.152, 43.111 or Biology
3. 25.621

Choose additional units from Table 1 to give a total of 8
1 General Studies elective

### Year 3

10.2116 or 10.2216
10.292A
10.212D or 10.222D
10.212B or 10.222B
10.2922
68.313
Choose 3 units from: 1.022, 1.032, 1.3533, 1.062, 1.133, 10.212A, 10.412B, 10.422A, 10.331, 10.422B, 10.4129, 25.6342
45.112 or 25.631 or 25.632 or 2.043A or 43.172 or 25.635
1 General Studies elective

Students proposing to proceed to Year 4 (Honours) must complete 8 Level III units including 10.422A.

### Year 4 (Honours)

68.304

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### 6832 Marine Science (Biological Oceanography)

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Chemistry</th>
<th>Mathematics</th>
<th>Biology</th>
<th>Physics</th>
<th>Geology</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.141 or both 2.121 and 2.131</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.001 or 10.011 or both 10.021B and 10.021C</td>
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<td></td>
<td></td>
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<tr>
<td>17.031, 17.041</td>
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</tr>
</tbody>
</table>

Choose 2 units from 1 of the strands:
1. 1.001 or 1.021 or Mathematics
2. 25.110, 25.120 or Biology

### Year 2

2.102A
43.111
44.101
41.101 or 45.201
68.302
Choose 1 unit from the subjects related to the strand chosen in Year 1:
1. 10.031 or 10.331 or 10.301 or Mathematics
2. 25.622

Choose units from: 17.012, 41.101, 44.121, 45.101, 45.201, 45.301 to give a total of 8
1 General Studies elective

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53
Year 3
43.172
45.112
Choose 2 Level III units from Table 1 which may include the subjects corresponding to the strand chosen in Years 1 and 2:
1. 68.313, 10.032
2. 25.632
Choose 3 units from Table 1
1 General Studies elective

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

Year 4 (Honours)
68.304

6833
Marine Science (Earth Science Oceanography)

Year 1
10.001 or 10.011 or both 10.021B and 10.021C  Mathematics
25.110, 25.120  Geology
Choose 4 units from 2 of the strands:
1. 1.001 or 1.021 and/or  Physics
2. 17.031, 17.041 and/or  Biology
3. 2.141 or both 2.121 and 2.131  Chemistry

Year 2
68.302
25.621, 25.622
Continue both of the strands chosen in Year 1:
1. 10.031 or 10.331 and/or  Mathematics
2. At least 1 unit from: 17.012, 43.111, 45.201 and/or  Chemistry
3. 25.622  Biology
Choose additional units from Table 1 to give a total of 8
1 General Studies elective

Year 3
Choose 3 Level III units from Table 1 which may include the subjects corresponding to the strands chosen in Years 1 and 2:
1. 68.313, 10.032 and/or  Mathematics
2. 43.172, 45.112 and/or  Geology
3. 2.123E
Choose 1 unit from Table 1
1 General Studies elective

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

Year 4 (Honours)
68.304

6834
Marine Science (Environmental Chemistry)

Year 1
2.141 or both 2.121 and 2.131  Chemistry
10.001 or 10.011  Mathematics
Choose 4 units from 2 of the strands:
1. 1.001 and/or  Physics
2. 17.031, 17.041 and/or  Biology
3. 25.110, 25.120  Geology

Year 2
2.102A, 2.102D
68.302
Continue both of the strands chosen in Year 1:
1. 10.031 or 10.331 and/or  Mathematics
2. At least 1 unit from: 17.012, 43.111, 45.201 and/or  Chemistry
3. 25.622  Biology
Choose additional units from Table 1 to give a total of 8
1 General Studies elective

Year 3
2.043A, 2.003D
Choose 2 Level III units from Table 1 which may include the subjects corresponding to the strands chosen in Years 1 and 2:
1. 68.313, 10.032 and/or  Mathematics
2. 43.172, 45.112 and/or  Geology
3. None
Choose 3 units from Table 1
1 General Studies elective

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

Year 4 (Honours)
68.304
**Genetics**

The Genetics program is designed to provide students with a firm foundation of genetical knowledge and also to give them experience in pertinent related areas.

Because the subject matter of Genetics ranges from the structure of viruses to the co-evolution of populations, students are encouraged to choose between three sequences: molecular and microbial, population and ecological, and classical and organismal. The three groups of subjects in second year correspond to these sequences; the combination of subjects chosen then will determine the choices available in Year 3.

The choice of Year 1 subjects available include Physics, Psychology, Geography, and units in the laboratory applications of computers. Experience with laboratory computers is an asset in many areas of genetics, and 68.451 is therefore strongly recommended as a year 1 subject.

Entry into a fourth (Honours) year is available, for above-average students, upon application to the Genetics Program Committee.

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**Anatomy**

Entry to Anatomy programs is limited to a quota of approximately 60. Students in Year 1 must enrol in Program 6801, and apply in October for entry to Anatomy the following year. Selection is determined by academic merit, based on a weighted aggregate of marks obtained in Year 1. Allowance is made for the relative difficulty of first year units in Mathematics and Physics, the more difficult subjects being given a greater weight. Introductory Chemistry is included in the aggregate even though not counting for a degree. The quota does not apply to the Science/Medicine course (course 3520).

Anatomy subjects are, in general, only available to students who have been admitted to the Anatomy quota. However, students in programs 4400 (Microbiology-Immunology strand) and 6840 (Genetics) may take 70.011A, 70.304, and 70.3041.

Students enrolled in programs for which Anatomy or Histology is relevant (e.g., Biochemistry, Physiology, Psychology) and who wish to study one or more Anatomy units should consult the Head of School.

A major in Anatomy may suitably be combined with a major in Biochemistry (70.304 or 70.3041 recommended), Physiology (note relevance of Neuroanatomy 1 and 2 to Neurophysiology), or Psychology (take Neuroanatomy 1 and 2). Owing to timetabling difficulties, the double major with Biochemistry may be impossible to complete in the minimum time.

72.301 Basic and Applied Pathology may be counted as a Level III Anatomy unit.
Physiology and Pharmacology

Physiology, the study of the processes and mechanisms which serve and control the various functions of the body, begins at the second year level with the full year subject Physiology 1 (the core subject for students who intend to proceed to the study of Physiology at a higher level).

Prior to commencing these subjects, students are required to have satisfactorily completed Level I courses in Mathematics, Cell Biology and Chemistry, as a background in these subjects is considered essential to an understanding of how the body functions. Students intending to major in Physiology should note Physiology 2 prerequisites.

Physiology 2 is a major (third year level) subject in Physiology and in this subject various systems of the body are treated in considerable detail. Progression to this full year subject normally requires the satisfactory completion of Physiology 1 and the Level II Biochemistry subject. Physiology 2 provides the 4 units at third year level required for a degree with a single major in Physiology. Alternatively it may be undertaken concurrently with a Level III subject offered by other schools in allied disciplines, such as Chemistry, Psychology, Zoology, Biochemistry or Anatomy, to form a program leading to the award of a degree with a double major. Students who wish to take Physiology as a major subject should follow Strand 1.

The School also offers the third year level subject Pharmacology, which includes a study of the uptake, distribution and excretion of drugs within the body, and of mechanisms by which drugs, and various endogenous chemicals, alter body function. This 2 unit subject is normally taken concurrently with Physiology 2, or with Level III Biochemistry or Chemistry subjects. Pharmacology is also a full year subject. Students who wish to form a major subject with Pharmacology should follow Strand 2.

Physiology 2 and Pharmacology are the most advanced undergraduate courses offered by the School which are conducted by way of formal lectures, tutorials and laboratory practical classes. Selected students who have satisfactorily completed one of these subjects may be permitted to enrol in a further year of study of either Physiology or Pharmacology which normally leads to their being awarded their degree with Honours.

The Honours year program, as presently conducted in this School, requires the student to complete a full year research project on a specific topic under the supervision of a member of staff, and to submit a thesis based on this work. The level of honours awarded is determined on the basis of the thesis, and on course work activities such as the preparation of literature reviews, and participation in seminar programs.

7300
Physiology and Pharmacology

Year 1
2.141 or both 2.121 and 2.131
10.001 or 10.011 or both 10.021B and 10.021C
17.031, 17.041
Choose 2 Level I units from Table 1
Year 2
73.111
Either
1. 41.101
or
2. Choose 3 Level II units (should normally include prerequisite subjects for one of the Pharmacology co-requisite subjects shown for year 3)
Choose 4 units from Table 1
1 General Studies elective

Year 3
Continue the strand chosen in Year 2:
Either
1. 73.012
or
2. 73.022
and either
2 Level III Chemistry units
or
41.102A and 41.102B
or
73.012
Choose further units from Table 1 to give a total of 23 for the complete program.
1 General Studies elective

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

Year 4 (Honours)
73.013 or 73.023

*For an explanation of the division into strands 1. and 2. refer to the preamble.

Recommended Double Majors
Physiology/Anatomy
Physiology/Biochemistry
Physiology/Chemistry
Physiology/Psychology
Physiology/Zoology
These combined courses of five years full time study enable a student in the School of Mechanical and Industrial Engineering to qualify for the award of the two degrees of Bachelor of Engineering and Bachelor of Science (BE BSc). The courses enable such combined degree students to major in the areas of computer science, materials science, mathematics, physics or statistics in addition to studying their chosen engineering speciality. The course is administered by the Faculty of Engineering.

All students who are accepted into the first year ‘science/arts compatible’ course in the School of Mechanical and Industrial Engineering may enrol directly into these combined degree courses. Continued enrolment in Year 2 requires a pass at first attempt in all subjects of Year 1 and students who fail to achieve this will automatically be disenrolled from these courses and be enrolled in their respective engineering programs (3610, 3660, 3680 or 3700). Alternatively, students may transfer into Year 2 of these courses, provided they have obtained a clear pass in the Year 1 ‘science/arts compatible’ course.

Normally, students enrolled in these BE BSc courses will be awarded their degrees at the conclusion of five years study. However, it is possible for students to take out the Science degree prior to the Engineering degree provided they have: 1. completed the requirements for Years 1, 2 and 3, 2. completed the General Studies requirements for the Science degree, and 3. obtained approval from the Board of Studies in Science and Mathematics.

Students may also undertake an additional honours year in Science and Mathematics and automatically re-enter the combined Science/Engineering course without having to re-apply for admission. To undertake such an honours year in Science and Mathematics, permission is to be obtained, at the end of Year 3, both from the Head of the School in which the honours year is to be undertaken and from the Head of the School of Mechanical and Industrial Engineering.

Students who commence the course and do not complete the Engineering component may take out a BSc degree on completion of one of the approved programs in the Science and Mathematics course. Similarly, students not wishing to complete the BSc degree course may revert to their respective Engineering programs (3610, 3660, 3680 or 3700) with appropriate credit for subjects satisfactorily completed.

Having completed the first three years as outlined below, students in Years 4 and 5 do Year 3 and Year 4 of their respective Engineering programs (3610, 3660, 3680 or 3700), except that significant repetition of subject material is not allowed. Instead, students are required to substitute either an appropriate Technical Elective or an appropriate Level II or III subject from Table 1 or Table 2, or in exceptional circumstances, some other equivalent subject with the permission of the School of Mechanical and Industrial Engineering. For more details of these combined courses, refer to the Faculty of Engineering Handbook.

**Year 1**

1.001
2.951 3. (or 2.121)
5.0011, 5.0012, 5.030, 5.0303, 5.061, 5.0721, 5.421
10.001 (or 10.011)

**Year 2**

5.0201, 5.300, 5.422 5.
10.111A (or 10.121A), 10.1113 (or 10.1213), 10.1114 (or 10.1214)
10.2111 (or 10.2211), 10.2112 (or 10.2212)

Choose 4 units from Table 1 or Table 2 for course 3681 2.

For later Years, see overleaf
Courses 3611/3661/3681/3701 continued

Year 3
5.043, 5.122, 5.620, 5.621
Choose 5 units from Table 1 or Table 2 for course 3681. 1 General Studies elective.

Years 4 and 5
Years 3 and 4 of respective Engineering programs 3610, 3660, 3680, 3700

Subject selections which satisfy the specific requirements for the various majors are summarized below. Provided co-and prerequisites are satisfied, there is scope for some subjects to be taken either in Year 2 or Year 3.

Computer Science Majors

Year 2
5.0201, 5.300, 5.422
6.621, 6.631, 6.641
10.111A (or 10.121A), 10.1113 (or 10.1213), 10.1114 (or 10.1214),
10.2111 (or 10.2211), 10.2112 (or 10.2212), 10.331 (or 10.351)

Year 3
1.002 or 1.012 or 1.022 or 2.102A
5.043, 5.122, 5.620, 5.621
4 Level III units from Table 1 and Table 2 offerings of School of Electrical Engineering and Computer Science for course 3681. 1 General Studies elective.

Mathematics Majors

Year 2
Same Year 2 as for Computer Science or Materials Science (3 units of Level II mathematics option) or Physics or Statistics majors
or
1.002 or 1.012 or 1.022 or 2.002A
5.0201, 5.300, 5.422
10.111A (or 10.121A), 10.1113 (or 10.1213), 10.1114 (or 10.1214),
10.2111 (or 10.2211), 10.2112 (or 10.2212)
3 units from 10.1115, 10.1116, 10.2113 (or 10.2213), 10.2115 (or 10.2215), 10.4112 (or 10.4212), 10.4111 (or 10.4211) or from any other appropriate Level II units from Table 1 or Table 2 for course 3681

Year 3
5.043, 5.122, 5.620, 5.621
10.331 or 10.351
4 Level III units from School of Mathematics offerings in Table 1. 1 General Studies elective.

Physics Majors

Year 2
1.002, 1.012, 1.022, 1.032
5.0201, 5.300, 5.422
10.111A, (or 10.121A), 10.1113 (or 10.1213), 10.1114 (or 10.1214),
10.2111 (or 10.2211), 10.2112 (or 10.2212)

Year 3
1.013, 1.023, 1.033, 1.043
1 Level III unit from School of Physics offerings in Table 1
5.043, 5.122, 5.620, 5.621
10.331 or 10.351
1 General Studies elective.

Materials Science Majors

Year 2
2.102A
4.412A, 4.422B, 4.432, 4.642
5.0201, 5.300, 5.422
and either Option 1.:
2.102B, 2.131
4.632 or 4.442 (recommended)
10.022
or Option 2.:
10.111A (or 10.121A), 10.1113 (or 10.1213), 10.2111 (or 10.2211),
10.2112 (or 10.2212)
1 unit from 10.1022, 1.982, 2.131, 4.442, 4.632, 10.1114 (or 10.1214)

Year 3
4.634
5.043, 5.122, 5.620, 5.621
10.331 or 10.351
1 General Studies elective.
and either Option 1.:
4.413, 4.423, 4.433C, 4.443, 4.453
48.403
or Option 2.:
3½ appropriate Level II or III units from Schools of Physics, Chemistry or Metallurgy offerings in Table 1 or in Table 2 for course 3681.

Statistics Majors

Year 2
1.002 or 1.012 or 1.022 or 2.102A
5.0201, 5.300, 5.422
10.111A (or 10.121A), 10.1113 (or 10.1213), 10.1114 (or 10.1214),
10.2111 (or 10.2211), 10.2112 (or 10.2212), 10.311A (or 10.321A),
10.311B (or 10.321B), 10.3111 (or 10.3211), 10.3112 (or 10.3212)

Year 3
5.043, 5.122, 5.620, 5.621
4 Level III units from Statistics offerings in Table 1
1 Level II or III unit from School of Mathematics or School of Physics offerings in Table 1
1 General Studies elective.

For Notes, see overleaf
1. Students planning to take higher level Computer Science subjects should also take 6.611 Computing I or 8.1120 Computing. Other students may seek permission to take some appropriate alternative subject.

2. The following considerations pertain to the choice of optional units in Years 2 and 3:
   (1) They include no more than 1 Level I unit.
   (2) They include at least 4 Level III units which satisfy the relevant major requirements.
   (3) They include no more than 1 unit from Schools other than Chemistry, Electrical Engineering and Computer Science, Mathematics, Materials Science and Engineering and Physics.
   (4) They include at least 1 Level II unit from the Schools of Chemistry or Physics.
   (5) They include 10.331 Statistics SS, 10.351 Statistics SM or 10.311B Basic Interference.
   (6) 4.632 Metallurgical Engineering 1C and 4.642 Metallurgical Engineering 1D are both deemed to have 1/2 unit values.

3. Students are recommended to choose 2.951 unless they wish to pursue studies requiring 2.121. The prerequisites of 2.121 and 2.131 for 2.102A Physical Chemistry may be waived on application to the Head of the School of Chemistry. Materials Science Option 1 majors must choose 2.121.

4. Materials Science majors may omit 10.1114 Complex Analysis or substitute 10.022 Engineering Mathematics 2 for the mathematics subjects. The balance of the units must then be made up from units from the Schools of Chemistry, Materials Science and Engineering or Physics offerings in Table 1 or Table 2 for course 3681.

5. if 4.412A, 4.422B and 4.432, Physical Metallurgy 1A, 1B and 1C respectively, are taken, students should take 5.422B instead of 5.422.

6. Anticipated Actual General Studies requirements correspond to whatever is required in Year 2 of the normal Mechanical and Industrial Engineering degree course.


8. 6.646 Computer Applications is excluded for students in course 3661 who should substitute a Level III unit from Table 2 offerings of School of Electrical Engineering and Computer Science.

9. Provided 5.4221 is taken concurrently with 4.642, the prerequisite requirement of 4.622 for 4.642 is assumed to be satisfied.

10. Materials Science majors who took 2.121 Chemistry 1A in Year 1 must take 2.131 Chemistry 1B. Those who took 2.951 Chemistry 1ME and wish to keep open the option of majoring in mathematics should include 10.1114 (or 10.1214) Complex Analysis in their selection; otherwise they are advised to select 1.022 Modern Physics or 1.982 Solid State Physics.

11. Under special circumstances, and with permission of the School of Physics, a student may substitute alternative Physics Level III offerings of equivalent unit value.

12. Students who followed the Year 2 for Computer Science majors should substitute 1.022 or 1.012 or 1.022A, those that followed the Year 2 for Statistics majors should substitute 1 Level II or III unit from the Schools of Physics or Mathematics offerings in Table 1.

13. Quota restrictions apply to certain Computer Science Level III units and application must be made in writing to the Head of the School of Electrical Engineering and Computer Science before the end of Session 2 in the preceding year. Prospective Computer Science majors should aim for a creditable academic attainment (85%) over Years 1 and 2.

14. These must include either 4.413, 4.423, 4.433C, 4.443 and 4.453, Physical Metallurgy 2A–2E inclusive, together with either 2.002A Physical Chemistry or 1.023 Statistical Mechanics (for which the prerequisite of 1.012 is waived provided students have passed 2.002A).
Undergraduate Study
Board of Studies in Science and Mathematics
and the Faculty of Engineering

3725
Combined Science/Electrical Engineering Course

Students in Electrical Engineering who maintain a creditable performance may qualify for the award of two degrees in five years of combined full-time study in which the requirements of the degrees have been merged. Students wishing to enrol in a combined course may do so only on the recommendation of the Head of School of Electrical Engineering and Computer Science and with the approval of the Faculty of Engineering and the Board of Studies in Science and Mathematics. Students wishing to enrol in, transfer into, or continue in a combined course shall have complied with all the requirements for prerequisite study, sequencing and academic attainment (a creditable performance, ie 65%).

Students who commence a course but subsequently do not wish to proceed with both areas of study, or who fail to maintain a creditable performance, revert to a single degree program with appropriate credit for subjects completed. Tertiary Education Assistance Scheme (TEAS) support is available for the five years of the combined degree programs.

Students may transfer into a combined course after partially completing the requirements for either degree provided suitable subjects have been studied. However, the choice of subjects and the time taken to complete the program can be seriously affected by this. Thus, students considering course 3725 should contact the Electrical Engineering School before completing their Year 2 enrolment. Application for transfer to a combined course must be made in writing to the Head of School by 9 January 1987.

Having completed Years 1 and 2 of course 3640 students in their third year complete a specific course of study consisting of four Level III Science units chosen from related disciplines, the appropriate General Studies electives and no less than four other Level II or Level III units, and otherwise accord with the rules of course 3970 leading to a major in Computer Science, Mathematics or Physics.

Students wishing to gain a degree at honours level in Science as part of their combined degree program shall meet all the relevant requirements of the Board of Studies in Science and Mathematics and of the School concerned. Such students may enrol for the honours year only on the recommendation of the Head of the School of Electrical Engineering and Computer Science and with the approval of the Head of the appropriate Science School, the Faculty of Engineering and the Board of Studies in Science and Mathematics. Tertiary Education Assistance Scheme (TEAS) support is available for the six years of the combined degree programs including honours level Science.

In Years 4 and 5 the students do Year 3 and Year 4 of course 3640. Depending on the program followed in their year of Science they may have already completed parts of the normal third and fourth year programs of the Electrical Engineering course, and they will be required to omit these from their program and to include an equivalent amount of other subjects chosen with the approval of the Head of the School.

Year 1
1. 961
2. 121
5. 006
6. 010
6. 611
10. 001
1 General Studies elective

Year 2†
1. 972, 1.982
10. 111A, 10.1113, 10.1114, 10.2111, 10.2112
1 General Studies elective
Year 3†*

Either
Computer Science
1 General Studies elective
Choose at least 8 Level II or Level III units including at least 4 Computer Science units at Level III, the balance to be chosen from Level III Computer Science units and other Level II or Level III units in Table 1 or Table 2 for program 0600**
or
Mathematics
1 General Studies elective
Choose at least 5 Mathematics units, 4 of which are Level III
Choose at least 3 Level II or Level III units from Table 1 or Table 2 for program 1000
or
Physics
1 General Studies elective
Choose 7 Level II or Level III units from Table 1 of which four must be Level III Physics units, chosen to include 1.0133, 1.0143, 1.023 and 1.0333

Year 4
From Electrical Engineering course, modified as required by Head of School

Year 5
From Electrical Engineering course

†Students intending to major in Computer Science should include 6.641 in their Year 2 enrolment. Students intending to major in Physics are required to take unit 1.992 in Year 2.
‡For Year 3 refer to course 3970 and to this Handbook.
**For this strand only the Level I unit, 14.501 Accounting and Financial Management may be taken in place of one of the other Level II or Level III units. Students should note that this subject is a prerequisite for the Level III unit, 6.647 Business Information Systems.
Undergraduate Study
Board of Studies in Science and Mathematics
and the Faculty of Engineering

3730
Programs in the
Combined Science/Civil Engineering
Course

For details of the combined Science/Civil Engineering Course refer to the Faculty of Engineering Handbook.

Approval may be given to change the programs listed below to allow for timetabling and the student’s academic interests. For any changes to subjects in italic print you should consult the Science and Mathematics Course Office, Room 211, Mathews Building.

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Geography and Environmental Chemistry

Year 1
1.981
2.121
8.1110, 8.1120, 8.1130, 8.1140
8.1210, 8.1410, 8.1610
10.001***
25.5112

Year 2
2.102A, 2.102C, 2.102D, 2.131
8.2110, 8.2210, 8.2320, 8.2410, 8.2420, 8.2430
10.022
27.010, 27.030
1 General Studies elective

Year 3
2.043A
8.2220, 8.2610, 8.3110, 8.3410, 8.3420, 8.3430, 8.3440
Two of the following: 27.133tt, 27.143tt, 27.153tt, 27.183tt
29.441, 29.491
2 General Studies electives

---

Physics with Mathematics

Year 1
1.001
2.991**
8.1110, 8.1120, 8.1130, 8.1140
8.1210, 8.1410, 8.1610
10.001***
25.5112

Year 2
1.012, 1.022, 1.032
8.2110, 8.2210, 8.2320, 8.2410, 8.2420, 8.2430
10.1113, 10.1114, 10.2111, 10.2112
10.381
1½ General Studies electives

Note: All material not in italic face relates to the BE degree component of this combined course.

* ***See footnotes at end of Course outline.
††These subjects are offered in pairs in alternate years. The two subjects offered in Year 3 are therefore excluded from those available in Year 4.

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Year 4
8.2120, 8.2310, 8.3210, 8.3220, 8.3230, 8.3320, 8.3330, 8.3510, 8.3610, 8.3620, 8.3640
27.193, 27.175, 27.176
At least 1½ units chosen from:
27.133tt, 27.143tt, 27.153tt, 27.183tt, 27.862, 27.863

Year 5
Choose 2 units from Table 1 in the Combined Sciences Handbook at Level II or higher
8.4110, 8.4220, 8.4320, 8.4330, 8.4420, 8.4430, 8.4440, 8.4520, 8.4620
Two of the following subjects:
8.4210, 8.4310, 8.4410, 8.4510, 8.4610

Note: All material not in italic typeface relates to the BE degree component of this combined course.
### Computing with some Mathematics

**Year 1**
- 1.981
- 2.991
- 8.1110, 8.1120, 8.1130, 8.1140
- 8.1210, 8.1410, 8.1610
- 10.001
- 25.5112

**Year 2**
- 6.621, 6.631, 6.641
- 8.2110, 8.2210, 8.2320, 8.2410, 8.2420, 8.2430
- 10.1113
- 10.1114
- 10.331
- 1 General Studies elective

**Year 3**
- 6.642, 6.643
- 8.2120, 8.2220, 8.2310, 8.2610, 8.3110, 8.3410, 8.3420, 8.3430, 8.3440, 8.3640
- 10.2111
- 10.2112
- 29.441, 29.491
- Choose a Level II or Level III Mathematics unit from Table 1 of the Combined Sciences Handbook

**Year 4**
- 6.646
- Choose two of 6.613, 6.632, 6.633
- 8.2310, 8.3220, 8.3310, 8.3320, 8.3330, 8.3510, 8.3510, 8.3610, 8.3620, 8.3630
- 1 General Studies elective
- Choose 1 Level II or Level III Mathematics unit from Table 1 in the Combined Sciences Handbook

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**Footnotes to Courses 3730 Programs**

- All material not in italic typeface refers to the BE degree component of this combined course.
- Students are advised to attempt 1.981 Physics 1CE but if timetabling difficulties arise or other exceptional circumstances prevail permission will be given to attempt 1.001 Physics 1.
- Students who have not satisfied the chemistry prerequisite for 2.991 Chemistry 1CE are required to take 2.111 Introductory Chemistry in Session 1 and 2.991 in Session 2.
- Students who have achieved a certain standard may attempt 10.011 Higher Mathematics 1.
- Students are encouraged to select higher level mathematics units where applicable.
A limited number of places (up to 16) are available in this course, and these are open only to students who have been accepted into the Faculty of Medicine.

For further details refer to the Faculty of Medicine Handbook. Below are programs for Years 1, 2 and 3 and the optional honours Year only; subsequent years (3, 4 and 5 of the Medical Course) are detailed in the Faculty of Medicine Handbook. Students must major in either Anatomy, Biochemistry, Physiology, Psychology, or any two of these, as well as satisfactorily completing a core course. Students majoring in Biochemistry must decide accordingly before enrolment in Year 2; other majors can be decided before enrolment in Year 3. Subjects chosen each year must be approved by the Course Controller prior to enrolment.

**Year 1**

1.001 or 1.021
2.121 & 2.131, or 2.141
10.001 or 10.011 or both 10.021B & 10.021C
17.031, 17.041
1 General Studies elective\(\dagger\)

**Year 2**

41.101\(^*\)
70.011A, 70.011C
73.111
80.014\(^**\)
1 General Studies elective\(\dagger\)

**Year 3**

There are 10 options, as set forth immediately below. The columns represent the primary choice (major in Anatomy, Biochemistry or Physiology); the rows represent the secondary choices (single or double major). Elective units may be selected from Table 1 and/or from the Anatomy units in Table 2.

<table>
<thead>
<tr>
<th>Anatomy Major</th>
<th>Biochemistry Major*</th>
<th>Physiology Major</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core Units</td>
<td>General Studies</td>
<td>General Studies</td>
</tr>
<tr>
<td></td>
<td>elective</td>
<td>elective</td>
</tr>
<tr>
<td></td>
<td>80.014(^**)</td>
<td>80.014(^**)</td>
</tr>
<tr>
<td></td>
<td>4 Level III Anatomy</td>
<td>41.102A</td>
</tr>
<tr>
<td></td>
<td>units</td>
<td>41.102B</td>
</tr>
<tr>
<td></td>
<td>together with:</td>
<td>together with:</td>
</tr>
<tr>
<td></td>
<td>73.012F</td>
<td>73.012F</td>
</tr>
<tr>
<td></td>
<td>3 Elective units</td>
<td>1 Elective unit</td>
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<tr>
<td></td>
<td></td>
<td>2 Elective units</td>
</tr>
<tr>
<td></td>
<td>3 Level III</td>
<td>4 Level III</td>
</tr>
<tr>
<td></td>
<td>Anatomy units(\dagger)</td>
<td>Anatomy units(\dagger)</td>
</tr>
<tr>
<td></td>
<td>(makes total of 7)</td>
<td></td>
</tr>
<tr>
<td>Single Major</td>
<td></td>
<td></td>
</tr>
<tr>
<td>73.012F</td>
<td>2 Level III</td>
<td>2 Level III</td>
</tr>
<tr>
<td>3 Level III</td>
<td>Anatomy units(\dagger)</td>
<td>Anatomy units(\dagger)</td>
</tr>
<tr>
<td>4 Level III</td>
<td>2 Elective units</td>
<td></td>
</tr>
<tr>
<td>with Anatomy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>41.102A</td>
<td>41.102B</td>
<td>41.102A</td>
</tr>
<tr>
<td>Double Major</td>
<td></td>
<td></td>
</tr>
<tr>
<td>73.012B</td>
<td>not available</td>
<td></td>
</tr>
<tr>
<td>with Biochemistry</td>
<td></td>
<td>(double major</td>
</tr>
<tr>
<td>Double Major</td>
<td></td>
<td></td>
</tr>
<tr>
<td>73.012</td>
<td>73.012</td>
<td>41.102B</td>
</tr>
<tr>
<td>with Physiology</td>
<td></td>
<td>(double major</td>
</tr>
</tbody>
</table>

**Year 4**

Students may join Year 3 of the Medical Course, or apply to take Honours and proceed to the Medical Course the following year. For honours courses, see Table 3.

*Students majoring in Biochemistry should take 2.102B Organic Chemistry.
**80.014 Human Behaviour is taken in either Years 2 or 3.
\(\dagger\)For Anatomy units see Table 2.
\(\dagger\)Enrolment in General Studies may be deferred until later years but two electives must be satisfactorily completed for a BSc degree, and three electives for the MB BS degrees.
Students must complete these requirements during the first three years, before entering the Medical Course, otherwise there will be timetabling difficulties.

Note: Students not majoring in Anatomy commonly take an additional Anatomy unit in Session 2. This may be either 70.012B, 70.011A, or 70.304 (listed in approximate order of likely usefulness).
4070 Mathematics Education Course
4080 Science Education Course

Objectives of the Course

The objectives of the Mathematics components broadly aim: to develop a comprehensive knowledge and interest in mathematical techniques and problem solving, to develop an ability to reason mathematically and to present mathematical reasoning clearly and persuasively, and to ensure the student's understanding of the applications of mathematics.

Objectives related to the education component seek: to develop skills in teaching mathematics, to provide an understanding of the major disciplines which contribute to educational theory, to develop a knowledge of the latest innovations in educational practice and theory and to clarify the methodologies and curriculum materials relevant to secondary mathematics teaching.

Honours and Pass Degree Requirements

The course is offered at both pass and honours levels.

1. The pass course requires successful completion of a four-year program.

2. The honours course requires successful completion of a five-year program in which the fifth year is devoted to an approved honours program in one of the following options:

   Pure Mathematics, Applied Mathematics, Mathematical Statistics, or Education*.

The grades in this program are Honours Class I, II/1, II/2 and III.
Students who wish to proceed to the honours year should apply in writing to the Head of the School of Education. A letter of acceptance from the Head of the School in which they wish to study during the honours year should be included with this application.

*Students proceeding to the honours year in Education must have completed the Advanced Education subjects in Year 4 in addition to those Education subjects prescribed for the degree at pass level.

## Components of the Course

The Mathematics Education Course consists of Mathematics, Education and General Studies components.

### 1. Mathematics Component

Two alternative programs are available to students in the fourth year of the course in 1987. The programs consist of units ranked as Level I, Level II, Level II/III, Level III and Level IV. These units vary from 56 to 84 hours in duration. The terms Levels I, II and III do not necessarily refer to the years in which the unit must be studied. Units at the various levels may be taken in other years provided the prerequisites are met. Level II/III units have only Level I prerequisites.

Students in their fourth year in 1987 must select one of the following programs:

- **5811 The Mathematics and Science Program**
  
  The pass course requires at least 23 units in addition to Education and General Studies subjects or

- **5812 The Mathematics and Liberal Studies Program**
  
  The pass course requires at least 24 units in addition to Education subjects.

For both programs the selection of units is subject to the requirements listed below:

1. Not less than 8 units, nor more than 10 units selected from Level I. Except with the approval of the Head of the School of Mathematics and the Director of Science Teacher Courses, not more than 2 Level I units may be taken in any one discipline other than Mathematics.

2. The following subjects or their higher equivalents shall be included:

   - 10.001, 10.111A, 10.1113, 10.1114, 10.2111, 10.2112.
   - 10.1111, 10.1112, 11.1121, 11.1123, 11.1127, 11.1128, provided that a student may substitute for any of the above units such higher units as are deemed equivalent (for the purposes of satisfying this rule) by a professor of Pure Mathematics.
   - Not less than 2 units from the following:

     - 10.1127, 10.2113, 10.2115, 10.212L, 10.212M, 10.331, 10.311A, 10.311B, 10.3111, 10.3112, 10.312A, 10.312B, 10.312C, 10.312D, 10.312E, 10.2116, 10.292A, provided that a student may substitute for any of the above units such higher units as are deemed equivalent (for the purposes of satisfying this rule) by the Head of the School of Mathematics.

3. Not less than 8 Level II or Level III Mathematics units from Table 1 (see below) and of these not less than four shall be Level III units of which only one may be Level II/III.

4. For the award of honours the student must complete 10 units as specified in an individual program and must meet prerequisite requirements set out in Table 3 (see below).

5. In order to graduate a student must pass all the units specified in the program of his/her choice.

   - Students in the second and third years of the course should choose a program available in the Science and Mathematics course (3970) which will allow them to major in Mathematics.

### 2. Education Component

The Education component is one of the major sequences in the course. It consists of subjects grouped as follows:

- **Theory of Education**
  - 58.702, 58.703, 58.704

- **Mathematics Curriculum and Instruction**
  - 58.742, 58.743, 58.744

- **School Experience**
  - 58.712, 58.713, 58.714

- **Honours**
  - 58.793, 58.794, 58.795, 58.799

From 1987 all Mathematics Education students enrolled in the pass degree course will complete the education component in the fourth year of the course.

### 3. General Studies Component

1. The General Studies component involves 56 hours in the pass course, which is made up of two half electives or their equivalent. The distribution of the two half electives may be varied to suit the programs of individual students.

2. In the Mathematics and Liberal Studies Program the Liberal Studies subjects provide the General Studies component.

### Enrolment Requirements

1. No student will be enrolled in the first year of the Mathematics Education course (4070) in 1987. Students in fourth year must be enrolled in one of the Mathematics programs for the Course 4070, the Education program and, in the case of the Mathematics and Science program (5811), general studies. Students in second and third years should be enrolled in one of the Mathematics programs for the Course 3970 and general studies.

2. A student may with the approval of the Director of Science Teachers’ Courses, and in consultation with the Head of the School of Mathematics, change from one selected Mathematics program to another. A written application to make the change must be lodged, including details of optional units selected in the new program, at the Science Education Office, Room 41, Building G2, Western Campus.
3. A student must take care to satisfy the requirements of sequences of units such as prerequisites and co-requisites. A prerequisite subject is one which must be completed prior to enrolment in the subject for which it is prescribed. A co-requisite subject is one which must either be completed successfully before or be studied concurrently with the subject for which it is prescribed. In exceptional circumstances, on the recommendation of the Head of the School of Mathematics, the particular prerequisite or co-requisite may be waived by the Director of Science Teachers' Courses.

Programs

The course taken by each student has three component programs:

1. Education Program

Students enrolled in the pass course in 1987, 1988 and 1989 will study education only in the fourth year of their course. Students enrolled in the education honours course will also study education in their fifth year. In 1987 the subjects available are as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Subject</th>
<th>Hours per week*</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>58.704</td>
<td>2.2</td>
</tr>
<tr>
<td></td>
<td>58.714</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>58.744</td>
<td>2½</td>
</tr>
</tbody>
</table>

Honours in Education

<table>
<thead>
<tr>
<th>Year</th>
<th>Subject</th>
<th>Hours per week</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>58.793</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>58.795</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>58.799</td>
<td></td>
</tr>
</tbody>
</table>

*Average for 28 weeks.

2. General Studies Program

(1) For students electing the Mathematics and Science Program or a mathematics program from the Science and Mathematics course (3970):

Two half electives (or equivalent) taken during Years 2, 3 and/or 4 for the pass degree.

(2) For students electing the Mathematics and Liberal Studies Program:

No specific General Studies subjects are required.

3. Mathematics Program

5811

Mathematics and Science

Year 1
10.001 or 10.011
Choose 6 units from:
Table 1 &/or
The BA course* &/or
Table 2 for program 5811 except 14.501

Year 2
10.111A or 10.121A, 10.1113 or 10.1213, 10.1114 or 10.1214, 10.2111 or 10.2211, 10.2112 or 10.2212
Choose 4 or 5 units from:
Table 1 &/or
The BA course* &/or
Table 2 for program 5811

Year 3
Choose 2 Level III Mathematics units from Table 1
Choose 2 or 3 units from:
Table 1 &/or
The BA course* &/or
Table 2 for program 5811

Year 4
Choose 2 Level III Mathematics units from Table 1
Choose a further Level II or III Mathematics unit if needed to make up the required 8
Choose 1 or 2 units from:
Table 1 &/or
The BA course* &/or
Table 2 for program 5811

Year 5
10.123 or 10.223 or 10.323.

*Up to 5 units of this program may be replaced by subjects offered in the BA degree course (6 credit points at Level I or 4 credit points at Upper Level are equivalent to 1 unit). The BA degree subjects are limited to those offered by the following schools: Economics, English, French, German, History, Political Science, Russian, Sociology, Spanish and Latin American Studies and Theatre Studies. Upper Level subjects from the School of Economics are restricted to all those in Economic History plus 15.052, 15.072, 15.263 and 15.273.

Not more than 8 units that are not in Table 1 may be taken without the approval of the Director of Science Teacher Courses.

5812

Mathematics and Liberal Studies

Year 1
10.011 or 10.001
Choose 4-6 units from:
Table 1 &/or
The BA course*

Year 2
10.111A or 10.121A, 10.1113 or 10.1213, 10.1114 or 10.1214, 10.2111 or 10.2211, 10.2112 or 10.2212
Choose 4 or 5 units from:
Table 1 &/or
The BA course*
Undergraduate Study: 4080 Science Education Course: Programs

Year 3
Choose 2 Level III Mathematics units from Table 1
Choose 2 or 3 units from:
Table 1* 
The BA course

Year 4
Choose 2 Level III Mathematics units from Table 1
Choose 2 or 3 units from:
Table 1* 
The BA course

Year 5
10.123 or 10.223 or 10.323

*Units in Geography, History and Philosophy of Science, and Philosophy shall be those from the BA degree course.

All those in Economic History plus 15.062, 15.072, 15.263 and 15.273.

The BA course

<table>
<thead>
<tr>
<th>Year</th>
<th>Course</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 3</td>
<td>Science Education Degree Course</td>
<td>Choose 2 Level III Mathematics units from Table 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Choose 2 or 3 units from:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Table 1*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The BA course*</td>
</tr>
</tbody>
</table>

4080 Science Education Degree Course

Bachelor of Science Diploma in Education BSc DipEd

The Science Education Course is a concurrent course leading to the award of the qualifications BSc DipEd and is designed primarily to prepare students for entry into the teaching profession as teachers of science in secondary schools.

An important feature of the course is that students take education subjects along with science subjects in second, third and fourth years. The science component is based on programs offered in the Science and Mathematics Course. Students may proceed to honours in a science or in education. One of the science units is a history and philosophy of science subject. This is included to give students an understanding of the nature of science and of its relationship to society, which is especially important to prospective teachers of science.

No new enrolments will be accepted into this course from 1987. Students already enrolled in the course may continue with their studies until completion of requirements for the award. The following arrangements apply:

1. Those students who have completed all of the Year 3 Education program by the end of 1986 should enrol in the Year 4 Education program in 1987 to complete the Education component for the award of the pass degree.

2. All other pass degree students registered in this course (4080) should enrol in 1987 with a view to completing the Mathematics component of the course in 1987 or 1988. The Education component will be available only in the fourth year of the course after completion of all or most of the Mathematics component.

Details of the fourth year Education program to be offered in this course in 1988 and 1989 are under review and are not available until late 1987.

Students enrolling in this course must seek advice from the Director of Science Teachers’ Courses, Room 41, Building G2, Western Campus or at the enrolment centre.

Objectives of the Course

The objectives of the course are those of the Science and Mathematics Course (3970) together with others which are essential for a course which is designed to prepare science teachers.

In summary, the objectives of the Science and Mathematics Course broadly aim to develop a working knowledge of scientific methods of investigation and to promote an understanding of the significance of science, technology, economics and sociological factors in modern society. The objectives seek to develop in the student the ability and disposition to think logically, to communicate clearly by written and oral means and to read critically. Students are encouraged to develop the habit of seeking and recognizing relationships between phenomena, principles, theories, conceptual frameworks and problems.

The education component of the course seeks to provide a knowledge of theories of education and the latest innovations in educational practice and theory, and the development of skills in teaching science.

Honours and Pass Degree Requirements

There are both pass and honours programs available in the course leading to the award of the qualifications Bachelor of Science and Diploma in Education (BSc DipEd).

1. The pass course requires successful completion of a four-year program.

2. The honours course requires successful completion of a five-year program in which the fifth year is devoted to an approved honours program in one of the following disciplines:

   Physics, Chemistry, Geology, Biochemistry, Biotechnology, Botany, Microbiology, Zoology, Education*, Physiology.

   The grades in this program shall be Honours Class I, II/1, II/2 and III.
Students who wish to proceed to the honours year should apply in writing to the Head of School of Education. A letter of acceptance from the Head of the School in which they wish to study during the honours year should be included with this application.

*Students proceeding to the honours year in Education must have completed the Advanced Education subjects in Year 4 in addition to those Education subjects prescribed for the degree at pass level.

## Components of the Course

The Science Education Course consists of Science, Education and General Studies components.

### 1. Science Component

The Science component for fourth year students in 1987 is based on the prescribed programs from the Science and Mathematics Course (3970) rearranged to spread over one additional year. For second and third year students the science programs are completed in three years as specified in the Science and Mathematics Course. These programs are composed of units ranked as Level I, Level II, Level II/III, Level III, and Level IV, such units varying from 56 to 84 hours. The terms Levels I, II and III do not necessarily refer to the years in which the unit must be studied. Units at the various levels may be taken in other years providing the prerequisites are met. Level II/III units have only Level I prerequisites. For the pass course the science component requires at least 23 units with the following requirements:

1. There shall be ten units from Level I and these must come from the following subjects: 1.001 (or 1.021 for biological science programs from the Science and Mathematics Course), 2.121, 2.131, 10.001 or 10.011 or 10.021B and 10.021C, 17.031, 17.041, 25.110, 25.120.
2. Not less than four units from Level III. For purposes of this clause Level II/III units are counted as Level III units.
3. Not less than two units beyond Level I in science disciplines in any of the teaching areas physics, chemistry (including biochemistry), biology and geology other than that of the student’s major. In special circumstances this requirement may be waived with the permission of the Director of Science Teachers’ Courses or as specified in individual programs.
4. One unit shall be a History and Philosophy of Science subject selected from a list of subjects approved by the Director of Science Teachers’ Courses. In special circumstances this requirement may be waived with the permission of the Director of Science Teachers’ Courses or as specified in individual programs.
5. For the honours program with honours in a science discipline there shall be at least six Level III units and students must meet prerequisite requirements set out in Table 3.
6. For the award of honours in a science discipline the student must complete at least ten Level IV units as specified in an individual program.
7. In order to graduate a student must pass all the units specified in the program of his/her choice.

### 2. Education Component

The Education Component is one of the major sequences in the course. It consists of subjects grouped as follows:

- **Theory of Education**: 58.702, 58.703, 58.704
- **Science Curriculum and Instruction**: 58.732, 58.733, 58.734
- **School Experience**: 58.712, 58.713, 58.714
- **Honours**: 58.793, 58.794
  - 58.795, 58.799

From 1987 all Science Education students enrolled in the pass course will complete the education component in the fourth year of their course.

### 3. General Studies Component

The General Studies component involves 56 hours in the pass course, which is made up of two half electives or their equivalent. The distribution of the two half electives may be varied to suit the programs of individual students.

## Enrolment Requirements

1. No student will be enrolled in the first year of the Science Education Course (4080) in 1987.
   
2. Second and third year students must be enrolled in a science program from the Science and Mathematics Course (3970) and in General Studies.

3. Fourth year students in 1987 must be enrolled in one of the Science Education programs listed below, the Education program and General Studies.

4. A student may, with approval of the Director of Science Teachers’ Courses, change from one selected Science program to another. A written application to make the change must be lodged, including details of any optional units selected in the new program, at the Science Education Office, Room 41, Building G2, Western Campus.

5. The allowed specific programs are made up of sequences of units. Where a choice is indicated care must be taken to satisfy the requirements such as prerequisites and co-requisites.

6. A prerequisite subject is one which must be completed prior to enrolment in the subject for which it is prescribed. A co-requisite subject is one which must either be completed successfully before or be studied concurrently with the subject for which it is prescribed. An excluded subject is one which cannot be counted together with the subject which excludes it towards the degree or qualification. In exceptional circumstances, on the recommendation of the head of the appropriate school, the particular prerequisite or co-requisite may be waived by the Director of Science Teachers’ Courses.
5. Students lacking the HSC prerequisites for 1.001 Physics 1 and/or 2.121 Chemistry 1A may satisfy prerequisites by completing the respective introductory subjects 1.021 Introductory Physics for Health and Life Scientists or 2.111 Introductory Chemistry. Students requiring 10.001 Mathematics 1 for Physics programs may satisfy prerequisites by completing 10.021B where appropriate. Under these circumstances these introductory subjects are not counted among the units required for the degree course.

### Programs

The Course followed by a particular student has three component programs.

1. **Education Program**
   Students enrolled in the pass course in 1987, 1988 and 1989 will study education only in the fourth year of their course. Students enrolled in the education honours course will also study education in their fifth year. In 1987 the subjects available are as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Subject</th>
<th>Hours per week*</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>58.704</td>
<td>2.2</td>
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<td>58.714</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>58.734</td>
<td>4</td>
</tr>
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</table>

   **Honours in Education**

<table>
<thead>
<tr>
<th>Year</th>
<th>Subject</th>
<th>Hours per week*</th>
</tr>
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<tr>
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<tr>
<td></td>
<td>58.799</td>
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</tbody>
</table>

   *Average for 28 weeks.

2. **General Studies Program**
   Two half electives (or equivalent) taken during second, third and/or fourth years for the pass degree.

3. **Science Program**
   Each Science program listed below is available to students in the fourth year of the course and is based on a program in the Science and Mathematics Course. Each one has an identifying number. The Science Education programs have 58 as the first two digits of the identifying number.

   Students in the second and third years of the course should choose the science program in the Science and Mathematics Course which is appropriate to their major area of study.

### 5801†† Physics

#### Year 1

- 1.001
- 2.121 & 2.131, or 2.141
- 10.001 or 10.011†
- 17.031, 17.041
- or
- 25.110, 25.120

#### Year 2

- 1.012, 1.022, 1.032
- 10.111†, 10.111†
- 10.211†, 10.2112†
- 17.031, 17.041
- or
- 25.110, 25.120

#### Year 3

- 1.002
- Choose 2 units from:
  - 1.0133, 1.0143, 1.023, 1.0333, 1.0343, 1.043
- Choose 1 HPS unit

#### Year 4

- Choose 2 units from:
  - 1.0133, 1.0143, 1.023, 1.0333, 1.0343, 1.043
- Choose 2 units from Table 1†

   Students proposing to proceed to Year 5 (Honours) year must take 6 Level III units

#### Year 5 (Honours)

- Choose one of 1.104, 1.304 or 1.504

   *Units available for choice from Table 1 in this program are those from schools other than Mechanical and Industrial Engineering, Electrical Engineering, Mathematics, Psychology, Geography, Philosophy.
   †Students are encouraged to select Higher level Mathematics units where applicable.
   ††Students should read carefully the notes accompanying program 0100 Physics and seek advice from the School of Physics regarding choice of units. For students proceeding to Year 5 consideration is given in Year 4 to students wishing to include further units of Mathematics.

### 5820 Chemistry

#### Year 1

- 1.001
- 2.141 or both 2.121 and 2.131
- 10.001 or 10.011 or both 10.021B & 10.021C
- 17.031, 17.041
- or
- 25.110, 25.120

#### Year 2

- 2.102A, 2.102B, 2.102C, 2.102D
- 17.031, 17.041
- or
- 25.110, 25.120
- Choose 1 unit from: Table 1†

---

*Note: Students are advised to consult the School of Physics for guidance on suitable units.*
Years
Choose 2 Level III Chemistry units
Choose 1 HPS unit
Choose 1 unit from Table 1*

Year 4
Choose 2 Level III Chemistry units
Choose 2 units from Table 1*

Students proposing to proceed to Year 5 (Honours) must take
7 Level III units

Year 5
2.004

*See this footnote to program 5801.

5825
Geology

Year 1
1.001
2.121 and 2.131, or 2.141
10.001 or 10.011 or both 10.021B & 10.021C
25.110, 25.120

Year 2
17.031, 17.041
25.212, 25.211, 25.221
Choose 2 units from Table 1*

Year 3
25.311, 25.312
Choose 1 HPS unit
Choose 1 unit from Table 1*

Year 4
Choose 2 Level III Geology units
Choose 2 units from Table 1*

Students proposing to proceed to Year 5 (Honours) must take
7 Level III units

Year 5 (Honours)
25.434

*See this footnote to program 5801.

5841
Biochemistry

Year 1
1.001
2.121 and 2.131, or 2.141
10.001 or 10.011 or both 10.021B & 10.021C
17.031, 17.041

Year 2
2.102B
25.110, 25.120
41.101
Choose 1 unit from Table 1*

Year 3
41.102A
Choose 1 HPS unit
Choose 1 unit from Table 1*

Year 4
Choose at least 2 units from:
41.102B, 41.102E
Choose 2 units from Table 1*

Students proposing to proceed to Year 5 (Honours) must com-
plete 7 Level III units.

Year 5 (Honours)
41.103

*See this footnote to program 5801.

5843
Botany

Year 1
1.001
2.121 and 2.131, or 2.141
10.001 or 10.011 or both 10.021B & 10.021C
17.031, 17.041

Year 2
25.110, 25.120
43.111
Choose 4 units from Table 1*

Year 3
Choose 2 Level III Botany units
Choose 1 HPS unit
Choose 1 unit from Table 1*

Year 4
Choose 2 Level III Botany units
Choose 2 units from Table 1*

Students proposing to proceed to Year 5 (Honours) must take
7 Level III units

Year 5 (Honours)
43.103

*See this footnote to program 5801.

5844
Microbiology

Year 1
1.001
2.121 and 2.131, or 2.141
10.001 or 10.011 or both 10.021B & 10.021C
17.031, 17.041
Year 2
25.110, 25.120
41.101
44.101, 44.121
Choose 1 unit from Table 1*

Year 3
44.102
Choose 1 HPS unit
Choose 1 unit from Table 1*

Year 4
44.112
Choose 2 units from Table 1*

Students proposing to proceed to Year 5 (Honours) must take 7 Level III units

Year 5 (Honours)
44.103
*See this footnote to program 5801.

5845
Zoology

Year 1
1.001
2.121 and 2.131, or 2.141
10.001 or 10.011 or both 10.021B & 10.021C
17.031, 17.041

Year 2
25.110, 25.120
45.101, 45.201, 45.301
Choose 2 Level II units of Biochemistry, Chemistry, Physics or Mathematics

Year 3
Choose 2 units from 45.121, 45.122, 45.142, 45.402
Choose 1 HPS unit
Choose 1 unit from Table 1*

Year 4
17.012
Choose 1 unit from 45.121, 45.122, 45.142, 45.402
Choose 1 Level III Zoology unit
Choose 1 unit from Table 1*

Students proposing to proceed to Year 5 (Honours) must take 6 Level III units

Year 5 (Honours)
45.103
*See this footnote to program 5801.

5873
Physiology

Year 1
1.001
2.121 and 2.131, or 2.141
10.001 or 10.011 or both 10.021B & 10.021C
17.031, 17.041

Year 2
25.110, 25.120
41.101
3.001

Year 3
3.012

Year 4
Choose 1 HPS unit
Choose 3 units from Table 1*

Students proposing to proceed to Year 5 (Honours) must take 7 Level III units

Year 5 (Honours)
3.013
*See this footnote to program 5801.
Undergraduate Study  
Board of Studies in Science and Mathematics 
and the Faculty of Law

**4770 Programs in the Combined Science/Law Course**

For details of the combined Science/Law Course refer to the Faculty of Law Handbook.

Below are approved programs for Years 1, 2 and 3 only. Years 4 and 5 are detailed in the Faculty of Law Handbook.

Note that where the levels of elective units are not specified they must be chosen so that the maximum number of Level I units, viz 8, is not exceeded.

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**Chemistry**

<table>
<thead>
<tr>
<th>Year</th>
<th>Units</th>
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</thead>
</table>
| **Year 1** | 1.001  
10.001 or 10.011  
90.112, 90.741 |
| Choose 2 Level I units from Table 1 |
| **Year 2** | 1.002, 1.012, 1.022, 1.032  
10.2111, 10.2112  
90.141, 90.161 |
| Choose 1 Level I or Level II unit from Table 1 |
| **Year 3** | 1.0133, 1.0143, 1.023, 1.0333, 1.0343, 1.043  
90.216, 90.301, 90.621 |
| Choose 2 units of appropriate levels from Table 1 |

---

**Physics**

<table>
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<th>Year</th>
<th>Units</th>
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</thead>
</table>
| **Year 1** | 1001  
10.001 or 10.011  
90.112, 90.741 |
| Choose 2 Level I units from Table 1 |
| **Year 2** | 1.002, 1.012, 1.022, 1.032  
10.2111, 10.2112  
90.141, 90.161 |
| Choose 1 Level I or Level II unit from Table 1 |
| **Year 3** | 1.0133, 1.0143, 1.023, 1.0333, 1.0343, 1.043  
90.216, 90.301, 90.621 |
| Choose 2 units of appropriate levels from Table 1 |

---

**Computer Science**

<table>
<thead>
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<th>Year</th>
<th>Units</th>
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</thead>
</table>
| **Year 1** | 6.611  
10.001 or 10.011  
90.112, 90.741 |
| Choose 3 Level I units from Table 1 |
| **Year 2** | 6.621, 6.631, 6.641  
90.141, 90.161 |
| Choose 1 Level II unit from Table 1 |
| Choose 2 Level I or Level II units from Table 1 |
| **Year 3** | 90.216, 90.301, 90.621 |
| Choose 4 Level III Computing Science units |
| Choose 2 other units of appropriate levels from Table 1 |

*Progress into Year 2 of this program is by competitive entry at the end of Year 1. See entry under Course 3970 Computer Science.*
Mathematics

Year 1
10.001 or 10.011
90.112, 90.741
Choose 4 Level I units from Table 1

Year 2
10.111A*, 10.1113*, 10.1114*, 10.2111*, 10.2112*
90.141, 90.161
Choose 1 Level II unit from Table 1
Choose 2 Level I or Level II units from Table 1

Year 3
90.216, 90.301, 90.621
Choose 4 Level III Mathematics units from Table 1
Choose 2 other units of appropriate levels from Table 1

*Students are encouraged to select Higher Level Mathematics units where applicable.

Geography

Year 1
10.001 or 10.011 or both 10.021B & 10.021C
27.111 or 27.818
27.819
Choose further Level I Science units from Table 1 to make a total
of 6.
90.112, 90.741

Year 2
Choose 3 Level II Geography units
90.141, 90.161
Choose 1 Level II unit from Table 1
Choose 2 Level I or Level II units from Table 1

Year 3
90.216, 90.301, 90.621
Choose 4 units from:
27.133, 27.143, 27.153, 27.163, 27.862, 27.863
Choose 2 units of appropriate levels from Table 1

Psychology

Year 1
10.001 or 10.011 or both 10.021B & 10.021C
12.100
90.112, 90.741
Choose 2 Level I units from Table 1

Year 2
12.200
Choose 2 units from:
12.201, 12.202, 12.204, 12.205
90.141, 90.161
Choose 1 Level II unit from Table 1
Choose 2 Level I or Level II units from Table 1

Year 3
90.216, 90.301, 90.621
Choose 4 Level III Psychology units from Table 1
Choose 2 other units of appropriate levels from Table 1

Biochemistry

Year 1
2.141 or both 2.121 & 2.131
10.001 or 10.011 or both 10.021B & 10.021C
17.031, 17.041
90.112, 90.741

Year 2
2.102B
41.101
90.141, 90.161
Choose 1 Level II unit from Table 1
Choose 2 Level I or Level II units from Table 1

Year 3
41.102A
41.102B
41.102E
90.216, 90.301, 90.621
Choose 2 units of appropriate levels from Table 1

Botany

Year 1
2.141 or both 2.121 & 2.131
10.001 or 10.011 or both 10.021B & 10.021C
17.031, 17.041
90.112, 90.741
Year 2
43.111
90.141, 90.161
Choose 3 Level II units from Table 1
Choose 2 Level I or Level II units from Table 1

Year 3
90.216, 90.301, 90.621
Choose 4 Level III Botany units from Table 1
Choose 2 other units of appropriate levels from Table 1

Microbiology

Year 1
2.141 or both 2.121 & 2.131
10.001 or 10.011 or both 10.021B & 10.021C
17.031, 17.041
90.112, 90.741

Year 2
41.101
44.101, 44.121
90.141, 90.161
Choose 2 Level I or Level II units from Table 1

Year 3
44.102, 44.112
90.216, 90.301, 90.621
Choose 2 units of appropriate levels from Table 1

Biotechnology

Year 1
2.141 or both 2.121 & 2.131
10.001 or 10.011 or both 10.021B & 10.021C
17.031, 17.041
90.112, 90.741

Year 2
41.101
42.101
90.141, 90.161
Choose group 1. or 2. or 3.
1. 44.101, 44.121
2 Level I or Level II units from Table 1
2. 2.102B
2 Level I or Level II units from Table 1
3. 2.102A, 2.102B, 2.102C or 2.102D

Year 3
42.102A, 42.102B
90.216, 90.301, 90.621
Choose group 1. or 2. or 3. as appropriate.
1. 44.102
Choose 2 other units of appropriate levels from Table 1
2. 41.102A
Choose 2 other units of appropriate levels from Table 1
3. Choose 2 Level III Chemistry units
Choose 2 other units of appropriate levels from Table 1

Zoology

Year 1
2.141 or both 2.121 & 2.131
10.001 or 10.011 or both 10.021B & 10.021C
17.031, 17.041
90.112, 90.741

Year 2
45.101, 45.201, 45.301
90.141, 90.161
Choose 41.101 or 2 Level II Chemistry units or 2 Level II Mathematics units
Choose 1 other Level I or Level II unit from Table 1

Year 3
90.216, 90.301, 90.621
Choose 4 Level III Zoology units from Table 1
Choose 2 other units of appropriate levels from Table 1

Ecology

Year 1
2.141 or both 2.121 & 2.131
10.001 or 10.011 or both 10.021B & 10.021C
17.031, 17.041
90.112, 90.741

Year 2
17.012
43.111
44.101
45.101, 45.201, 45.301
90.141, 90.161

Year 3
90.216, 90.301, 90.621
Choose one of the following:
1. 001
2.141 or both 2.121 & 2.131
25.110, 25.120

Marine Science

Year 1
10.001 or 10.011 or both 10.021B & 10.021C
17.031, 17.041
90.112, 90.741
Choose one of the following:
1.001
2.141 or both 2.121 & 2.131
25.110, 25.120

Year 2
43.111
44.101
45.201 or 41.101
68.302
90.141, 90.161
Choose one or two of the following as appropriate:

2.102A
10.031, 10.331 or 10.301
17.012
25.622
44.121

**Year 3**

43.172
45.112
90.216, 90.301, 90.621

Choose one of the following groups:

1. 2.043A
   1 other Level III and 2 other units of appropriate levels from Table 1
2. 10.032, 10.412A
   2 other units of appropriate levels from Table 1
3. 2 other Level III units and 2 other units of appropriate levels from Table 1

---

**Anatomy†**

**Year 1**

10.001 or 10.011 or both 10.021B & 10.021C
17.031, 17.041
90.112, 90.741

Choose 2 Level I units from Table 1

**Year 2**

70.011A, 70.011C
90.141, 90.611

Choose 2 Level II units from Table 1*

Choose 2 Level I or Level II units from Table 1

**Year 3**

90.216, 90.301, 90.621

Choose 4 Level III Anatomy units from Table 2

Choose 2 other units of appropriate levels from Table 1*

*Anatomy units from Table 2 may be taken in lieu.
†Progress into Year 2 of this program is by competitive entry at the end of Year 1.
See entry under Course 3970 Anatomy.

---

**Physiology and Pharmacology**

**Year 1**

2.141 or both 2.121 & 2.131
10.001 or 10.011 or both 10.021B & 10.021C
17.031, 17.041
90.112, 90.741

**Year 2**

41.101
73.111
90.141, 90.161

Choose 1 Level I or Level II unit from Table 1

**Year 3**

73.012
90.216, 90.301, 90.621

Choose 2 units of appropriate levels from Table 1
### Table 1

#### Information Key

The following is the key to the information supplied about each subject in the table below: F (Full year, ie both sessions); S1 (Session 1); S2 (Session 2); SS (single session, ie one only); I, II, III (Levels, I, II, III); Hpw (Hours per week); C (Credit).

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Level</th>
<th>Unit Value</th>
<th>When Offered</th>
<th>Hpw</th>
<th>Prerequisites</th>
<th>Co-requisites</th>
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*For students who enrol in and successfully complete the subjects 1.021 Introductory Physics (2 units) and 1.001 Physics (2 units) the total unit value of the combined subjects will be counted as 3 units.

*Where mathematics units are specified as prerequisites or as co-requisites, the higher levels of such units are acceptable and preferable. Similarly Physics 1.001 is acceptable in place of 1.021. Students are also advised that other units may be acceptable equivalent prerequisites or co-requisites to those listed, eg Unit 1.982 of course 3640 may be acceptable in place of 1.022. Enquiry should be made to the School of Physics.

**Students wishing to enrol in units 1.713, 1.763 or 1.773 without the stated prerequisites or corequisites should enquire from the School of Physics as to the suitability of their previous studies.

††To be offered in odd numbered years only.

†††Not offered in 1987.

### Chemistry

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*Students majoring in Chemistry may take 2.141 in lieu of 2.121 and 2.131.*
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*Also offered over the full year at 3 hours per week, for the 'Production Technology' option only.

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*Excluded for students in programs 0600, 6806.
**Pass Conceded (PC) awarded prior to Session 2, 1983 is not acceptable.
### Mathematics

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### Pure Mathematics

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#### Higher Pure Mathematics Level II††

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†For any listed unit an appropriate higher unit may be substituted.

‡Mathematics 10.021 is included for students desiring to attempt only one Level II Mathematics unit. If other Level II units in Pure Mathematics, Applied Mathematics are taken, 10.031 Mathematics will not be counted.

§Mathematics 10.032 is included for students desiring to attempt only one Level III Mathematics unit. If other Level III units in Pure Mathematics or Applied Mathematics are taken, 10.032 Mathematics will not be counted except that 10.412A may be taken with 10.032.
**Mathematics (continued)**

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**Higher Applied Mathematics Level II**

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*10.1128 is highly recommended.
*t10.1229 is highly recommended.
**For any listed unit, an appropriate higher unit may be substituted.
††1. Admission to Higher Pure Mathematics 2 traditionally requires completion of 10.011 Higher Mathematics 1; students who gain good grades in Year 1 may be allowed to take Higher Pure Mathematics 2 units subject to the approval of the Head of Department. 10.061 Discrete Mathematics is also advised.
2. Students majoring in Physics who wish to take Higher Pure Mathematics 2 should attempt 10.121A, 10.1213, 10.1214, either 10.2211 or 10.2111 and either 10.2212 or 10.2112.
3. Students considering doing Higher Pure Mathematics in years III or IV should take 10.121A, 10.1213, 10.1214 and 10.2211 or 10.2111, and 10.2212 or 10.2112; 10.1115 and 10.1116 Finite Mathematics A and B are also advised.

*Normal prerequisites for attempting Level III Pure Mathematics units are at least two Level II Mathematics units, including any course prerequisites. For any listed unit, an appropriate higher unit may be substituted.
†††Students wishing to enrol in Level III Higher Pure Mathematics units should consult the Department before enrolling. Normal prerequisites for attempting Level III Higher Pure Mathematics units are at least two Level II Mathematics units, including any course prerequisites, at an average of distinction level, or their higher equivalents. Subject to the approval of the Head of Department, these may be relaxed.
*These subjects are to be offered in odd numbered years.
‡‡These subjects are to be offered in even numbered years.
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### Statistics

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*For any listed unit an appropriate higher unit may be substituted.
†Plus any two Level III Pure Mathematics, Applied Mathematics, Theoretical Mechanics or Computer Science units. It is sufficient to take 10.312B (10.322B) in the same year.
**For a student taking four of the higher units 10.322A, 10.322C, 10.322D, 10.3321, 10.3322, 10.3223, 10.3224, 10.3225, 10.312F is required to take 10.3225.
The evening course 10.311A will, subject to sufficient enrolment, run at 2 hours per week throughout the year.
*At least four units from 10.322A, 10.322C, 10.3221, 10.3222, 10.3223, 10.3224, 10.3225, 10.312F.

### Psychology

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*Pass Conceded (PC) awarded prior to Session 2, 1983 is not acceptable.

Notes:

1. A student may not enrol in more than four Level II Psychology units.
2. A student may not enrol in more than three Level III Psychology units unless 12.200 Research Methods 2 has been passed.
3. A student may not enrol in more than six Level III Psychology units unless 12.300 Research Methods 3A has been passed.
4. A major in Psychology is 12.100, two Psychology Level II units, including 12.200 and four Psychology Level III units.
5. A student may not enrol in more than three Psychology Level III units selected from 12.304 Personality and Individual Differences 3, 12.322 Abnormal Psychology 3, 12.324 Experimental Psychopathology 3, 12.331 Counselling Psychology 3, and 12.335 Behavioural Evaluation and Assessment 3.
6. A student may not enrol in more than two Psychology Level III units selected from 12.320 Social Psychology 3, 12.325 Social Behaviour 3 and 12.334 Behaviour in Organizations 3.

### Biological Sciences

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*Students with percentile range 61-100 in HSC Examination 4 unit Science with Biology, or 2 unit Biology may apply to enrol in 45.201 or 45.301 in lieu of 17.041 after completion of 17.031. Students are selected by the Head of School for enrolment in these units. If successful, students will have met the prerequisite requirement of 17.041 Biology B for all units.

### Applied Geology

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*Field work of up to 1 day.
**Field work of up to 2 days.
***Field work of up to 3 days.
****Field work of up to 4 days.
†Field work of up to 5 days.
‡Field work of up to 8 days.
††Not available for programs 2500, 2503 nor in Geology program of Course 4770, nor in Geology with some Mathematics program of Course 3730.
†††It is desirable that students taking 25.312 should also have taken 25.223.
Undergraduate Study: Table 1: Board of Studies in Science and Mathematics (Units offered)

Geography

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*A field excursion, equivalent to 8 tutorial hours, is a compulsory part of the subject.

**Two field tutorials, equivalent to 16 tutorial hours, are compulsory.

***Three days fieldwork, equivalent to 24 tutorial hours, is compulsory.

†Up to 5 days fieldwork, equivalent to 40 tutorial hours, is compulsory.

‡Offered in alternate years.
### Surveying

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*These two subjects must be taken together in the one year.

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*In exceptional circumstances a student may apply to the Head of School for variation of the prerequisite.

### Biotechnology

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*In exceptional circumstances a student may apply to the Head of School for variation of the prerequisite.

*Pass Conceded (PC) or Terminating Pass (PT) awarded prior to Session 2, 1983 is not acceptable.
## Botany

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**A student may apply to the School for variation of the prerequisite.**

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†All units available only during the daytime.
*In exceptional circumstances a student may apply to the Head of School for variation of the prerequisite.
Pass Conceded (PC) awarded prior to Session 2, 1983 is not acceptable.
Undergraduate Study: Table 1: Board of Studies in Science and Mathematics (Units offered)

### Zoology

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Note: A student will not be admitted to Level III Zoology units without special permission of the Head of School, unless Chemistry 2.001 or 2.121 and 2.131, or 2.141, has been completed.

Students who wish to complete a major in the School of Zoology must take Biometry 45.101 and at least two Level II units from one of the following Schools: Biochemistry, Chemistry, or Mathematics, except as detailed in an approved program.

†Level III courses conducted by the School of Zoology are available only during the daytime.

§Students intending to enrol in this unit should register with the School of Zoology for the February field trip by 14 January.

*One of: 10.311A; 10.321A; 10.331 may be substituted for 45.101 with special permission of the Head of School.

### Philosophy

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Philosophy**
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### Philosophy (continued)

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*In exceptional circumstances a student may apply to the School for variation of the prerequisite or co-requisite.

**Level II status in Philosophy consists in 1. being in second or later year of university study, and 2. having taken and passed at least one Level I Philosophy unit. If the unit is composed of two half-units, these must have been passed in the same session. The prerequisite may be waived in certain cases by the School.

†Not offered in 1987.

‡Due to the extra library work required in the preparation of essays a combination of three half-unit Philosophy subjects count as the equivalent of two Science units.

### History and Philosophy of Science

Students undertaking subjects in History and Philosophy of Science are required to supplement the class contact hours by study in the Library.

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<th>Unit Value</th>
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Note: only two Level 1 units may be counted towards Course 3970.
### Board of Studies in Science and Mathematics

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### Pathology

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### Physiology and Pharmacology

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Note: The above represent the normal prerequisites for the courses in Physiology, but the Head of School may recommend that students with a good academic record be granted exemption from them.

*Students intending to major in Physiology should note Physiology 2 prerequisites.
# Community Medicine

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<th>Unit</th>
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<td>S1</td>
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<td>43.101, 41.101</td>
<td>(or their equivalents)</td>
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†One unit of statistical methods, or theory, as approved by the Head of School.

* A unit of genetics and a unit of statistical methods, or theory, as approved by the Head of School.
### Table 2: Board of Studies in Science and Mathematics (units offered)

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<td>73.111, 41.101, 2.102B, 70.011A, 70.011C, 80.014</td>
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<td></td>
</tr>
<tr>
<td>80.014</td>
<td>Human Behaviour</td>
<td>II</td>
<td>1</td>
<td>F</td>
<td>3</td>
<td>70.011A***</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Students who have passed 2.121 may not subsequently enrol in 2.111. Students meeting the 2.121 prerequisite are not permitted to enrol in 2.111 without the permission of the Head of the School of Chemistry. Once students enrol in 2.111 they must pass 2.121 before they can proceed to 2.121 or 2.131. Students may not count more than two Level I Chemistry units towards BSc degree requirements.

**In exceptional circumstances the Head of School may give permission for students outside the specified programs to undertake one of these subjects.

***Pass Conceded (PC) awarded prior to Session 2, 1963, is not acceptable.

****Not available in Year 1 of programs 0600, 1000, 5811, 1400.

†††May be counted in Courses 3611, 3661, 3681 and 3701 in special circumstances only.

§§Excluded by 25.211.

†††May not be offered in 1987 if insufficient enrolments.

‡‡‡May be counted in Courses 3611, 3661, 3681 and 3701 in special circumstances only.

Excluded by 25.211.

††††May not be offered in 1987 if insufficient enrolments.

70.304 and 70.3041 are mutually exclusive (see Subject Descriptions later in this handbook).

§§Anatomy units may be counted as Table 1 units in any program on obtaining special permission of the Head of the School of Anatomy.
### Course 3970
Level IV units offered by the Board of Studies in Science and Mathematics

#### Table 3

A student planning to complete a program involving any unit/units from this table must seek the approval of the Head of the School in which the unit is taught.

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Level</th>
<th>Unit Value</th>
<th>When Offered</th>
<th>Prerequisites in Years 1, 2, 3 or 4</th>
<th>Number of Level III Units Required</th>
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<tbody>
<tr>
<td>1.104</td>
<td>Physics 4 (Honours)</td>
<td>IV</td>
<td>10</td>
<td>F</td>
<td>Program 0100</td>
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<td>Program 0161</td>
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<tr>
<td>1.304</td>
<td>Applied Physics 4 (Honours)</td>
<td>IV</td>
<td>10</td>
<td>F</td>
<td>Program 0100</td>
<td>7</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>Program 0161</td>
<td>6</td>
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<td>1.504</td>
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<td>F</td>
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<td>1.604</td>
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<td>10</td>
<td>F</td>
<td>Program 0100</td>
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<td>2.004</td>
<td>Chemistry 4</td>
<td>IV</td>
<td>10</td>
<td>F</td>
<td>4 Level III Chemistry units</td>
<td>8</td>
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<td>Program 5820</td>
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<td>6.606</td>
<td>Computer Science 4</td>
<td>IV</td>
<td>10</td>
<td>F</td>
<td>6.613, 6.632, 6.642, 6.643</td>
<td>8</td>
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<tr>
<td>10.123</td>
<td>Pure Mathematics Honours</td>
<td>IV</td>
<td>10</td>
<td>F</td>
<td>Program 1000</td>
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<td>*Program 5811 or 5812</td>
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<td>10.223</td>
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<td>10</td>
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<td>Program 5810</td>
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<td>Theory of Statistics Honours</td>
<td>IV</td>
<td>10</td>
<td>F</td>
<td>Program 1006</td>
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<td></td>
<td>*Program 5811 or 5812</td>
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<tr>
<td>12.403</td>
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<td>No.</td>
<td>Name</td>
<td>Level</td>
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<td>When Offered</td>
<td>Prerequisites in Years 1, 2, 3 or 4</td>
<td>Number of Level III Units Required</td>
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<td>14.794</td>
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<td>14.853</td>
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<td>14.857</td>
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<td>14.886</td>
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<td>F</td>
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<td>14.887</td>
<td>Research Topics in Information Systems 2</td>
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<td>14.891</td>
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<td>25.410</td>
<td>Resource Geology†</td>
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<td>25.4101</td>
<td>Topics in Advanced Geology†</td>
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<td>S1</td>
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<td>25.420</td>
<td>Field Project†</td>
<td>IV</td>
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<td>25.412</td>
<td>Sedimentary Basin Resources†</td>
<td>IV</td>
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<td>Programs 2500 and 5825</td>
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<td>25.414</td>
<td>Mineral Resources†</td>
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<td>25.415</td>
<td>Engineering and Environmental Geology†</td>
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<td>25.931</td>
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<td>25.434</td>
<td>Geology 4 Honours (Single Major)</td>
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<td>F</td>
<td>Programs 2500, 2503, Program 5841</td>
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<td>27.844</td>
<td>Geography 4</td>
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<td>F</td>
<td>Program 2700, 27.050</td>
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<tr>
<td>41.103</td>
<td>Biochemistry 4</td>
<td>IV</td>
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<td>F</td>
<td>4 Level III Biochemistry units</td>
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<tr>
<td>42.103</td>
<td>Biotechnology 4</td>
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<td>10</td>
<td>F</td>
<td>4 Level III units in a discipline, or disciplines, related to Biotechnology</td>
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<tr>
<td>43.103</td>
<td>Botany</td>
<td>IV</td>
<td>10</td>
<td>F</td>
<td>4 Level III Botany units or a closely related discipline</td>
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<tr>
<td>44.103</td>
<td>Microbiology Honours</td>
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<td>10</td>
<td>F</td>
<td>44.102, 44.112, Program 5844</td>
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<td>45.103</td>
<td>Zoology 4</td>
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<td>10</td>
<td>F</td>
<td>4 Level III Zoology units Program 5845</td>
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<tr>
<td>62.014</td>
<td>History and Philosophy of Science Honours</td>
<td>IV</td>
<td>10</td>
<td>F</td>
<td>Program 6200</td>
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<td>62.024</td>
<td>Science Studies Honours</td>
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<td>10</td>
<td>F</td>
<td>Program 6200</td>
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<tr>
<td>68.304</td>
<td>Marine Science 4</td>
<td>IV</td>
<td>10</td>
<td>F</td>
<td>Program 6831, 6832, 6833 or 6834</td>
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<tr>
<td>No.</td>
<td>Name</td>
<td>Level</td>
<td>Unit Value</td>
<td>When Offered</td>
<td>Prerequisites in Years 1, 2, 3 or 4</td>
<td>Number of Level III Units Required</td>
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<td>68.404</td>
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<td>F</td>
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<tr>
<td>68.430</td>
<td>Combined Geology Physics Honours</td>
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<td>F</td>
<td>Program 0100</td>
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<tr>
<td>70.013</td>
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<td>IV</td>
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<td>F</td>
<td>4 Level III Anatomy units</td>
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<tr>
<td>72.304</td>
<td>Pathology Honours</td>
<td>IV</td>
<td>10</td>
<td>F</td>
<td>72.301</td>
<td>6</td>
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<tr>
<td>73.013</td>
<td>Physiology 4</td>
<td>IV</td>
<td>10</td>
<td>F</td>
<td>4 Level III Physiology units</td>
<td>7</td>
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<tr>
<td>73.023</td>
<td>Pharmacology</td>
<td>IV</td>
<td>10</td>
<td>F</td>
<td>Program 7300(b)</td>
<td>7</td>
</tr>
<tr>
<td>79.014</td>
<td>Human Genetics</td>
<td>IV</td>
<td>10</td>
<td>F</td>
<td>At least 3 of the following: 41.102A, 43.102, 44.122, 45.121, 79.201, 79.202, 79.302, 68.403</td>
<td>8</td>
</tr>
</tbody>
</table>

*Some Higher Mathematics units should normally be included at Levels II and III in order to enter Level IV Mathematics. Students should discuss their Year 3 program with the Department concerned.

*Students entering 1.504 from the 0100 program should have demonstrated adequate mathematical ability.

*Field work of up to 7 days duration is a compulsory part of the subject.

*Students undertaking Geology IV Honours in program 2500 or 5825 must enrol in 25.410, 25.4101, 25.420 and one of the subjects 25.412, 25.414, 25.415, or 25.931.
Undergraduate Study:
Faculty of Biological Sciences
Faculty of Biological Sciences

Introduction

The Schools of the Faculty of Biological Sciences contribute programs to the Science and Mathematics Course (3970) and the Faculty supervises the undergraduate course in Psychology (3431). The Schools of the Faculty also offer facilities for students to proceed to the award of a Graduate Diploma in Biochemical Engineering (5320); Graduate Diploma in Biotechnology (5340); to masters degrees in Biological Technology (8260) and in Psychology (8250 and 8255); and to the award of masters degrees by research and the award of the degree of Doctor of Philosophy.

Students requiring advice about the undergraduate course should contact
School of Psychology .......................... Dr K. R. Llewellyn
Mr T. J. Clulow

Students requiring advice about graduate studies should check details later in this handbook and also enquire from the Head of the appropriate School.
Faculty of Biological Sciences

Course Outline 3431

3431
Psychology Degree Course
— Full-time Course
Bachelor of Science (Psychology)
BSc(Psychol)

The four year course in Psychology, which leads to the award of the degree of Bachelor of Science (Psychology), is designed to meet the requirements of students who intend to become professional psychologists, as either practitioners or research workers. It provides extensive study of psychological theory and practice, supported by an appropriate selection of other subjects. The course is available on a full-time basis only. Entry into the course is subject to a quota which is determined from time to time.

In the fourth year, students undertake a program of study which includes courses in the major areas of general psychology and in a number of applied fields. In addition, each student must complete either a research thesis or a group research project.

Details of the qualifications required for admission to the Psychology Course leading to the award of BSc(Psychol), the course requirements for Pass and Honours at graduation and rules governing admission with advanced standing are given below.

Rules governing the Psychology Course

1. Applicants for admission to the Course must be matriculated to this University; and also have satisfied either the entrance requirements for 10.001 Mathematics 1 or 10.021B General Mathematics 1B and 10.021C General Mathematics 1C or for 17.031 Biology A and 17.041 Biology B.

2. (1) In order to qualify for admission to the award of degree of BSc(Psychol) under these regulations a candidate must attend classes and satisfy the examiners in the following subjects:

(a) Each of:
   12.100 Psychology 1
   12.200 Research Methods 2
   12.201 Biological Basis of Psychology 2
   12.202 Social and Cognitive Psychology 2
   12.203 Psychology 2A

   A total of 8 Level III units of Psychology including 12.300 and 12.305 from Group A (see Table 1). Additionally, students intending to take the thesis alternative in Psychology Level IV Honours are required to include 12.301 Research Methods 3B from Group B (see Table 1).

   (In special cases, the Head of the School of Psychology or his representative may approve of the substitution of some other appropriate course or equivalent units.)

and either

   12.400 Psychology 4 (Thesis — Course 3431) or 12.401 Psychology 4 (Course 3431) leading to the award of the degree of Bachelor of Science (Psychology).

(b) Five other subjects (or their equivalent in units) selected to meet the following requirements:

   (i) that they shall include at least one of:
   10.011 Higher Mathematics 1 or
   10.001 Mathematics 1 or
   10.021B General Mathematics 1B and 10.021C General Mathematics 1C
   or
   17.031 Biology A and
   17.041 Biology B.

   (They may include both the above alternatives.)
(ii) that they shall include at least one of:

53.001 Introduction to Sociology or
15.001 Microeconomics 1 and 15.011 Macroeconomics 1 or Political Science 1 (select two of 54.1003 Australian Political Institutions, 54.1004 Government in the Modern World and 54.1005 A History of Political Thought) or
52.103 Introductory Philosophy A and 52.104 Introductory Philosophy B.

or

with the approval of the Head of the School of Psychology, one other Arts I subject.

(iii) that they shall include at least one subject (two Science and Mathematics Level II units or twelve Arts Upper Level credit points are equivalent to one Level II subject) which together with the subject meeting the requirements of (i) or (ii) immediately above constitutes a recognized sequence of two courses.

Examples of recognized sequences are:

- 10.001 Mathematics 1, followed by two Mathematics Level II units (chosen from 10.111A, 10.1113, 10.1114, 10.2111 and 10.2112) or by both of 10.311A Probability and Random Variables and 10.311B Basic Inference;
- 17.031 Biology A and 17.041 Biology B followed by two Level II units chosen from the following units according to the regulations of the Board of Studies in Science and Mathematics:
  41.101 Biochemistry (equivalent to 2 units)
  45.101 Biometry
  45.301 Vertebrate Zoology
  68.601 Genetics of Behaviour 1
  68.602 Genetics of Behaviour 2
  73.121 Physiology 1B (equivalent to 2 units)
- 53.001 Introduction to Sociology followed by twelve credit points value of Sociology Upper Level subjects
  15.001 Microeconomics 1 and 15.011 Macroeconomics 1 followed by twelve credit points value of Economics Upper Level subjects
  Political Science 1 followed by twelve credit points value of Political Science Upper Level subjects
  52.103 Introductory Philosophy A and 52.104 Introductory Philosophy B followed by twelve credit points value of Philosophy Upper Level subjects

(2) The proposed course must be approved by the Head of the School of Psychology or his representative prior to or during enrolment. The courses must be chosen in such a way as to fit in with the timetable.

(3) Progression in the Course shall be by subjects, and the subjects in the Course may be completed in any order consistent with the requirements concerning prerequisites and corequisites for the subjects chosen.

3. Prerequisites and Co-requisites

Before enrolling in any course (or equivalent units of a subject) the student shall have attended the classes and shall have satisfied the examiners in all relevant prerequisite subjects.

The student should refer to the appropriate Faculty Handbook for a statement of subject prerequisites and/or co-requisites.

4. The degree of BSc(Psychol) will be awarded at either Pass level or with Honours, after a minimum of four years of full-time study.

Rules governing admission to the Psychology Course with advanced standing

1. Graduates of the University of New South Wales may be admitted to the Psychology Course leading to the award of the degree of BSc(Psychol) 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 of the University of New South Wales who transfer from another course to the Psychology Course may be admitted to the Psychology Course with exemption in no more than seven Psychology Course subjects or their unit equivalents.

3. Graduates or undergraduates of other universities may be admitted to the Psychology Course with advanced standing.

4. Students admitted under Rule 3 who have satisfied the examiners in subjects of the same title or subject matter as those permissible in the Psychology Course may, subject to the approval of the appropriate Heads of School, be granted exemption in no more than five subjects, of which no more than two may be Psychology subjects.

Recommended Psychology Course patterns

The course requirements have been so designed that they allow for:

1. a solid core of psychology to equip the psychologist-in-training with psychological theory, skill in experimentation and psychological techniques;

2. supporting studies in mathematics and/or biology (a minimum of one such course is compulsory);

3. supporting studies in the social sciences (a minimum of one such course is compulsory); and

Scientific Sciences
For these reasons, no course patterns are prescribed. The patterns to be completed by students who are admitted with advanced standing will take into account the subjects credited. Students commencing university studies for the first time will arrange their pattern of supporting subjects in consultation with the Head of the School or his representative before completing enrolment.

In Year 1, students must take four subjects which include 12.100, either Biology 1 or a first-year Mathematics, one of Economics 1, Sociology 1, Philosophy 1 or Political Science 1 or one other Arts 1 subject, and a fourth subject. (It should be noted that the University has arranged these subjects so that there is no clash of timetables. If other subjects are taken, care must be taken to check that there is no timetable clash in the program that is chosen.)

In Year 2 students take 12.200, 12.201, 12.202, 12.203, a second-year follow on subject from one of the non-Psychology subjects completed in Year 1, and one other Level I, II or III non-Psychology subject. Eight Level III units of Psychology are taken in Year 3, while Year 4 consists of either 12.400 or 12.401 only.

Some examples of patterns, based on different supporting subjects are suggested below:

**Compulsory Psychology Subjects**

**Year 1**
12.100

**Year 2**
12.200, 12.201, 12.202, 12.203

**Year 3**
8 Psychology Level III units including 12.300 and 12.305 from Group A. Additionally, if intending to take the thesis alternative in Psychology 4 12.301 must be taken from Group B.

**Year 4**
*Either* 12.400 or 12.401

With Pure Mathematics or Statistics as the main supporting subject

**Year 1**
10.001 Mathematics 1
A Level I Social Science subject, *and*
One other Level I subject

**Year 2**
*Either* two units of Level II Pure and Applied Mathematics, or 10.311A and 10.311B Theory of Statistics Level II, *and*
One other Level I or II subject

With Biochemistry or Physiology as the main supporting subject

**Year 1**
2.121 Chemistry 1A and 2.131 Chemistry 1B
*Either* 10.001 Mathematics 1, or 10.021B General Mathematics 1B and 10.021C General Mathematics 1C, *and*
17.031 Biology A and 17.041 Biology B

**Year 2**
A Level I Social Science subject, *and*
*Either* 41.101 Biochemistry, or 73.121 Physiology 1B

With Zoology or Genetics as the main supporting subject

**Year 1**
10.001 Mathematics 1, or 10.021B General Mathematics 1B and 10.021 General Mathematics 1C
17.031 Biology A and 17.041 Biology B, *and*
A Level I Social Science subject

**Year 2**
*Either* 45.101 Biometry, 45.201 Invertebrate Zoology, 45.301 Vertebrate Zoology and one other unit for Zoology, or 68.601 Genetics of Behaviour 1, 68.602 Genetics of Behaviour 2 and two other units for Genetics

With Social Sciences as the main supporting subject

**Year 1**
10.001 Mathematics 1, or 10.021B General Mathematics 1B and 10.021C General Mathematics 1C, *or*
17.031 Biology A and 17.041 Biology B
A Level I Social Science subject, *and*
One other Level I subject

**Year 2**
An Upper Level Social Sciences subject, *and*
One other Level I or II subject

Notes: 1. For details of Psychology units, and Science and Mathematics units, including pre- and co-requisites, refer to Table 1 of the Science and Mathematics Course details set out earlier in this handbook.
2. For details of Social Science (Arts) subjects, including pre- and co-requisites, refer to the Faculty of Arts Handbook.
Undergraduate Study: Faculty of Science
Faculty of Science

Introduction

The Schools of the Faculty of Science contribute programs to the Science and Mathematics Course (3970) and the Faculty supervises the undergraduate courses in Optometry (3950) and the graduate diploma course Food and Drug Analysis (5510). The Schools of the Faculty also offer facilities for students to proceed to masters degrees in Chemistry (8770), Mathematics (8740), Optometry (8760), Physics (8730), Statistics (8750) and Master of Science and Society (8780), to the award of masters degrees by research and to the award of the degree of Doctor of Philosophy.

Students requiring information about the undergraduate course should contact the representative of the appropriate School:
School of Chemistry ................................................................. Dr D. S. Alderdice
School of Optometry ................................................................. Dr J. A. Alexander

Students requiring information about the graduate studies which are available should seek advice from:
Graduate Diploma in Food and Drug Analysis ............................ Associate Professor G. Crank

or in the case of masters and doctors degrees from:
School of Chemistry ...................................................................... Professor P. S. Clezy
School of Mathematics .................................................................. Associate Professor W. E. Smith
School of Optometry ..................................................................... Professor H. B. Collin
School of Physics ......................................................................... Professor H. G. L. Coster
### Optometry Course

The School of Optometry 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. The first year of the course involves a study in the fundamental sciences of physics, chemistry, mathematics and biology. Students who have completed the first year of a science course including physics, chemistry, mathematics and general and human biology or zoology at any Australian university are eligible for selection for admission to the second year of the course. Second, third and fourth years are devoted to professional training in optometry including clinical optometry in the final year.

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Hours per week</th>
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<tbody>
<tr>
<td>1.001</td>
<td>6</td>
</tr>
<tr>
<td>2.121</td>
<td>Chemistry 1A and</td>
</tr>
<tr>
<td>2.131</td>
<td>Chemistry 1B or</td>
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<tr>
<td>2.141</td>
<td>Chemistry 1M</td>
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<td>Mathematics 1 or</td>
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<td>10.011</td>
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<tr>
<td>10.021B</td>
<td>General Mathematics 1B and</td>
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<tr>
<td>10.021C</td>
<td>General Mathematics 1C</td>
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<tr>
<td>17.031</td>
<td>Biology A and</td>
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<tr>
<td>17.041</td>
<td>Biology B</td>
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</tbody>
</table>

In special cases, students who do not meet the prerequisites for admission to 2.121 Chemistry 1A may be enrolled in 2.111 Introductory Chemistry in Session 1, 2.121 Chemistry 1A in Session 2 and be permitted to carry 2.131 Chemistry 1B into Session 1 of Year 2.

<table>
<thead>
<tr>
<th>Year 2</th>
<th></th>
<th>S1</th>
<th>S2</th>
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<tbody>
<tr>
<td>31.851</td>
<td>Optics</td>
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<td>31.852</td>
<td>Visual Optics</td>
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<td>3</td>
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<tr>
<td>31.853</td>
<td>Measurement of Light and Colour</td>
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<td>2</td>
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<tr>
<td>31.821</td>
<td>Anatomy and Physiology of the Eye and Visual System</td>
<td>6</td>
<td>7</td>
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<tr>
<td>73.011A</td>
<td>Principles of Physiology</td>
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<td>6</td>
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<tr>
<td>12.100</td>
<td>Psychology</td>
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<td>31.861</td>
<td>Optometry A</td>
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<tr>
<td>31.862</td>
<td>Diagnosis and Management of Ocular Disease</td>
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<tr>
<td>31.863</td>
<td>Theory of Spectacle Lenses and Optical Instruments</td>
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<tr>
<td>31.864</td>
<td>Clinical Methods</td>
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<td></td>
<td>Two General Studies Electives</td>
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<th>Year 4</th>
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<td>12.471</td>
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<td>31.841</td>
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<td>71.001</td>
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<tr>
<td></td>
<td>Total</td>
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</tbody>
</table>
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Combined Science/Optometry Course

Conditions for the combined course leading to the award of the degrees of BSc BOptom in the Faculty of Science

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. a person may be admitted under these rules if he or she has 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.
Undergraduate Study: Subject Descriptions

Identification of Subjects by Number

A subject is defined by the Professorial Board as ‘a unit of instruction approved by the University as being a discrete part of the requirements for a course offered by the University’.

Each approved subject of the University is identifiable both by number and by name as this is a check against nomination of subject other than the one intended.

Subject numbers are allocated by the Registrar and the system of allocation is based on the following guidelines:

1. The authority offering the subject, normally a School of the University, is indicated by the number before the decimal point.
2. Each subject number is unique and is not used for more than one subject title.
3. Subject numbers which have not been used for some time are not used for new subject titles.
4. Graduate subjects are indicated by a suffix ‘G’ to a number with three digits after the decimal point. In other subjects three or four digits are used after the decimal point.

Subjects taught are listed in full in the handbook of the faculty or board of studies responsible to the particular course within which the subjects are taken. Subject descriptions are contained in the appropriate section in the handbooks.

The identifying numerical prefixes for each subject authority are set out below.

Servicing Subjects are those taught by a school or department outside its own faculty, and are published at the end of the entry for the relevant school. Their subject descriptions are also published in the handbook of the faculty in which the subject is taught.

HSC Exam Prerequisites

Subjects which require prerequisites for enrolment in terms of the HSC Examination percentile range refer to the 1978 and subsequent Examinations.

Candidates for enrolment who obtained the HSC in previous years or hold other high school matriculation should check with the appropriate school on what matriculation status is required for admission to a subject.

Information Key

The following is the key to the information which may be supplied about each subject:

The following is the key to the information which may be supplied about each subject:

• S1 (Session 1); S2 (Session 2)
• F (Session 1 plus Session 2, ie full year)
• S1 or S2 (Session 1 or Session 2, ie choice of either session)
• SS (single session, but which session taught is not known at time of publication)
• CCH class contact hours
• L (Lecture, followed by hours per week)
• T (Laboratory/Tutorial, followed by hours per week)
• hpw (hours per week)
• C (Credit or Credit units)
• CR (Credit Level)
• DN (Distinction Level)
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<tr>
<th>School, Department etc</th>
<th>Faculty</th>
<th>Page</th>
</tr>
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<tbody>
<tr>
<td>School of Physics</td>
<td>Science</td>
<td>119</td>
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<tr>
<td>School of Chemistry</td>
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<tr>
<td>School of Materials</td>
<td>Applied Science</td>
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</tr>
<tr>
<td>School of Mechanical and Industrial Engineering*</td>
<td>Engineering</td>
<td>129</td>
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<tr>
<td>School of Electrical Engineering and Computer Science*</td>
<td>Engineering</td>
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<tr>
<td>School of Mines (Mineral Processing and Extractive Metallurgy and Mining Engineering)</td>
<td>Applied Science</td>
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<tr>
<td>School of Civil Engineering</td>
<td>Engineering</td>
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<tr>
<td>School of Fibre Science and Technology (Wool Science)</td>
<td>Applied Science</td>
<td>149</td>
</tr>
<tr>
<td>School of Mathematics</td>
<td>Science</td>
<td>156</td>
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<tr>
<td>School of Architecture</td>
<td>Architecture</td>
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<tr>
<td>School of Psychology</td>
<td>Biological Sciences</td>
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<tr>
<td>School of Fibre Science and Technology (Textile Technology)</td>
<td>Applied Science</td>
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<tr>
<td>School of Accountancy*</td>
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<td>School of Economics*</td>
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<tr>
<td>School of Health Administration</td>
<td>Professional Studies</td>
<td>162</td>
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<tr>
<td>School of Optometry</td>
<td>Science</td>
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<tr>
<td>School of Optometry</td>
<td>Engineering</td>
<td>164</td>
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<tr>
<td>School of Mines (Applied Geology)*</td>
<td>Applied Science</td>
<td>165</td>
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<tr>
<td>School of Pharmacology*</td>
<td>Professional Studies</td>
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<td>School of Botany</td>
<td>Biological Sciences</td>
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<tr>
<td>School of Microbiology</td>
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<tr>
<td>School of Zoology</td>
<td>Biological Sciences</td>
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<tr>
<td>Faculty of Philosophy*</td>
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<td>School of Philosophy*</td>
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<tr>
<td>School of Sociology*</td>
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<td>School of Political Science</td>
<td>Arts</td>
<td>173</td>
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<tr>
<td>School of English</td>
<td>Arts</td>
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<tr>
<td>School of History</td>
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<tr>
<td>School of Physical Therapy*</td>
<td>Arts</td>
<td>176</td>
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<tr>
<td>School of Sociology*</td>
<td>Arts</td>
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<tr>
<td>School of Social Work</td>
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<td>School of German Studies</td>
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<tr>
<td>School of Spanish and Latin American Studies</td>
<td>Arts</td>
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<tr>
<td>Subjects Available from Other Universities</td>
<td>Science</td>
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<td>Faculty of Science</td>
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<td>Board of Studies in Science and Mathematics</td>
<td>Science</td>
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<tr>
<td>School of Anatomy*</td>
<td>Medicine</td>
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<td>School of Medicine</td>
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<tr>
<td>School of Pathology*</td>
<td>Medicine</td>
<td>186</td>
</tr>
<tr>
<td>School of Physiology and Pharmacology*</td>
<td>Medicine</td>
<td>187</td>
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<tr>
<td>School of Surgery</td>
<td>Medicine</td>
<td>188</td>
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<tr>
<td>School of Obstetrics and Gynaecology</td>
<td>Medicine</td>
<td>189</td>
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<tr>
<td>School of Paediatrics</td>
<td>Medicine</td>
<td>190</td>
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<tr>
<td>School of Psychiatry</td>
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<tr>
<td>School of Medical Education</td>
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<tr>
<td>School of Community Medicine*</td>
<td>Medicine</td>
<td>193</td>
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<tr>
<td>Faculty of Medicine*</td>
<td>Medicine</td>
<td>194</td>
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<tr>
<td>Medicine/Science/Biological Sciences</td>
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<td>Australian Graduate School of Management</td>
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<tr>
<td>Faculty of Law</td>
<td>Law</td>
<td>197</td>
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</tbody>
</table>
Physics Level I Units

1.001 Physics 1

Prerequisites: 2 unit Mathematics or 3 unit Mathematics or 4 unit Mathematics and (for 1.001 only) 10.021B

2 unit Science (Physics) or 2 unit Science (Chemistry) or 4 unit Science (Multistrand)

Co-requisite: 10.021C or 10.001 or 10.011.

Aims and nature of physics and the study of motion of particles under the influence of mechanical, electrical, magnetic and gravitational forces. Concepts of force, inertial mass, energy, momentum, charge, potential, fields. Application of the conservation principles to solution of problems involving charge, energy and momentum. Electrical circuit theory, application of Kirchhoff's laws to AC and DC circuits. Uniform circular motion, Kepler's laws and rotational mechanics. Properties of matter: solids, liquids, gases. The wave theories of physics, transfer of energy by waves, properties of waves. Application of wave theories to optical and acoustical phenomena such as interference, diffraction and polarization.

1.021 Introductory Physics 1 (For Health and Life Scientists)

(MS L3T3)

Prerequisites: None. Co-requisites: 10.021A and 10.021B, or 10.021B and 10.021C, or 10.001 or 10.011.

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.

1.041 Laboratory Computers in Physical Sciences

Prerequisites: As for 1.001. Co-requisite: 10.001, and 1.021 or 1.001 or 1.011. Excluded: Programs 0601, 0610 and 0611, 6806.

Fundamentals of binary logic, binary arithmetic, arithmetic operations as logical algorithms. Electronic logic devices, principles of computer operation, microprocessors and microcomputer architecture. Machine language and BASIC programming in microcomputers. Fundamentals of real world interfacing techniques, flow of data and control across the interface. Mathematical modelling of the real world in BASIC, iteration and simulation techniques, laboratory experiments collecting real world data via an interface and analysing it in the microcomputer. The developing role of the laboratory computer in scientific research.

1.061 Computer Applications in Experimental Science 1

Prerequisites: 6.611. Co-requisite: 1.001, 10.001 or 10.011. Excluded: 1.041, 1.042.

Review of binary logic variables, arithmetic operations as logical algorithms on binary variables, computer architecture and machine language instruction sets. Microprocessor and microcomputer architecture; Apple II microcomputer architecture, disc operating system, graphics, languages. Computer modelling of real physical systems iterative techniques. Fundamentals of interfacing, data and control flow across the interface. Transducers, encoding. Data collection techniques used in experimental sciences. Laboratory experiments involving direct data collection via interfaces, data reduction and comparison with computer models. The developing role of the laboratory computer in experimental science.

Physics Level II Units

1.002 Mechanics, Waves and Optics

Prerequisites: 1.001 or 1.011, 10.001 or 10.011. Co-requisite: 10.2111. Excluded: 1.992, 10.4111, 10.4211.

Harmonic motion, systems of particles, central force problems, Lagrange's equations, coupled oscillations, travelling waves, pulses, energy and momentum transfer, polarization, birefringence, interference, thin films, gratings, lasers, holography, fibre optics, Faraday effect, photoelasticity.

1.012 Electromagnetism and Thermal Physics

Prerequisites: 1.001 or 1.011, 10.001 or 10.011. Co-requisite: 10.2111. Excluded: 1.972, 1.992.

Electric field strength and potential, Gauss' law, Poisson's and Laplace's equations, capacitance, dielectrics and polarization, 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.
1.022 Modern Physics
Prerequisites: 1.001 or 1.011, 10.001 or 10.011. Co-requisite: 10.2112. Excluded: 1.9322, 1.982.

Special theory of relativity: time dilation, length contraction, simultaneity, Lorentz transformations, energy and mass. Photon properties, de Broglie relations, Uncertainty principle, operators in quantum mechanics, postulates of quantum mechanics, potential wells, steps and barriers, harmonic oscillator, H atom, angular momentum, magnetic moment, electron spin, nuclear spin. Atomic and molecular spectra, lasers, quantum statistics, free electron model of a metal, band theory; nuclear size, density, mass; nuclear models, fission and fusion, nuclear forces.

1.032 Laboratory
Prerequisites: 1.001 or 1.011, 10.001. Excluded: 1.9222.

Alternating current circuits, complex impedance, resonance, mutual inductance, introductory electronics, diode and characteristics and circuits, power supplies, transistor characteristics, single stage and coupled amplifiers, experiments using AC circuits. Experimental investigations in a choice of areas including radioactivity, spectroscopy, properties of materials, Hall effect, nuclear magnetic resonance, photography, vacuum systems.

1.0522 Methods in Mathematical Physics
Prerequisites: 1.001, and 10.001 or 10.011. Co-requisites: 10.2111 or 10.2211.

Not offered in 1987.


1.062 Computer Applications in Experimental Science 2
Prerequisite: 1.061. Excluded: 1.042.

Interface between computer and experiment, programmed and interrupt interaction, direct and dual port memory access concepts, hardware, software and timing restraints. Real-world variables, transducers and conversion to binary representation, converters and counters, signals and noise. Data collection, reduction and storage as digital matrices. Numerical modelling, analysis and elementary control of a system.

1.9222 Electronics
Prerequisites: 1.001 or 1.001 or 1.021. Excluded: 1.032.

The application of electronics to other disciplines. Includes: principles of circuit theory and analogue computing; amplifiers, their specification and application, transducers; electronic instrumentation; industrial data acquisition.

1.9322 Introduction to Solids
Prerequisites: 1.001 or 1.011 or 1.021. Excluded: 1.022, 4.402, 4.412.

Introductory quantum mechanics and atomic physics; crystal structure; point and line defects; introductory band theory; conductors, semi-conductor and insulators; energy level diagrams.

1.9422 Introduction to Physics of Measurement
Prerequisites: 1.001 or 1.011. Excluded: 1.042.

Resolution; accuracy and sensitivity of instruments, errors of observation; experimental design, transducers; thermometry; electrical noise; servo systems; mechanical design of apparatus; optical instruments; optical fibres; photometry; calorimetry; analogue to digital conversion and digital instruments; measurement of very large and very small quantities.

Physics Level III Units

1.0133 Quantum Mechanics
Prerequisites: 1.022, 10.2112. Excluded: 2.023A, 10.222F.

Revision of basic concepts, harmonic oscillator systems, spherically symmetric systems, angular momentum, H atom, first-order perturbation theory, identical particles, Exclusion Principle, atomic structure, spin-orbit coupling. Helium atom, introductory quantum theory of molecules.

1.0143 Nuclear Physics
Co-requisite: 1.0133.

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.

1.023 Statistical Mechanics and Solid State Physics
Prerequisites: 1.012, 1.022, 10.2112.

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.

1.0333 Electromagnetism
Prerequisites: 1.012, 10.2111, 10.2112. Excluded: 10.222C.

Electromagnetic fields; Maxwell’s equations, Poynting theorem, electromagnetic potentials, electromagnetic waves. Reflection and transmission, Fresnel equations, waveguides, radiation fields, dipoles and antenna theory.
1.0343 Advanced Optics
Co-requisite: 1.002.
Fresnel and Fraunhofer diffraction, Fourier transforms, filtering, coherence length and time, stellar interferometers, laser theory, non-linear optics.

1.043 Experimental Physics A
Prerequisite: 1.032.
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).

1.0533 Experimental Physics B1
Prerequisite: 1.032.
Selected experiments and projects. Advanced experimental techniques and open ended projects in the areas covered in 1.043 Experimental Physics A together with projects involving electron and nuclear magnetic resonances, low temperature physics and super-conductivity. Fourier optics, holography.

1.0543 Experimental Physics B2
Prerequisite: 1.032.
As for 1.0533 Experimental Physics B1.

1.1133 Advanced Quantum Mechanics
Formal structure, matrix formalism, relativistic quantum mechanics, spin, scattering theory, Born approximation, phase shifts, many particle systems, occupation number formalism.

1.133 Electronics
Prerequisites: 1.922 or 1.032.

1.1433 Biophysics
Prerequisites: 1.012, 1.022.

1.1533 Biophysical Techniques
Prerequisites: 1.012, 1.022, 1.032.
Theory and application of physical techniques of relevance to the study of biological systems. Techniques considered may include optical and electron microscopy X-ray and neutron diffraction, magnetic resonance, lasers, light scattering, calorimetry, fluorescence, electrochemical techniques and electrophysiological methods and dielectric measurements.

1.1633 Astrophysics
Prerequisites: 1.022.

1.3033 Mechanical Properties of Materials
Properties of materials in relation to their structure: atomic and molecular structure of solids; elasticity, inelasticity, long-range (rubber) elasticity, viscoelasticity; plasticity; brittle fracture; viscosity and surface tension of liquids; adhesion; friction and lubrication.

1.3133 Physics of Solid State Devices
Prerequisite: 1.023.
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.

1.3143 Topics in Condensed Matter Physics
Prerequisite: 1.023.
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.

1.3533 Marine Acoustics
Offered in odd-numbered years only.
Wave theory: general wave equation for fluids, viscoelastic media and solids. Travelling and standing wave solutions. Wave guides: fluid and solid wave guides, ray and mode theories. Sound transmission in the ocean and application of reflection and refraction theory, scattering and diffraction effects.
1.5133 Classical Mechanics and Field Theory
Prerequisites: 1.002 or 10.411B, 10.1113, 10.2111, 10.2112.
Lagrange's equations and applications, variational principles, Hamiltonian formulation, canonical transformations, Poisson brackets, Hamilton-Jacobi equation, continuous systems and fields.

1.5233 Electrodynamics
Prerequisites: 1.022, 1.0113, 10.2111, 10.2112. Co-requisite: 1.0333. Excluded: 10.222C.
Special relativity, covariant formulation of electrodynamics, stress tensor, radiation from moving charges, Lienard-Wiechert potentials, synchrotron radiation, bremsstrahlung, electro-magnetic mass, radiative damping, multipole expansion for fields, scattering.

1.5333 Radiation and Matter
Prerequisites: 1.012, 1.022, 10.2111, 10.2112. Co-requisites: 1.0133 or 10.222F or 2.023A, 1.0333 or 10.222C.

1.5433 Plasmas and Laser Fusion
Prerequisites: 1.012, 1.022.
Microscopic and macroscopic descriptions of plasma, electromagnetic waves in plasma, stress tensor, ponderomotive force, laser-plasma interactions, momentum transfer and instabilities, non-linear force, self-focussing mechanisms, laser induced nuclear fusion, theoretical and experimental progress and prospects.

1.5533 General Relativity
Prerequisites: 1.012, 1.022, 10.1113, 10.2111, 10.2112. Excluded: 1.523.
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.

1.713 Advanced Laser and Optical Applications
Co-requisite: 1.002. See also Table 1.
Laser operation, characteristics, theory, design of such types as gas, ion, molecular, eximer and dye lasers. Filter design, multiple beam interference, etalon use, dielectric mirror design. Modulators, theory and application, electro and acousto optic phenomena. Detectors, types, basic theory and design. Solid state and vacuum tube systems. Non-linear optics, theory and applications. A design study and case history of a typical optical system. Materials processing fundamentals. Laser safety.

1.763 Laser and Optical Technology Laboratory 1
Prerequisite: 1.032. See also Table 1.
Aims to make students conversant with the techniques employed in advanced laser technology and to become familiar with the various components used in such applications. Includes: a study of advanced optical techniques including the construction, operation and characterization of various types of laser; preparation and investigation of optical, electro-optical and other related devices in terms of their basic behaviour and with respect to applications in complex optical systems; a small lecture content on a variety of topics relating to laser applications and including safety aspects.

1.773 Laser and Optical Technology Laboratory 2
Co-requisite: 1.763. See also Table 1.
This laboratory unit extends the work of the 1.763 unit in providing further experience with advanced optical systems. Students visit external establishments where lasers are being used for commercial purposes and are involved with experimental tasks related to these high technology applications. Session 2: each student is required to complete a design study and assembly of an advanced optical system selected to answer a specific problem appropriate to the subject.

Physics Level IV Subjects
All Physics honours subjects consist of lecture topics and project work. Some of the lecture topics of which quantum mechanics, statistical mechanics and solid state physics are examples, are taken by all students. Other topics which are considered particularly relevant to the type of honours chosen are also prescribed. The actual list of topics in this second category varies from time to time and is partly influenced by student numbers and interest. Examples of such topics are given below under each honours subject heading. The project work forms a very significant part of each unit. Usually two projects are undertaken during the year of study.

Students whose academic records are satisfactory are invited to enrol in the honours year. Full details of lecture topics and projects are then supplied. The approval of the Head of School is required for each program of study.

1.104 Physics 4 (Honours)
Examples of specific lecture topics which may be offered include: astronomy, additional topics in solid state physics, lasers, biophysics.

1.304 Applied Physics (Honours)
Examples of specific lecture topics which may be offered include: physical principles of instrumentation, applied solid state physics, physics of materials.
1.504 Theoretical Physics 4 (Honours)

Examples of specific lecture topics which may be offered include: quantum theory of solids, plasma theory, quantum electrodynamics.

1.604 Biophysics 4 (Honours)

Biophysics, statistical mechanics and solid state physics are examples of prescribed topics. Additional lecture topics may be selected from those on offer in other Physics honours units and from Biochemistry and Physiology.

Servicing Subjects

These are subjects taught within courses offered by other faculties.

For further information regarding the following subject see the Faculty of Arts Handbook.

1.901 Astronomy  S1 or S2 L2T2

Involves an overview of Astronomy, from the solar system to the galaxies. Includes an exploration of the solar system, to indicate the advances that have been made, particularly and most recently with space probes, in our understanding of planetary systems. The characteristics of stars discussed along with their use in establishing an understanding of stellar evolution. The treatment of galaxies includes consideration of the nature of our galaxy and its relation to other external systems, concluding with a brief discussion of aspects of observational cosmology. Discussion of such recent topics as black holes, pulsars, quasars.

For further information regarding the following subject see the Faculty of Architecture Handbook.

1.931 Physics 1 (Building)  S2 L4T2

4 credit points; compulsory. Prerequisites: nil.


For further information regarding the following subjects see the Faculty of Engineering Handbook.

1.951 Physics 1 (Mechanical Engineering)  F L2T2

Prerequisites: As for 1.001 Physics 1.

For students in the School of Mechanical and Industrial Engineering.


1.961 Physics 1 (Electrical Engineering)  F L3T3

Prerequisite: As for 1.001 Physics 1.

For students in the School of Electrical Engineering.

Electrostatics in vacuum, electrostatics in dielectrics, steady state currents, magnetostatics in vacuum, ferromagnetism, electromagnetic induction, transient currents. Vectors, motion in one dimension, motion in a plane, particle dynamics, work and energy, the conservation of energy, conservation of linear momentum, collisions, rotational kinematics, rotational dynamics, simple harmonic motion, gravitation. Temperature, heat and the first law of thermodynamics, kinetic theory of gases. Waves in elastic media, sound waves, geometrical optics, interference, diffraction, gratings and spectra, polarization.

1.971 Physics 1 (Surveying)  F L3T3

Prerequisite: As for 1.001 Physics 1.

For students in the School of Surveying.

Aims and nature of physics, linear and rotational mechanics, hydrostatics, elasticity, gravitation, temperature, electricity and magnetism, wave motion, optical instruments, interference and diffraction, lasers and atomic clocks. The importance in surveying of precise frequency, time, speed and distance measurements.

1.981 Physics 1 (Civil Engineering)  S1 L2T2 and S2 L2T1

Prerequisite: As for 1.001 Physics 1.

For students in the School of Civil Engineering.

1.962 Physics of Measurement (Surveying)  
Prerequisite: 1.971.

For students in the School of Surveying.


1.972 Electromagnetism (Electrical Engineering)  
Prerequisite: 1.961 or 1.001 or 1.011, 10.001. Co-requisites: 10.2111, 10.2112. Excluded: 1.012.

Electrostatics in vacuum, electrostatics in dielectrics, electric currents, magnetostatics in vacuum, magnetic scalar potential, magnetostatics in magnetic media, time varying fields, Maxwell’s equations.

1.982 Solid State Physics (Electrical Engineering)  
Prerequisite: 1.961 or 1.001 or 1.011, 10.001. Co-requisites: 10.2111, 10.2112. Excluded: 1.022, 1.9322.

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.

1.992 Mechanics and Thermal Physics (Electrical Engineering)  

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.

**Chemistry Level I Units**

2.111 Introductory Chemistry  
Prerequisite: Nil.

Note: Students who have passed 2.121 or 2.131 may not enrol in 2.111 or 2.141. Students meeting the 2.121 or 2.141 prerequisite are not permitted to enrol in 2.111 without the permission of the Head of the School of Chemistry. Students who enrol in 2.111 must pass 2.111 before they can proceed to 2.121 or 2.131 or 2.141.

Classification of matter and the language of chemistry. The gas laws and the ideal gas equation, gas mixtures and partial pressure. The structure of atoms, cations and anions, chemical bonding, properties of ionic and covalent compounds. The periodic classification of elements, oxides, hydrides, halides and selected elements. Acids, bases, salts, neutralization. Stoichiometry, the mole concept. Electron transfer reactions. Qualitative treatment of reversibility and chemical equilibrium, the pH scale. Introduction to the diversity of carbon compounds.

2.121 Chemistry 1A  
Prerequisites:

2 unit Mathematics* or
3 unit Mathematics or
4 unit Mathematics
and
2 unit Science (Physics) or
2 unit Science (Chemistry) or
4 unit Science or
3 unit Science or
2.111.

*This refers to the 2 Unit Mathematics subject which is related to the 3 Unit Mathematics subject. It does not refer to the subject 2 Unit Mathematics (Mathematics in Society).


Note: Students who have passed 2.121 or 2.131 may not enrol in 2.111 or 2.141. Students meeting the 2.121 or 2.141 prerequisite are not permitted to enrol in 2.111 without the permission of the Head of the School of Chemistry. Students who enrol in 2.111 must pass 2.111 before they can proceed to 2.121 or 2.131 or 2.141.
2.131 Chemistry IB

Prerequisite: 2.121.

Chemical equilibrium, equilibrium constants, quantitative calculations applied to acid-base and solubility equilibria; buffers, titrations, chemical analysis. Oxidation and reduction reactions, electrode potentials. Chemical thermodynamics, entropy, free energy. Chemistry of carbon compounds, stereoisomerism; alkanes, alkenes, alkynes, aromatic compounds, alcohols, ethers, aldehydes, ketones, carboxylic acids and their derivatives, amines.

Note: Students who have passed 2.111 may be permitted to enrol in 2.131 on application to the Head of the School of Chemistry.

2.141 Chemistry 1M

Prerequisites:

HSC Exam
Percentile Range
Required

2 unit Mathematics
71-100

3 unit Mathematics
21-100

4 unit Mathematics
1-100

and

2 unit Science (Chemistry) or
51-100

4 unit Science or
51-100

3 unit Science
or
51-100

2.111

*This refers to the 2 Unit Mathematics subject which is related to the 3 Unit Mathematics subject. It does not refer to the subject 2 Unit Mathematics (Mathematics in Society).

Note: As for Note, 2.121 Chemistry 1A.

The syllabus is an integrated one of 2.121 and 2.131 (see above). Students majoring in Chemistry may take 2.141 in lieu of 2.121 and 2.131.

Chemistry Level II Units

2.102A Physical Chemistry

Prerequisites: 2.121 and 2.131, or 2.141; and 10.011 or 10.001 or 10.021B and 10.021C. Excluded: 2.002A.

Thermodynamics: first, second and third laws of thermodynamics; statistical mechanical treatment of thermodynamic properties; applications of thermodynamics: chemical equilibria, phase equilibria, solutions of nonelectrolytes and electrolytes, electrochemical cells. Kinetics: order and molecularity; effect of temperature on reaction rates; elementary reaction rate theory. Surface chemistry and colloids: adsorption, properties of dispersions; macromolecules and association colloids.

Chemistry Level III Units

2.102B Organic Chemistry

Prerequisite: 2.131 or 2.141. Excluded: 2.002B

Discussion of the major types of organic reaction mechanisms (eg addition, substitution, elimination, free-radical, molecular rearrangement) within context of important functional groups (eg aliphatic hydrocarbons, monocyclic aromatic hydrocarbons, halides, organometallic compounds, alcohols, phenols, aldehydes, ketones, ethers, carboxylic acids and their derivatives, nitro compounds, amines and sulfonic acids). Introduction to application of spectroscopic methods to structure determination.

2.102C Inorganic Chemistry and Structure

Prerequisites: 2.121 and 2.131, or 2.141. Excluded: 2.042C.


2.102D Chemical and Spectroscopic Analysis

Prerequisites: 2.121 and 2.131, or 2.141; and 10.011 or 10.001 or 10.021B and 10.021C. Excluded: 2.002D and 2.003H.


Core Units

2.103A Physical Chemistry

Prerequisites: 1.001, 2.102A and 2.102C. Excluded: 2.013A.

2.103B Organic Chemistry

Prerequisite: 2.102B. Excluded: 2.003B.

Heterocyclic Chemistry: synthesis and reactions of the following heteroaromatic systems; pyridine, quinoline, isoquinoline, pyrimidine, pyrrole, furan, thiophen, indole, imidazole; examples of naturally occurring alkaloids where relevant. Aromatic Chemistry: stereochemistry of acyclic systems; classical and non-classical strain in cyclic systems; stereochemistry and conformation of monocyclic and polycyclic compounds; synthesis, reactions and rearrangement of monocyclic compounds including stereochemical selectivity; transannular reactions in medium rings; synthesis and reactions of fused and bridged polycyclic systems; examples of steroids and terpenes where relevant. Structure Determination: application of spectroscopic methods (eg nuclear magnetic resonance, mass spectroscopy) to determination of organic structures.

2.103C Inorganic Chemistry

Prerequisite: 2.102C. Excluded: 2.003C.

Transition metal chemistry: bonding theory; energies and population of d-orbitals and their correlations with stereochemistry, thermodynamic properties, spin states; theory and applications of magnetism; theory and applications of electronic spectra; stability of metal complexes; stabilisation of oxidation states; metal carbonyls; descriptive chemistry of transition metals; special characteristics of second and third transition series metals. Lanthanide elements: lanthanide contraction and its consequences: electronic configurations and oxidation states; spectral and magnetic properties; stabilities of complexes; separation. p-block elements: the inert pair effect; bonding, structure, and reactivity of representative compounds; halogen chemistry.

2.103D Analytical Chemistry

Prerequisite: 2.102D. Excluded: 2.003D.

Instrument design, theory and operating principles for the following instrumental areas; electrochemical, atomic and molecular spectroscopy, chromatography, mass spectrometry, automated analysis, thermal analysis.

Elective Units

2.113A Kinetics and Mechanism of Chemical Change

Prerequisite: 2.103A. Excluded: 2.053A.


2.113B Synthetic Organic Chemistry

Prerequisite: 2.103B. Excluded: 2.013B.


2.113C Advanced Inorganic Chemistry

Prerequisite: 2.102C. Co-requisite: 2.103C. Excluded: 2.013C.

Spectroscopy and magnetism of transition metal compounds: applications of infrared, electronic and Moessbauer spectra; magnetic properties of polynuclear complexes. Inorganic reactivity: rates and mechanisms of ligand substitution and electron transfer; molecular rearrangements; reactions of co-ordinated ligands and activation of co-ordinated molecules; excited state reactivity. Bio-inorganic chemistry: the occurrence and co-ordination of metals in biology: heme proteins and oxygen coordination, redox and proteolytic metalloenzymes; metal storage and transport proteins; Innovations and technological developments: accounts of current advances, including topics such as inorganic polymers, inclusion compounds, zeolites, electronically delocalised compounds, and metal clusters.

2.113D Advanced Instrument Analysis

Prerequisite: 2.102D. Corequisite: 2.103D. Excluded: 2.013D.

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. Sample selection procedures; extraction and recovery of major, minor, trace and ultra-trace constituents; origins, identification and elimination of interference effects. 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.

2.113E Nuclear and Radiation Chemistry

Prerequisite: 2.102A or 2.102B or 2.102C or 2.102D. Excluded: 2.003E.

2.123A Biophysical and Interfacial Chemistry S2 L3T3
Prerequisite: 2.102A. Excluded: 2.033A.
Interplay of interfacial, colloidal and macromolecular science. Physical properties of macromolecules. Determination of molecular size from gel permeation chromatography, diffusion, sedimentation, viscometry, osmometry and light scattering. Spectroscopic properties: circular dichroism, optical rotary dispersion and X-ray diffraction; conformation of macromolecules; Helix/random coil transitions. The use of modern spectroscopic techniques in surface chemistry including low energy electron diffraction, Auger electron, UV and X-ray photo-electron spectroscopy; electron energy loss, ion scattering and secondary ion diffraction. Auger electron, UV and X-ray photo-electron techniques in surface chemistry including low energy electron Helix/random coil transitions. The use of modern spectroscopic techniques in surface chemistry including low energy electron diffraction, Auger electron, UV and X-ray photo-electron spectroscopy; electron energy loss, ion scattering and secondary ion emission at the gas/solid interface. Surface free energy and related thermodynamic concepts applied to the study of solutes at interfaces; wetting behaviour, capillarity, detergency, mineral flotation, micelles and bio-physical membranes. Adsorption and its significance in resulting biological and synthetic catalytic processes.

2.123B Biological Organic Chemistry S2 L2T4
Prerequisite: 2.103B. Excluded: 2.023B.

2.123E Environmental Chemistry S2 L3T3
Prerequisites: 2.102A and 2.102D. Excluded: 2.043A.

2.133B Applied Organic Chemistry S1 L2T4
Prerequisite: 2.102B. Corequisite: 2.103B. Excluded: 2.003L.
Discussion at advanced level of the chemistry of selected commercially important groups of organic materials with emphasis on reaction mechanisms and model systems. Polymerization processes and synthetic polymers: Thermal and oxidative polymerization, treatment of initiators, chain transfer agents, retarders; sulfur-olefin reactions. Pigments and dyestuffs: Basis of colour in organic compounds, azo, carbonyl, cationic dyes, colour photography; synthetic and natural pigments, eg phthalocyanines, carotenoids, flavones, anthocyanins; fluorescent whiteners. Oxidation and reduction processes: Oxidation of allylic compounds, phenols, sulfur compounds etc; catalytic dehydrogenation and hydrogenation; hydride and dissolving metal reductions.

2.1813 Quantum Chemistry and Symmetry S1 L1½T1½
Prerequisites: 2.102C, and 10.111A or 10.031. Excluded: 2.023A.

2.1823 Computers in Chemistry S1 or S2 L1T2
Prerequisites: 2.102A and 2.102D.
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.

2.1833 Molecular Structure Determination S2 L1½T1½
Prerequisites: 2.102C and 2.102D.
The theory and practice of 1. crystal structure determination by x-ray diffraction 2. multinuclear NMR spectroscopy, and 3. mass spectrometry, in the determination of molecular structure. Experimental requirements and procedures; instrumentation. Interpretation of results; applications to contemporary chemical systems; examples from current research problems. Databases and computing. Evaluation of complementary information from these techniques about molecular structure, chemical bonding, and chemical reactivity.

2.1843 Organometallic Chemistry S2 L1T2
Prerequisites: 2.102B and 2.102C. Excluded: 2.003M.
Preparation, structure and reactions of transition metal and main group organometallic compounds; metal vapour syntheses. Structure and bonding of ligands; ligand stabilisation and activation; novel effects of ligand bulk and geometry. Catalytic applications of organometallic compounds.

Chemistry Level IV Unit

2.004 Chemistry Honours
An honours program consisting of selected series of lectures on advanced topics in Chemistry and a research project. Students intending to seek admission to this program should consult the School re selection of 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 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 and Engineering Handbooks.

2.003J Fundamentals of Biological and Agricultural Chemistry

Prerequisites: 2.121 and 2.131, or 2.141. Excluded: 2.013L, 41.101.

Aspects of the chemical and physical properties of materials important in biological systems. Methods of separation, of purification and estimation, and correlations of structure with reactivity. Methods of separation and identification, such as gel permeation, discussed as appropriate to each topic. Significance of isomerism in biological systems, optical and geometrical, absolute configuration. Amino acids, peptides and introduction to protein structure. Relevant properties, acid/base properties, pH values, zwitterion, isoelectric points. Simple peptide synthesis. Treatment of carbohydrates, establishment of structures, reactivity. Chemistry of monosaccharides, disaccharides and polysaccharides. Methods of analysis, chemical and physicochemical. Fats, correlation of properties with saturated and unsaturated fatty acid composition. Structural chemistry of fatty acids. Reaction of unsaturated fatty acids, urea complexes. Detergents. Trace elements in biological systems. Chemistry of common heterocyclic systems with emphasis on molecules of biological importance.

2.043L Chemistry and Enzymology of Foods

Prerequisite: 2.002B. Excluded: 2.003J, 2.043L.

The chemistry of food constituents at an advanced level and the relationship between the chemistry and enzymology associated with the origin and handling of foodstuffs. Treatment of the stability of constituents, changes in colour and texture occurring during processing and storage. Methods of assessment, chemical and physical. General classification of constituents, role of free and combined water. Fixed oils and fats, rancidity of enzymic and autoxidative origin, antioxidants — natural and synthetic — theories on mechanisms of action, carbohydrates, reactivity, role in brewing processes, carbohydrate polymers, starch structure, enzymic susceptibility and mode of action, estimations, enzymic degradation and enzymic browning, reactions and stability of natural pigments, vitamins, preservatives.

2.030 Organic Chemistry

Prerequisite: 2.002B.

The spectroscopic identification of organic compounds, free radical chemistry and electro-organic 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 discussing syntheses and reactions including degradation.

2.951 Chemistry 1ME

Prerequisite: As for 2.121.
A treatment of chemistry which illustrates the application of the principles of chemistry to problems of concern to mechanical engineers. Topics: chemistry of materials, thermochemistry, chemical kinetics and equilibrium, radioactivity and nuclear power, electrochemistry and corrosion of metals. Introduction to organic chemistry, structure and properties of polymers, fuels and lubricants. Surface chemistry.

2.991 Chemistry 1CE

Prerequisites: As for 2.121.

For further information regarding the following subject see the Faculty of Medicine Handbook.

81.002 Chemistry and Biochemistry for Medical Students

Prerequisites:

2 unit Science (Chemistry) or 4 unit Science or 3 unit Science

Conjoint subject with the School of Biochemistry.

Materials Science and Engineering

4.413 Physical Metallurgy 2A

Prerequisite: 4.412A.

4.423 Physical Metallurgy 2B

Prerequisite: 4.412A.
4.433C Physical Metallurgy 2C
Prerequisite: 4.412A.

4.442 Physical Metallurgy 1D
Prerequisite: 1.001 or 1.011.

4.443 Physical Metallurgy 2D
Prerequisite: 4.432.

4.453 Physical Metallurgy 2E
Prerequisite: 4.432.

4.633 Metallurgical Engineering 2C
Prerequisites: 10.001 or 10.011, 4.442.

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Mechanical and Industrial Engineering

5.006 Engineering E
Prerequisites: as for 5.010. Excluded: 5.010, 5.0201, 5.030.

5.0011 Engineering Mechanics 1
Prerequisite:

<table>
<thead>
<tr>
<th>HSC Exam Percentile Range Required</th>
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<tbody>
<tr>
<td>Either</td>
</tr>
<tr>
<td>2 unit Science (Physics) or</td>
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<tr>
<td>4 unit Science (multistrand) or</td>
</tr>
<tr>
<td>2 unit Industrial Arts or</td>
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<tr>
<td>3 unit Industrial Arts</td>
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Excluded: 5.010, 5.0101, 5.0201.

Note: Students who wish to enrol in this subject in courses other than the full-time courses in Aeronautical Engineering, Electrical Engineering, Industrial Engineering, Mechanical Engineering and Naval Architecture can make up for the lack of the prerequisite by work taken in Physics in the first half of the first year.


5.0012 Introductory Engineering Design and Materials Science
Prerequisite: 4.432.
Excluded: 5.0016, 5.010.

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 Materials Science: Structure and properties of main types of engineering materials, with emphasis on the way in which properties may be controlled by controlling structure.
5.0201 Engineering Dynamics 1A  
**Prerequisite:** 5.010 or 5.0101. Excluded: 5.0011.

Kinematics of a particle in the plane: rectilinear and curvilinear motion; motion relative to a translating frame of reference. Kinetics of a particle in the plane: Newton's second law; D'Alembert's principle; work, power and energy. Virtual work. Kinetics of a system of particles: impulse and momentum; moment of momentum; equations of motion; impact. Fixed-axis rotation of a rigid body: angular momentum; equation of motion; moment of inertia; energy; centre of percussion. Steady mass flow.

5.030 Engineering C  
**Prerequisite:** as for 5.0011. Excluded: 5.0016, 5.0302.


and one of the following options (determined by the course of study).

1. **Production Technology**  
(Mechanical, Industrial and Aeronautical Engineering and Naval Architecture students must take this option.) Description and appraisal of the processes classified as: forming from liquid or solid, material removal, material joining. Machines. Analysis of the primary functions of the machine tools and an appraisal of their limitations. Principles of operation of common machine tools and illustrations of their use.

2. **Introduction to Chemical Industry**  
(Chemical Engineering and Industrial Chemistry students must take this option.) The chemical industry in Australia. The role of professional societies. Special topics on the engineering and chemical aspects of the industry, ie pollution control, energy sources, food and biochemicals and polymers, mineral processing, safety, etc. A visit to a factory in the Sydney area and the preparation of a short report after an introduction to information retrieval by university librarians.

3. **Introduction to Metallurgical Engineering**  
(Metallurgy students must take this option.) History and significance of the exploitation of metals. Ores, mineral economics, mineral processing, and metal extraction and processing methods illustrated by reference to the Australian mineral and metal industries. Properties, uses and applications of metallic materials. The role of the metallurgist in industry and in processing and materials research, and in relation to conservation and the environment.

4. **Introduction to Mining Engineering**  
(Mining Engineering students must take this option.) Mineral deposits; metallic, non-metallic and fuels. Elements of prospecting and exploration. Basic mining techniques. Mining phases: development, exploitation, beneficiation and withdrawal. Mining and the environment. Mining services. Relevance of basic science and engineering subjects to mining design and operations.

5. **Introduction to Ceramic Engineering**  
(Ceramic Engineering students take this option.) The classification of materials. The nature of ceramics. The materials science approach. The scope of the ceramic industry. The origin, classification, physical properties and uses of clay minerals and other non-clay raw materials. Principal unit operations used in the ceramic industry. Drying and firing of ceramics, melt forming, pot forming and other forming procedures.

5.0721 Computing  
**Co-requisite:** 10.001 or 10.011.


5.300 Engineering Dynamics 1B  
**Prerequisites:** 1.001 or 1.951, 5.0201, 10.001 or 10.011.

Kinematics and kinetics of rigid bodies in planar motion: absolute motion and motion relative to translating and rotating frames of reference; constraint and degrees of freedom; friction; extensions to Newton's second law; D'Alembert's principle; differential equations of motion; gyroscopic couple; work and energy, variational principles; impulse and momentum, impact.

5.421 Mechanics of Solids 1  
**Prerequisite:** 5.010 or 5.0011.


5.4220 Mechanics of Solids 2  
**Prerequisites:** 5.421 or 8.171, 10.001 or 10.011. Excluded: 5.422, 5.4221.


5.4221 Mechanics of Solids 2  
**Prerequisites:** 5.421 or 8.171, 10.001 or 10.011. Excluded: 5.422, 5.4220, 5.4222.

Intended for Materials Science Majors in combined BE BSc degree course.

5.620 Fluid Mechanics 1  
Prerequisites: 1.001 or 1.951, 5.010, 10.001 or 10.011. Co-requisite: 5.300. Excluded: 5.622.


5.621 Gasdynamics 1  
Excluded: 5.621, 5.653, 5.611.

One dimensional steady flow: isentropic channel flow, normal shock waves, supersonic wind tunnels and diffusers. Two dimensional steady flow: oblique shock waves, Prandtl-Meyer expansions, nozzles, airfoils. One dimensional unsteady flow: moving waves, reflections, explosions in ducts, shock tubes; method of characteristics; internal flows, piston and valve effects.

Electrical Engineering and Computer Science

6.010 Electrical Engineering 1  
Prerequisite: Electricity and magnetism section of 1.961.

Prepares students for the various areas and disciplines of Electrical Engineering. Includes field and circuit theory; electronics; logic circuits; communications; energy conversion; automatic control. Laboratory exercises and project work are major components.

6.021A Circuit Theory 1  
Prerequisites: 1.961 or equivalent, 6.010, 10.001.


6.021C Electronics 1  
Prerequisite: 1.982, 6.021A (one of these to be passed, the other to be attempted at an acceptable level and to be repeated concurrently).

Principles of operation and low-frequency characteristics of PN diodes, bipolar and field effect transistors, thyristors and various optoelectronic devices. Transistor low-frequency small-signal equivalent circuits. Design and analysis of low frequency Class A transistor amplifiers. Temperature effects. Device ratings and use of data sheets.

6.066 Computing Science Honours

6.611 Computing 1  
Prerequisite: As for 10.001. Co-requisite: 10.001 or 10.011. Excluded: 6.600, 6.620, 6.021D (1.041 excluded for students enrolled in Program 6806 and Computer Science programs in the Science and Mathematics course).

Introduction to programming: design and correctness of algorithms and data structures; programming in a high-level algorithmic language which provides simple, high level program control and data structuring facilities. Problem solving: basic ideas of problem solving; introduction to abstract structures used for computing solutions to problems. Introduction to propositional logic, computing machinery, computer arithmetic, artificial intelligence, and operating systems.

6.613 Computer Organization and Design  
Prerequisites: 6.631 or 6.021E, 6.021D or 6.620 or 6.621 (Pass Conceded (PC) awarded prior to Session 2, 1983, is not acceptable for these subjects). Excluded: 6.031B.

Bussing structures (asynchronous and synchronous); input/output organization; polling, interrupt and DMA control; parallel and serial device and processor communication and interfacing. Memory organization; CPU and control unit design. Microprocessor case studies.

6.621 Computing 2A  
Prerequisites: 6.611, 10.001 or 10.011. Excluded: 6.620, 6.021D.

For those students who intend to take further subjects in computer science.

Expansion and development of material introduced in 6.611 Computing 1. Systematic program development: introduction to programming language semantics, reasoning about programs, program derivation, abstract programs, realization of abstract programs (conversion from abstract to concrete). Practice in programming in a high-level programming language. Data structures: arrays, lists, sets, trees, recursive programming. Introduction to computer organization: a simple machine architecture. Introduction to operating systems.

6.631 Computing 2B  
Prerequisites: 6.620 or 6.621 or 6.021D, 6.600 (CR). Excluded: 6.021E.

Assembler programming: programming in a low level machine oriented language in order to illustration the mapping of higher level language constructs onto a typical machine and the interaction between operating systems and devices. Digital Logic Design: Boolean algebra and logic gates, simplification of Boolean functions, combinational logic, medium scale integration building blocks, clocked sequential circuits, registers and memory, computer arithmetic.

6.632 Operating Systems  

Introduction to operating systems via an intensive case study of a particular system, namely the UNIX Time-sharing system which runs on the PDP11 computer. Includes system initialization, memory management, process management, handling of interrupts, basic input/output and file systems. A comparison of UNIX with other operating systems. General principles for operating system design.
6.633 Data Bases and Networks S2 L3T2

Data Base Management Systems: data models; relational and network structures; data description languages; data manipulation languages; multi-schema structures. Data integrity and security; recovery; privacy. Computer Networks: economic and technological considerations; digital data transmission; error detection and recovery; network configurations; circuit switching, packet switching; communication protocols, current international standards; data compression; encryption and decryption.

6.641 Computing 2C S1 or S2 L3T2
Prerequisites: 6.620 or 6.021D or 6.621, 6.600 (CR).


6.642 Design and Analysis of Algorithms S1 L3T2
Prerequisite: 6.641.

Techniques for the design and performance analysis of algorithms for a number of classes of problems. Analysis of algorithms: order notation, recurrence equations, worst case and expected order statistics. Design of efficient algorithms: recursion, divide and conquer, balancing; backtracking algorithms, branch and bound, dynamic programming; set manipulation problems; fast search algorithms, balanced optimal and multiway trees; graph representations and algorithms; pattern matching algorithms. NP — complete problems. Design and specification of programs: modularization, interface design, introduction to formal specification techniques.

6.643 Compiling Techniques and Programming Languages S2 L3T2


6.646 Computer Applications S2 L3T2
Prerequisites: 6.620 or 6.021D or 6.621 or 6.600 (CR), or both of 10.311A and 10.311B, 10.331, or equivalent. Excluded: 6.622.

The use of computers for solving problems with a substantial mathematical and operational research content: includes use of some standard software packages. Topics selected from: discrete event simulation; a simulation language; pseudo random number generation; simple queueing theory, applications of mathematical programming; dynamic programming; statistical calculations; critical path methods; computer graphics, artificial intelligence.

6.647 Business Information Systems S2 L3T2

Introduction to accounting systems — general ledger, debtors and creditors; models of business information systems; integrated business systems. System specification, system analysis, system design and implementation; testing and debugging. Managing a project team, project control. The COBOL programming language. File organization and design; sequential, indexed sequential, random, inverted, B-tree file organizations; data dictionaries, program generators, automatic system generators. A major project, written in COBOL, is undertaken as a team exercise.

Mathematics

Note: When a unit is listed as a prerequisite or co-requisite, the appropriate higher unit may be substituted.

Many units 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 Credit are only awarded in the ordinary level in exceptional circumstances.

Students should note that all of the Mathematics honours programs require them to take most of their Mathematics units at higher level. However, students should not think that the higher level units are intended only for those in honours programs. Any student with the ability to undertake higher units benefits from so doing.

First Year Mathematics

10.001 Mathematics 1. This is the standard subject and is generally selected by the majority of students in the Faculties of Science, Biological Sciences, Engineering and Applied Science who intend to pursue further studies in mathematics, computer science, physics, chemistry or engineering.
Undergraduate Study: Subject Descriptions

10.011 Higher Mathematics 1 (day course only). This subject has the same purpose as 10.001, but is aimed at the more mathematically able students, including those who may wish to take an honours degree in mathematics. It covers all the material in 10.001, plus other topics, at greater depth and sophistication. It is intended for students who have obtained high marks in the 3 unit mathematics course of the Higher School Certificate as well as for those who have taken the 4 unit course.

General Mathematics

This is a combination of the single session units 10.021 B and 10.021C and provides for students who do not intend studying mathematics beyond first year but whose other studies require some knowledge of basic mathematical ideas and techniques. It is particularly designed to meet the needs of such students in Biological Sciences, Optometry, Applied Psychology and Wool and Pastoral Sciences. However, students who select this subject should weigh seriously the implications of their choice because no further mathematical units are normally available. A student with meritorious performance in 10.021C may be permitted to proceed to a certain limited number of second year subjects intended for biologists and chemical engineers. The single unit 10.021B is also available to students seeking a prerequisite for 10.001.

Mathematics as a Subsidiary Subject

The School also provides the sequence of two units 10.031 and 10.032 at the second and third levels respectively, for students in the Science and Mathematics Course and the Faculty of Science who are mainly interested in the chemical and biological sciences. These courses offer an introduction to mathematical techniques for scientists and engineers.

There is also the Level II unit in Statistics, 10.331, which provides an introduction to statistical procedures commonly used in Science, and which also leads to the Level III units 10.3321 Regression Analysis and Experimental Design, 10.3322 Applied Stochastic Processes and, with a Credit Pass, to 10.312B Experimental Design (Applications) and Sampling.

For both the above Level II units the entry qualification is a pass in 10.001 Mathematics 1, but in appropriate cases students who have passed in 10.021C General Mathematics 1C at a satisfactory level may be given permission to enrol.

10.001 Mathematics 1  F L4T2

Prerequisite:

HSC Exam  Percentile Range  Required

2 unit Mathematics* or  71-100
3 unit Mathematics or  21-100
4 unit Mathematics or  1-100
10.021B.

Excluded: 10.011, 10.021B, 10.021C.

*This refers to the 2 Unit Mathematics subject which is related to the 3 Unit Mathematics subject. It does not refer to the subject 2 Unit Mathematics (Mathematics in Society).

10.011 Higher Mathematics 1 F L4T2

Prerequisite:  

HSC Exam  Percentile Range  Required

3 unit Mathematics  71-100
4 unit Mathematics  11-100

Excluded: 10.001, 10.021B, 10.021C.

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

10.021B General Mathematics 1B  S1 L4T2

Prerequisite:

HSC Exam  Percentile Range  Required

2 unit Mathematics* or  51-100
3 unit Mathematics or  11-100
4 unit Mathematics or  1-100
10.021A.

Excluded: 10.011, 10.001.

*This refers to the 2 Unit Mathematics subject which is related to the 3 Unit Mathematics subject. It does not refer to the subject 2 Unit Mathematics (Mathematics in Society).

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.

10.021C General Mathematics 1C  S2 L4T2

Prerequisite: 10.021B. Excluded: 10.001, 10.011.

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.

10.031 Mathematics  F L1T1

Prerequisite: 10.001 or 10.011 or 10.021C (CR).

Note A: A unit, together with 10.032, which is available to Faculty of Science students as one of a sequence of two units constituting a terminating service course in mathematics. As such it is mutually exclusive to any other Level II or Level III unit in Pure and/or Applied Mathematics and/or Theoretical Mechanics except that 10.412A may be taken with 10.031 and 10.032.

Note B: Mathematics 10.031 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, 10.031 Mathematics will not be 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.
Sciences

10.032 Mathematics  F  L1T1
Prerequisite: 10.031.

Note A: As for Note A in 10.031 Mathematics.

Note B: Mathematics 10.032 is included for students desiring to attempt only one Level III Mathematics unit. If other Level III units in Pure Mathematics, Applied Mathematics or Theoretical Mechanics are taken, 10.032 Mathematics will not be counted.

Vector calculus; special functions; convolution theorem and applications; complex variable theory; Fourier integrals; Laplace transforms with application to ordinary and partial differential equations.

10.081 Discrete Mathematics  S2 L4T2
Co-requisites: 10.001 or 10.011.


Pure Mathematics

10.1115 Pure Mathematics 2 — Finite Mathematics A  S1 L1½T½
Prerequisite: 10.001.

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.

10.1116 Pure Mathematics 2 — Finite Mathematics B  S2 L1½T½
Prerequisite: 10.1115 (or any other Year 2 Mathematics half-unit).

Introduction to combinatorial computing, recurrence relations, examples of divide and conquer strategies, backtracking and branch and bound algorithms. Finite Fourier transforms, roots of unity, convolutions, applications to fast multiplication and the analysis of pseudo-random numbers. Boolean algebra, switching circuits.

10.121A Higher Pure Mathematics 2 — Algebra  F  L2T½
Prerequisite: 10.001 or 10.001 (DN). Excluded: 10.111A, 10.1111.


10.1213 Higher Pure Mathematics 2 — Multivariable Calculus  S1 L2T½
Prerequisite: 10.011 or 10.001 (DN). Excluded: 10.1113.

As for 10.1113 Pure Mathematics 2 — Multivariable Calculus, but in greater depth.

10.1214 Higher Pure Mathematics 2 — Complex Analysis  S2 L2T½
Prerequisite: 10.1213. Excluded: 10.1114.

As for 10.1114 Pure Mathematics 2 — Complex Analysis, but in greater depth.

10.1111 Pure Mathematics 3 — Group Theory  S1 L1½T½
Prerequisites: ***

Mathematical systems, groups, determination of small groups, homomorphisms and normal subgroups.

10.1112 Pure Mathematics 3 — Geometry  S2 L1½T½
Prerequisites: ***

Elementary concepts of Euclidean, affine and projective geometries.
10.1121 Pure Mathematics 3 —
Number Theory
Prerequisites: ***. Excluded: 10.1421, 10.121C.
Euclidean algorithm, congruences, sums of squares, diophantine equations.

10.1123 Pure Mathematics 3 —
Logic and Computability
Prerequisites: ***.
The propositional calculus — its completeness and consistency; Turing machines, unsolvable problems; computability and Church’s thesis; Godel’s incompleteness theorems.

10.1124 Pure Mathematics 3 —
Combinatorial Topology
Prerequisites: ***.
Elementary combinatorial topology of surfaces.

10.1125 Pure Mathematics 3 —
Ordinary Differential Equations
Prerequisites: 10.111A ***. Excluded: 10.1425, 10.122B.
Systems of ordinary differential equations; variations of constants formula; stability; Poincare space; Lyapunov’s direct method.

10.1126 Pure Mathematics 3 —
Partial Differential Equations
System of partial differential equations; characteristic surfaces; classifications; Cauchy problem; Dirichlet and Neumann problems; the maximum principle; Poisson’s formula; conformal mapping.

10.1127 Pure Mathematics 3 —
History of Mathematics
Prerequisites: ***.
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.

10.1128 Pure Mathematics 3 —
Foundations of Calculus
Prerequisites: ***. Excluded: 10.122B.

10.1521 Pure Mathematics 3 —
Combinatorics and its Applications
Prerequisites: ***.
Generating functions, their properties and applications to partitions and recurrence relations. Branching processes, trees and the analysis of their paths, the analysis of algorithms and the Galton-Watson process. Coding theory and other design problems, Latin squares, block designs and error-correcting codes.

10.1522 Pure Mathematics 3 —
Differential Geometry
Prerequisites: 10.1113, ***. Co-requisites: ***. Excluded: 10.1325, 10.112C, 10.122C.
Curves and surfaces in space. Gaussian curvature, Gauss theorem, Gauss Bonnet theorem.

10.1523 Pure Mathematics 3 —
Functional Analysis and Applications
Prerequisites: 10.111A, 10.2112, ***. Co-requisite: 10.1128 (strongly recommended). Excluded: 10.122B.

10.122B Higher Pure Mathematics 3 —
Real Analysis and Functional Analysis
The limit processes of analysis; introduction to Lebesgue integration; introduction to metric spaces. Hilbert spaces; linear operators; Fourier series.

10.1321 Higher Pure Mathematics 3 —
Rings and Fields
Rings; integral domains; factorization theory. Fields; algebraic and transcendental extensions. Introduction to algebraic number theory; quadratic reciprocity.

***Students are not normally permitted to attempt a Level III Pure Mathematics unit unless they have completed at least two Level II units from 10.111A, 10.1113, 10.1114, 10.2111 and 10.2112.
10.1322 Higher Pure Mathematics 3 — Galois Theory  
Galois fields. Galois groups. Solution of equations by radicals. Further algebraic number theory.

10.1323 Higher Pure Mathematics 3 — Complex Analysis  
Prerequisites: 10.1214 or 10.1114 (DN). Co-requisites: 10.122B (strongly recommended).  

10.1324 Higher Pure Mathematics 3 — Integration and Fourier Analysis  
Co-requisite: 10.122B.  
Lebesgue integration; measure theory. Fourier transforms.

10.1325 Higher Pure Mathematics 3 — Differential Geometry  
Prerequisites: 10.121A or 10.111A (DN), 10.1213 or 10.1113 (DN). Co-requisite: 10.1522.  
Curves and surfaces in space; classification of surfaces. Curvature; geodesics.

10.1326 Higher Pure Mathematics 3 — Calculus on Manifolds  
Co-requisites: 10.1325.  
Manifolds; vector fields; flows. Introduction to Morse theory. Differential forms; Stokes' theorem; the Gauss-Bonnet theorem.

10.1421 Higher Pure Mathematics 3 — Number Theory  
Co-requisite: 10.121A or 10.111A (DN).  
Prime numbers; number theoretic functions; Dirichlet series; partitions. Continued fractions; diophantine approximation; p-adic numbers.

10.1422 Higher Pure Mathematics 3 — Groups and Representations  
Prerequisites: 10.121A or 10.111A (DN) and 10.1111 (DN). Co-requisite: 10.1121.  
Abelian groups; composition series; nilpotent groups; soluble groups. Representations and characters of finite groups; induced representations.

10.1423 Higher Pure Mathematics 3 — Topology  
Prerequisites: 10.1213 or 10.1113 (DN). Co-requisite: 10.1121.  
Naive set theory; the axiom of choice. Metric and topological spaces; compactness.

10.1424 Higher Pure Mathematics 3 — Geometry  
Prerequisites: 10.121A or 10.111A (DN) and 10.1111 (DN). Co-requisite: 10.1121.  
Axioms for a geometry; affine geometry, Desargues' theorem; projective geometry.

10.1425 Higher Pure Mathematics 3 — Ordinary Differential Equations  
Existence and uniqueness theorems. Linearization. Qualitative theory of autonomous systems.

10.1426 Higher Pure Mathematics 3 — Partial Differential Equations  
Classification, characteristics. Cauchy problem; Dirichlet and Neumann problems. Distributions.

10.123 Pure Mathematics 4  
An honours program consisting of the preparation of an undergraduate thesis together with advanced lectures on topics chosen from fields of current interest in Pure Mathematics. With the permission of the Head of Department, the subject may also include advanced lecture courses given by other Departments or Schools.

+ Normal prerequisites for attempting Level III Higher Pure Mathematics units are at least two Level II Mathematics units, including any course prerequisites, at an average of distinction level, or their higher equivalents.

Applied Mathematics

10.2111 Applied Mathematics 2 — Vector Calculus  
Prerequisite: 10.001. Excluded: 10.2211.  
Properties of vectors and vector fields; divergence, gradient, curl of a vector; line, surface, and volume integrals. Gauss' and Stokes' theorems. Curvilinear co-ordinates.

10.2112 Applied Mathematics 2 — Mathematical Methods for Differential Equations  
Prerequisite: 10.001. Excluded: 10.2212.  
10.2113 Applied Mathematics 2 —
Linear Programming  S1 or S2 L1½T½
Mathematical modelling and solution techniques for linear optimization problems. Feasible regions, graphical methods, the standard problem, basic solutions, fundamental theorem, simplex and revised simplex methods, duality and the dual simplex method, sensitivity analysis, the transportation problem.

10.2115 Applied Mathematics 2 —
Discrete-Time Systems  S1 or S2 L1½T½
Prerequisite: 10.001. Excluded: 10.2215.
Applications selected from problems of importance in engineering, biological, social, management, and economic systems.

10.2116 Applied Mathematics 2 —
Continuous-Time Systems  S2 L1½T½
Prerequisite: 10.001. Excluded: 10.2216.
The study of continuous dynamical systems. One-dimensional systems, kinematic waves, applications to traffic flow and waves in fluids. Momentum equation for one-dimensional fluid flow, sound waves. Dynamics of a system of particles, oscillations. An introduction to the modelling of biological and ecological systems.

10.261A Applied Mathematics 2 —
Mathematical Computing  F L1½T½
Prerequisite: 10.001.
The development of efficient and reliable software for mathematical applications using FORTRAN. Data types, input/output, structured programming, communication between sub-programs, file manipulation, portability, efficiency, accuracy, documentation, debugging. Examples will be chosen from the following areas: non-linear equations in one and two variables, extrapolation procedures, numerical quadrature, systems of linear equations, difference equations, ordinary differential equations.

10.2111 Higher Applied Mathematics 2 —
Vector Analysis  S1 L2T½
Prerequisite: 10.011 or 10.001 (CR). Excluded: 10.2111.
As for 10.2111 but in greater depth.

10.2122 Higher Applied Mathematics 2 —
Mathematical Methods for Differential Equations  S2 L2T½
Prerequisite: 10.011 or 10.001 (CR). Excluded: 10.2122.
As for 10.2122 but in greater depth.

10.2213 Higher Applied Mathematics 2 —
Linear Programming  S1 or S2 L1½T½
Prerequisite: 10.011 or 10.001 (CR). Excluded: 10.2213.
As for 10.2113 but in greater depth.

10.2215 Higher Applied Mathematics 2 —
Discrete-Time Systems  S2 L1½T½
Prerequisite: 10.011 or 10.001 (DN). Excluded: 10.2215.
As for 10.2115, but in greater depth.

10.2216 Higher Applied Mathematics 2 —
Continuous-Time Systems  S2 L1½T½
Prerequisite: 10.011 or 10.001 (CR). Excluded: 10.2216.
As for 10.2216 but in greater depth.

10.212A Applied Mathematics 3 —
Numerical Analysis  F L1½T½
Prerequisites: 10.2112, 10.111A. Excluded: 10.222A.

10.212B Higher Applied Mathematics 3 —
Fluid Dynamics  S1 L3T1
Prerequisite: 10.2111, 10.2112. Excluded: 10.222B, 10.422A.
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.

10.212D Applied Mathematics 3 —
Mathematical Methods  S2 L3T1
Prerequisites: 10.2112, 10.111A, 10.111B, 10.111C. Excluded: 10.0331, 10.033, 10.222D, 10.412D, 10.422D, 10.4331, 10.2921.
10.212L Applied Mathematics 3 — Optimization Methods

Prerequisites: 10.111A, and 10.1113 or 10.211L. Excluded: 10.222L.

Development, analysis and application of methods for optimization problems. Theory of multivariable optimization; including necessary and sufficient optimality conditions, stationary points, Lagrange multipliers, Kuhn-Tucker conditions, convexity and duality. Numerical methods for one dimensional minimization, unconstrained multivariable minimization (including steepest descent, Newton, quasi-Newton and conjugate gradient methods) and constrained multi-variable minimization (including linear programming and quadratic programming).

10.212M Applied Mathematics 3 — Optimal Control

Prerequisites: 10.1113 and 10.1114, 10.111A. Excluded: 10.222M.


[Examples and applications are selected from physical, engineering economics, resource and financial management, social and biological systems.]

10.212N Applied Mathematics 3 — Dynamical Systems

Prerequisites: 10.111A, 10.2112, 10.1125. Excluded: 10.222N.

Nonlinear differential equations and applications to time-dependent systems. Perturbation methods, averaging and asymptotic techniques, Floquet theory, bifurcation theory. Hamiltonian dynamics, Liouville’s theorem, integral invariants, canonical transformations, action-angle variables. Applications to ecological, biological and mechanical systems.

10.222A Higher Applied Mathematics 3 — Numerical Analysis

Prerequisites: 10.2212 or 10.2112 (CR), 10.121A or 10.111A (CR). Excluded: 10.212A.

As for 10.212A but in greater depth.

10.222B Higher Applied Mathematics 3 — Fluid Dynamics

Prerequisites: 10.2211 or 10.2111 (CR), 10.2212 or 10.2112 (CR) Excluded: 10.212B, 10.422A.

As for 10.212B but in greater depth.

10.222C Higher Applied Mathematics 3 — Maxwell’s Equations and Special Relativity

Prerequisites: 10.221 or 10.2111 (DN), 10.2212 or 10.2112 (DN), 10.1214 or 10.1114 (DN), 1.001. Excluded: 1.033, 1.0333.

Theory and applications of electromagnetic fields and waves. Electrostatics; Poisson and Laplace equations, potential theory, boundary value problems, spherical harmonics, Green’s functions, dielectrics. Magnetic fields and forces; applications, magnetohydrodynamics. Electromagnetic fields, electromagnetic potentials, waves and radiation, vector and scalar wave equations, spherical waves, applications. Lorentz transformation, relativistic electrodynamics.

10.222D Higher Applied Mathematics 3 — Mathematical Methods

Prerequisites: 10.2212 or 10.2112 (CR), 10.1213 or 10.1113 (CR), 10.1214 or 10.1114 (CR). Excluded: 10.0331, 10.033, 10.212D, 10.412D, 10.422D, 10.4331, 10.2921.

As for 10.212D but in greater depth.

10.222M Higher Applied Mathematics 3 — Optimal Control

Prerequisites: 10.1213 or 10.1113 (CR), 10.1214 or 10.1114 (CR), 10.121A or 10.111A (CR). Excluded: 10.212M.

As for 10.212M but in greater depth.

10.222N Higher Applied Mathematics 3 — Dynamical Systems

Prerequisites: 10.121 A or 10.111A (CR), 10.1425 or 10.1125 (CR), 10.2212 or 10.2112 (CR). Excluded: 10.212N.

As for 10.212N but in greater depth.

10.223 Applied Mathematics 4

An honours program consisting of the preparation of an undergraduate thesis together with advanced lecture courses. Lecture topics include selections from: advanced mathematical methods for applied mathematics, advanced optimization, numerical analysis, theory of linear and non-linear dynamical systems, optimal control, operations research, functional analysis and applications, mathematics of economic models and of economic prediction, fluid mechanics, oceanography, microhydrodynamics, and analytical and numerical solution of partial differential equations. With permission of the Head of Department, the subject may also include advanced lecture courses given by other Departments or Schools.
10.233 Applied Mathematics 4 (Short Course)

6 units consisting of the preparation of an undergraduate thesis together with advanced lecture courses. Lecture topics include selections from: topics listed in 10.223 With permission of the Head of Department, the subject may also include advanced lecture courses given by other Departments or Schools.

10.262A Applied Mathematics 3 — Mathematical Software

Prerequisites: 10.111A, 10.2112, and either 6.621 or 10.211E or 10.261A or equivalent.

Underlying methods, development, and use of mathematical software packages; primarily of those written in FORTRAN. Numerically stable methods for matrix factorizations, solution of systems of linear equations and calculation of matrix eigenvalues and eigenvectors. Numerical quadrature, including special methods for singular, oscillatory and infinite integrals and for multiple integrals. Numerical solution of ordinary differential equations, including initial and boundary value problems. Extensive use is made of computers and software packages. A basic knowledge of Fortran is assumed.

10.292A Applied Mathematics 3 — Oceanography

Prerequisites: 10.2111 or 10.031, 1.001. Excluded: 10.412A.


10.2921 Applied Mathematics 3 — Transform Methods

Prerequisites: 10.1113, 10.1114, 10.2112 or equivalent. Excluded: 10.0331, 10.033, 10.212D, 10.222D, 10.412D, 10.422D, 10.4331.


10.2922 Applied Mathematics 3 — Applied Time Series Analysis

Prerequisites: 10.2112 or 10.031 or 10.022. Corequisites: 10.2921 or 10.212D or equivalent. Excluded: 10.4129.

Techniques for analyzing time-varying data. Classification of random processes, sampling for discrete analysis, Fourier analysis, spectra, filtering. Cross-spectra, estimation and hypothesis testing, confidence limits, application to experiment planning. Emphasis on computer analysis of actual data.

Statistics

10.311A Theory of Statistics 2 — Probability and Random Variables

Prerequisite: 10.001 or 10.011 or 10.021C (CR). Excluded: 10.321A, 10.301, 10.331, 45.101.

Probability, random variables, standard discrete and continuous distributions, multivariate distributions, transformations, random sampling, sampling distributions, limit theorems.

10.311B Theory of Statistics 2 — Basic Inference

Prerequisite: 10.311A. Excluded: 10.321B, 10.301, 10.331, 45.101.

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.


Prerequisite: 10.001 or 10.011. Excluded: 10.311A, 10.301, 10.331, 45.101.

As for 10.311A but in greater depth.

10.321B Higher Theory of Statistics 2 — Basic Inference

Prerequisite: 10.321A. Excluded: 10.311B, 10.301, 10.331, 45.101.

As for 10.311B but in greater depth.

10.3111 Theory of Statistics 2 — Statistical Computing and Simulation

Prerequisite: 10.001 or 10.011. Co-requisite: 10.311A.

Introduction to APL, random variables, univariate transformation, simulation of random variables, APL programming, integer value random variables, random walks — theory and simulation, introduction to Markov chains.

10.3211 Higher Theory of Statistics 2 — Statistical Computing and Simulation

Prerequisite: 10.001 or 10.011. Co-requisite: 10.321A.

As for 10.3111 but in greater depth.

10.3112 Theory of Statistics 2 — Nonparametric Statistical Inference

Prerequisite: 10.311A. Co-requisite: 10.311B.

Order statistics, exact and approximate distributions, multinomial distributions, goodness of fit, contingency tables, one-sample and two-sample estimation and inference problems.
10.3212 Higher Theory of Statistics 2 — Nonparametric Statistical Inference  S2 L1½T½
Prerequisite: 10.321A. Co-requisite: 10.321B.

As for 10.3112 but in greater depth.

10.312A Theory of Statistics 3 — Stochastic Processes  S1 L3T1
Prerequisites: 10.311A, 10.111A, 10.1113. Excluded: 10.322A.


10.312C Theory of Statistics 3 — Linear Models  S1 L3T1
Prerequisites: 10.311B, 10.111A, 10.1113. Excluded: 10.322C.


10.312F Theory of Statistics 3 — Statistical Computation  S2 L2T2
Prerequisites: 10.311B or 10.321B, 10.3111 or 10.3211.


10.3121 Theory of Statistics 3 — Sample Survey Theory  S1 L1½T½
Prerequisite: 10.311B. Excluded: 10.3221.

Finite population sampling theory illustrated by mean estimation; simple random, stratified, cluster, systematic, multistage and ratio sampling, sampling proportional to size.

10.3122 Theory of Statistics 3 — Design and Analysis of Experiments  S2 L1½T½
Prerequisites: 10.311B, 10.312C. Excluded: 10.3222.


10.3123 Theory of Statistics 3 — Statistical Inference  SS L1½T½
Prerequisite: 10.311B. Excluded: 10.3223.

Uniformly minimum variance unbiased estimation, Cramer-Rao inequality, Lehman-Scheffe theorem. Monotone likelihood ratio distributions and uniformly most powerful unbiased tests. Generalized likelihood ratio test, exact test and large samples tests. Bayesian point estimation, interval estimation and hypothesis testing.

10.3124 Theory of Statistics 3 — Nonparametric Methods  SS L½T½
Prerequisites: 10.311B, 10.3112. Excluded: 10.3224.


10.3321 Regression Analysis and Experimental Design  S1 L1½T½
Prerequisite: 10.331 or 10.311B or approved equivalent. Excluded: 10.3122, 10.3222.


10.3322 Applied Stochastic Processes  S2 L1½T½
Prerequisite: 10.331 or 10.311A or 10.321A, or approved equivalent. Excluded: 10.312A, 10.322A.


10.322A Higher Theory of Statistics 3 — Stochastic Processes  S1 L3½T1
Prerequisites: 10.321A, 10.111A, 10.1113. Excluded: 10.312A.

As for 10.312A but in greater depth.

10.322C Higher Theory of Statistics 3 — Linear Models  S1 L3½T1
Prerequisites: 10.321B, 10.111A, 10.1113. Excluded: 10.312C.

As for 10.312C but in greater depth.
S2 L3T1  
Prerequisites: 10.321A, 10.111A, 10.1113.

S1 L1½T½  
Prerequisite: 10.321B. Excluded: 10.3121.
As for 10.3121 but in greater depth.

10.3222 Higher Theory of Statistics 3 — Design and Analysis of Experiments  
S2 L1½T½  
Prerequisites: 10.321B, 10.322C. Excluded: 10.3122.
As for 10.3122 but in greater depth.

10.3223 Higher Theory of Statistics 3 — Statistical Inference  
SS L1½T½  
Prerequisite: 10.321B. Excluded: 10.3123.
As for 10.3123 but in greater depth.

10.3224 Higher Theory of Statistics 3 — Nonparametric Methods  
SS L1½T½  
As for 10.3124 but in greater depth.

10.3225 Higher Theory of Statistics 3 — Statistic Project  
F  
Prerequisites: 10.321A, 10.321B. Co-requisites: At least four units from 10.322A, 10.322C, 10.3221, 10.3222, 10.3223, 10.3224, 10.322D, 10.312F.

10.323 Theory of Statistics 4

10.301 Statistics SA  
F L1½T½  
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.

10.331 Statistics SS  
F L1½T½  
An introduction to the theory of probability, with finite, discrete and continuous sample spaces. The standard elementary 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 and mixed models, involving multiple comparisons and estimation of variance components.

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 and Engineering Handbooks.

10.022 Engineering Mathematics 2  
F L2T2  
Prerequisite: 10.001.
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.

10.0331 Electrical Engineering Mathematics 3 — Transform Methods  
S1 L1½T½  
Prerequisites: 10.111A, 10.1113, 10.1114, 10.2112. Exclusions: 10.412D, 10.422D and 10.4331.
10.0332 Electrical Engineering Mathematics 3 —
Numerical Methods 
Prerequisites: 10.111A, 10.1113, 10.1114, 10.2111, 10.2112. Exclusions 10.212A, 10.222A.


10.341 Statistics SU 
Prerequisite: 10.001 or 10.011.

Introduction to probability theory, random variables and distribution functions, sampling distributions, including those of t, f, and F. Estimation procedures, including confidence interval estimation with an emphasis on least squares and surveying problems, and computer based exercises.

10.351 Statistics SM 
Prerequisite: 10.001 or 10.011.

For students in Aeronautical, Industrial and Mechanical Engineering and Naval Architecture.

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, f, and F. Estimation of parameters: the methods of moments and maximum likelihood and confidence interval estimation. The standard test of statistical hypotheses, and, where appropriate, the powers of such tests. An introduction to regression and the bivariate normal distribution.

10.361 Statistics SE 
Prerequisite: 10.001 or 10.011.

For students in the School of Electrical Engineering.

Introduction to probability theory, random variables and distribution functions; the binomial, Poisson and normal distributions in particular. Standard sampling distributions, including those of f and t. Estimation by moments and maximum likelihood; confidence interval estimation. The standard tests of significance based on the above distribution with a discussion of power where appropriate.


10.381 Statistics SC 
Prerequisite: 10.001 or 10.011.


Psychology

Psychology Level I Unit

12.100 Psychology 1 
Prerequisite: 12.100. (Pass Conceded (PC) awarded prior to Session 2, 1983 is not acceptable.)

An introduction to 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.

Psychology Level II Units

12.200 Research Methods 2 
Prerequisite: 12.100. (Pass Conceded (PC) awarded prior to Session 2, 1983 is not acceptable.)

General introduction to the design and analysis of experiments; hypothesis testing, estimation, power analysis; general treatment of simple univariate procedures; correlation and regression.

12.201 Biological Basis of Psychology 2 
Prerequisite: 12.100. (Pass Conceded (PC) awarded prior to Session 2, 1983 is not acceptable.)

Two strands: one emphasises basic biological structures and mechanisms, with particular emphasis on specific sensory systems (eg pain) and behaviour (eg aggression); the other strand emphasises structure and function of sensory systems, evaluates neurological concepts and models, and examines the sensory interaction of people with their environment.

12.202 Social and Cognitive Psychology 2 
Prerequisite: 12.100. (Pass Conceded (PC) awarded prior to Session 2, 1983 is not acceptable.)

Two strands: one provides a consideration of the content, methods and models of social psychology and evaluates effects of social factors on behaviour of individuals and groups; the other strand is concerned with cognitive behaviour of humans, particularly in relation to speech, pattern recognition, memory and thinking.

12.203 Psychology 2A 

Available to Course 3431 students only.
Computing, assessment and introduction to clinical practice.
12.204 Human Relations 2  
Prerequisite: 12.100. (Pass Conceded (PC) awarded prior to Session 2, 1983 is not acceptable.)

Social and personality development of the individual; human relations in the family group. Interpersonal relationships and, in particular, the handling of anxiety, aggression and communication.

12.205 Individual Differences 2  
Prerequisite: 12.100. (Pass Conceded (PC) awarded prior to Session 2, 1983 is not acceptable.)

Measurement and significance of individual differences in intellectual, motivational and personality functioning. Statistics, to cover the fundamentals of hypothesis testing.

Psychology Level III Units: Group A

12.300 Research Methods 3A  
Prerequisite: 12.200.

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.

12.305 Learning and Behaviour 3  
Prerequisites: 12.200 and 12.201.

The establishment and elimination of extended sequences of behaviour in complex environments. Implications of the theories and research for applied work.

Psychology Level III Units: Group B

12.301 Research Methods 3B  
Prerequisites: 12.200 and 12.300.

Multivariate statistics and computing. Data analysis using the SPSS and PSY computer programs; their statistical basis.

12.304 Personality and Individual Differences 3  
Prerequisites: 2 Psychology Level II subjects.

Personality dynamics and structure and differences in ability and intelligence.

12.310 Physiological Psychology 3  
Prerequisites: 12.200 and 12.201.


12.311 Perception 3  
Prerequisites: 12.200 and 12.201.

Studies of infant perception, conflict between vision and other senses, certain illusions, and of the perception of size and distance generally.

12.312 Language and Cognition 3  

Stages involved in reception of stimulus information from environment, its analysis, storage, and transmission into responses. Stress on processing of language.

12.314 Motivation and Emotion 3  
Prerequisites: 12.200 and 12.201.

An examination of contemporary research regarding ‘drives’, ‘incentives’ and ‘emotions’ as determinants of animal and human action. Theoretical perspectives cover biological and social influences.

12.315 Theories of Associative Learning 3  
Prerequisite: 12.305.

Contemporary theoretical approaches to instrumental and classical conditioning. Topics may include: traditional behaviour theories, information processing theory, cybernetic theory, and neurophysiological approaches.

12.316 Psychophysiology 3  
Prerequisites: 12.200 and 12.201.

The major theoretical, methodological, and applied issues in psychophysiology. Topics may include: arousal, attention, habituation, lie detection, clinical assessment, and biofeedback.

12.320 Social Psychology 3  

Contemporary research areas in social psychology. Topics may include: the social basis of human interaction, interpersonal relationships, social perception and cognition, and interpersonal communication.

12.321 Developmental Psychology 3  

The development of perception and the development of operational thought; the development of language and its relationship to the development of thought; and the development of reading.

12.322 Abnormal Psychology 3  
Prerequisites: 12.200 and 12.201.

Descriptive psychopathology: symptomatology and diagnostic features of schizophrenia, organic brain syndromes, affective disorders, neurotic disorders, psychopathy, sexual aberrations, and addictions.
12.324 Experimental Psychopathology 3  
Prerequisite: 12.322.  
S2 L2T2  
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; driven behaviours.

12.325 Social Behaviour 3  
S1 L2T2  
Research and theory in applied social psychology. Topics may include the relation of the physical setting to behaviour, cross cultural studies, and race relations.

12.330 Psychological Assessment 3  
Prerequisites: 12.200, and 1 other Psychology Level II subject. Excluded: 12.203.  
S1 L2T2  
Principles and techniques of psychological assessment. Types of tests and their application in selection and allocation procedures.

12.331 Counselling Psychology 3  
Prerequisites: 2 Psychology Level II subjects.  
S2 L2T2  
Principles and techniques of counselling in a variety of contexts. Interviewing, group process and structure, and interpersonal relations.

12.332 Behavioural Change 3  
Prerequisites: 12.200 and 12.201.  
S2 L2T2  

12.333 Ergonomics 3  
Prerequisite: 12.200.  
SI L2T2  
Aspects of human performance relevant to work design. The principles involved in designing the environment in general, and work in particular, to suit humans' capabilities.

12.334 Behaviour in Organizations 3  
Prerequisites: 2 Psychology Level II subjects.  
S2 L2T2  
Theories and research methods for understanding behaviour in organizations and in the environment.

12.335 Behavioural Evaluation and Assessment 3  
Prerequisite: 12.200.  
S2 L2T2  
Assessment and evaluation of individual behaviour and behavioural change. Problems of measurement and scale construction; objective versus subjective measures; self report, behavioural and psychophysiological measures. Interviewing and behavioural analysis; psychometric testing and case history taking.

12.340 Special Topic 3  
S1 L2T2  
Not offered in 1987.

Psychology Level IV Units

12.400 Psychology 4 (Thesis — Course 3431)  
Prerequisite: All requirements for Years 1-3 of the course.  
F  
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.

12.401 Psychology 4 (Course 3431)  
Prerequisite: All requirements for Years 1-3 of the course.  
F  
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.

12.403 Psychology 4 (Thesis)  
Prerequisites: 12.100, 12.200, 12.201, 12.202 and 8 Psychology Level III units, including 12.300 and 12.305 from Group A and 12.301 from Group B, with a weighted average of at least 68%, and at the discretion of the Head of School.  
F  
Psychology 4 in the Arts, and Science and Mathematics degree courses. A supervised research thesis and course work to be determined in consultation with the Head of School.

12.404 Psychology 4  
Prerequisites: 12.100, 12.200, 12.201, 12.202 and 8 Psychology Level III units, including 12.300 and 12.305 from Group A, with a weighted average of at least 68%, and at the discretion of the Head of School.  
F  
Psychology 4 in the Arts, and Science and Mathematics degree courses. Course work and a supervised group research project to be determined in consultation with the Head of School.

Psychology Servicing Subjects

These are subjects taught within courses offered by other faculties.

For further information regarding the following subject see the Faculty of Commerce Handbook.
12.651 Psychology (Industrial Relations)

Prerequisite: Nil.

Not offered in 1987.

Problems and limitations affecting social research in industry. Critical review of American research from Hawthorne to Herzenberg 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 headings of ‘participation’ and ‘democracy in industry’.

For further information regarding the following subject see the Faculty of Science section in this Handbook.

12.741 Psychology (Optometry)

Prerequisite: 12.100.

Visual Perception: The nature and characteristics of visual perception. Topics to be discussed include: psychophysics, the organization of visual perception, the influence of context, and the effects of learning and motivation on perception. Throughout the course emphasis will be placed on an examination of relevant experimental data. Abnormal Psychology: The concepts of normality and abnormality, and an examination of the principal psychodynamic processes. Causes and symptoms of various mental disorders are introduced with some emphasis on the importance of these symptoms in optometrical practice.

Accountancy

14.501 Accounting and Financial Management 1A

Prerequisite: Nil.

The basic concepts of financial model building and information systems, including the double-entry recording system, the accounting cycle, income measurement and financial reporting, and an introduction to basic elements of auditing.

14.511 Accounting and Financial Management 1B

Prerequisite: 14.501.

Development of basic concepts introduced in 14.501 Accounting and Financial Management 1A, including corporate reporting, business finance, system design, elementary computer applications.

14.522 Accounting and Financial Management 2A

Prerequisites: 14.511 plus

HSC minimum mark required

2 unit Mathematics or 2 unit
3 unit Mathematics 3 unit or
4 unit Mathematics 4 unit

The design, production and use of accounting and other quantitative information in the planning and control of organizations, with particular reference to manufacturing activities.

14.542 Accounting and Financial Management 2B

Prerequisite: 14.511 plus HSC results as for 14.522.

Critical examination of concepts and problems in income measurement, asset valuation and financial reporting for various forms of business undertaking with particular reference to corporate organizations, including associated aspects of auditing and taxation and methods of accounting for changing prices.

14.563 Accounting and Financial Management 3A

Prerequisite: 14.542.


14.573 Accounting and Financial Management 3A (Honours)

Prerequisite: 14.542.

Includes 14.563 Accounting and Financial Management 3A as well as additional and more advanced work in both accounting theory and in the financial management and accountability of corporate enterprises.

14.583 Accounting and Financial Management 3B

Prerequisite: 14.522.

Management Accounting: advanced treatment of management accounting theory and applications including statistical cost analysis, budgetary and strategic planning and decision models.

14.593 Accounting and Financial Management 3B (Honours)

Prerequisite: 14.522.

Includes 14.583 Accounting and Financial Management 3B, as well as more advanced work dealing with theoretical and research issues in management accounting.
14.602 Computer Information Systems 1  
Prerequisite: 15.411 or approved studies in computer science.

Information systems and the organization, architecture of typical commercial application systems, the systems lifecycle, the systems analysis/design task, tools and techniques of the systems analyst, documentation techniques, internal controls and interfacing with the edp auditor, file design concepts, logic and computer hardware, commercial computer programming.


Systems design: physical design of business systems, specifications and updating of VSAM files, man-machine dialogue procedures, top-down structured design and evolutionary design methodologies. Introduction to communications networks. Operating systems concepts: processor, storage, device and process management, segmentation and paging systems. COBOL programming.

14.605 Information Systems Implementation  
Prerequisite: 14.603.

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

14.607 Distributed Computer Systems  
Prerequisite: 14.603.

Advanced data communication concepts, computer networks, reference to international standards and common industry communications software packages; transaction processing software and interface with data management systems; local networks; interaction between text processing and data processing; a case study based on a microcomputer network.

14.608 Database Systems  
Prerequisite: 14.603 or 14.606.

Advanced data storage concepts, including detailed study of alternative approaches to database management systems. Management information needs and database specification in a commercial environment. Detailed evaluation, with project work, of a microcomputer based database management system. Information retrieval concepts, relational query-systems, security, control and audit considerations.

14.611 Information Systems Development  
Prerequisite: 14.603 and approval by the Head of the Department of Information Systems.

A systems analysis and design case study. Information systems project management, data processing administration, on-line systems, design techniques, internal controls.

14.513 Business Finance 2  
Prerequisites: 14.511, 15.011 and 15.421.

The essential aspects of financial decision-making 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.

14.614 Business Finance 3A  
Prerequisite: 14.613.

Financial decision making within the framework of capital market theory. Includes diversification, risk and return, determinants of risk, efficient market hypothesis with emphasis on Australian evidence, capitalization changes and performance measures, takeovers and mergers.

14.615 Business Finance 3B  
Prerequisite: 14.614.

Theory and analytical techniques relevant to investment analysis and management. Includes analysis and valuation of securities, properties of accounting numbers, portfolio theory and asset pricing models, capital asset returns and information, bond ratings and yields and financial distress predictions.

14.774 Legal Environment of Commerce  
Prerequisite: 2 unit English (General) or 2 unit English or 3 unit English.

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.

14.794 Honours Thesis

14.853 Advanced Systems Management  
Prerequisite: Admission to BCom degree course at Honours level.

As for 14.953G. See Graduate Study: Subject Descriptions.

14.857 Operations Research for Management 1  
Entry approval by Head of Department of Information Systems.

As for 14.957G. See Graduate Study: Subject Descriptions.

14.886 Research Topics in Information Systems 1  
Entry approval by Head of Department of Information Systems.

As for 14.986G. See Graduate Study: Subject Descriptions.
14.887 Research Topics in Information Systems 2
Entry approval by Head of Department of Information Systems.
As for 14.987G. See Graduate Study: Subject Descriptions.

14.891 Decision Support Systems
Prerequisite: 14.603
As for 14.991G. See Graduate Study: Subject Descriptions.

#### Economics

15.001 Microeconomics 1
S1 or S2 L2T1½
Commerce/Arts/Applied Science/Sciences prerequisite: 15.011.
HSC minimum mark required

- 2 unit English (General) or 60
- 2 unit English or 53
- 3 unit English 1


15.002 Microeconomics 2
S1 L2T2
Commerce prerequisite: 15.011.
Applied Science/Sciences prerequisites: 15.011 plus 15.401 or 15.411 or 10.001 or 10.011.
Arts prerequisite: 15.011. Co-requisites: 15.401 or 15.411 or 10.001 or 10.011.
Excluded: 15.012, 15.072.


15.003 Macroeconomics 3
S2 L2T2
Commerce prerequisite: 15.042 or 15.052.
Excluded: 15.013.

Macroeconomic theory and policy including an introduction to the theory of economic policy, the structure and dynamic characteristics of macro-models, fiscal policy, monetary theory and policy, inflation and unemployment. Rational expectations. Macroeconomic policy in Australia.

15.011 Macroeconomics 1
S1 or S2 L2T1½
Commerce/Arts/Applied Science/Sciences prerequisite: 15.001.

The economics of output, employment and inflation, including social accounting, consumption and investment functions, the Keynesian goods market model, supply and demand for money, interactions between the goods and money markets in equilibrium and disequilibrium situations, inflation and the balance of payments.

15.042 Macroeconomics 2
S2 L2T2
Commerce prerequisite: 15.011.

Arts/Applied Science/Sciences prerequisites: 15.002 plus 15.401 or 15.411 or 10.001 or 10.011. Co-requisite 15.421.
Excluded: 15.052, 15.062.


15.052 Applied Macroeconomics
S1 or S2 L2T1½
Commerce prerequisite: 15.011.

Arts/Applied Science/Sciences prerequisite: 15.011.
Excluded: 15.052 and 15.042.


15.072 Applied Microeconomics
S1 or S2 L2T1½
Commerce prerequisite: 15.011.
Excluded: 15.012 and 15.002.

Structural change in the Australian economy. The effect of different market structures on firms and consumer welfare. The consequences of markets 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. The economics of non-renewable and other resources. Australia's international trade and investment and the effects of restrictions on international trade and investment.

15.143 Microeconomics 3
S1 L2T2
Commerce prerequisite: 15.002 or 15.012.
Excluded: 15.153.

15.901 Australia in the International Economy in the 20th Century  

Prerequisite: Commerce/Applied Science/Arts/Sciences prerequisite: 

- 2 unit English (General) or 60
- 2 unit English or 53
- 3 unit English 1

The international economy at the end of the 19th century: trade, factor flows, and payment arrangements. Problems of the international economy between the wars. The impact of World War II and the international economy in the post-war era. Australian economic development and its relationship with the international economy; economic fluctuations; problems of the inter-war period; growth of manufacturing; government policy and action; the importance of the mining industry; economic development and the distribution of income and wealth.

15.902 Management Strategy and Business Development  

Prerequisite: 15.901.  
Applied Science/Arts/Sciences prerequisite: 

- 2 unit English (General) or 60
- 2 unit English or 53
- 3 unit English 1

The strategy and structure of large scale business enterprise over the past century. An analysis of the process of growth from small family firms and partnerships to corporate enterprises and multi-national corporations. The external business environment. Case studies of managerial hierarchies, investment strategy and diversification of firms in transport, mass retailing and mass production.

### Biological Sciences

17.031 Biology A  

Prerequisite: 

- 2 unit Science (Physics) or 31-100
- 2 unit Science (Chemistry) or 31-100
- 2 unit Science (Geology) or 31-100
- 2 unit Science (Biology) or 31-100
- 4 unit Science (multistrand) 31-100

Basic cell structure; membranes, organelles, prokaryotic and eukaryotic cells; cellular locomotion; basic biological molecules; enzymes: structure and metabolic roles, cellular compartmentalization and enzyme function; diffusion, osmosis and active transport; theory of inheritance, linkage, mutation, information transfer and protein synthesis.

### Requirements for Practical Work

Equipment required for practical work is set out in the Course Guide, available during enrolment time at the First Year Registration Centre (Physics Building). Students must purchase this prior to the first week of session.

17.041 Biology B  

Prerequisite: 17.031. Excluded: 17.021.

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.

17.012 General Ecology  

Prerequisites: 17.031 and 17.041.

Evolution and environmental selection in the Australian continent; geological, palaeoclimatological, biogeographical and historical background. Functional organization of ecosystems: energy budgets, hydrological and biogeochemical cycles. Integrated structure and function of ecosystems, including cropping and management of natural resources. Aspects of microbial ecology. Students are required to attend a field camp as an integral part of the course.

### Applied Geology

25.110 Earth Materials and Processes  

25.211 Earth Materials 1

Prerequisites: 25.120.


25.212 Earth Environments 1

Prerequisites: 25.120.


25.221 Earth Materials 2

Prerequisite: 25.211.


25.223 Earth Physics

Prerequisite: 25.110.


25.2261 Mathematical Geology 1

Prerequisite: 25.120.

Geological Statistics: Measurement scales in geology. Probability distributions and their properties; sampling and test of significance. Application of these techniques using geological data. Geological Computing: FORTRAN programming; text editing; control language for VAX and CYBER.

25.311 Earth Materials 3

Prerequisite: 25.221.

25.321 Earth Materials 4  
Pre requisite: 25.221.


25.312 Earth Environments 2  
Pre requisite: 25.212 (note: it is desirable that students taking this unit have also taken 25.223).


25.314 Mineral and Energy Resources 1  
Co-requisite: 25.221 or 25.311.

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 interaction. 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. Field work of up to three days is a compulsory part of the subject.

25.3162 Mathematical Geology 2  
Pre requisite: 25.2261.

Application of the mathematical techniques listed below to geological data processing and analysis. Analysis of variance. Introduction to matrix algebra. Regression analysis; trend surface analysis; time series analysis; Markov chain analysis. Introduction to nonparametric statistics. Introduction to multivariate statistics. Practical work based on the use of SPSS, BMDP and other library programs.

25.324 Mineral and Energy Resources 2  
Pre requisite: 25.212 or 25.5212.


25.325 Engineering and Environmental Geology  
25.3261 Geochemical Analytical Techniques  S2 L1T1
Prerequisite: 25.311.

25.3271 Structural Geology  S2 L1T1
Prerequisite: 25.221.
Advanced Structural Geology: Analysis of structural elements at the microscopic, mesoscopic and macroscopic scales. Detailed studies of the analysis of metamorphic terrains, eg Cooma Complex, Broken Hill. Field work of up to four days is a compulsory part of the subject.

25.333 Exploration Geophysics  S1 L3 and S2 L1T1
Prerequisite: 25.120.
Physical properties of rocks and soils. Introduction to seismic, gravity, magnetic, electrical, electromagnetic and radiometric methods of geophysical exploration. Application of these methods in the search for mineral deposits, petroleum, coal and groundwater and in civil and mining engineering projects. Interpretation of geophysical data. Field work of up to three days is a compulsory part of the subject.

25.410 Resource Geology  S1 L3T6

25.412 Sedimentary Basin Resources  S2 L1T1
Prerequisite: 25.120. Excluded: 25.212.
Field work of up to five days is a compulsory part of the subject. See Sedimentary Basin Resources strand in Applied Science Course 3000 Applied Geology Year 4. Available only to programs 2500, 5825.

25.414 Mineral Resources  S2 L1T1
Prerequisite: 25.312.
Field work of up to seven days is a compulsory part of the subject. See Mineral Resources strand in Applied Science Course 3000 Applied Geology Year 4. Available only to programs 2500, 5825.

25.420 Field Project  S2
A major field-laboratory project, which generally includes geological mapping, on some aspect of mineral or sedimentary basin resources, engineering or environmental geology or resource geophysics.

25.4101 Topics in Advanced Geology  S1 L3
Topics in geology selected from a list of subjects available from the Head of Department.

25.434 Geology Honours (Single Major)  S2
Prerequisite: 25.5212. Excluded: 25.312.
Topics in advanced geology within developing sedimentary environments and associated lithofacies within developing sediment wedges. Global Geophysics: Principles of gravity, geomagnetism, palaeomagnetism, geothermy and seismology and their relation to shape, internal constitution, dynamic processes and major tectonic features of the earth. Mineralogy and Petrology: Igneous and sedimentary rock types of the ocean floor and their significance. Field work of five days is a compulsory part of the subject.

25.5212 Sedimentology  S1 L1T1
Prerequisite: 25.120. Excluded: 25.212.
As for Sedimentology in 25.212 Earth Environments 1. Available only to Course 3145.

25.5313 Stratigraphy  S1 L2
Prerequisite: 25.5212. Excluded: 25.312.
As for Stratigraphy in 25.312 Earth Environments 2.

25.621 Marine Geology  F L1T2
Prerequisites: 25.601 or both 25.110 and 25.120.
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. Global Geophysics: Principles of gravity, geomagnetism, palaeomagnetism, geothermy and seismology and their relation to shape, internal constitution, dynamic processes and major tectonic features of the earth. Mineralogy and Petrology: Igneous and sedimentary rock types of the ocean floor and their significance. Field work of five days is a compulsory part of the subject.
25.622 Hydrological and Coastal Surveying  F L1T2
Prerequisites: Nil.

General principles of surveying, with particular reference to coastlines and off-shore techniques. Optical and electronic methods of distance measuring and position fixing. Methodology for short-term and long-term measurement of tides and flow currents. Bathymetric surveys in shallow and deep water conditions. Coastline morphologies and their relationship to the behaviour of water masses. Analysis of sedimentary systems in deltaic, estuarine and near-shore environments. Data collecting, processing and storage. Shallow-water investigations for bedrock morphologies. Field work of five days is a compulsory part of the subject.

25.631 Marine Geology 2  F L1T2
Prerequisite: 25.621.


25.632 Estuarine Geology  F L1T2
Prerequisite: Nil.

The physical nature of the estuarine environment; its characteristic topography, chemistry and layering of water masses; tidal behaviour. Characteristic sediments, stratigraphy of sediment bodies and distribution patterns of sediments and microfossils in estuaries. Inorganic and microbial diagenesis of estuarine sediments. Procedures for mapping, sampling and sample analysis, Mineral morphology. Statistical treatment of results. Field work of four days is a compulsory part of the subject.

25.6341 Marine Mineral Deposits and Oceanic Minerals  S1 L1T1


25.6342 Exploration and Seismic Methods  S2 L2T1

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.

25.931 Geophysics

See Geophysics strand of Applied Science Course 3000 Applied Geology Year 4. Available only to programs 2500, 5825.

25.9311 Gravity and Magnetic Methods  S1 L2T1
Prerequisites: 1.001 and 10.001. It is desirable that students taking this unit have a background in geology.

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

25.9312 Seismic Methods  S1 L2T1
Prerequisites: 1.001 and 10.001. It is desirable that students taking this unit have a background in geology.


25.9313 Electrical Methods  S1 L2T1
Prerequisites: 1.001 and 10.001. It is desirable that students taking this unit have a background in geology.

Introductory theory and field practice of resistivity, self-potential, induced polarization and airborne and ground electromagnetic methods. Geological interpretation of field data. Geophysical logging. Field work of one day is a compulsory part of the subject.

25.9314 Geological Applications  S1 L1T1
Prerequisite: 25.120.

A subject of ten weeks' duration. Structural Geology: Elements of structural geology, stereographic projection and fracture analysis. Geology of Fuels: Origin of coal, oil and natural gas; stratigraphic and structural consideration of oil and coalfields. Hydrogeology: Principles of hydrogeology; transmission of groundwater in rocks and soils. Field work of one day is a compulsory part of the subject.
25.9321 Geophysical and Geological Applications

Prerequisite: 25.120. Excluded: 25.6342.

Geological Interpretation of Geophysical data: Seismic stratigraphy. Coal-seam geometry from high resolution seismic and in-seam data. Geology of Ore Deposits: Mineralogy of industrially important metallic and non-metallic minerals. Theories of ore formation including secondary enrichment processes. Available only in program 2503.

Geography

27.010 Land Studies

Concepts, significance and problems of land. Land as territory and land as resource in Australia. Constraints imposed by the physical environment on human occupancy and settlement patterns, the variety of conflicts that result and management strategies. Practical work involves study of the ways in which the attributes and characteristics of land are displayed on maps, air photos and satellite imagery, and introduces these as basic information sources and research tools in applied geography.

27.030 Environmental Processes

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, alternatives to and movement of materials.

27.050 Geographical Data Analysis

Prerequisites: 27.111 or 27.010 and 27.030. Excluded: 27.162, 27.632, 27.813, 27.884.

Inferential statistics and hypothesis testing in the analysis of spatial data. Methods of analysing categorical data, identifying spatial correlation and associations, and multivariate methods applicable to topics in physical and economic geography.

27.133 Pedology

Prerequisites: 27.010 and 27.030 or 27.111 or any two units from 2.111, 2.121, 2.131, 2.141, and 27.811, 27.828 or 27.311 or 25.012 or 25.022.

Methodology of pedogenic studies and the application of these studies to the understanding of soil-landform relationships. Soil physical and chemical properties and their interrelationships, emphasizing clay-mineral 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.

27.143 Biogeography

Prerequisites: 27.010 and 27.030 or 27.811 or 27.828 or 17.031 and 17.041 or 27.111 or 27.172.


27.153 Climatology

Prerequisites: 1.001 or 27.811 or 27.828 or 25.110 and 25.120 or 17.031 and 17.041 or 27.111.

27.172 Environmental Measurements F L2T4
Prerequisites: 27.111; or 27.818 and 27.819; or 27.801 and 27.802; or 27.301 and 27.302.

Sampling strategies and survey methods for the collection of environmental data. Data analyses using laboratory and statistical methods. The collection and analyses of weather and climatic data, and the maintenance of meteorological stations. Methods of field surveying and instrumentation for the study of geomorphologic and hydrologic processes. Drainage basin morphometry, dynamics and function, including controls on run-off and sediment transport. The measurement of soil physical and chemical properties in the field and laboratory with special reference to plant growth and soil water and geomorphologic processes. The relationships between weathering processes and soil properties. Methods of surveying, classifying and mapping soils. Measurement and description of vegetation. Vegetation survey, sampling and species abundance measure. Monitoring energy and nutrient flow and the effects of humans on ecosystems.

27.175 Introduction to Remote Sensing S1 L2T2
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.

27.176 Remote Sensing Applications S2 L2T2
Prerequisite: 27.175 or 27.1711.

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.

27.183 Geomorphology S2 L2T3
Prerequisites: 25.110 and 25.120 or 27.010 and 27.030 or 27.811 or 27.828 or 27.111 or 27.172. Excluded: 27.860.


27.193 Environmental Impact Assessment S1 L2T1

Rationale and basic objectives; standardized types of environmental impact assessment (EIA), including matrix approach, adopted methods of EIA in Australia. Frequently used assessment and predictive techniques for meteorological, hydrological, biological, socio-economic impact. 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 possible future developments in EIA. Practical exercises representing components of typical EIAs.

27.432 Computer Mapping and Data Display S1 L1T3
Prerequisites: Successful completion of a Year 1 program in Applied Science, Science or Arts (or equivalent) as approved by Head of School.

Principles of graphic information processing. Introduction to thematic mapping and automated cartography; theoretical and practical problems in displaying and mapping data by computer. Review and application of computer mapping packages including SYMAP, SYMVU, CALFORM, GIMMS and SURFACE II.

27.562 Geographic Information Systems S2 L2T2
Prerequisites: 10.021B and 10.021C, or 10.001 or 10.011 or 27.432.

An introduction to information systems of particular relevance for economic geography with special reference to computer-based systems for resource evaluation. Problems of data structures, geocoding, and spatial identifiers. Model-based information systems. Project work: case study evaluation and the development of information systems for monitoring spatial change.

27.753 Social Welfare and Urban Development S2 L2T3
Prerequisite: 27.829 or 27.812. Note: This prerequisite does not necessarily apply to students enrolled in the Faculty of Applied Science.

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.

27.813 Geographic Methods S2 L2T2
Prerequisites: 27.010 and 27.030, or 27.111 or 27.050, 27.801 and 27.802, or 27.818 and 27.819. Excluded: 27.050, 27.2613.

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.
27.818 Australian Environment and Human Response  
**Prerequisite:** Nil. Excluded: 27.010, 27.030 27.801, 27.295, 27.111.

Themes selected from the mechanisms of the physical environment with particular reference to Australia and the Sydney region. *Landscape as an expression of dynamic response:* land capability and land use problems, humans as agents of landscape change. *Energy and Atmospheric Circulation over Australia:* local weather patterns and weather extremes, human responses to fire, flood, and drought hazards. *Development and Stability of Hillslopes:* soil, vegetation and drainage relationships, problems of soil erosion. *Coastal Ecosystems:* problems of demand, risk and management in the coastal zone. Lectures are supplemented with tutorials, workshops, and field tutorials. Students are required to provide some materials for workshop exercises and to contribute to the cost of field tutorials.

27.819 Technology and Regional Change  
**Prerequisite:** Nil. Excluded: 27.802.

The impact of technological change on the spatial organization of human activities and regional development and disparities. The implications of technological change on population distribution, resource utilization, and settlement patterns are examined at different scales emphasizing the social consequences at the community and regional level. Examples are taken from Third World and modernized countries, with particular reference to Australian case studies.

27.824 Spatial Population Analysis  
**Prerequisite:** 27.812 or 27.829. Excluded: 27.834.

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

27.825 Urban Activity Systems  
**Prerequisite:** 27.812, 27.829. Excluded: 27.835.

The understanding of problems arising from processes of change in non-metropolitan areas, with particular reference to their effects on the functional structure of country towns in NSW. Topics include: functional classification, service provision, economic base, rural mobility decentralization and settlement policies, and urban systems.

27.826 Urban and Regional Development  
**Prerequisite:** 27.812, or 27.829. Excluded: 27.836.

Theories of urban and regional change leading to assessment of the role of planning. Emphasis on resource allocation, conflict resolution and evaluation techniques including cost-benefit analysis and environmental impact assessment. Lectures accompanied by seminars and workshop sessions which concentrate on methodology.

27.828 Australian Natural Environments  
**Prerequisite:** 27.801 or 27.818. Excluded: 27.111, 27.811.


27.829 Australian Social Environments  
**Prerequisite:** 27.802 or 27.819. Excluded: 27.010, 27.030, 27.812.

Focus is on the interaction between human communities and the built environment in Australia: the effects of the natural environment on the evolution of settlement patterns; detailed analysis of rural and metropolitan social environments. Emphasis on inner city, suburbia, behavioural and social area approaches, and to managerialist and structural theories of social change on areas and their communities.

27.844 Honours Geography  
**F**

**Prerequisite:** Arts students must satisfy Faculty requirements for entry to the Honours Level program and must have obtained at least 54 credit points in Geography subjects, including 12 Level 1 credit points. A minimum cumulative average at Credit level is required for all Upper Level subjects taken which must include 27.884.

Details of Honours Geography for science students are available from the School of Geography office.

Students are required: 1. To undertake an original piece of work extending throughout the year and to submit a thesis based upon it. 2. To participate in seminars and fieldwork (usually undertaken prior to Session 1) as notified by the School of Geography.

27.862 Australian Environment and Natural Resources  
**Prerequisite:** 27.010 and 27.030 or 27.811 or 27.812 or 27.828 or 27.829. Excluded: 27.872.

Continental and regional patterns of land, water and energy resources in Australia and its territorial waters, and natural factors affecting their development, including climate, soils and terrain; problems of limited surface and underground water resources and of conflicting demands, exemplified through particular basin studies; comparable reviews of energy, minerals and forest resources, human resources and development.

27.863 Ecosystems and Man  
**Prerequisite:** 27.010 and 27.030, or 27.111 or 27.311/811 or 27.312/812 or 27.828 or 27.829. Excluded: 27.873, 27.363.

The structure and functioning of ecosystems, humans' interaction with ecosystems; Australian case studies of ecosystem management, including pastoral, cropping, forestry, coastal and urban ecosystems.
27.883 Special Topic S1 or S2 L4
Prerequisite: Nil.

Admission by permission to suitable students with good Passes in at least four subjects at Upper Level. A course of individually supervised reading and assignments as an approved topic in Geography not otherwise offered.

27.884 Advanced Geographic Methods S1 L2T2
Prerequisites: 27.813 or both 27.2813 and 27.2814. Excluded: 27.050, 27.880.

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.

Surveying

29.1010 Surveying 1 S1 L2½T2½

29.2010 Surveying 2 S2 L1½T2½
Principles of levelling. Methods, recording. Levelling instruments; testing and adjustment. Theodolites; principles and construction. Horizontal and vertical angle measurement.

29.441 Surveying for Engineers S1 or S2 L2T4

29.491 Survey Camp
A one-week field camp for students studying 29.441 Surveying for Engineers.

31.851 Optics S1 L2T4 S2 L1T3
Prerequisites: 1.001 or 1.021, 10.001 or 10.021B and 10.021C or 10.011.


Optometry

31.821 Anatomy and Physiology of Eye and Visual System S1 L4T2 S2 L5T2
Prerequisites: 17.031, 17.041. Co-requisite: 73.011A

31.852 Visual Optics S1 L3T1 S2 L2T1
Prerequisites: 1.001 or 1.021, 10.001 or 10.021B and 10.021C or 10.011.


31.853 Measurement of Light and Colour S2 L1T1
Prerequisite: Nil.


31.841 Clinical Optometry F L1T1S2 L1T1

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.

31.861 Optometry A FL51T1S2 L1T1S2 L1T1

Refraction: Theory and practice of keratometry, aetiology of ametropia, objective and subjective refraction, prescribing special visual aids. Orthoptics and binocular vision: Convergence/accommodation anomalies, strabismus, amblyopia. Contact lenses: Corneal anatomy and physiology, contact lens design and manufacture, fitting techniques. Low vision: Examination of the low vision patient, selection of aids.

31.862 Diagnosis and Management of Ocular Disease FL5T1S2 L2T1
Prerequisites: 31.821.


31.863 Theory of Spectacle Lenses and Optical Instruments FL1T1S2 L1T1S2 L1T1
Prerequisite: 31.851, 31.852.

Advanced geometrical optics and spectacle lens design. Aberrations and their control. The elements of microscopic and macroscopic systems.

31.864 Clinical Methods FT5

Practical assignments in ophthalmoscopy, biomicroscopy, tomometry, gonioscopy, visual fields, colour vision tests, refraction, assessment of binocular vision, strabismus.

31.871 Optometry B FL6

Biochemistry

41.101 Biochemistry  F L2½T3½
Prerequisites: 17.041, and 2.121 and 2.131, or 2.141. Excluded: 2.003J.

The chemical properties of amino acids, peptides and proteins, carbohydrates, nucleic acids and lipids and the biological roles of these compounds. The nature and function of enzymes. The intermediary metabolism of carbohydrates, lipids and nitrogenous compounds. The relationship between structure and function of enzymes, other proteins, hormones and biological membranes, metabolic networks and control mechanisms. The molecular mechanism of gene expression and protein synthesis. Photosynthesis. Practical work to amplify the lectures.

41.103 Biochemistry Honours

Advanced training in selected areas of biochemistry including a supervised research program of 500 hours minimum duration that places emphasis on the use of specialized techniques relevant to the research area. A written thesis on the research is required.

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.

41.102A Biochemistry of Macromolecules  S1 L3T9
Prerequisites: 41.101, 2.102B.

Polysaccharides and glycoproteins including bacterial cell walls. Chemistry and biology of polynucleotides. Methods of amino acid and nucleic acid sequence analysis. Protein structure and synthesis. Active centres of some proteins. Sub-unit organization of proteins. Enzyme kinetics. Practical work to illustrate the lectures and to provide experience in modern biochemical techniques.

41.102B Physiological Biochemistry  S2 L3T9
Prerequisites: 41.101, 2.102B


41.102E Molecular Biology of Higher Organisms  S2 L2T4
Prerequisite: 41.102A.

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 characterization 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 specialized 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 hybridization and DNA sequencing.

Biotechnology

42.101 Introduction to Biotechnology  S2 L2T4
Prerequisites: 2.121 and 2.131, or 2.141; 17.041; 10.011 or 10.001 or 10.021B and 10.021C.

An introduction to biotechnology as a multidisciplinary subject, dealing with the application of biochemical systems or their products in industry. Industrial uses include: production of single products (such as amino acids, vitamins, antibiotics etc), single cell protein, alternate fuels from renewable resources and fermented foods and beverages; biological waste treatment; aspects of pollution control; biodeterioration and biodegradation; and principles of enzyme technology. Concepts relevant to productivity in these systems, including: thermodynamic feasibility, techniques of environmental and genetic manipulation, choice of the appropriate biological catalyst(s) for a particular process, regulation of gene activity. The laboratory component emphasizes the manipulation of different classes of microorganisms and the use of biochemical products involved in a variety of biotechnological areas.
42.102A Biotechnology A

Prerequisites: 41.101 and 42.101 or 44.101 (Pass Conceded (PC) or Terminating Pass (TP) awarded prior to Session 2, 1983, is not acceptable).

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 micro-organisms, laboratory-scale fermenter operation, microbial enzyme isolation, visits to industrial fermentation plants and industrial seminars.

42.102B Biotechnology B

Prerequisite: 42.102A (Pass Conceded (PC) or Terminating Pass (TP) awarded prior to Session 2, 1983, is not acceptable).

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 optimization techniques. The economics of microbial processes are considered and comparison made with alternative modes of production or treatment. The economics of agro-industry 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.

42.102C Microbial Genetics

Prerequisites: 41.101 or 44.101. Excluded: 43.102.

A detailed study of the mutational basis of microbial variation. Mutagens; mechanisms of mutagenesis; induction, enrichment, isolation and characterization of mutants; mechanisms of repair of mutational damage. Systems of gene transfer and recombination in fungi, bacteria and bacterial viruses; the use of these systems in constructing genetic maps, and as tools for probing aspects of microbial physiology and biochemistry. Genetic control of gene expression; the operon concept and its application to specific regulatory systems. Genetic code, collinearity between a gene and its product, genes within genes, suppression of mutations. Restriction and modification of DNA; genetic engineering — its implications and prospects. Genetics of nitrogen fixation.

42.103 Biotechnology (Honours)

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

42.114 Fermentation Processes

Factors governing the use of micro-organisms in industrial processes, including the selection, maintenance and improvement of micro-organisms, the control of environmental factors, batch and continuous flow operational patterns, product recovery, process optimization and waste disposal. Demonstrations of the operation and control of fermenter systems and of microbial process simulation.

Botany

43.111 Flowering Plants

Prerequisites: 17.031 and 17.041.

Plant cell structure, structure and functions of the major organs in angiosperms (flowers, roots, stems and leaves), secondary thickening and arborescence, transport systems in plants, seeds and germination. Variation in structure and function in relation to environment. Introduction to taxonomy and identification of major Australian plant families. A short field excursion is part of the subject.

43.131 Fungi and Man

Prerequisites: 17.031 and 17.041.

An introduction to the biology and taxonomy of fungi followed by a study of their economic importance to man. Includes: fungi as pathogens of plants and animals; use of fungi as food and in the production of useful chemical products; medical uses of fungi, including drugs and hallucinogens; degradation of organic matter, particularly in soils and of timber; interaction of fungi with other organisms; chemical control of fungi.

43.112 Taxonomy and Systematics

Prerequisite: 43.111.

The assessment, analysis and presentation of data for classifying organisms both at the specific and supra-specific level.

43.121 Environmental Physiology

Prerequisites: 17.031, 17.041, 2.121 and 2.131, or 2.141.

How plants function in relation to the constraints imposed on them by soil and atmospheric environments. Includes: germination, growth and development, particularly photosynthesis, respiration, inorganic nutrition, water relations, transport processes and reproductive physiology. Important practical applications of various physiological mechanisms.
43.132 Mycology and Plant Pathology  S2 L2T4
Prerequisite: 43.131.

A detailed study of the fungi, including both saprophytic and plant pathogenic species. Includes: hyphal structure and ultra-structure; morphology and taxonomy of members of major taxonomic groups; spore liberation, dispersal, deposition, germination, infection and the establishment of a host-pathogen relationship; morphogenesis of vegetative and fruiting structures; cytology, genetics; ecological considerations of fungi in specialized habitats, survival mechanisms and methods of control of plant pathogens.

43.142 Environmental Botany  S1 L2T4
Prerequisites: 17.031 and 17.041.

The soil and atmospheric environments in which plants live and a study of the interaction of plants with their environment. Energy and mass transfer. Emphasis is placed on the role of environmental science in food production.

43.152 Plant Community Ecology  S2 L2T4
Prerequisites: 43.111 and 17.012 or 27.111.

Recognition and delimitation of plant communities. Ecology of selected Australian vegetation types. Use of numerical methods and application of community concepts to palaeoecology. Field work is an integral part of this course.

43.172 Phycology and Marine Botany  S1 L2T4
Prerequisite: 43.111.

The biology of freshwater, marine and soil algae with particular emphasis on the marine flora of SE Australia. Field work is part of the subject.

43.192 Ultrastructure  S2 L2T4
Prerequisite: 43.111 or 43.121 or 41.101 or 44.101 or 45.201 or 45.301. Excluded: 43.182.

The impact of the study of ultrastructure in biological research and teaches techniques currently used in ultrastructural research. While covering the basic ultrastructure of prokaryotes and of eukaryote cells and organelles, emphasis also on areas where ultrastructural research is at present making an important contribution to understanding how cells work: for example, motility, secretion, control of cell wall deposition, transport and cell communication. Practical work: students use transmission and scanning electron microscopes to investigate material they themselves prepare, using negative staining, ultra-microtomy and freeze-fracture; also includes optical systems in light microscopy, principles and practice of fixation and embedding tissues for light and electron microscopy; histochemistry and techniques of enzyme localization.

Servicing Subjects
These are subjects taught within courses offered by other faculties.

43.202 Botany for Landscape Architects  S1 L2T3
Prerequisite: Nil.

How green plants function. What is known about how plants grow. Specific topics include: what happens in a plant meristem, hormone interactions and growth, transport systems in plants, water uptake and use, mineral nutrition, the role of light and leaves in photosynthesis, control of flowering process, germination and senescence. Emphasis is on the interaction between plant structure and function.

Microbiology

Level II Units

44.101 Introductory Microbiology  S1 L2T4
Prerequisites: 17.031 and 17.041.

The general nature, occurrence and importance of microorganisms. A systematic review of the major groups of microorganisms; the eucaryotic protista (micro-algae, protozoa and fungi); procaryotic protista (blue-green algae, “higher” bacteria, typical unicellular bacteria and small bacteria-like forms); plant, animal and bacterial viruses. The relationship between microorganisms and their environment, ecological considerations. Interactions between microorganisms and higher organisms.

44.121 Microbiology 1  S2 L2T4
Prerequisites: 44.101 and 41.101 or 2.003J.

The balanced structure of this unit makes it suitable for students majoring in microbiology and also for students who wish to enlarge their knowledge and skills in microbiology beyond those obtained in 44.101 Introductory Microbiology or equivalent units at other institutions.

Level III Units

44.102 General Microbiology  S1 L4T8
Prerequisites: 44.101, 44.121 (Pass Conceded (PC) awarded prior to Session 2, 1983, is not acceptable). 41.101.

Prerequisites: 44.102. General Microbiology SI L4T8
Prerequisites: 44.101, 44.121 (Pass Conceded (PC) awarded prior to Session 2, 1983, is not acceptable). 41.101.

Systems for the isolation, identification and taxonomic description of microorganisms; fine structure, cyto-chemistry, genetics of bacteria and viruses; metabolic requirements of microorganisms; and their environment, growth, inhibition and death; energy-yielding and biosynthesizing systems; genetic and phenotypic control systems.

44.112 Applied Microbiology  S2 L4T8
Prerequisites: 44.102.

Endeavours to relate the basic facts about microorganisms to a variety of practical conditions. The nature of bacterial and fungal diseases of humans, their cultural and serological identification and spoilage of food and dairy products. The nature of bacterial activity and control of microorganisms in soil, air, water and in their relationship with higher organisms (other than humans), their industrial applications including manufacture, preservation and spoilage of food and dairy products. The nature of bacterial and fungal diseases of humans, their cultural and serological diagnosis, epidemiology, treatment and prevention will be discussed in some detail.

44.122 Immunology  S2 L2T4
Prerequisites: 17.031 and 17.041, 41.101.

Basic immunology and immunological techniques. The interdisciplinary nature of the subject makes this unit suitable for students taking any major sequence in biological science and also for higher degree students who require a background training in immunology. The course includes phylogeny and ontogeny of the immune response; antigen and antibody structure, antigen-antibody reaction, immunochemistry; immunogenetics, clinical immunology; transplantation.

44.132 Virology  S2 L2T4
Prerequisites: 44.102.

The structure, replication and behaviour of animal, plant and bacterial viruses; applications of virological techniques; virus diseases of animals and plants, their epidemiology and control.

Level IV Units

44.103 Microbiology Honours  F
Advanced training in selected areas of microbiology, 1. a formal component consisting of seminars, tutorials, introductory electron microscopy and written assignments, 2. a supervised research program in a specific area of microbiology or immunology.

Servicing Subjects

These are subjects taught within courses offered by other faculties.

For further information regarding the following subject see the Faculty of Medicine Handbook.

80.311 Paraclinical Science
In conjunction with School of Pathology and School of Physiology and Pharmacology.

Zoology

Students are not admitted to Level III Zoology units, without special permission of the Head of School, unless Chemistry 2.001 or 2.121 and 2.131, or 2.141, has been completed.

45.101 Biometry  S2 L2T4

Statistical methods and their application to biological data, including introduction to probability; the binomial, Poisson, normal distributions; student's t, f and variance ratio tests of significance based on the above distributions, the analysis of variance of orthogonal and some non-orthogonal designs; linear regression and correlation. Non-linear and multiple regression. Introductory factorial analysis. Introduction to experimental design. Non-parametric statistics, including tests based on r, the Kruskal-Wallis test, Fisher's exact probability test and rank correlation methods. Introduction to programming in BASIC.

45.112 Marine Ecology  S1 L2T4
Prerequisites: 17.031, 17.041, 45.201 or 25.022 or 2.002D.

A study of the ecology of marine organisms with particular reference to the physical, chemical and biological environment in which they occur. Both field and laboratory practical work are included.

Students intending to enrol in this unit should register with the School of Zoology by 14 January for the February field trip.

45.121 Evolutionary Theory  S1 L3T3
Prerequisites: 17.031, 17.041.

Current evolutionary theory, emphasizing the population level. Ecological genetics, evolutionary aspects of ecological niche theory, speciation, evolution of social behaviour, molecular evolution and general evolutionary genetics. Some background in genetics is desirable.

45.122 Animal Behaviour  S2 L2T4
Prerequisites: 45.101, and 45.201 or 45.301.

An introduction to Ethology, the biological study of behaviour. Physiological, ecological, developmental and evolutionary aspects of behaviour are examined as important elements in the analysis of behaviour, particularly social behaviour. Both field and laboratory work are included.

45.132 Ecological Physiology  S2 L2T4
Prerequisites: 45.201 or 45.301.

A study of 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 and temperature regulation/acclimation. Particular attention is given to Australian fauna and conditions.
45.142 Comparative Physiology

Prerequisite: 45.201 or 45.301.

Basic physiology of nerves, muscles, sensory perception, blood circulation, respiration, gastrointestinal tract, kidneys and hormones. Physiology of reproduction. The control of organ systems and body functions.

45.152 Population and Community Ecology

Prerequisites: 17.041 and 10.001 or 10.011 or both 10.021B and 10.021C.

Examination of the dynamics of one, two or more interacting populations. Systems analysis and simulation in ecology. Theoretical and mathematical analysis of the dynamics and stability of ecosystems. Topics in the optimal management of renewable resources. Unifying concepts in ecology.

45.201 Invertebrate Zoology

Prerequisites: 17.031, 17.041.

A comparative study of the major invertebrate phyla with emphasis on morphology, systematics and phylogeny. Practical work to illustrate the lecture course. Obligatory field camp.

45.301 Vertebrate Zoology

Prerequisites: 17.031 and 17.021, or 17.041.

A 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 the lecture course. Field excursions as arranged.

45.302 Vertebrate Zoogeography and Evolution

Prerequisite: 45.301.

A geographic approach to the current distribution, abundance and types of vertebrate species in the Australian region. Particular emphasis is placed on the basic principles of speciation, the history of the Australian continent, vertebrate adaptations and changes in the distribution and abundance of the Australian vertebrate fauna under the influence of humans. Field excursions as arranged.

45.402 Entomology

Prerequisites: 17.031, 17.041, 45.201.

Classification, external morphology and internal anatomy of insects, studies on environmental sensory physiology and behaviour—especially reproductive behaviour, social organisation, pheromones and rhythms. Practical work to illustrate the lectures.

45.422 Economic Zoology

Prerequisite: 45.201 or 45.402.

A study of the biology, ecology and control of vertebrate and invertebrate animals which harm humans and their possessions. Human and domestic animal parasitology, pests on plants, diseases caused or spread by animals, chemical, biological and physical control, and side effects.

45.601 Introductory Genetics

Prerequisites: 2.131 or 2.141, 17.031, 17.041. Excluded: 9.801.


Chemical Engineering and Industrial Chemistry

48.023 Chemical Engineering Science 1

Prerequisites: 1.001, 10.001.

48.024 Chemical Engineering Principles 1 S1 L2T1 S2 L1T1
Prerequisites: 1.001, 10.001.

The following topics, from 48.023: Flow of Fluids, Heat Transfer 1, Dimensions.

48.037 Chemical Engineering Science 2 F L5T2
Prerequisites: 2102A, 48.023.


48.038 Chemical Engineering Principles 2 S1 L3T1 S2 L1T1
Prerequisite: 48.024.

The following topics, from 48.037; Mass Transfer (Theory), Heat Transfer 2 (Theory), Fluid-particle Systems, Surface Separation Processes.

48.403 Polymer Science S1 or S2 L2T1
Prerequisites: 2102A, 2.102B, 10.031, 10.301. Co- or prerequisites: 48.001, 48.113.


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. 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.

First Enrolment in Philosophy

There are two Level I subjects:
52.103 Introductory Philosophy A (Session 1)
52.104 Introductory Philosophy B (Session 2)

Each of these has 1-unit value; they can be taken separately, and a student 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.

Value of Upper Level Subjects in Philosophy

With the exception of two which count as full units, all upper level subjects in Philosophy are part units, of which three together have the value of two full units; otherwise, each one counts as a half-unit.

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Major in Philosophy

Students majoring in Philosophy must take the equivalent of two full Upper Level (II/III) units in Year 2, and the equivalent of 4 full Upper Level (II/III) units in Year 3.

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 units or half-units may be waived; for example, in the case of students who have already studied similar material, or who wish to take isolated units or half-units relevant to another discipline. Students who feel they have a case for a concession of this kind should consult the School.

52.103 Introductory Philosophy A  S1 L3T1 C6
Prerequisites: Nil.

The general topic of Persons, with reference to some at least of the following: Freud’s theory of mental processes; Sartre’s account of human existence; the mind-body problem.

Assessment: Weekly exercises, tutorial work, and on each section of the work either a one-hour or a take-home examination.

52.104 Introductory Philosophy B  S2 L3T1 C6
Prerequisites: Nil.

Topics normally include: issues in ethics and political philosophy; the nature of religion and religious belief; deduction in modern formal logic and related problems of the ambiguity of natural languages.

Assessment: Weekly exercises, tutorial work, and on each section of the work a one-hour examination.

52.219 Philosophical Foundations of Marx’s Thought  S2 L3 C6
Neil Harpley, Barbara Roxon
Prerequisite: Upper Level status in Philosophy. Excluded 52.373.

A discussion of the basics of Marx’s historical materialism and dialectical materialism.

Assessment: Exercises and essays.

52.2001 The Nature of Mind  S1 L2 C4
Dr Philip Cam
Prerequisite: Upper Level status in Philosophy.

A philosophical study of some conceptions of mind from Descartes to the present day, including: Descartes and Huxley on dualism and mechanism, James’ naturalism, Freud’s psychodynamics, Skinner’s behaviourisms, Piaget’s developmental psychology, neo-cognitivism.

52.2002 Contemporary Philosophy of Mind  S1 L2 C4
Dr Philip Cam
Prerequisite: Upper Level status in Philosophy.

General introduction to current issues in the Philosophy of Mind: intentionality and the theory of intentional systems; computational models and their physical basis; the nature of mental representation; theories of consciousness; philosophy and artificial intelligence; the concept of a person; mechanism, freedom and responsibility.

52.2003 Issues in the Philosophy of Psychology  S2 L2 C4
Dr Philip Cam
Prerequisite: Either 52.2001 or 52.2002.

Philosophical investigation of some theoretical issues in psychology and related sciences; folk theories and psychological science, behaviourism and its critics, some limits of cognitive psychology, relations between psychological and physiological explanation, the computer as a model of the mind, perceptions as hypotheses, the character and status of mental images.

52.2010 Reasoning Skills  S1 or S2 L2 C4
Prerequisite: Any Level I subject. Excluded: 52.233.

Reasoning skills in which practical arguments are examined in classroom exercises; lectures on practical argument in the courtroom, politics and everyday life as compared with arguments in mathematics and theoretical science.

Assessment: Exercises, essay and class examination.

52.2020 Descartes  S1 L2 C4
Ray Walters
Prerequisite: Upper Level status in Philosophy. Excluded / 52.163.

The main issues raised in the philosophy of Descartes and their importance for the development of modern philosophy. Emphasis is on the cogito ergo sum argument, the Cartesian method and the search for rational certainty, his theory of ideas, the body-mind problem.

Assessment: Exercises or essay and examination.

52.2021 Spinoza and Leibniz  S2 L2 C4
Ray Walters
Prerequisite: 52.163 or 52.2020. Excluded: 52.303.

The main issues raised in the philosophy of the two great 17th century rationalists, with emphasis upon the development of their metaphysical systems in response to unresolved problems in the philosophy of Descartes and to contemporary scientific thinking. Their ethical views.

Assessment: Exercises or essay and examination.
52.2030 *Predicate Logic A*  
**Prerequisite:** Any Level 1 subject. **Excluded:** 52.153, 52.162, 52.1531.

A system of natural deduction is presented for the first order predicate calculus. Emphasis is upon construction of formal derivations, methods of showing the invalidity of formal arguments, and the evaluation of informal arguments by symbolization.

**Assessment:** Exercises.

52.2031 *Predicate Logic B*

**Prerequisite:** 52.1531 or 52.2030. **Excluded:** 52.153, 52.1532.

A continuation of Predicate Logic A, including the theories of identity and of definite descriptions.

**Assessment:** Exercises.

52.2040 *Greek Philosophy: Thales to Plato*  
**Peter Gibbons**

**Prerequisite:** Upper Level status in Philosophy. **Excluded:** 52.183.

The leading ideas of the Greek philosophers from Thales to Plato with special reference to the Pre-Socratics.

**Assessment:** To be decided in consultation with students.

52.2050 *Classical Political Philosophy*  
**Dr Stephen Cohen**

**Prerequisite:** Upper Level status in Philosophy. **Excluded:** 52.182, 52.203.

The basis of political society, its various functions and its relation to the individuals in it, investigated primarily through the works of Hobbes, Locke, Rousseau and Mill. Topics include the theory of a social contract, the establishment of political rights and obligations, and the relation of moral and political concerns within a political society.

**Assessment:** Two short essays and an examination.

52.2060 *Sartre*  
**Barbara Roxon**

**Prerequisite:** Upper Level status in Philosophy. **Excluded:** 52.213.

An examination of Sartre's account of freedom, relations between persons and his social theory.

**Assessment:** Essays and exercises.

52.2130 *British Empiricism*  
**Neil Harpley**

**Prerequisite:** Upper Level status in Philosophy. **Excluded:** 52.173.

A survey of the empiricist tradition with special concentration on Locke and Berkeley.

**Assessment:** Exercises and essays or examination.

52.2140 *Scientific Method*  
**Ray Walters**

**Prerequisite:** Upper Level status in Philosophy. **Excluded:** 52.193.

The nature of empirical knowledge as exemplified in the physical and social sciences, with emphasis on the concept of explanation, the nature of induction and scientific laws, and controversies over the nature of scientific knowledge.

**Assessment:** Exercises or essay and examination.

52.2150 *Philosophy of Law*  
**Dr Stephen Cohen**

**Prerequisite:** Upper level status in Philosophy. **Excluded:** 52.105.

Selected conceptual and normative issues in the philosophy of law, centring around the broad areas of law (eg, its nature, validity, bindingness, and relation to morality), liberty, justice, responsibility (including strict and vicarious liability), and punishment.

**Assessment:** Essays, possibly an examination.

52.2170 *Hume*  
**Neil Harpley**

**Prerequisite:** Upper Level status in Philosophy. **Excluded:** 52.152, 52.563.

A study of Hume's epistemology, his discussion of arguments for the existence of God and free will.

**Assessment:** Essay and exercises or examination.

52.2220 *The Ethics of Plato and Aristotle*  
**Dr Stephen Cohen**

**Prerequisite:** Upper Level status in Philosophy. **Excluded:** 52.523, 52.5231.

A systematic investigation of the moral theories of Plato and Aristotle. Beginning with the immoral and subsequent amoral position of Thrasymachus and his question in Book 1 of The Republic, "Why should I be just?", the subject investigates the ways in which Plato and Aristotle each set out the problems of the nature of morality and why a person should be moral, their approaches to the solutions of these problems, and their positive moral theories.

**Assessment:** Two short essays and an examination.

52.2230 *Theories in Moral Philosophy*  
**Dr Stephen Cohen**

**Prerequisite:** Upper Level status in Philosophy. **Excluded:** 52.523, 52.5232.

Three moral theories central in the history and development of moral philosophy. Hume, Kant, and Mill offer differing 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 in itself and in comparison with the other two theories examined.

**Assessment:** Two short essays and an examination.
52.2240 Philosophical Study of Woman  S1 L2 C4
Neil Harpley, Barbara Roxon
Prerequisite: Upper Level status in Philosophy. Excluded: 52.283.
A discussion of crucial structures involved in women's situation.
Assessment: Exercises and essays.

52.2250 Plato's Theory of Forms  S2 L2 C4
Peter Gibbons
Prerequisite: Upper Level status in Philosophy. Excluded: 52.483.
A study of some dialogues of Plato, with special attention to Socratic definition and Plato's Theory of Forms.
Assessment: To be decided in consultation with students.

52.2260 Aesthetics  S2 L2 C4
Ray Walters
Prerequisite: Upper Level status in Philosophy. Excluded: 52.273.
An examination of the central concepts, types of judgment and theories occurring in the field of aesthetics or theory of art.
Assessment: Exercises or essay and examination.

52.2270 Social and Political Philosophy  L2 C4
Dr Stephen Cohen
Prerequisites: Upper Level status in Philosophy. Excluded: 52.513.
Not offered in 1987.
Largely through contemporary writings, including a number of journal articles, investigation of, eg rights, freedom, law and legislation, responsibility, liability, coercion, punishment and justice.
Assessment: Essay.

52.2330 Psychoanalysis — Freud and Lacan  S2 L2 C4
Barbara Roxon
Prerequisite: Upper Level status in Philosophy. Excluded: 52.573.
A discussion of psychoanalytic theory, particularly for what it shows about the relation between the individual and the social.
Assessment: Exercises and essays.

52.2360 Theories, Values and Education  S2 L2 C4
Martin Bibby
Prerequisite: Upper Level status in Philosophy. Excluded: 52.583.
The nature of theories of education, and the contributions to them of philosophy, psychology and sociology; values in education and the social sciences; the justification of an ordering of educational goals.
Assessment: Essay.

52.2371 Plato's Later Dialogues  S2 L2 C4
Peter Gibbons
Prerequisite: 52.483 or 52.2250 (or, by permission, a course covering similar material). Excluded: 52.293.
Centred round some of Plato's later dialogues, the Theaetetus and Sophist in particular.
Assessment: To be decided in consultation with students.

52.2980 Seminar A  S2 T2 C4
Excluded: 52.423.
Admission by permission, based on a student's performance in Upper Level subjects. Topics vary and are influenced by student requests. Possible topics include: contemporary ethics; contemporary moral issues; logical atomism; Wittgenstein; theories of the emotions; issues in social and political philosophy.
Assessment: Essay.

52.2990 Reading Option A  S1 or S2 C4
Excluded: 52.413.
Admission by permission, to suitable students with good Passes in at least two subjects at Upper Level. A course of individually supervised reading and assignments on an approved topic not otherwise offered.
Assessment: Essay.
Sociology

53.001 Introduction to Sociology  F 3CCH C12

An introduction to a critical and reflexive sociology by examination of contemporary Australian society. Major topics include: Thinking about Australian society; political economy of Australian society; social movements, social philosophies and State responses; and culture and resistance. Specific topics: the analysis of every day life; social class; gender; political party formation; popular culture; media moral panics. Provides a sound basis for further studies in the social sciences.

Assessment: On the basis of performance in essays, written assignments, and tutorial classes.

Education

58.704 Theory of Education 3  F L3
Prerequisite: 58.703.

Sociology of Education: Includes sociology of the school and classroom, deviance, knowledge and the curriculum, sexism, in schools, social trends and problems and their implications for education, technology work and lifelong learning. Selected Studies in Education: two education theory options to be selected from among a number available; some deal with the separate disciplines of philosophy, psychology, sociology, others may draw from more than one. In any given year the options offered depend on the staff available and on student demand. Topics may include the following: Computer assisted instruction, the talented child, learning disabilities, social trends and problems, sociology of the school and classroom, methodology for criticism, ethical theory and moral education, science and religion in education.

58.714 Teaching Practice 3  F 15 days
Prerequisites: 58.713, 58.723 or 58.733 or 58.743 or 58.753.
Co-requisites: 58.724 or 58.734 or 58.744 or 58.754 or 58.764.

Provision for further opportunities for students to develop teaching competence; each student is placed in a high school for 15 days and works in close association with a teacher.

58.734 Science Curriculum and Instruction 3  S1 L1T4 S2 T3
Prerequisites: 58.703, 58.713, 58.733.

Examination of NSW secondary school science syllabuses, investigation of curriculum material suitable for use in teaching secondary school science, development of teaching resources, the professional development of the science teacher, the teaching of biology, chemistry, geology and physics. Classroom Issues and Strategies: aspects relating to assessment and measurement including test planning, standardized tests, marking and reporting, essay-type tests, scaling of test scores, uses and effects of assessment.

58.744 Mathematics Curriculum and Instruction 3  S1 L3 S2 L2
Prerequisites: 58.703, 58.713, 58.743.

The teaching of senior secondary school mathematics syllabuses, curriculum development projects in mathematics and their application in NSW, critical analysis of learning problems of school students, investigation of practical remedies for such problems. The subject is designed to complement 58.714 Teaching Practice 3, taken together these subjects provide a wide set of experiences which equip potential teachers to fit successfully into the NSW teaching environment. Classroom Issues and Strategies: aspects relating to assessment and measurement including test planning, standardized tests, marking and reporting, essay-type tests, scaling of test scores, uses and effects of assessment.

58.793 Advanced Education 1  F 1CCH

Students study one of the following segments: Philosophy of Education segment: some connected issues in social and political philosophy, and their implications for educational theory and practice. Includes: freedom, compulsion and the aims of education; neutrality of education systems, schools, teachers and courses; and justice and equality. Educational Psychology segment: introduction to selected aspects of on-going research activities in educational psychology. The area is selected following discussions with staff members. Sociology of Education segment: more detailed and extensive examination of central topics studied in the pass strand. Consideration of selected issues to do with social theory, the nature of the sociological enterprise and sociological methods.

58.794 Advanced Education 2  F 1CCH

Each student engages in twenty-eight hours of supervised study appropriate to his or her proposed research, as approved by the Head of School.

58.795 Advanced Education 3  F 4CCH

Enrolment is subject to approval by the Head of School.

In their full-time Honours year, all students enrol in four twenty-eight-hour units of study appropriate to their research, as approved by the Head of School.

58.799 Thesis  F
History and Philosophy of Science

Students undertaking subjects in History and Philosophy of Science are required to supplement the class contact hours by study in the Library.

Level I

62.110 Science, Technology and Social Change
Dr D. P. Miller
Prerequisite: Nil.

Relations between science, technology and society which have evolved in the 20th century. 1. Topics which illustrate the effects of scientific and technological development on society — especially those, such as pollution and unemployment, which are apparently unintended; and 2. Selected theories which have been proposed to explain and evaluate the nature of technological change. Topics include: the use of pesticides; the implications of microprocessor technology; the development of nuclear energy and the debate about recombinant DNA research. Theories of Galbraith, Commoner, Dickson and others — particularly in relation to the question as to whether unintended consequences of scientific and technological development can be eliminated by 'technological fixes' or whether they are inevitable in modern industrial society.

Assessment: Essay (40 percent); tutorials (30 percent); class tests (30 percent).

62.111 Man, Megalith and Cosmos
Dr G. A. Freeland
Prerequisite: Nil.

The roots of scientific thinking in antiquity, and the development of the central traditions which were to form the foundations of modern science, stressing origins of geometry, astronomy, astrology and cosmology. Emphasis on the interpretation of evidence from archaeology, particularly that relating to the megalithic cultures, and on the assessment of the relevance of anthropological studies, particularly of Australasia and the Pacific region. Topics include: evidence for archaeoastronomical interpretations of prehistoric sites; theories of the origins of geometry; inter-relationships of science and religion; traditional Pacific navigation; patterns of reasoning in early times, and in primitive cultures today; the evolution of mythology; cosmology and astronomy in mythology; the scientific and philosophical legacy of Greek science, particularly of Aristotle, Euclid and Ptolemy; a comparative study of the astronomy and cosmology of Mesopotamia, Egypt, Greece, America, etc; the background to the Copernican Revolution; the Von Daniken phenomenon; the mystery of the Dogons; an appraisal of astrology.

Assessment: 2 short essays (33½ percent); 2 tests (33½ percent); tutorials (33½ percent).

62.211 The Seventeenth Century
Intellectual Revolution
S2 L2T1 C6

A/Professor D. R. Oldroyd
Prerequisite: Nil.

The intellectual revolution, centred upon science of the 17th and early 18th centuries, which led on to the Enlightenment. The Mediaeval and Renaissance background. Bacon and Cartesianism; empiricism; experimentation and the virtuosi; the idea of progress. The mechanization of the world picture; Descartes and Cartesianism; rationalism; the revival of atomism, materialism. The Copernican Revolution. Locke. Hobbes.

Assessment: Essay (40 percent); tutorials (30 percent); examination (30 percent).

Level II/III

62.022 Materials, Machines and Men
SS L2T1 C6

Prerequisite: Completion of Arts subjects carrying at least 24 credit points, or a Pass in four Level I Science units. Excluded: 26.564, 26.251, 62.253.

Not offered in 1987.

The rise of technology in its social and cultural context before, during and since the Industrial Revolution. This Revolution, which has been described as the most significant event in human history since the Agricultural Revolution of the New Stone Age, is examined in some detail, and concentrates on technology and its effects on human beings. Considers the professionalization of engineering, the spread of industrialization in Britain, in Europe and the USA, and examines the Second Industrial Revolution. Emphasis on the social and economic effects of the interactions of technology and society.

Assessment: Tutorial paper (30 percent); performance in class (40 percent); class test (10 percent); examination (20 percent).

62.032 The Scientific Theory
S2 L2T1 C6

A/Professor W. R. Albury

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, a number of philosophically interesting problems relating to scientific theories are subjected to analysis. Topics include: the principles of theory construction; perception and observation; the structure of scientific revolutions; scientific explanation; the status of laws and theoretical terms; the 'existence' of theoretical entities; relationships between theory and observation; the functions of models; the principles of theory establishment and rejection.

Assessment: One essay (33½ percent); tests (33½ percent); tutorials (33½ percent).
62.052 Scientific Knowledge and Political Power

Mr G. H. Bindon

Prerequisite: As for 62.022. Excluded: 62.252.

An introduction to the political dimensions of 20th century science. Topics include: growth of expenditure on science in the 20th century; attempts to define the social function of science in the inter-war years; the radical scientists' movement of the 1930s — the freedom versus planning debate; science and politics in the Second World War; government patronage and political expectations in the post-war period; science and economic growth; the science-technology relationship; the rejection of laissez-faire in the 1960s; approaches to science policy; critiques of the role of science in contemporary society; scientists as experts; the question of social responsibility in science.

Assessment: Essays (50 percent); tutorials (50 percent).

62.062 The Social System of Science

Mr G. H. Bindon

Prerequisite: As for 62.022. Excluded: 62.262.

An introduction to the social dimension of the practice of science. The production and application of scientific knowledge as an activity in constant interaction with its socio-economic, political and cultural environments. The principal features of this interaction in relation to each of the following aspects of scientific activity: the processes of research and discovery; the dissemination of research findings and their acceptance or rejection; the development or abandonment of accepted theories; and the technological applications of scientific knowledge.

Assessment: Essays and tutorial work.

62.072 Historical Origins of the American Scientific Estate

Dr D. P. Miller

Prerequisite: As for 62.022. Excluded: 62.272.

The development of American scientific institutions and research from the early years of the Republic, when that country was a scientific backwater, to its present position of global dominance in terms of research resources. Questions about the historical roots of organized research in universities, industrial corporations and government organizations. The American case illustrates well the processes whereby the rapidly emerging scientific profession and its varied specialisms forged links between these sectors of society. Topics: the place of science in a young resource-rich democracy, the uses of science in Progressive ideology, and the war-born relationship of science, government and the military.

Assessment: 2 essays (60 percent); tutorial assessment (40 percent).

62.082 Science, Technology and Developing Countries

Mr G. H. Bindon

Prerequisite: As for 62.022. Excluded: 62.282.

The disparities between the scientific and technical capabilities of industrialized and developing societies. The reasons for these disparities and their economic and social consequences. Aspects include: the problems of dependency; the product cycle and its impact on location of production; concepts of the 'learning curve', aspects of technology choice; bargaining processes; transnational corporations and the 'truncation' of the industrial sector; efforts to define 'appropriate' technologies; modes of technology transfer; alternate models and policies for scientific and technological development; the role of traditional technology; the impact of modern technology on international relations. Issues: the consequences of modern science and technology for the role of the military in developing countries; food and population problems; energy use; environmental impacts; class structure, etc. The social role and function of scientific communities in less developed countries and the process of diffusion of science from the centre to the periphery and the evolution of national scientific communities and institutions are addressed through the use of case studies.

Assessment: Essay (50 percent); tutorials (50 percent).

62.103 The Discovery of Time

Dr G.A. Freeland

Prerequisite: As for 62.022. Excluded: 62.23.

The history of time, from the Ancient World through the Twentieth Century. The principal strands studied are: 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 of progress, the cognition of time, the age of the Earth and the antiquity of humanity, time and the development of modern science. Throughout, attention will be paid to the historical context within which specific episodes and developments occurred and to cultural consequences of changes in the cognition of time.

Assessment: 2 essays (30 percent each); tutorials (20 percent); class tests (20 percent).

62.104 The Darwinian Revolution

A/Professor D. R. Oldroyd


Scientific, philosophical, and social antecedents and consequences of Darwin's theory of evolution. The prevailing ideas in biology before Darwin in the context of the general climate of ideas in the 18th and early 19th centuries. Darwin's life and work in some detail, followed by a consideration of the work of Mendel and the establishment of the 'synthetic' theory of evolution. The impact of evolutionary ideas in such diverse fields of thought as religion, literature, music, political theory, epistemology, ethics, and the social and behavioural sciences.

Assessment: Examination (30 percent); tutorial exercises (40 percent); essay (30 percent).
62.106 Mind, Mechanism and Life

Dr P. Slezak

Prerequisite: As for 62.022. Excluded: 62.302.

The development of scientific ideas concerning the nature of life, mind and behaviour. While the subject includes both a brief treatment of early ideas and reference to issues in contemporary biological and behavioural sciences, the main focus is on the period from the Proto-Scientific Revolution of the 16th century to the advent of the general purpose computer. Topics include: Vesalius and the School of Padua; the biological thought of William Harvey; machines and the mechanical philosophy; Cartesianism and the mechanization of biology; classical theories of the relationship between mind and body; neurophysiology from the 18th to the early 20th century; the mechanist-vitalist disputes; Wundt, Fechner and the rise of experimental psychology; the Freudian revolution; Pavlov and the conditioned reflex; behaviorism and its critics; mind, brain, life and the computer.

Assessment: Essay (33½ percent); tutorial assessment (33½ percent); tests (33½ percent).

62.109 The History of Medical Theory and Practice

A/Professor W. R. Albury


Development of theory and practice in Western Medicine from the time of Hippocrates to the 20th century. Material covered in four sections: 1. 'bedside' medicine from antiquity to the French Revolution; 2. 'hospital' medicine in the early 19th century; 3. 'laboratory' medicine in the late 19th century; and 4. 'technological' medicine in the 20th century, with particular emphasis on the social role of modern medicine.

Assessment: Essays, tutorial work and examination.

62.241 Relations Between Science and the Arts

Prerequisite: As for 62.022.

Not offered in 1987.

The relationships between science, literature, painting and music in the history of Western culture. 'Art' and 'Science' in the ancient world. Pythagoreanism and its cultural influences; science, painting and architecture in the Renaissance. The Scientific Revolution and its influence on English literature. Optical theories of Newton and Goethe and their effect on literature and painting: Science, philosophy, technology and their influence on painting, literature and music in the 19th and 20th centuries. Creativity in science and the arts. Scientific and humanistic cultures in the modern world. The 'two-cultures' debate.

Assessment: Tutorial exercises (40 percent); essay (30 percent); examination (30 percent).

62.245 The New Biotechnologies and Their Social Context

Dr D. Bartels

Prerequisite: 62.110 or by permission of the Head of School for Biological Sciences students in Years 3 and 4.

The social implications of the new biotechnologies, 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. Topics include: the debate on the safety of genetic engineering; in vitro fertilization and related reproductive technologies; the ethics of human genetic engineering; university-industry interactions in biotechnology; the release into the environment of engineered organisms; mechanisms for public participation in the control of biotechnology.

62.246 Technological Development in 20th Century Australia

Ms J. Buckley-Moran

Prerequisite: 62.110.

The historical development of technology in Australia during the 20th century, with an analytic focus on three key dimensions: linkages between scientific research, industrial development and economic growth, technological change and its impact on Australian society; the distinctive features of Australia's geopolitical situation. Topics include: The origin, expansion and transformation of the CSIRO, the maturation and professionalization of the Australian research community; the politicization of science and the post-war legacy; the failure of Australian research to serve an industrialized economy; science policy and technological change in the 1970s and 1980s; comparison with the Canadian situation and the experience of newly industrializing countries.

62.285 Man, Woman and Deity

Prerequisite: As for 62.022.

Not offered in 1987.

Conceptions of deity, from earliest times to the present, in relation to changing notions of sexuality and generation; the place of human beings in relation to their environment and the cosmos; the roles of the sexes within different cultures. Topics: Archaeological evidence for early ideas concerning generation and for the relations of man to the cosmos; the Earth Mother Goddess; biology, religion and mythology; feng-shui and geomancy; the symbolism of city, temple and dwelling; religion, sexuality and generation in ancient civilizations and primitive societies, with special reference to the Australian Aborigines; the Medieval and Renaissance world views; the tyranny of the machine; conservation and stewardship in the Middle Ages; the cultus of the Virgin Mary in relation to scientific and social change; theories of biological generation; concepts of Deity and Nature in relation to science and the environmentalist movement; the Gaia hypothesis.

Assessment: 1 essay (33½ percent); 2 tests (33½ percent); tutorials (33½ percent).
62.551 The Arch of Knowledge: History of the Philosophy and Methodology of Science to 1800

A/Professor D. R. Oldroyd
Prerequisite: As for 62.022. Excluded: 62.561.
The development of ideas concerning the nature and methods of the sciences from antiquity to 1800: Platonism and Aristotelianism; scholastic philosophy; the realist/nominalist debate; the Paduan school; Galileo and the mathematization of nature; Bacon and Baconianism; Descartes and Cartesianism; Newton and Newtonianism; Locke as an under-labourer in the Newtonian garden; criticisms of Newtonian science and Lockean empiricist epistemology; Leibniz, Berkeley and Hume; French empiricism and philosophy of language; Condillac; Kant's Copernican Revolution and principles of Kantian philosophy.
Assessment: 2 essays (50 percent); 2 seminar presentations (50 percent).

62.552 Modern History of the Philosophy and Methodology of Science: 1800 to the Present

Not offered in 1987.
The development of ideas concerning the nature and methods of the sciences from 1800 to the present: Herschel, Mill and Whewell (British empiricism in conflict with Kantian transcendental philosophy); Comte, Mach and 19th century positivism; Peirce, James and pragmatism; Poincaré and conventionalism; Duhem and instrumentalism; Meyerson and realism; Frege, Russell and logicism; Wittgenstein and Hanson; Einstein and the new science; Bridgman and operationism; Eddington and selective subjectivism; the Vienna Circle and logical positivism; Carnap and positivist reductionism; Hesse and modellism; Popper and falsificationism; Lakatos and 'research programs'; Feyerabend and methodological anarchism; sociologists of knowledge.
Assessment: 2 essays (50 percent); 2 seminar presentations (50 percent).

62.554 Computers, Brains and Minds: Foundations of the Cognitive Sciences

Dr P. Slezak
Prerequisite: As for 62.022. Excluded: 52.564.
Introduction to contemporary discussions of the mind, thought, intelligence and consciousness. Focus on the issues which arise in connection with the so-called 'cognitive sciences' — the disciplines which include such fields as computer science, the various neuro-sciences, cognitive psychology, linguistics and the philosophy of mind. Stress on the recent revolutionary developments in the computer simulation of thought or 'artificial intelligence' and linguistics, since both these areas shed new light on traditional questions concerning the mind. Questions are: Can computers think? and Is the brain a machine? Exploration of the theories, methods and philosophical issues which arise from the 'computational' or 'information processing approach' to the mind.
Assessment: Essay (40 percent); tests (30 percent); tutorials (30 percent).

62.570 Language and Mind: The Impact of Chomsky's Revolution

Dr P. Slezak
Prerequisites: As for 62.022.
Chomsky's theories of language and mind which have revolutionised linguistics, psychology and philosophy. History of linguistics and psychology, especially the Behaviourist approach of Skinner. Chomsky's impact on traditional philosophical debate between Rationalists and Empiricists concerning innate ideas.

Level III

62.105 Research Methods in History and Philosophy of Science

Dr D. Bartels
Arts prerequisite: Completion of Arts or other approved subjects, carrying at least 72 credit points; including at least 12 credit points gained in HPS subjects completed with an average grade of Credit or better. For approved subjects see under Summary of Subjects, History and Philosophy of Science. Excluded: 62.520.

Sciences prerequisite: 4 HPS subjects with an average of Credit or better or by permission of the Head of School. Excluded: 62.520.
A weekly seminar designed to prepare students to carry out Honours level research in HPS. The historiography of science, and its relations to philosophical and social studies of science, are analysed through discussion of texts representing predominant approaches to HPS during the last 30-40 years. In addition, bibliographical, editorial, and other research exercises are carried out.
Assessment: Essay, seminars and written exercises.

62.3001 Philosophical Problems in Evolutionary Biology

A/Professor D. R. Oldroyd
Arts prerequisite: Completion of Arts or other approved subjects, carrying at least 72 credit points. Co-requisite: 62.032 or 62.104. Sciences prerequisites: Third year standing. Co-requisite: 62.032 or 62.104.
Current controversies in evolutionary theory, with consideration of topics such as essentialism and population thinking, falsifiability of the principle of natural selection, the 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, neo-Lamarckism, and creationism.
62.3005 Issues in the Philosophy of Science  
S2 L2 C4

Dr P. Slezak

Prerequisite: As for 62.105.

Selected topics in contemporary philosophy of science chosen from among the following: Scientific Laws, Theories and Explanations, Observation, Evidence, Confirmation, Induction, Models and Metaphors, Realism and Instrumentalism, Verification and Falsification, Scientific Discovery and Scientific Revolutions, Theoretical Reduction, Methodological Problems of Social Sciences, Teleological and Purposive Explanation, Rationality and Scientific Method, Science and Pseudo-Science Demarcation.

Level IV Honours Programs

62.014 History and Philosophy of Science Honours

Prerequisite: Completion of years 1-3 of program 6200, with marks that result in an average of Credit or better in the eight HPS units included in that program.

Candidates are required to undertake an advanced program of study in the intellectual history and/or philosophy of science. The program includes 62.105 (unless this unit has previously been completed), a seminar in Advanced Philosophy of Science, the presentation of a thesis, and such other course work as may be determined by the Head of School. Students wishing to undertake this program should contact the School of History and Philosophy of Science at the earliest opportunity.

62.024 Science Studies Honours

Prerequisite: Completion of years 1-3 of program 6200 (including 62.052, 62.062, 62.072 and 62.082), with marks that result in an average of Credit or better in the eight HPS units included in that program.

Candidates are required to undertake an advanced program of study in the social history of science and/or sociology of science and/or science policy. The program includes 62.105 (unless this unit has previously been completed), a seminar in Advanced Social Studies of Science, the presentation of a thesis, and such other course work as may be determined by the Head of School. Students wishing to undertake this program should contact the School of History and Philosophy of Science at the earliest opportunity.

Board of Studies in Science and Mathematics

68.302 Introductory Marine Science  
S2 L3T1

Excluded: 25.601.

Ocean basins, sediments, properties of seawater, ocean circulation, coasts and coastal processes. Marine biology and ecology, primary and secondary productivity.

68.313 Physical Oceanography  
S2 L2T2

Prerequisites: 10.001 or 10.011; 1.001.

The physical properties and motions of the oceans, and their measurement. Oceanographic instrumentation. The design of small and large scale ocean experiments. Laboratory and field work.

68.451 Biological Laboratory Computing  
S2 L2T4

Prerequisites: As for 10.021B. Excluded: 1.041, Programs 0600, 6806.

Concepts and problems in biology and biology-related areas amenable to the application of computers; experience in elementary BASIC programming and data analysis using large mainframes and laboratory microcomputers; use of microcomputers for collecting data from laboratory instruments, and for controlling instruments in experiments. Includes a segment taught in common with 1.041 Laboratory Computers in Physical Sciences.

68.430 Geology and Physics Honours

An honours program combining Geology and Physics in Program 0100, made by arrangement with the Heads of the two Schools.

68.601 Genetics of Behaviour 1  
S2 L2T3

Prerequisite: 17.031. Excluded: 79.402.

Introductory behaviour genetics with most examples coming from human genetics. Single gene, polygene and chromosomal genetics which illuminate normal and abnormal behaviour; mathematical treatment of data; non-human mammalian behaviour. Practical classes and limited clinical contact.

68.602 Genetics of Behaviour 2  
S2 L2T3

Prerequisite: 68.601 or 79.402. Excluded: 79.403.

The topics of 68.601 at a more advanced level. Continued emphasis on human behaviour with essential consideration of microbial and invertebrate studies. Extended mathematical treatment of data. Projects involving community contact replace some of the practical sessions.
### Anatomy

#### 70.011A Histology 1
**Prerequisites:** 17.031, 17.041.

Elementary theory of light and electron microscopy. Cell morphology and cell ultrastructure. Introduction to simple histological techniques. 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). 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. One lecture per week followed by a 2-hour practical-tutorial class.

#### 70.011B Mammalian Embryology
**Co-requisite:** 70.011A.


#### 70.011C Introductory Anatomy
**Prerequisites:** 17.031, 17.041.

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

#### 70.012B Visceral Anatomy
**Prerequisite:** 70.011C.

The topographical and cross-sectional anatomy of the great visceral systems — gastrointestinal, respiratory, cardiovascular, and genitourinary. Clinical, living and radiological anatomy.

#### 70.012C Neuroanatomy 1
**Prerequisites:** 70.011A, 70.011C.


#### 70.013 Anatomy 4
**F**

Prerequisite: Completion of the first three years of any Science program with a major in Anatomy (see Table 3 of Combined Sciences Handbook).

An honours program consisting of the preparation of an undergraduate thesis and participation in School seminars.

#### 70.304 Histology 2
**S2 L2T4
Prerequisite:** 70.011A. Excluded: 70.3041. (If 70.304 is taken after 70.3041, total counts only 1 unit.)

May not be offered in 1987.


#### 70.3041 Histological and Histochemical Techniques
**S2 L1T2
Prerequisites:** 17.031, 17.041 and either 41.101 or 45.301 or 70.011A. Excluded: 70.304.


#### 70.305 Neuroanatomy 2
**S2 L1T2
Prerequisite:** 70.012C.

In seminar format, topics in contemporary neuroanatomy, working from original papers. Includes: sensory and motor areas of the neocortex, hippocampus, cerebellum, and sense organs. Recent work on the development of the central nervous system. Recent advances in neurohistochemistry and neuroendocrinology. Students are required to undertake a substantial amount of private study.

#### 70.306 Functional Anatomy 1
**S1 L2T4
Prerequisite:** 70.011C.

Introduction to fundamental issues in the morphology and dynamics of human movement systems. Includes: physical properties of bone, muscle and connective tissue; biomechanics, movement analysis and neuromuscular control. These basic principles are applied to a study of musculoskeletal components of head and neck and upper limb. Emphasis on modern analytical techniques and findings. Tutorials include limb and joint dissections plus study of surface and radiological anatomy.

#### 70.307 Functional Anatomy 2
**S2 L2T4
Prerequisite:** 70.306.

A continuation of 70.306. Includes: a detailed study of the musculoskeletal components of trunk and lower limb, functional morphology of muscle, biomechanics and energetics of walking and running.
Pathology

72.301 Basic and Applied Pathology F L2T1
Prerequisites: 70.011A, 70.011C, 73.111 or equivalent.
Lectures 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, arthritis, pulmonary and myocardial infarction as well as lung, alimentary and cerebral tumours. Correlation of pathological processes with development of specific clinical syndromes.

Physiology and Pharmacology

73.111 Physiology 1A F L2T4
Prerequisites: 17.031 & 17.041; 2.121 & 2.131, or 2.141; 10.001 or 10.011 or 10.021 B & C. Excluded: 73.121, 73.011A. Co-requisite: 41.101.
Introduction to fundamental physiological principles, dealing first with basic cellular function in terms of chemical and physical principles, and, second, with the operation of the various specialized systems in the body, for example, the cardiovascular system, whose function it is to transport materials to and from the tissues of the body; the respiratory system which must maintain the exchange of oxygen and carbon dioxide between the atmosphere and the blood; the gastrointestinal system which enables food materials to be modified by digestion and absorbed into the circulation; the kidney which is involved in the regulation of body fluid and electrolyte balance and with the excretion of the waste products of metabolism; the endocrine system which releases chemical messengers, called hormones, that are carried in the blood stream to regulate a great variety of body functions, eg metabolism and reproductive activity; the nervous system which by means of very rapidly propagated electrical impulses is responsible for all our movements, sensations, memories, emotions and consciousness itself. A substantial series of practical class experiments on these different areas of physiology is included in the course. This subject is taken by students enrolled in any of the Physiology programs.

73.121 Physiology 1B F L2T4
Prerequisites: As for Physiology 1A except that 2.131 may be accepted as a co-requisite. Excluded: 73.111.
Covers the same general areas of physiology as Physiology 1A but in less detail and with less intensive practical courses. Physiology 1B may be taken by students not intending to study physiology at Level III.

73.011A Principles of Physiology (Optometry) F L2T4
Prerequisites: As for Physiology 1A except that 2.131 may be accepted as a co-requisite. Excluded: 73.111.
Covers the same general areas of physiology as Physiology 1A but in less detail and with less intensive practical courses. Principles of Physiology is taken only by students in the BOptom degree course.

73.012 Physiology 2 F L4T8
Prerequisites: 73.111, 41.101, 41.111.
A major subject offered in third year, providing a more advanced course of study in Physiology. Students spend considerable time performing laboratory experiments which illustrate various physiological principles and introduce them to the techniques used in physiological investigation. The course is orientated towards the areas of physiology constituting the major research interests of the School. It is divided into several sections which may be available in special circumstances as separate 1 and 2 unit Level III courses, including Membrane Biology, Neurophysiology and Organ Physiology, details of which are given below.

73.012A Membrane Biology S1 L2T4
For entry consult Head of School of Physiology and Pharmacology.
The properties of cell membranes including permeation of ions, solutes and water across membranes, generation of electrical signals in nerve and muscle cells produced by ion movements, and transmission of information between cells. Stress on modern research techniques and on a critical examination of appropriate classical papers.

73.012B Neurophysiology S1 L2T4
For entry consult Head of School of Physiology and Pharmacology.
A detailed study in two broad areas, neural mechanisms in sensation and the control of posture and movement. Includes the regulation of visceral and other autonomic effector structures and the neural substrates and correlates of certain higher functions such as speech, memory and consciousness. Directed towards the experimental analysis of nervous system function, to introduce the techniques and approaches used in neurophysiological research. Sensation: an integrated lecture and experimental course is given on somatic, visual and auditory sensory mechanisms. Laboratory work: students conduct psychophysical experiments to evaluate subjective sensory capabilities. The neural mechanisms underlying these subjective abilities are examined in animals in electrophysiological experiments which involve recording the impulse patterns from individual neurones within the sensory systems. Students are required to analyze the mechanisms employed by the nervous system to code information about specific parameters of sensory stimuli.

Lectures and experiments on motor function are directed towards an understanding of the various reflex and voluntary mechanisms controlling posture and movement. The section dealing with nervous control of visceral function is concerned mainly with regulation of cardiorespiratory activity.
73.012C Organ Physiology  
Prerequisites: for 73.012A, B, C: normally as for 73.012. For entry consult Head of School of Physiology and Pharmacology.

An advanced study dealing with major physiological systems of the body and usually includes detailed segments from: the cardiovascular and respiratory systems; endocrines, kidney, fetal physiology, gastrointestinal physiology and exercise physiology. Emphasis on the functions of individual organs as well as the overall operations of particular body systems including their neural control mechanisms. Emphasis on the approaches and techniques involved in physiological research. Students are therefore required to carry out an extensive series of experiments which usually employ mammalian (including human) preparations.

73.012F Clinical Physiology  
Prerequisites: 73.111; 41.101; 41.111 or 2.002B; 70.011A; 70.011C; 80.014.

This Level III subject is only available in course 3820, and only to those students not undertaking Physiology 2. The subject is intended to supplement the Level II, Physiology 1A course in order to provide an adequate grounding for double degree students in applied or clinical aspects of physiology before they enter Year 3 of the Medical Course.

Covers aspects of normal and disordered physiology in the following areas: cardiovascular and cardiorespiratory mechanisms; body fluid balance and kidney function; the endocrine system; central nervous system; gastrointestinal physiology.

73.022 Pharmacology  
Prerequisite: 73.111 or 73.121. Co-requisites: 73.012 or 41.102A & 41.102B or two Level III Chemistry units.

Includes a study of the absorption, distribution and metabolism of drugs as well as a study of the pharmacology of the autonomic nervous system, the cardiovascular system, the central nervous system, the kidney, the endocrine system and also a study of pharmacokinetics. A practical class program complements the lecture program by demonstrating a variety of basic pharmacological techniques.

73.023 Honours

Honours Study

Depending on their undergraduate records students may be accepted by the Head of the School to undertake a fourth year of study towards an honours degree in Physiology or in Pharmacology. This would usually be done by students planning a career in either of these fields. During the honours year the student carries out a research project under the supervision of a staff member and submits a thesis based on the research project. The student can usually nominate the general research area in which he or she wishes to work from those being studied in the School. Within this research area the student is given a specific project by the supervisor.

Community Medicine

79.201 Population Genetics  
Prerequisite: one unit of statistical methods, or theory, as approved by the Head of School.

The genetic structure of populations: demographic structure, 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; observed human population structures; computer methods.

79.202 Human Genetic Analysis  
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, including twin and family studies; estimation and applications of genic and genotypic frequencies, selective values, mutation and migration rates, coefficients of kinship, inbreeding and assortative mating, effective population sizes, recombination fractions and heritabilities; segregation analysis; risks of recurrence of disease; genetical consequences of human intervention; computer methods.

79.302 Biochemical Genetics of Man  
Prerequisites: 41.101, 43.101.

Inherited variation of blood group antigens, serum proteins and red-cell enzymes, their possible selective roles, and their application to the study of differences between and within populations. Application of statistical techniques to analyzing population data.

Faculty of Medicine

80.014 Human Behaviour  
Prerequisites: No formal prerequisites. Students may take the subject in Year 2 or Year 3 of Course 3820.

As for 80.012.
Graduate Study:
Faculty of Biological Sciences
Faculty of Science
Faculty of Biological Sciences and Faculty of Science Enrolment Procedures

All students re-enrolling in 1986 or enrolling in graduate courses should obtain a copy of the free booklet Enrolment Procedures 1986 available from School Offices and the Admissions Office. This booklet provides detailed information on enrolment procedures and fees, enrolment timetables by Faculty and course, enrolment in miscellaneous subjects, locations and hours of Cashiers and late enrolments.

Faculty of Biological Sciences

Facilities are available in each of the Schools for research leading to the degrees of Master of Science and Doctor of Philosophy. The School of Biotechnology offers a graduate diploma course in Biochemical Engineering, a graduate diploma in Biotechnology and a Master's course in Biotechnology by formal study, and the School of Psychology offers Master of Psychology and Master of Science (Psychology) 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:

41.103 Biochemistry Honours
42.103 Biotechnology Honours
43.103 Botany Honours
44.103 Microbiology Honours
12.403 Psychology 4 (Thesis)
45.103 Zoology Honours

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:

41.999G Biochemistry
42.999G Biotechnology
43.999G Botany
44.999G Microbiology
12.999G Psychology
45.999G 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.

Biotechnology

5014
Biochemical Engineering Graduate Diploma Course
Graduate Diploma
GradDip

The Department of Biotechnology, conjointly with the School of Chemical Engineering and Chemical Technology, offers a course in biochemical engineering which leads to the award of a graduate diploma (GradDip). The course is open to graduates in the biological sciences, chemistry, chemical engineering or agriculture, and can be completed in one year of full-time or over a longer period by part-time study. It contains a component of graduate level ‘bridging’ subjects, designed to facilitate the introduction of graduates with a variety of backgrounds to the current practice of biochemical engineering.

The normal entrance requirement is an appropriate degree or equivalent qualification in biological sciences, chemistry, chemical engineering or agriculture. Intending students are referred to the conditions for the award of Graduate Diplomas set out later in this handbook.

<table>
<thead>
<tr>
<th>Hours per week</th>
<th>Session 1</th>
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<th>Session 2</th>
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<tbody>
<tr>
<td></td>
<td>S1</td>
<td>S2</td>
<td>S1</td>
</tr>
<tr>
<td>42.211G Principles of Biology</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>42.212G Principles of Biochemistry</td>
<td>3</td>
<td>0</td>
<td>0</td>
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<tr>
<td>44.101 Introductory Microbiology</td>
<td>6</td>
<td>0</td>
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</tr>
<tr>
<td>48.282G Thermodynamics</td>
<td>4</td>
<td>0</td>
<td>0</td>
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<tr>
<td>48.284G Mass Heat and Momentum Transfer</td>
<td>4</td>
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</table>

5015
Biotechnology Graduate Diploma Course
Graduate Diploma
GradDip

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 will not be 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 19 hours per week, or two years part-time study, consisting of an average of 9½ 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.

<table>
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<tr>
<th>Hours per week</th>
<th>Session 1</th>
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<th>Session 2</th>
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<tr>
<td></td>
<td>S1</td>
<td>S2</td>
<td>S1</td>
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<tr>
<td>Obligatory Subjects</td>
<td></td>
<td></td>
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<tr>
<td>Full Year</td>
<td></td>
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<td></td>
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<tr>
<td>42.215G Practical Biotechnology</td>
<td>7</td>
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<tr>
<td>Session 1</td>
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<tr>
<td>42.102A Biotechnology A</td>
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</table>

| Elective Subjects | Full Year | | | |
|-------------------|----------|------------|----------|
| 42.104G Graduate Seminars | 2 | 2 | 0 | 0 |
| 42.111G Reading List in Biotechnology (Microbiology) | 3 | 3 | 0 | 0 |
| 42.112G Reading List in Biotechnology (Biochemistry) | 3 | 3 | 0 | 0 |
| 42.305G Case Studies | 0 | 2 | 0 | 2 |

| Session 1 | | | | |
| 44.101 Introductory Microbiology | 6 | | 0 | 0 |
| 42.212G Principles of Biochemistry | 3 | | 0 | 0 |

| Session 2 | | | | |
| 42.101 Introduction to Biotechnology | 6 | | 0 | 0 |
| 42.102B Biotechnology B | 6 | | 0 | 0 |
| 44.121 Microbiology 1 | 6 | | 0 | 0 |

Master of Science (Biotechnology)

The Department also offers a formal graduate course at the masters’ level (Master of Science (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 Graduate Degrees set out later in this handbook.
Sciences

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.

8041
Master of Science (Biotechnology) Graduate Course

Master of Science (Biotechnology)
MSc(Biotech)

<table>
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<th>Hours per week</th>
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<td>S1</td>
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</table>

**Full Year**
- 42.306G Project 7 7

**Session 1**
- 42.303G Biochemical Process Control 5 0
- 42.304G Biodeterioration and Biodegradation 5 0

**Session 2**
- 42.301G Microorganism Productivity 0 5
- 42.302G Enzyme Technology 0 5
- 42.305G Case Studies 0 2
- 17 19

Psychology

Head of School
Dr K. R. Llewellyn
Administrative Officer
Mr T. J. Clulow

The School of Psychology offers courses leading to the award of the degrees of Master of Psychology and Master of Science (Psychology).

**Master of Psychology**

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 I or Class II in Psychology;
2. completion of a research thesis or research project in the Honours fourth year;

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.

A student who does not satisfy the above requirements may be permitted to undertake a qualifying course prescribed by the Head of School, satisfactory completion of which will be accepted as meeting entrance requirements.

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. An application to register for the degree of Master of Psychology must be made on the prescribed form which shall be lodged with the Registrar at least two months before the commencement of the academic 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.

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 250 hours of supervised clinical practice must be completed in the first year, and a further 430 hours in the second year.

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.

8250
Master of Psychology Graduate Course—
Full-time

Master of Psychology
MPsychol

<table>
<thead>
<tr>
<th>Hours per week</th>
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<tbody>
<tr>
<td>S1</td>
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</table>

**Year 1**
- 12.230G Developmental Disabilities and Disorders 3 3
- 12.231G Professional Practice: 250 hours
- 12.237G Biological and Environmental Bases of Behavioural Disturbance 2 2
- 12.239G Research and Evaluation Methods 2

Year 1 subjects continued overleaf
Master of Science (Psychology)

The degree is available only to students who hold the degree of Doctor of Philosophy in an approved area of psychology. In combination with the PhD, the degree is designed to train candidates for academic positions in clinical psychology and to provide the background necessary for advancement to senior posts in applied fields.

The minimum period of full-time registration for the degree is three sessions, and the minimum period of part-time registration is six sessions. Students with advanced standing may have the minimum period reduced by up to one-third of the program.

Assessment of student performance is by sessional examinations, class tests and seminar papers.

8255
Master of Science (Psychology) Graduate Course—
Full-time
Master of Science (Psychology)
MSc (Psychol)

Year 1

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Hours S1</th>
<th>Hours S2</th>
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<tbody>
<tr>
<td>12.230G</td>
<td>Developmental Disabilities and Disorders</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>12.231G</td>
<td>Professional Practice: 250 hours</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>180 hours in Session 1</td>
<td>250 hours in Session 2</td>
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<tr>
<td>12.235G</td>
<td>Community Psychology</td>
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<tr>
<td>12.240G</td>
<td>Graduate and Clinical Seminars</td>
<td>2</td>
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<tr>
<td>12.241G</td>
<td>Graduate Colloquium</td>
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<tr>
<td>12.242G</td>
<td>Research Thesis*</td>
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<tr>
<td>12.243G</td>
<td>Experimental Clinical Psychology</td>
<td>5</td>
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<tr>
<td>12.244G</td>
<td>Psychological Assessment</td>
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Year 2

Full Year

<table>
<thead>
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<th>Course Code</th>
<th>Course Name</th>
<th>Hours S1</th>
<th>Hours S2</th>
</tr>
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<tbody>
<tr>
<td>12.231G</td>
<td>Professional Practice: 430 hours</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>12.235G</td>
<td>Community Psychology</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>12.241G</td>
<td>Graduate Colloquium</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>12.243G</td>
<td>Experimental Clinical Psychology</td>
<td>3</td>
<td></td>
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</tbody>
</table>

Note: Part-time students normally are expected to take half the full-time program in any one session.

Contributes approximately 40 per cent to the overall grading for the degree.

*Note: Part-time students normally are expected to take half the full-time program in any one session.

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:

- Faculty of Science
- School of History and Philosophy of Science
- School of Optometry
- School of Chemistry
- School of Mathematics
- School of Physics
- School of Mathematics
- School of Physics
- School of Mathematics
- School of Physics
- School of Mathematics
- School of Physics

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 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 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 awards are set out later in this handbook.
5530
Physical Oceanography Graduate Diploma Course
Graduate Diploma in Physical Oceanography GradDip

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 (67.001G) worth 50% of the total accreditation for the program, the remaining 50% being comprised as indicated below.

1. Compulsory Subjects

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>Subject Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>67.001G</td>
<td>Experimental Project</td>
<td>14</td>
</tr>
<tr>
<td>67.002G</td>
<td>Geophysical Fluid Dynamics</td>
<td>4</td>
</tr>
<tr>
<td>67.003G</td>
<td>Instrumentation</td>
<td>1</td>
</tr>
<tr>
<td>67.004G</td>
<td>Applied Data Analysis</td>
<td>2</td>
</tr>
</tbody>
</table>

2. Elective Subjects

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>Subject Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>67.005G</td>
<td>Theoretical Project</td>
<td>7</td>
</tr>
<tr>
<td>6.380G</td>
<td>Data acquisition and analysis in Remote Sensing</td>
<td>1</td>
</tr>
<tr>
<td>6.387G</td>
<td>Programming and software in Remote Sensing</td>
<td>1</td>
</tr>
</tbody>
</table>

The lecture time for the whole course is a minimum of 140 hours.

3. Research Project

A short research project (with report) of approximately 4 months' duration full-time (400 hours laboratory work) is selected in relation to the combined interests of the student and the supervisor.

8770
Master of Chemistry Graduate Course
Master of Chemistry MChem

Three programs are available, emphasizing different areas of chemistry. Each program consists of a number of lecture courses (each separately examinable), laboratory instruction and visits to laboratories. In addition each student undertakes a short research project, with a research report assessed by two examiners. The student may also be required to undergo an oral examination.

Program 2.581G Advanced Analytical Chemistry and 2.583G Analytical Science (Chemistry) are available only on a full-time basis; however, the qualifying program may be taken part-time.

Program 2.582G Food and Drug Chemistry may be taken either full-time or part-time.

Details of the programs are:

2.581G Advanced Analytical Chemistry

This program should be of interest to chemistry graduates who are involved in the practice or teaching of analytical chemistry.

1. 2.581G Advanced Analytical Chemistry Lecture Courses

Students are required to take all of the following nine core courses of lectures:

(1) Analytical flame spectroscopy;
(2) Advanced electrochemical analysis;
(3) Chromatography;
(4) Analytical chemistry of pollutants;
(5) Emission, IR, Mass and XRF spectroscopy;
(6) Calculations and statistics in analytical chemistry;
(7) Chemical analysis of organic and biological materials;
(8) Operations and applications of minicomputers in chemistry;
(9) Chemical microscopy.

The lecture time for the whole course is a minimum of 140 hours.

2. Laboratory Instruction and Visits to Laboratories

An additional minimum of 150 hours is spent by students in selected areas of laboratory practice, instruction and visits to laboratories.

3. Research Project

A short research project (with report) of approximately 4 months' duration full-time (400 hours laboratory work) is selected in relation to the combined interests of the student and the supervisor.

2.582G Food and Drug Chemistry

This program involves an advanced study of the chemistry, stability, mode of action (where applicable) and analysis of food constituents, food additives and selected drugs. Entry to this program is excluded in the case of applicants who have completed the Graduate Diploma in Food and Drug Analysis (course 5510).
1. Food and Drug Chemistry 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

   The lecture time for the whole course is 160 hours. An additional 392 hours is spent by students in formal laboratory work. Students who have not previously taken an approved course in microbiology are required to complete unit 44.101 Introductory Microbiology (84 hours) in addition to the above program.

2. Research project
   A short research project (with report) of approximately 4 months' duration full-time (400 hours laboratory work) is selected in relation to the combined interests of the student and the supervisor.

2.583G Analytical Science (Chemistry)
   This program provides a more broadly based training in methods of chemical analysis than 2.581G.

1. Formal course work
   Students are required to complete all of the following courses of lectures and associated laboratory work.
   (1) Classical methods of chemical analysis
   (2) Instrumental analysis
   (3) Toxicology, occupational and public health
   (4) Special instrumental analysis methods

   The lecture time for the whole course is 98 hours. An additional 196 hours is spent in formal laboratory sessions.

2. Project
   A short project (with report) requiring 400 hours of laboratory work, which may be either original research work or development work. The field of work will be selected considering the combined interests of the student and supervisor.

5510 Food and Drug Analysis Graduate Diploma Course
Diploma in Food and Drug Analysis DipFDA
   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.

Intending students are referred to the conditions for the award of graduate diplomas set out later in this handbook.

Year 1

<table>
<thead>
<tr>
<th>Part-time**</th>
<th>Hours per week</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.231G Food and Drugs 1</td>
<td>4</td>
</tr>
<tr>
<td>2.371G Treatment of Analytical Data</td>
<td>1*</td>
</tr>
<tr>
<td>2.281G Instrumental Techniques in Food and Drug Analysis</td>
<td>4</td>
</tr>
<tr>
<td>44.101 Introductory Microbiology</td>
<td>3t</td>
</tr>
<tr>
<td></td>
<td>11</td>
</tr>
</tbody>
</table>

*For 20 weeks.

**Offered in Session 1 only, at 6 hpw.

**Full-time students take Years 1 and 2 in the one year.

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History and Philosophy of Science

Head of School
Associate Professor W. R. Albury

The School of History and Philosophy of Science offers a graduate program of coursework and research leading to the award of the degree of Master of Science and Society. The course is designed for graduates in the natural sciences, the applied sciences, technology and the social sciences or other relevant disciplines, who have a special interest in or concern with problems in the contemporary relationships between science and society, government and politics. The conditions for the award of the degree are set out later in this handbook.

8780 Master of Science and Society Graduate Course
Master of Science and Society MScSoc

The MScSoc pass program comprises 8 units of the course, which should normally be completed over 4 sessions of part-time (evening) study. A unit of the course requires 28 hours of seminar classwork and additional private study.

The following core units are common to the programs of all candidates:
62.716G Science and Society in the Twentieth Century*
62.713G Project*

Candidates may select 4 further units from the following list:
The Master of Mathematics 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 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 study in statistics. Honours graduates in mathematics may be exempted from a maximum of half the course. The conditions for the award of the degree are set out later in this handbook.

The academic requirement for the degree is 24 credits.

Each candidate's program of study must be approved by the Head of the School.

### Compulsory Subjects

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.381G</td>
<td>Experimental Design 1</td>
<td>2</td>
</tr>
<tr>
<td>10.383G</td>
<td>Stochastic Processes</td>
<td>2</td>
</tr>
<tr>
<td>10.385G</td>
<td>Multivariate Analysis 1</td>
<td>2</td>
</tr>
<tr>
<td>10.390G</td>
<td>Statistical Inference</td>
<td>2</td>
</tr>
<tr>
<td>10.392G</td>
<td>Project</td>
<td>2</td>
</tr>
</tbody>
</table>

### Elective Subjects

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.382G</td>
<td>Experimental Design 2</td>
<td>2</td>
</tr>
<tr>
<td>10.384G</td>
<td>Time Series</td>
<td>2</td>
</tr>
<tr>
<td>10.386G</td>
<td>Multivariate Analysis 2</td>
<td>2</td>
</tr>
<tr>
<td>10.387G</td>
<td>Sample Survey Design</td>
<td>2</td>
</tr>
<tr>
<td>10.388G</td>
<td>Sequential Analysis</td>
<td>2</td>
</tr>
<tr>
<td>10.399G</td>
<td>Non-Parametric Methods</td>
<td>2</td>
</tr>
<tr>
<td>10.391G</td>
<td>Special Topic* A</td>
<td>2</td>
</tr>
<tr>
<td>10.393G</td>
<td>Special Topic* B</td>
<td>2</td>
</tr>
<tr>
<td>10.394G</td>
<td>Discrete Distributions</td>
<td>2</td>
</tr>
<tr>
<td>10.212M</td>
<td>Optimal Control Theory or</td>
<td>3</td>
</tr>
<tr>
<td>10.222M</td>
<td>Higher Optimal Control Theory</td>
<td></td>
</tr>
</tbody>
</table>

Up to 6 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:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.403G</td>
<td>Theory of Land Use/Transport Interaction</td>
<td></td>
</tr>
<tr>
<td>8.405G</td>
<td>Urban Transport Planning Practice</td>
<td>2</td>
</tr>
<tr>
<td>8.417G</td>
<td>Transport and Traffic Flow Theory</td>
<td>4</td>
</tr>
<tr>
<td>10.212L</td>
<td>Optimization Methods or</td>
<td>3</td>
</tr>
<tr>
<td>10.222L</td>
<td>Higher Optimization Methods</td>
<td></td>
</tr>
<tr>
<td>15.423</td>
<td>Econometrics B</td>
<td>2</td>
</tr>
<tr>
<td>18.771G</td>
<td>Simulation in Operations Research</td>
<td>2</td>
</tr>
</tbody>
</table>

*To be arranged: eg biological statistics, further work on order statistics, population statistics, non-linear programming, discrete distribution theory.
Optometry

Head of School
Professor H. B. Collin

The School of Optometry offers a formal graduate course leading to the award of the degree of Master of Optometry (MOptom). This course comprises the study of three elective graduate subjects and of advanced Clinical Optometry, together with the preparation of a thesis on an assigned project. It 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 later in this handbook.

8760 Master of Optometry Graduate Course

Master of Optometry MOptom

<table>
<thead>
<tr>
<th>Hours per week</th>
</tr>
</thead>
<tbody>
<tr>
<td>31.701G Advanced Clinical Optometry 4</td>
</tr>
<tr>
<td>31.799G Project 8</td>
</tr>
<tr>
<td>3.702G Advanced Physiological Optics 4</td>
</tr>
<tr>
<td>3.703G Pleorhoptics and Binocular Vision 4</td>
</tr>
<tr>
<td>3.704G Advanced Contact Lens Studies 4</td>
</tr>
<tr>
<td>3.705G Advanced Contact Lens Practice 4</td>
</tr>
<tr>
<td>3.706G Occupational Optometry 4</td>
</tr>
<tr>
<td>3.707G Clinical Photography 4</td>
</tr>
</tbody>
</table>

Three elective graduate subjects chosen from the list below (each 4 hours)

The six elective graduate subjects offered are quite independent, and any three of them are suitable for a student seeking advanced professional training of a general nature. If clinical specialization is aimed at, the student would be advised to elect the graduate subjects shown below:

<table>
<thead>
<tr>
<th>Specialization</th>
<th>Graduate Subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact Lenses</td>
<td>1. Advanced Contact Lens Studies</td>
</tr>
<tr>
<td></td>
<td>2. Advanced Contact Lens Practice</td>
</tr>
<tr>
<td></td>
<td>3. Clinical Photography</td>
</tr>
<tr>
<td>Occupational Optometry</td>
<td>1. Occupational Optometry</td>
</tr>
<tr>
<td></td>
<td>2. Pleorhoptics and Binocular Vision</td>
</tr>
<tr>
<td></td>
<td>3. Advanced Physiological Optics</td>
</tr>
<tr>
<td>Orthoptics</td>
<td>1. Pleorhoptics and Binocular Vision</td>
</tr>
<tr>
<td></td>
<td>2. Clinical Photography</td>
</tr>
</tbody>
</table>

Physics

Head of School
Associate Professor J. C. Kelly

Executive Assistant to Head of School
Dr J. R. Hanscomb

Administrative Officer
Mrs P. Shaw

8730 Master of Physics Graduate Course

Master of Physics MPhysics

The School of Physics offers a graduate course leading to the award of the Master of Physics degree (MPhysics).

The Master of Physics degree course is intended for honours graduates in physics. Others may be admitted if they have submitted evidence of such academic and professional attainments as may be approved by the Faculty of Science on the recommendation of its Higher Degree Committee. Applicants with other qualifications may be admitted after completing a qualifying examination approved by the Faculty of Science.

The subject matter of the course provides an advanced training in a branch of physics, the topic of which is determined during the year preceding that in which it is offered.

Students undertaking the masters course by formal study must enrol in one of the following subjects:

1.801G Energy Alternatives
1.802G Astrophysics
1.803G Acoustics
1.804G Biophysics
1.805G Applied Physics

Enrolment in any one of the above subjects normally involves at least five units of lecture material, a literature survey, and small research project.
Graduate Study:

Subject Descriptions

Identification of Subjects by Number

A subject is defined by the Professorial Board as 'a unit of instruction approved by the University as being a discrete part of the requirements for a course offered by the University'.

Each approved subject of the University is identifiable both by number and by name as this is a check against nomination of subject other than the one intended.

Subject numbers are allocated by the Registrar and the system of allocation is based on the following guidelines:

1. The authority offering the subject, normally a School of the University, is indicated by the number before the decimal point.
2. Each subject number is unique and is not used for more than one subject title.
3. Subject numbers which have not been used for some time are not used for new subject titles.
4. Graduate subjects are indicated by a suffix 'G' to a number with three digits after the decimal point. In other subjects three or four digits are used after the decimal point.

Subjects taught are listed in full in the handbook of the faculty or board of studies responsible to the particular course within which the subjects are taken. Subject descriptions are contained in the appropriate section in the handbooks.

The identifying numerical prefixes for each subject authority are set out below.

Servicing Subjects are those taught by a school or department outside its own faculty, and are published at the end of the entry for the relevant school. Their subject descriptions are also published in the handbook of the faculty in which the subject is taught.

HSC Exam Prerequisites

Subjects which require prerequisites for enrolment in terms of the HSC Examination percentile range refer to the 1978 and subsequent Examinations.

Candidates for enrolment who obtained the HSC in previous years or hold other high school matriculation should check with the appropriate school on what matriculation status is required for admission to a subject.

Information Key

The following is the key to the information which may be supplied about each subject:

- SI (Session 1); S2 (Session 2)
- F (Session 1 plus Session 2, ie full year)
- S1 or S2 (Session 1 or Session 2, ie choice of either session)
- SS (single session, but which session taught is not known at time of publication)
- CCH (class contact hours)
- L (Lecture, followed by hours per week)
- T (Laboratory/Tutorial, followed by hours per week)
- hpw (hours per week)
- C (Credit or Credit units)
- CR (Credit Level)
- DN (Distinction Level)
1. **School of Physics**  
   Science  
   Page 186

2. **School of Chemistry**  
   Science  
   Page 186

4. **School of Materials Science and Engineering**  
   Applied Science

5. **School of Mechanical and Industrial Engineering**  
   Engineering

6. **School of Electrical Engineering and Computer Science**  
   Applied Science

7. **School of Mines**  
   (Mineral Processing and Extractive Metallurgy and Mining Engineering)
   Applied Science

8. **School of Civil Engineering**  
   Engineering

9. **School of Fibre Science and Technology**  
   (Wool Science)  
   Applied Science

10. **School of Mathematics**  
    Science  
    Page 187

11. **School of Architecture**  
    Architecture

12. **School of Psychology**  
    Biological Sciences  
    Page 189

13. **School of Fibre Science and Technology**  
    (Textile Technology)  
    Applied Science

14. **School of Accountancy**  
    Commerce

15. **School of Economics**  
    Commerce  
    Page 190

16. **School of Health Administration**  
    Professional Studies

17. **Biochemical Sciences**  
    Biological Sciences  
    Engineering

18. **School of Mechanical and Industrial Engineering**  
    (Industrial Engineering)  
    Architecture

21. **Department of Industrial Arts**  
    Engineering

23. **School of Nuclear Engineering**  
    Applied Science

25. **School of Mines**  
    (Applied Geology)

26. **Department of General Studies**  
    Board of Studies in General Education

27. **School of Geography**  
    Applied Science

28. **School of Marketing**  
    Commerce

29. **School of Surveying**  
    Engineering

30. **Organizational Behaviour**  
    Commerce  
    Page 190

31. **School of Optometry**  
    Science  
    Engineering  
    Page 190

32. **Centre for Biomedical Engineering**  
    Architecture

35. **School of Building**  
    Architecture

36. **School of Town Planning**  
    Architecture

37. **School of Landscape Architecture**  
    Applied Science

38. **School of Biological Technologies**  
    (Food Science)  
    Applied Science

39. **Graduate School of the Built Environment**  
    Architecture

40. **Professorial Board**  
    Biological Sciences

41. **School of Biochemistry**  
    Biological Sciences

42. **School of Biological Technologies**  
    (Biotechnology)  
    Faculty of Science  
    Applied Sciences  
    Page 191

43. **School of Botany**  
    Biological Sciences

44. **School of Microbiology**  
    Biological Sciences

45. **School of Zoology**  
    Biological Sciences

46. **Faculty of Applied Science**  
    Applied Science

47. **Faculty of Engineering**  
    (Safety Science)  
    Engineering

48. **School of Chemical Engineering and Industrial Chemistry**  
    Applied Science

49. **School of English**  
    Arts

50. **School of History**  
    Arts

51. **School of Philosophy**  
    Arts

52. **School of Sociology**  
    Arts

53. **School of Political Science**  
    Arts

55. **School of Librarianship**  
    Professional Studies

56. **School of French**  
    Arts

57. **School of Theatre Studies**  
    Arts

58. **School of Education**  
    Professional Studies

59. **Department of Russian**  
    Arts

60. **Faculty of Arts**  
    Arts

61. **Department of Music**  
    Arts

62. **School of History and Philosophy of Science**  
    Arts

63. **School of Social Work**  
    Professional Studies

64. **School of German Studies**  
    Arts

65. **School of Spanish and Latin American Studies**  
    Arts

66. **Subjects Available from Other Universities**

67. **Faculty of Science**  
    Science

68. **Board of Studies in Science and Mathematics**  
    Board of Studies in Science and Mathematics

70. **School of Anatomy**  
    Medicine

71. **School of Medicine**  
    Medicine

72. **School of Pathology**  
    Medicine

73. **School of Physiology and Pharmacology**  
    Medicine

74. **School of Surgery**  
    Medicine

75. **School of Obstetrics and Gynaecology**  
    Medicine

76. **School of Paediatrics**  
    Medicine

77. **School of Psychiatry**  
    Medicine

78. **School of Medical Education**  
    Medicine

79. **School of Community Medicine**  
    Medicine

80. **Faculty of Medicine**  
    Medicine

81. **Medicine/Science/Biological Sciences**  
    Medicine

85. **Australian Graduate School of Management**  
    AGSM

90. **Faculty of Law**  
    Law
Physics

Not all graduate subjects are necessarily offered in any one year.

1.118G Methods of Theoretical Physics

For PhD degree, MSc and MPhysics degree course students.
Response functions and Green’s functions. Symmetry and group theory. Many particle systems. Tensor calculus and variational techniques.

1.128G Methods of Experimental Physics

For PhD degree, MSc and MPhysics degree course students.

1.801G Energy Alternatives

For MPhysics degree course students.
A study of energy alternatives: solar thermal and solar electric energy; energy from fossil fuels; conversions, hydrogen, nuclear fusion and fission, wind, ocean and geothermal sources of energy; political and sociological aspects of energy alternatives.

1.805G Applied Physics

For MPhysics degree course students.
A study of advanced physical instruments, data handling and control, measurement technology and materials science with special reference to physics in industry.

Servicing Subjects

These are subjects taught within courses offered by other faculties.

For further information regarding the following subject see the Faculty of Architecture handbook.

1.927G Acoustic Theory

2 credit points.
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.

Chemistry

2.231G Food and Drugs 1 and
2.242G Food and Drugs 2

These two units contain common subject material but are subdivided to enable them to be taken over one or two years.

Treatment of the food section develops from considerations of proximate analysis — gross determination of classes of food components — to detailed examinations within the groups for more important compounds. Conversely the course in drug work progresses from the examination of simple materials, including identification of unknowns by macro and micro procedures to the examination of compounded materials. A background section on food handling is included, while some attention is given to chemotherapy etc in the drug course.

Subject-matter covers treatment of the main classes of foodstuffs, such as: Foods: Origin, general introduction to analytical methods, relation to likely adulterations and impurities, groups of constituents; carbohydrates, sugars, by physical and chemical methods, jams and preserves, pectin, agar, alginates, oils and fats; protein foods, meat, gelatin, fish products; dairy products, milk, cream, cheese, etc; fermented liquids, beer, wine, spirits, minor constituents. Principles of food processing, dehydration, quick freezing, canning; cereal products; beverages and flavouring essences; nutritional aspects, vitamins in detail; preservatives and food additives; radiation chemistry of food products. Drugs: Elements of pharmacology chemotherapy and modes of action, galenicals, identification tests for alkaloids, etc. Analytical chemistry of analgesics, sedatives, hypnotics, steroid hormones, insecticides, antibiotics, etc. Antibiotics, penicillin, streptomycin, aureomycin, sulphonamides. Activity of enzyme preparations; antiseptics and disinfectants; soaps and detergents.

2.251G Toxology, Occupational and Public Health

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, metal toxicants, etc. Effects of these substances on living organisms, particularly man. 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.

2.271G Chemistry and Analysis of Foods

Illustrates the bases and application of analytical techniques as applied to foods. Emphasis is placed on the design of methods, on the preparation of material for instrumental analysis and on the interpretation of data. Includes: proteins and flesh foods, carbohydrates and saccharine foods, fats and oils, dairy and fermentation products, vitamins, food additives — preservatives and colouring matters, pesticide residues, metal contaminants — food microscopy.
2.281G Instrumental Techniques in Food and Drug Analysis

Principles involved in modern instrumental techniques; detailed application and interpretation of results. UV, IR, NMR, and ESR, emission and atomic adsorption spectroscopy, polarography, X-ray methods, fluorescence spectroscopy and gas chromatography. Services 2.231G, 2.242G and 2.251G but is also suitable as a single subject for those wishing to familiarize themselves with modern techniques.

2.371G Treatment of Analytical Data

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, graphical representations, calculation of measures of location and spread; probability and random errors, binomial, normal and Poisson distributions; comparisons of sets of measurements, tests of significance; associated data, linear regression analysis; analysis of variance; biological assays, bacteriological counts, sampling problems.

2.581G Advanced Analytical Chemistry


Mathematics

10.194G Advanced Mathematics Lecture Courses

Each year a selection of courses is offered in the following areas:

Algebraic geometry; algebraic topology; categorical and homological algebra; commutative algebra; group theory; Lie groups and algebras; representation theory; group theory and its physical applications; advanced quantum mechanics; differential geometry; differential equations; optimal control theory; functional analysis; applied functional analysis; operator theory; harmonic analysis; advances numerical analysis; theory of functions; finite mathematics; number theory; logic; theoretical astrophysics; history of mathematics; recent advances in mathematics; mathematical economics; optimization and control.

10.302G Regression Analysis and Experimental Design

Prerequisite: First course in Statistics.


10.303G Applied Stochastic Processes

Prerequisite: First course in Statistics.


10.372G Statistical and Experimental Design

The concepts of random variables, means, variances, the common tests and confidence intervals based on the normal distribution, some simple analyses of variance.

Comparative experiments: requirements of a good experiment; assumptions underlying the conventional models of standard designs and their analyses, purpose of randomization; how the physical circumstances of an experiment are related to its formal model on which it is based; the internal estimate of error obtained from the variation left after accounting for all sources of systematic variation; these points illustrated by considering in some detail the fully randomized design, the randomized block design, the 2-factorial randomized design, and the fully randomized design with one concomitant variable.

Survey sampling: the distinction between a survey sample and an experiment planned to compare a set of treatments, and how it affects the inferences that may be made; simple random sampling, stratified random sampling.

10.381G Experimental Design 1

Modified designs for fixed effects models. Incomplete and balanced incomplete block designs. Confounding and fractional replication. Randomization theory. Multiple comparisons.

10.382G Experimental Design 2

Extensive treatment of random and mixed models. Combinatorial structure of designs, cross-over and lattice designs, response surfaces.

10.383G Stochastic Processes


10.384G Time Series


10.385G Multivariate Analysis 1

Likelihood ratio tests for means, variances and structure. Discriminant, principal component, canonical and factor analysis.
10.386G Multivariate Analysis 2
The general linear hypothesis and analysis of dispersion. Tests based on roots, distribution theory.

10.387G Sample Survey Design
Simple, stratified and systematic random sampling. Estimation of proportions, ratios, and sample sizes. Multi-stage sampling.

10.388G Sequential Analysis
The sequential probability ratio test — OC and ASN functions. General theory of sequential tests. Sequential estimation.

10.389G Non-Parametric Methods

10.390G Statistical Inference
Decision theory. General theory of estimation and hypothesis testing.

10.391G Special Topic A
To be arranged, eg biological statistics, further work on order statistics, population statistics, non-linear programming, discrete distribution theory.

10.392G Project

10.393G Special Topic B
To be arranged, eg biological statistics, further work on order statistics, population statistics, non-linear programming, and other topics.

10.394G Discrete Distributions
Discrete and lattice distributions — their general properties mostly via generating functions. The structures of contagious (clustered) distributions, with a study of specific examples such as the negative binomial, Neyman and Poisson-Pascal families, together with estimation and fitting procedures.

10.401G Seiches and Tides

Servicing Subjects
These are subjects taught within courses offered by other faculties.

For further information regarding the following subject see the Faculty of Arts Handbook.

10.062G Advanced Mathematics General
For research workers throughout the University requiring employment of advanced mathematics. Topics vary from year to year according to demand and interest.

For further information regarding the following subjects see the Faculty of Engineering Handbook.

10.061G Advanced Mathematics for Electrical Engineers C3
Boundary value problems in partial differential equations. Selected topics from complex variable analysis, integral transforms, and orthogonal functions and polynomials.

10.361G Statistics C3
Probability theory, a survey of random processes with engineering applications — processes in discrete and continuous time. Markov processes, ergodicity, stationarity, auto-correlation, power spectra, estimation of auto-correlation and power spectra.

10.371G Statistics C3
Revision of probability and distribution theory, including estimation of hypothesis testing. Extension of this to include topics such as more complex probabilistic modelling, analyses of modified data (censored, truncated and missing observations), general statistical inference (decision theory), acceptance testing, and reliability analysis (hazard functions).

32.012G Biomedical Statistics SS L2½T1½ C4
Statistical assessment of normal and diseased states. Statistical relationships between multiple variables used to assess disease; analysis of variance, regression, factor analysis, discriminant analysis. Progression of diseases over time. Diagnosis and assessment of treatments. Experimental design and sampling. Computation methods.

32.101G Mathematical Modelling for Biomedical Engineers S1 L3T1 C4
Model formulation and validation of ordinary and partial differential equations by analytical and numerical techniques.
Psychology

12.230G Developmental Disabilities and Disorders
An essentially practical course focusing on childhood disorders, such as mental retardation, infantile autism, physical and sensory handicaps, specific learning difficulties, and hyperactivity. Methods of assessment to be studied include standardized tests of child development, behavioural check lists 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.

12.231G Professional Practice
Supervised work with clients in the School’s clinic, and in approved institutions.

12.235G Community Psychology
A range of basic theoretical issues, community problems and intervention strategies using recent concepts in behavioural community psychology as a framework. Development of community psychology and relationships with other areas of psychology and other disciplines, theoretical systems and models, factors related to community problems, values and intervention, intervention strategies at different systems levels, prevention, health promotion, institutional change, service delivery systems, needs assessment, planning and evaluation or programmes, and psychologists’ current and likely future roles in the community.

12.237G Biological and Environmental Bases of Behavioural Disturbance
A series of lectures and seminars on biological aspects of the aetiology and treatment of behavioural disturbance. Includes: behavioural genetics; organic brain syndromes; schizophrenia; depression; psychophysiology of stress; metabolic and endocrinological aspects of behavioural disturbance; nutrition and behavioural disturbance; psychopharmacology and psychotherapy; somatic treatments.

12.239G Research and Evaluation Methods
Problems of experimental design in the clinical field; measurement and scaling; analysis of change, including sequential analysis, and the application of the experimental methods to the individual cases. Design and evaluation of community programs.

12.240G Graduate and Clinical Seminars
A series of seminars on topics of particular relevance to the practice of clinical psychology, eg the organization and regulation of psychology as a profession; ethical standards in relation to clients, members of other professions, and the public; legal aspects of psychological practice. Additional topics dealing with contemporary issues in clinical psychology are chosen in consultation with students undertaking the seminars.

12.241G Graduate Colloquium
Participation in the staff-graduate student colloquium.

12.242G Research Thesis
A research thesis involving an investigation into some aspect of clinical or community psychology.

12.243G Experimental Clinical Psychology
The theoretical basis of clinical practice in individual, group, institutional, and community settings. The application of the principles of experimental psychology to the analysis of both adaptive and maladaptive patterns of behaviour. The study of a wide range of techniques of behavioural intervention.

12.244G Psychological and Behavioural Assessment
Prerequisite: 12.250G.

12.245G Behavioural Health Management
Lectures, practical classes and supervised clinical experience concerned with the theoretical and practical issues associated with the design, implementation and evaluation of behavioural programs for the promotion of positive mental and physical health.

12.249G Child Clinical Psychology

12.250G Psychological Assessment
A theoretical basis, background information and practical skills in methods of assessment typically used in clinical psychology. Theory and research on interviewing, introduction to DSM III, clinical assessment interviewing, assessment of intellectual functioning (including in children), test access and use and computerised testing, neuropsychological and organicity assessment, personality assessment and its clinical use, assessment and goal attainment scaling, and ethical, legal and professional issues.

12.251G Human Neuropsychology
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.
Economics

15.001 Microeconomics 1  S1 or S2 L2T1½
Commerce/Arts/Applied Science/Sciences prerequisite:

HSC minimum
mark required

2 unit English (General) or  60
2 unit English or  53
3 unit English  1


Organizational Behaviour

30.960G Technological Change and Organizational Participation  S1 and S2 L3
Prerequisite: 30.942G or 14.955G.

The complex relationships between technological change and organizational participation in societies using advanced technology, with particular reference to Australia, California, Japan, Germany and the Nordic nations. Key issues include: the relationship between technological change and sociotechnical systems, skill formation, organizational learning, industrial relations, humanization of work, organizational equity, participation, and power.

Optometry

31.701G Advanced Clinical Optometry  F T4
Clinical work on selected patients, with special emphasis on advanced techniques and new developments. All areas of ophthalmic examination procedures are covered, including: external and internal examination of the eyes; visual functions; tonometry; objective optometry; evaluation of binocular functions; aniseikonia; sub-normal vision; geriatric and pediatric optometry; the clinical application of electrophysiological techniques. The assessment of new instruments, methods and treatment.

31.702G Advanced Physiological Optics  F L2T2

31.703G Pleorthoptics and Binocular Vision  F L2T2
An integrated subject, in which binocular vision and pleorthoptics are studied from theoretical and clinical viewpoints. Clinical experience is provided by selected patients. Includes: The nature and control of eye movements and their role in maintaining the perception of a stable visual world. Binocular and monocular subjective visual directions. The neurophysiological substrate of binocular vision and its phenomena. Stereopsis and its measurement. Accommodation, convergence, and oculo-motor imbalance. Laboratory and clinical methods of measuring eye position and visual directions. The aetiologies, measurement, and treatment of strabismus, anomalous correspondence, eccentric fixation and amblyopia.

31.704G Advanced Contact Lens Studies  F L1T3

31.705G Advanced Contact Lens Practice  F L1T3
The examination, evaluation and aftercare of contact lens patients.
Graduate Study: Subject Descriptions

31.706Q Occupational Optometry


31.707G Clinical Photography

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 'safe-set' method. Copying, slide making, macrophotography, microphotography. 'Invisible light' photography (ultra-violet and infra-red), photofluorography, speedlight techniques, fundus photography. Dark-room techniques, portable dark-rooms. Quantitative photographic data analysis.

31.799G Project

Biotechnology

42.104G Graduate Seminars

42.111G Reading List in Biotechnology (Microbiology)

42.112G Reading List in Biotechnology (Biochemistry)

42.211G Principles of Biology

A study of the characteristics of living systems, including a functional treatment of cytology, metabolism, bioenergetics; structure, function and characteristics of single and multicellular systems; growth; cell division; reproduction; heredity and evolution.

42.212G Principles of Biochemistry

A condensed treatment of biochemistry comprising the following aspects: the elemental and molecular composition of living organisms; the chemistry and roles of the biological elements and molecules; the thermodynamics and enzymatic catalysis of metabolism; catabolic, anabolic, amphibolic and anaplerotic processes, with emphasis on hydrolysis and synthesis of polymers, glycolysis and gluconeogenesis of glucose, O-oxidation and synthesis of fatty acids, deamination and decarboxylation of amino acids, the tricarboxylic acid cycle, electron transport and oxidative phosphorylation; metabolic regulation and integration.

42.213G Biochemical Methods

A laboratory program in practical biochemistry. The basic instrumentation and methodology of the biochemist will be introduced by practical exercises and demonstrations. A comprehensive treatment of the relevance and applicability of biochemical techniques is covered in tutorials.

42.214G Biotechnology

The selection, maintenance and genetics of industrial organisms; metabolic control of microbial synthesis; fermentation kinetics and models of growth; batch and continuous culture; problems of scale-up and fermentor design; control of the microbial environment; computer/fermentor interactions. Industrial examples will be selected from: antibiotic and enzyme production, alcoholic beverages, single cell protein (SCP), microbial waste disposal and bacterial leaching. Tutorial/practical sessions include: problem solving, instrumentation, continuous culture techniques, and mathematical modelling and simulation of industrial processes.

42.215G Practical Biotechnology

Illustration, demonstration and operation of laboratory-scale and pilot-scale equipment. Visits to appropriate industries. Experimental project or critical review.

42.301G Microorganism Productivity

Mechanisms of metabolic control: induction, repression and forms of activation and inhibition; microbial genetics; mutation, selection, genetic transfer and manipulation; environmental parameters; oxygen tension, pH, temperature, energy source etc. as are relevant to productivity in industrially important microorganisms.

Detailed studies: choice of substrate, screening and isolation of microorganisms, systematic application of techniques of genetic and physiological manipulation required to optimize product formation (products include amino acids, nucleotides, enzymes and other macromolecules, antibiotics and other physiologically active compounds), potential strain improvement of micro-organisms involved in other industrial processes (for example, mineral leaching, single cell protein production, detoxification and waste disposal).

Laboratory component includes current techniques of microorganism isolation and maintenance, genetic manipulation and physiological manipulation.
42.302G Enzyme Technology
Enzymes in vivo; properties; roles; sources; optimization of enzyme concentration, for example by nutritional control, environmental control and by genetic manipulation. Isolation of enzymes: methods of extraction and purification; stabilizing safeguards; assay procedures; kinetics of isolated enzymes. Immobilization of enzymes: entrapment in insoluble matrices; adsorption on high molecular weight inert carriers; ionic binding to ion-exchange materials; covalent enzyme-enzyme linkage via a low molecular weight bifunctional reagent; covalent linkage to a high molecular weight support; changes in kinetic parameters and stability after immobilization; advantages and disadvantages of immobilization. Enzyme Reactor Engineering: design of batch and continuous systems, including open and closed plug flow and stirred reactors; comparison of kinetics in various designs; scale-up. Enzyme application: analysis; fabric, food and biochemical industries; medical treatment; medical diagnosis. Occupational hazards: allergic responses to enzymes; infection from pathological samples.

Methods of isolation, immobilization and application of enzymes for analytical, industrial and medical purposes will be illustrated by laboratory exercises and short projects. Practical comparison of various reactor designs will also be made.

42.303G Biochemical Process Control
Biochemical reactors: range of basic designs; range of biocatalysts, from microbial conglomerates to free enzymes; heat and mass transfer; design; scale-up; sterility; kinetics; economic considerations. Techniques for efficient operation and control of batch, single-stage continuous and multi-stage continuous processes.

Use of computers: aids to understanding the effects of operating variables for process optimization and control. Detailed examples: microbial processes such as production of antibiotics, organic acids, amino acids and enzymes; enzymic processes.

Practical illustration of: sample processes such as yeast and antibiotic production; mathematical simulation by analog computation; computer control of biochemical processes.

42.304G Biodeterioration and Biodegradation
Basic mechanisms of biodeterioration and biodegradation; direct and indirect attack mechanisms; co-metabolism and mixed population phenomena; factors controlling rates of degradation and recalcitrance of materials to biological attack; biological accelerators.

Detailed treatment of: biological corrosion of metals and alloys; biodeterioration of fuels, petrochemical products, synthetic materials, timber and cellulosic products, building materials etc.; degradation of rocks and minerals; biological leaching of ores and mineral processing residues.

The laboratory component includes assessment of biodegradability of common industrial materials (detergents, surface coatings, fuels, biocides etc); evaluation of protective methods; determination of biological leachability of minerals and mineral processing residues.

42.305G Case Studies
Critical evaluation of industrial processes and research and development procedures. Includes: study of isolated and selected areas of biotechnology, detailed study and evaluation of all aspects of an industrial process from the isolation of the appropriate organism or other biological starting material to the production and use of the final products, critical evaluation of techniques arising from current research and development programs.

42.306G Project
An experimental or technical investigation or design project in the general field of biotechnology.

42.999G Alternative Higher Degree Qualifying Program
Training similar in content and standard to 42.103 Biotechnology (Honours), but designed specifically for students who cannot regularly attend the University.

Microbiology

44.999G Alternative Higher Degree Qualifying Program
Similar in standard to 44.103 Microbiology Honours, but designed for students who cannot regularly attend the University.

Zoology

45.900G Ecological Studies in Arid Lands Management
Prerequisite: Degree with background in bioscience or equivalent.

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 Botany are prescribed to cover aspects of vegetation description and plant/environment interactions.
Chemical Engineering and Industrial Chemistry

48.283G Bioprocess Unit Operations and Equipment Design

Prerequisite or corequisite: 48.284G or equivalent.

Engineering design and operating characteristics of plant and processes normally used, eg sterilization and air purification, dehydration drying at reduced pressure, reduced temperature preservation, radiation, product isolation, sedimentation, filtration, centrifugation, extraction, absorption, chromatography and ion exchange, absorption with reaction, electrophoresis and dialysis, aseptic design, materials of construction, effluent disposal.

48.284G Heat, Mass and Momentum Transport

A bridging subject designed to provide an introductory understanding of the mechanisms of transport processes. This subject would not be offered to a graduate with a background in chemical engineering principles. Mechanisms of molecular and turbulent transport. Heat, mass and momentum transport as rate processes. Boundary layer theory. Lift and drag coefficients. Introduction to non-Newtonian flow.

Sociology

Graduate Study

53.309G Social and Technological Forecasting

The nature of various contemporary approaches to the forecasting of social and technological change, and the use of forecasting in particular sectors of economic, social and technological activity. The course examines a number of commonly held views about the future and their connection with theories about relations between science, technology and society.

53.571G Technology and Working Life

Dr Judy Wajcman

Technology as a social and political phenomenon. Responses to technology both in the present (eg the microprocessor, nuclear energy debates) and in the past (eg Luddism). The way particular schools of social theory have conceived of technology: Marx, Weber, Frankfurt school and other relevant theoretical perspectives. Other topics include: micro-electronic technology and the labour process; nuclear energy; technology and sexism; weapons technology; and alternative technology.

History and Philosophy of Science

62.709G The Scientific Community

A sociological analysis of the pure science community, which establishes the characteristics of this subgroup of society by examining its internal and external social relations. The internal relations refer to cognitive and behavioural factors within the community itself that promote (or retard) the advancement of science. The external relations refer to the political, ideological, economic and bureaucratic forces in society that shape and control the scientific community and the knowledge it produces.

62.710G Science, Philosophy and Social Values

Exposition and appraisal of some of the classical ethical theories. Examination of the claims of science to be able to provide a basis for moral judgements. Attempted establishment of an ethical framework which may serve as a basis for decision-making when problems of an ethical nature arise in science. Selected case studies, in which decisions as to the most appropriate form of action are evaluated in the light of the ethical framework previously established. The social responsibility in science movement and its problems.

62.713G Project

Students are required to prepare a minor research dissertation under the supervision of a member of staff and to attend introductory seminars and occasional addresses by visiting speakers.

62.714G Knowledge, Power and Public Policy

An introduction to the relationship between science and politics in the 20th century; the nature and consequences of government support for research and development; the freedom vs planning debate in science policy, decision-making frameworks and the attempts to establish criteria of choice in a no-growth situation; science and technology policy - international perspectives.

62.716G Science and Society in the 20th Century

The key issues raised by the interaction between science and society in the 20th century. The subject consists of six topic modules drawn from the following list, each presented over a period of four weeks.

1. The Social and Economic Relations of Technology. Fundamental concepts concerning the imperatives of technology, the technostructure, the political dimensions of technological change, technological determinism, the technological fix, the ideology of industrialization, alternative technology. 2. Theories of Social Change. A comparative analysis of leading theories of social change, including Marxism and theories of industrial and post-industrial society, stressing the role of science and technology.
3. Technology and Social Change. A case study of the social impact of (1) energy technologies on Australia and/or the developing world; or (2) the microelectronic revolution on commerce and industry. 4. Historical Dimensions of Scientific Change. A case study of a major conceptual advance in 20th century science (e.g. the development of relativistic physics or of genetics and molecular biology) as an introduction to problems of (1) scientific change and progress; (2) scientific community relations, and (3) science, ideology and responsibility. 5. The Philosophy of Science. Contemporary issues in the philosophical analysis of science. Stress on (1) the dynamics of conceptual change; (2) theories of progress; (3) models of scientific reasoning and method; and (4) external relations of scientific theory and practice. 6. Science as a Social Enterprise. Scientific institutions, patterns of communication, norms and values; social determinants of conformity and innovation; the internal and external politics of science. 7. Social Responsibility in Science. A history of the "Social Responsibility movement"; ethical and political dimensions of the problem of responsibility in science.

62.718G Science in National Cultures: Comparative Historical Perspectives

Historical and contemporary aspects of the comparative development of scientific institutions and research styles in different national contexts. Other themes: the modes of interaction and mutual perceptions of scientific communities in Western industrializing nations from the 19th century, the question of convergence in systems of scientific organization in East and West.

62.719G Science Policy: The International Dimension

A detailed consideration of the justification for, and the arguments against government intervention in systems of research and development. Theoretical discussions of this problem are given concrete focus by appraisals of the policy machinery evolved in various developed countries, including the United States, Great Britain, Australia, Canada, France, West Germany, Holland and Israel.

62.720G Philosophy of Science and the Sociology of Knowledge

Recent philosophical and sociological theories concerning the nature of scientific knowledge and the role which social conditions play in its production and acceptance. Topics include: post-Kuhnian philosophies of science; neo-Marxist theories of science and ideology; the 'strong program' for the sociology of knowledge; 'field' theories and the analysis of power relations in science; and epistemological problems raised by commercial and governmental direction of scientific research.

Faculty of Science

67.001G Experimental Project in Physical Oceanography

A report of an experimental project, including recording, preparation, analysis and interpretation of field or laboratory data.

67.002G Geophysical Fluid Dynamics

Aspects of the physical features of the oceans. Includes ocean waves (rotational and gravitational), tides, large scale wind driven ocean circulation, coastal dynamics, thermohaline circulations and mixing processes.

67.003G Instrumentation

Laboratory, moored, shipborne, airborne and space instrumentation commonly used in oceanographic experiments; their applications and limitations.

67.004G Applied Time Series Analysis

Classification of random processes, sampling for discrete analysis, Fourier analysis, spectra, filtering. Cross-spectra, estimation and hypothesis testing, confidence limits, application to experiment planning. Emphasis on computer analysis of actual data.

67.005G Theoretical Project in Physical Oceanography

A theoretical project aimed at developing the prediction of oceanographical phenomena, tailored to meet individual student background but taken only by those students with a strong theoretical background.

Physiology and Pharmacology

Honours and Graduate Study

Depending on their undergraduate records students may be accepted by the Head of the School to undertake a fourth year of study towards the award of an honours degree in Physiology or in Pharmacology. This would usually be done by students planning a career in either of these fields. During the fourth year student carries out a research project under the supervision of a staff member and submits a thesis based on the research project. The student can usually nominate the general research area in which he or she wishes to work from those being studied in the School. Within this research area the student is given a specific project by the supervisor. Higher degree study for the award of a MSc or PhD degree may also be undertaken by selected students.
Graduate Study

Conditions for the Award of Higher Degrees

Rules, regulations and conditions for the award of first degrees are set out in the appropriate Faculty Handbooks.

For the list of undergraduate courses and degrees offered see Disciplines of the University: Faculty (Undergraduate Study) in the Calendar.

The following is the list of higher degrees and graduate diplomas of the University, together with the publication in which the conditions for the award appear.

For the list of graduate degrees by research and course work, arranged in faculty order, see Disciplines of the University: Table of Courses (by faculty): Graduate Study in the Calendar.

For the statements Preparation and Submission of Project Reports and Theses for Higher Degrees and Policy with respect to the Use of Higher Degree Theses see the Calendar.

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<td>Master of Science without supervision</td>
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<td>Master of Welfare Policy</td>
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**Graduate Diploma**

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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.

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.

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.

(4) A full-time candidate shall be fully engaged in advanced study and research except that the candidate may undertake not more than five hours per week or a total of 240 hours per year on work which is not related to the advanced study and research.

(5) Before permitting a part-time candidate to enrol, the Committee shall be satisfied that the candidate can devote at least 20 hours each week to advanced study and research for the degree which (subject to (8)) shall include regular attendance at the school on an average of at least one day per week for 48 weeks each year.

(6) A candidate shall be required to undertake an original investigation on an approved topic. The candidate may also be required to undergo such assessment and perform such other work as may be prescribed by the Committee.

(7) The work shall be carried out under the direction of a supervisor appointed from the full-time academic members of the University staff.

(8) The work, other than field work, shall be carried out in a school of the University except that the Committee:
(a) may permit a candidate to spend not more than one calendar year of the program in advanced study and research at another institution provided the work can be supervised in a manner satisfactory to the Committee;
(b) may permit a candidate to conduct the work at other places where special facilities not possessed by the University may be available provided the direction of the work remains wholly under the control of the supervisor;
(c) may permit a full-time candidate, who has been enrolled as a full-time candidate for at least six academic sessions, who has completed the research work and who is writing the thesis, to transfer to part-time candidature provided the candidate devotes at least 20 hours each week to work for the degree and maintains adequate contact with the supervisor.

(9) 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.

(10) No candidate shall be awarded the degree until the lapse of six academic sessions from the date of enrolment in the case of a full-time candidate or eight academic sessions in the case of a part-time candidate. In the case of a candidate who has had previous research experience the committee may approve remission of up to two sessions for a full-time candidate and four sessions for a part-time candidate.

(11) A full-time candidate for the degree shall present for examination not later than ten academic sessions from the date of enrolment. A part-time candidate for the degree shall present for examination not later than twelve academic sessions from the date of enrolment. In special cases an extension of these times may be granted by the Committee.

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4. (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 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.

*Or department where a department is not within a school.
(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.

5. (1) There shall be not fewer than three examiners of the thesis, appointed by the Professorial Board on the recommendation of 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:

(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 re-present 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 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 be permitted to resubmit the thesis after a further period of study and/or research.

6. A candidate shall pay such fees as may be determined from time to time by the Council.

1. The degree of Master of Chemistry or Master of Mathematics or Master of Optometry or Master of Physics by formal course work may be awarded by the Council to a candidate who has satisfactorily completed a program of advanced study.

2. (1) A candidate for the degree shall have been awarded an appropriate four-year degree of Bachelor from the University of New South Wales or a qualification considered equivalent from another university or tertiary institution at a level acceptable to the Higher Degree Committee of the Faculty of Science (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.

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.

*Or department where a department is not within a school.
(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 candidature shall be four academic sessions from the date of enrolment for a full-time candidate and eight sessions for a part-time candidate. In special cases an extension of these times may be granted by the Committee.

Fees

4. A candidate shall pay such fees as may be determined from time to time by the Council.

Master of 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.

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.

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.

*Or department where a department is not within a school.
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.

5. (1) There shall be not fewer than two examiners of the thesis, appointed by the Professorial Board on the recommendation of 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 re-present 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.

6. A candidate shall pay such fees as may be determined from time to time by the Council.

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.

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.

*Or department where a department is not within a school.
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.

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 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 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.

5. (1) There shall be not fewer than two examiners of the thesis, appointed by the Professorial Board on the recommendation of 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 re-present 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.

6. A candidate shall pay such fees as may be determined from time to time by the Council.

Master of Mathematics (MMath)
See Master of Chemistry above.

*Or department where a department is not within a school.
Graduate Study: Conditions for the Award of Higher Degrees

See Master of Chemistry above.

See Master of Optometry (MOptom) above.

See Master of Physics (MPhysics) above.

See Master of Engineering above.

See Master of Science (MSc) above.

See Master of Science (MSc) without supervision above.

1. The degree of Master of Psychology by formal course work 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.

2. (1) A candidate for the degree shall have been awarded a 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 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.

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 academic year.

(2) A candidate for the degree shall be required to undertake such formal subjects and, except in exceptional circumstances, pass at the first attempt 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 an extension of these times may be granted by the Committee.

4. A candidate shall pay such fees as may be determined from time to time by the Council.
Master of Science (Biotechnology) (MSc(Biotech))

1. The degree of Master of Science (Biotechnology) by formal course work may be awarded by the Council to a candidate who has satisfactorily completed a program of advanced study.

Qualifications

2. (1) A candidate 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 Higher Degree Committee of the Faculty of Biological Sciences (hereinafter referred to as the Committee).

(2) In exceptional cases an applicant who submits evidence of such other academic and/or professional qualifications as may be approved by the Committee may be permitted to enrol for the degree.

(3) If the Committee is not satisfied with the qualifications submitted by an applicant the Committee may require the applicant to undergo such assessment or carry out such work as the Committee may prescribe, before permitting enrolment.

Enrolment and Progression

3. (1) An application to enrol as a candidate for the degree shall be made on the prescribed form which shall be lodged with the Registrar at least two calendar months before the commencement of the session in which enrolment is to begin.

(2) A candidate for the degree shall be required to undertake such formal 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 candidature shall be four academic sessions from the date of enrolment for a full-time candidate and eight sessions for a part-time candidate. In special cases an extension of these times may be granted by the Committee.

Fees

4. A candidate shall pay such fees as may be determined from time to time by the Council.

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Master of Science (Psychology) (MSc(Psychol))

1. The degree of Master of Science (Psychology) by formal course work may be awarded by the Council to a candidate who has satisfactorily completed a program of advanced study.

Qualifications

2. (1) A candidate for the degree shall have been awarded the degree of Doctor of Philosophy from the University of New South Wales or a qualification considered equivalent from another university or tertiary institution, in an area of psychology acceptable to the Higher Degree Committee of the Faculty of Biological Sciences (hereinafter referred to as the Committee).

(2) If the Committee is not satisfied with the qualifications submitted by an applicant the Committee may require the applicant to undergo such assessment or carry out such work as the Committee may prescribe, before permitting enrolment.

Enrolment and Progression

3. (1) An application to enrol as a candidate for the degree shall be made on the prescribed form which shall be lodged with the Registrar at least two calendar months before the commencement of the academic year.

(2) A candidate for the degree shall be required to undertake such formal subjects and, except in exceptional circumstances, pass at the first attempt such assessment as prescribed.

(3) The progress of a candidate shall be reviewed at least once annually by the Committee and as a result of its review the Committee may cancel enrolment or take such other action as it considers appropriate.

(4) No candidate shall be awarded the degree until the lapse of three academic sessions from the date of enrolment in the case of a full-time candidate or six sessions in the case of a part-time candidate. The maximum period of candidature shall be four academic sessions from the date of enrolment for a full-time candidate and eight sessions for a part-time candidate. In special cases an extension of these times may be granted by the Committee.

Fees

4. A candidate shall pay such fees as may be determined from time to time by the Council.
1. The degree of Master of Science and Society at Honours level may be awarded by the Council on the recommendation of the Higher Degree Committee of the Faculty of Science (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. The degree shall be awarded with the grade of Honours Class 1 or with the grade of Honours Class 2.

2. (1) A candidate for the degree shall:
   (a) 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, and
   (b) have completed the requirements for the award of the degree at Pass level.
   (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.

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 of History and Philosophy of Science (hereinafter referred to as the head of the school) 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 assessment 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 academic 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 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 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 academic sessions in the case of a part-time or external candidate. 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 four academic sessions from the date of enrolment. A part-time or external candidate for the degree shall present for examination not later than eight academic sessions from the date of enrolment. In special cases an extension of these times may be granted by the Committee.

4. (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 present an account of the candidate’s own research. In special cases work done jointly 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.

Master of Science and Society (MScSoc) at Honours Level
Qualifications

Enrolment and Progression

Thesis
Examination

5. (1) There shall be not fewer than two examiners of the thesis, appointed by the Professorial Board on the recommendation of 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 thesis and shall recommend to the Committee that:

(a) the candidate be awarded the degree either with Honours Class 1 or with Honours Class 2 without further examination; or

(b) the candidate be awarded the degree either with Honours Class 1 or with Honours Class 2 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 either with Honours Class 1 or with Honours Class 2 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 re-present 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 examination, recommend whether or not the candidate may be awarded the degree. If it is decided that the candidate be not awarded the degree the Committee shall determine whether or not the candidate may resubmit the thesis after a further period of study and/or research.

Fees

6. A candidate shall pay such fees as may be determined from time to time by the Council.

Master of Science and Society (MScSoc) at Pass Level

Qualifications

1. The degree of Master of Science and Society at Pass level may be awarded by the Council to a candidate who has satisfactorily completed a program of advanced study.

2. (1) A candidate for the degree shall have been awarded an appropriate degree of Bachelor from the University of New South Wales or a qualification considered equivalent from another university or tertiary institution at a level acceptable to the Higher Degree Committee of the Faculty of Science (hereinafter referred to as the Committee).

(2) In exceptional cases an applicant who submits evidence of such other academic and professional qualifications as may be approved by the Committee may be permitted to enrol for the degree.

(3) If the Committee is not satisfied with the qualifications submitted by an applicant the Committee may require the applicant to undergo such assessment or carry out such work as the Committee may prescribe, before permitting enrolment.

Enrolment and Progression

3. (1) An application to enrol as a candidate for the degree shall be made on the prescribed form which shall be lodged with the Registrar at least two calendar months before the commencement of the session in which enrolment is to begin.

(2) A candidate for the degree shall be required to undertake such formal 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. The maximum period of candidature shall be eight academic sessions from the date of enrolment. In special cases an extension of 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.
1. The degree of Master of Statistics by formal course work may be awarded by the Council to a candidate who has satisfactorily completed a program of advanced study.

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 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.

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 remission 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.

4. A candidate shall pay such fees as may be determined from time to time by the Council.

---

**Graduate Diploma**

1. A Graduate Diploma may be awarded by the Council to a candidate who has satisfactorily completed a program of advanced study.

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.

3. (1) An application to enrol as a candidate for the 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.
Scholarships and Prizes

The scholarships and prizes listed below are available to students whose courses are listed in this handbook. 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.

Scholarships

Undergraduate Scholarships

Listed below is an outline only of a number of scholarships available to students. Full information may be obtained from Room G20, located on the Ground Floor of the Chancellery.

Unless otherwise indicated in footnotes, applications for the following scholarships should be made to the Registrar by 14 January each year. Please note that not all of these awards are available every year.

<table>
<thead>
<tr>
<th>Donor</th>
<th>Value</th>
<th>Year/s of Tenure</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>General</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bursary Endowment Board*</td>
<td>$200 pa</td>
<td>Minimum period of approved degree/combined degree course</td>
<td>Merit in HSC and total family income not exceeding $6000</td>
</tr>
<tr>
<td>Sam Cracknell Memorial</td>
<td>Up to $3000 pa payable in fortnightly instalments</td>
<td>1 year</td>
<td>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</td>
</tr>
</tbody>
</table>

*Apply to The Secretary, Bursary Endowment Board, PO Box 480, North Sydney 2060, immediately after sitting for HSC.
### Undergraduate Scholarships (continued)

<table>
<thead>
<tr>
<th>Donor</th>
<th>Value</th>
<th>Year/s of Tenure</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Girls Realm Guild</strong></td>
<td>Up to $1500 pa</td>
<td>1 year renewable for the duration of the course subject to satisfactory progress and continued demonstration of need</td>
<td>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</td>
</tr>
<tr>
<td><strong>W. S. and L. B. Robinson</strong></td>
<td>Up to $4200 pa</td>
<td>1 year renewable for the duration of the course subject to satisfactory progress</td>
<td>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.</td>
</tr>
<tr>
<td><strong>Universities Credit Union</strong></td>
<td>$500 pa</td>
<td>1 year with the possibility of renewal</td>
<td>Prior completion of at least 1 year of any undergraduate degree course. Eligibility limited to members of the Universities Credit Union Ltd of more than one year's standing or members of the family of such members.</td>
</tr>
</tbody>
</table>

### Science

**Chemistry**

| John Ragnar Anderson Memorial Bequest | Up to $1500 pa | 1 year renewable for the duration of the course subject to satisfactory progress | Permanent residence in Australia and eligibility for admission to a full-time degree course in Chemistry |

### Mathematics

<table>
<thead>
<tr>
<th>George Szekeres Award</th>
<th>$200 pa</th>
<th>1 year</th>
<th>Open to students entering the final year of the honours degree course in Pure Mathematics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Olivetti Australia Pty Ltd</td>
<td>Up to $600 pa</td>
<td>2 years subject to satisfactory progress</td>
<td>Eligibility for admission to the third year of an honours program in the School of Mathematics in Pure/Applied Mathematics, Theoretical Mechanics or Statistics and leading to the award of the degree of Bachelor of Arts, Bachelor of Science, or Bachelor of Science Diploma in Education</td>
</tr>
</tbody>
</table>

### Optometry

| Gibb and Beeman | Up to $750 pa | 1 year renewable for the duration of the course, subject to satisfactory progress | Available to students under 21 years of age who are permanent residents of Australia enrolling in Year 1 of the full-time degree course in Optometry |

**Applications close 30 September each year.**
Graduate Scholarships

Application forms and further information are available from the Student Enquiry Counter, located on the Ground Floor of the Chancellorcy. Information is also available on additional scholarships which may become available from time to time, mainly from funds provided by organizations sponsoring research projects.

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*; 3. *Scholarships Guide for Commonwealth Postgraduate Students*, published by the Association of Commonwealth Universities*.

Where possible, the scholarships are listed in order of faculty.

<table>
<thead>
<tr>
<th>Donor</th>
<th>Value</th>
<th>Year/s of Tenure</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>University of New South Wales Postgraduate Scholarships</td>
<td>Living allowance of $7000 pa. Other allowances may also be paid.</td>
<td>1-2 years for a Masters and 3-4 years for a PhD degree</td>
<td>Applicants must be honours graduates (or equivalent). Applications to Dean of relevant Faculty.</td>
</tr>
<tr>
<td>Commonwealth Postgraduate Research Awards</td>
<td></td>
<td></td>
<td>Applicants must be honours graduates (or equivalent) or scholars who will graduate with honours in current academic year, and who are domiciled in Australia. Applications to Registrar by 31 October.</td>
</tr>
<tr>
<td>Commonwealth Postgraduate Course Awards</td>
<td>Living allowance of $8126 pa. Other allowances may also be paid.</td>
<td>1-2 years; minimum duration of course</td>
<td>Applicants must be graduates or scholars who will graduate in current academic year, and who have not previously held a Commonwealth Postgraduate Award. Preference is given to applicants with employment experience. Applications to Registrar by 30 September.</td>
</tr>
<tr>
<td>Australian American Educational Foundation Travel Grant (Fulbright)*</td>
<td></td>
<td></td>
<td>Applicants must be graduates, senior scholars or post-doctoral Fellows. Applications close 30 September.</td>
</tr>
<tr>
<td>Australian Federation of University Women</td>
<td>Amount varies, depending on award</td>
<td>Up to 1 year</td>
<td>Applicants must be female graduates who are members of the Australian Federation of University Women</td>
</tr>
<tr>
<td>The Caltex Woman Graduate Scholarships</td>
<td>Six State awards of $5000 each One National award valued at $22,000 pa for study at an approved overseas institution.</td>
<td>1 year 2 years</td>
<td>Applicants must be female graduates who will have completed a University degree or diploma this year and who are Australian citizens or have resided in Australia for at least seven years. Selection is based on scholastic and literary achievements, demonstrable qualities of character and accomplishments in cultural and/or sporting/recreational activities. Applications close late September.</td>
</tr>
</tbody>
</table>

*Available for reference in the University Library. Application forms are available from The Secretary, Department of Education and Youth Affairs, AAEF Travel Grants, PO Box 826, Woden, ACT 2606.
<table>
<thead>
<tr>
<th>Donor</th>
<th>Value</th>
<th>Year/s of Tenure</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Commonwealth Scholarship and Fellowship Plan</strong></td>
<td>Varies for each country. Generally covers travel, living, tuition fees, books and equipment, approved medical expenses. Marriage allowance may be payable.</td>
<td>Usually 2 years, sometimes 3</td>
<td>Applicants must be graduates who are Australian citizens and who are not older than 35 years of age. Applications close with Registrar in September or October each year.</td>
</tr>
<tr>
<td>The English-Speaking Union (NSW Branch)</td>
<td>$5000</td>
<td></td>
<td>Applicants must be residents of NSW or ACT. Awarded to young graduates to further their studies outside Australia. Applications close mid-April.</td>
</tr>
<tr>
<td>Frank Knox Memorial Fellowships at Harvard University</td>
<td>Stipend of US$6500 pa plus tuition fees</td>
<td>1, sometimes 2 years</td>
<td>Applicants must be British subjects and Australian citizens, who are graduates or near graduates of an Australian university. Applications close with the Registrar, mid-October.</td>
</tr>
<tr>
<td>Gowrie Scholarship Trust Fund</td>
<td>$4000 pa. Under special circumstances this may be increased.</td>
<td>2 years</td>
<td>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 Registrar by 31 October.</td>
</tr>
<tr>
<td>Harkness Fellowships of the Commonwealth Fund of New York**</td>
<td>Living and travel allowances, tuition and research expenses, health insurance, book and equipment and other allowances for travel and study in the USA</td>
<td>12 to 21 months</td>
<td>Candidates must be: 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 36 years of age. Applications close 31 August.</td>
</tr>
<tr>
<td>The Rhodes Scholarship*</td>
<td>Approximately £3600 stg pa</td>
<td>2 years, may be extended for a third year</td>
<td>Unmarried male and female Australian citizens aged between 19 and 25 who have been domiciled in Australia at least 5 years and have completed at least 2 years of an approved university course. Applications close in mid-September each year.</td>
</tr>
</tbody>
</table>

**Application forms must be obtained from the Australian representative of the Fund, Mr J. T. Larkin, Department of Trade, Edmund Barton Building, Kings Avenue, Barton, ACT 2600. These must be submitted to the Registrar by 15 August.**

*Applications to The Honorary Secretary of the NSW Committee, University of Sydney, NSW 2006.*
### Graduate Scholarships (continued)

<table>
<thead>
<tr>
<th>Donor</th>
<th>Value</th>
<th>Year/s of Tenure</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General (continued)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Rothmans Fellowships Award††</strong></td>
<td>$20,000 pa</td>
<td>1 year, renewable up to 3 years</td>
<td>The field of study is unrestricted. Applicants must have at least 3 years graduate experience in research. Applications close in July.</td>
</tr>
<tr>
<td>Sam Cracknell Memorial</td>
<td>Up to $3,000 pa</td>
<td></td>
<td>See above under Undergraduate Scholarships, General</td>
</tr>
<tr>
<td><strong>Biological Sciences</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>John Clark Memorial Award in Psychology</strong></td>
<td>$1,000</td>
<td>1 year</td>
<td>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</td>
</tr>
<tr>
<td><strong>Science</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Australian Telecommunications and Electronics Research Board</td>
<td>$11,500 pa if only scholarship held or $5,000 if additional to another scholarship</td>
<td>1 year for a Masters and up to 3 years for a PhD degree</td>
<td>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 and who are aged under 25 years at 1 January. Applications close late September.</td>
</tr>
<tr>
<td>Contact Lens Society of Australia</td>
<td>$2,000 pa</td>
<td></td>
<td>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.</td>
</tr>
<tr>
<td>Gordon Godfrey Scholarship in Theoretical Physics</td>
<td>$1,500 pa</td>
<td>1-3 years</td>
<td>To enable a suitable graduate to undertake a research degree in Theoretical Physics. May be held concurrently with another award.</td>
</tr>
<tr>
<td>The Rutherford Scholarship</td>
<td>Travel, fees, etc. A stipend which, if held in the UK, is approx. £4,090 stg pa.</td>
<td>3 years</td>
<td>To enable graduates under 26 years of age to undertake experimental research in a branch of natural science. It is tenable at a British Commonwealth University other than the country in which the applicant graduated. Applications close mid-February.</td>
</tr>
<tr>
<td>Science Research Scholarship of the Royal Commission for the Exhibition of 1851</td>
<td>£4,090 stg pa</td>
<td>Normally tenable 3 years</td>
<td>To enable graduates under 26 years of age to undertake research in some branch of pure or applied science, or engineering, at an overseas university. Applicants must be British Commonwealth citizens or citizens of the Republics of Ireland, Pakistan or South Africa. Applications close mid-February.</td>
</tr>
</tbody>
</table>

††Applications to the Secretary, Rothmans University Endowment Fund, University of Sydney, NSW 2006.
Graduate Scholarships (continued)

<table>
<thead>
<tr>
<th>Donor</th>
<th>Value</th>
<th>Year/s of Tenure</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Science (continued)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shell Scholarship in Science or Engineering</td>
<td>Adequate funds for living allowance, tuition and travel expenses</td>
<td>2 years, sometimes 3</td>
<td>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 by 26 September.</td>
</tr>
</tbody>
</table>

Prizes

Undergraduate University Prizes

The following table summarizes the 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.

<table>
<thead>
<tr>
<th>Donor/Name of Prize</th>
<th>Value $</th>
<th>Awarded for</th>
</tr>
</thead>
<tbody>
<tr>
<td>General</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sydney Technical College Union Award</td>
<td>150.00</td>
<td>Leadership in the development of student affairs, and academic proficiency throughout the course</td>
</tr>
<tr>
<td>University of New South Wales Alumni Association</td>
<td>Statuette</td>
<td>Achievement for community benefit – students in their final or graduating year</td>
</tr>
<tr>
<td>Faculties of Applied Science and Engineering</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Institution of Engineers, Australia</td>
<td>Medal and 200.00</td>
<td>The most proficient final year (or last 2 years part-time) student in the Bachelor of Engineering (or Bachelor of Science (Engineering)) degree courses offered by the following Schools: Civil Engineering Electrical Engineering and Computer Science Mechanical and Industrial Engineering Chemical Engineering and Industrial Chemistry Mining Engineering Textile Technology (Engineering option only)</td>
</tr>
<tr>
<td>Board of Studies in Science and Mathematics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Logica Pty Limited</td>
<td>200.00</td>
<td>Best performance by a graduand in the Computer Science Honours degree course</td>
</tr>
</tbody>
</table>
### Undergraduate University Prizes (continued)

<table>
<thead>
<tr>
<th>Donor/Name of Prize</th>
<th>Value $</th>
<th>Awarded for</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>School of Accountancy</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Australian Society of Accountants</td>
<td>100.00</td>
<td>14.501 Accounting and Financial Management 1A</td>
</tr>
<tr>
<td></td>
<td>100.00</td>
<td>14.522 Accounting and Financial Management 2A</td>
</tr>
<tr>
<td></td>
<td>100.00</td>
<td>14.563 Accounting and Financial Management 3A and 14.583 Accounting and Financial Management 3B</td>
</tr>
<tr>
<td>Chamber of Manufactures of New South Wales</td>
<td>250.00</td>
<td>14.703 Advanced Auditing</td>
</tr>
<tr>
<td>Coopers and Lybrand</td>
<td>250.00</td>
<td>14.542 Accounting and Financial Management 2B</td>
</tr>
<tr>
<td>Corporate Affairs Commission</td>
<td>100.00</td>
<td>14.803/14.903G Regulation of Accounting</td>
</tr>
<tr>
<td>Datec Pty Ltd</td>
<td>200.00</td>
<td>14.605 Information Systems 3B</td>
</tr>
<tr>
<td></td>
<td>150.00</td>
<td>Best honours thesis related to information systems design, data management or management science techniques used for commercial applications</td>
</tr>
<tr>
<td>Esso Australia Ltd</td>
<td>500.00</td>
<td>Overall outstanding achievement in the subjects:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>14.501 Accounting and Financial Management 1A,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>14.511 Accounting and Financial Management 1B,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>14.522 Accounting and Financial Management 2A,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>14.542 Accounting and Financial Management 2B</td>
</tr>
<tr>
<td>Greenwood, Challoner &amp; Co</td>
<td>100.00</td>
<td>14.777 Legal Organisation of Commerce</td>
</tr>
<tr>
<td>K. M. G. Hungerford</td>
<td>100.00</td>
<td>14.563 Accounting and Financial Management 3A</td>
</tr>
<tr>
<td>IBM</td>
<td>150.00</td>
<td>Highest aggregate mark in any two of the following subjects:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>14.603 Computer Information Systems 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>14.605 Information Systems Implementation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>14.606 Management Information Systems Design</td>
</tr>
<tr>
<td></td>
<td></td>
<td>14.607 Distributed Computer Systems</td>
</tr>
<tr>
<td></td>
<td></td>
<td>14.608 Database Systems</td>
</tr>
<tr>
<td>Law Book Co Ltd</td>
<td>75.00</td>
<td>14.511 Accounting and Financial Management 1B</td>
</tr>
<tr>
<td></td>
<td>Books</td>
<td>14.805/14.905G EDP Auditing</td>
</tr>
<tr>
<td>Peat, Marwick, Mitchell and Company</td>
<td>200.00</td>
<td>General Proficiency in Accounting and Financial Management subjects</td>
</tr>
<tr>
<td>Price Waterhouse</td>
<td>250.00</td>
<td>14.813 Business Finance 2</td>
</tr>
<tr>
<td>Schroders Australia Limited</td>
<td>200.00</td>
<td>14.794 Honours thesis on an accounting topic</td>
</tr>
<tr>
<td>Rod Sinden Memorial</td>
<td>250.00</td>
<td>14.783 Taxation Law</td>
</tr>
<tr>
<td>Taxation Institute of Australia</td>
<td>100.00</td>
<td>14.859/14.959G Advanced Studies in Taxation</td>
</tr>
<tr>
<td>John Menzies McKellar White Memorial</td>
<td>200.00</td>
<td>14.563 Accounting and Financial Management 3A</td>
</tr>
<tr>
<td>E. S. Wolfenden Memorial</td>
<td>200.00</td>
<td>14.613 Business Finance 2</td>
</tr>
<tr>
<td>Arthur Young &amp; Co</td>
<td>80.00</td>
<td></td>
</tr>
</tbody>
</table>

| **School of Anatomy**                       |         |                                                                             |
| The Gray’s Point Prize in Anatomy           | 50.00   | Highest aggregate mark in Year 1 of Anatomy                                 |
| Jane Skillen in Anatomy                     | 40.00   | Outstanding merit in all branches of Anatomy                                |
| The Prize in Practical Anatomy              | 100.00  | Practical Anatomy (including Radiological Anatomy) – Year 2 of the medical course |
### Undergraduate University Prizes (continued)

<table>
<thead>
<tr>
<th>Donor/Name of Prize</th>
<th>Value $</th>
<th>Awarded for</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>School of Biological Technologies</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Department of Biotechnology</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mauri Foods</td>
<td>175.00</td>
<td>Best result in 42.101 Introduction to Biotechnology</td>
</tr>
<tr>
<td></td>
<td>175.00</td>
<td>Best result in one of the Level 3 Biotechnology subjects</td>
</tr>
<tr>
<td></td>
<td>175.00</td>
<td>Best result in the Biotechnology honours degree program</td>
</tr>
<tr>
<td><strong>Department of Food Science and Technology</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cottees General Foods</td>
<td>120.00</td>
<td>38.141 Food Regulation and Control</td>
</tr>
<tr>
<td>Nestle Australia Pty Ltd</td>
<td>200.00</td>
<td>Best performance in 38.140 Food Technology project in the Bachelor of Science degree course in Food Technology</td>
</tr>
<tr>
<td>Wilfred B. S. Bishop</td>
<td>75.00</td>
<td>General proficiency throughout Bachelor of Science degree course in Food Technology by a student who has made a significant contribution to staff and student activities</td>
</tr>
<tr>
<td><strong>School of Chemical Engineering and Industrial Chemistry</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abbott Laboratories Pty Ltd</td>
<td>150.00</td>
<td>Bachelor of Engineering degree course in Chemical Engineering – Year 4</td>
</tr>
<tr>
<td>Australasian Corrosion Association (NSW Branch)</td>
<td>150.00</td>
<td>Best performance in 48.121 Corrosion in the Chemical Industry</td>
</tr>
<tr>
<td></td>
<td>and one year's membership of the Association</td>
<td></td>
</tr>
<tr>
<td>The Australian Gas Light Company's in Chemical Engineering</td>
<td>200.00</td>
<td>Subject selected by Head of School</td>
</tr>
<tr>
<td>Australian Paper Manufacturers Ltd</td>
<td>100.00</td>
<td>48.163 Instrumentation and Process Control in Industrial Chemistry</td>
</tr>
<tr>
<td></td>
<td>100.00</td>
<td>48.163 Instrumentation and Process Control in Chemical Engineering</td>
</tr>
<tr>
<td>Chemical Technology Society</td>
<td>25.00</td>
<td>Best graduate in Bachelor of Science degree in Industrial Chemistry</td>
</tr>
<tr>
<td></td>
<td>25.00</td>
<td>Best graduate in Bachelor of Science degree course in Industrial Chemistry, Years 1 and 2 or Stages 1 to 4</td>
</tr>
<tr>
<td>CSR Limited</td>
<td>50.00</td>
<td>Subject within the discipline of Industrial Chemistry, selected by Head of School</td>
</tr>
<tr>
<td>Esso Australia Ltd</td>
<td>200.00</td>
<td>Best performance in Year 2 Chemical Engineering</td>
</tr>
<tr>
<td>Institution of Chemical Engineers</td>
<td>100.00</td>
<td>Best result for the thesis in the final year, or equivalent part time stage, of the Bachelor of Engineering degree course</td>
</tr>
<tr>
<td></td>
<td>and medal</td>
<td></td>
</tr>
<tr>
<td>Shell</td>
<td>100.00</td>
<td>General proficiency in Year 2 or its part-time equivalent in either the Chemical Engineering course or the Industrial Chemistry course</td>
</tr>
</tbody>
</table>
### Undergraduate University Prizes (continued)

<table>
<thead>
<tr>
<th>Donor/Name of Prize</th>
<th>Values</th>
<th>Awarded for</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>School of Chemical Engineering and Industrial Chemistry (continued)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Simon-Carves Australia</td>
<td>100.00</td>
<td>General proficiency in Year 3 or its part-time equivalent in either the Chemical Engineering course or the Industrial Chemistry course</td>
</tr>
<tr>
<td>Stauffer Australia Limited</td>
<td>100.00</td>
<td>General proficiency in Year 4 or its part-time equivalent in either the Chemical Engineering course or the Industrial Chemistry course</td>
</tr>
<tr>
<td>Western Mining Corporation Ltd</td>
<td>150.00</td>
<td>For a student who, in the opinion of the Head of School, has performed some meritorious activity of note either inside or outside the University</td>
</tr>
<tr>
<td></td>
<td>100.00</td>
<td>48.135 Thermodynamics</td>
</tr>
<tr>
<td></td>
<td>100.00</td>
<td>Subject selected by Head of School</td>
</tr>
<tr>
<td></td>
<td>150.00</td>
<td>48.036 Chemical Engineering Laboratory 1</td>
</tr>
<tr>
<td></td>
<td>150.00</td>
<td>48.044 Chemical Engineering Laboratory 2</td>
</tr>
</tbody>
</table>

| **Department of Fuel Technology** | | |
| Australian Institute of Energy | 50.00 | For a fuel subject or allied subject project |
| Fuel Technology Staff | 200.00 | Best performance in Year 3 or 4 Fuel Technology subject in the Bachelor of Engineering degree course in Chemical Engineering |
| Shell | 150.00 | Subject selected by Head of School |

### School of Chemistry

<table>
<thead>
<tr>
<th>Donor/Name of Prize</th>
<th>Values</th>
<th>Awarded for</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACI Australia Limited</td>
<td>60.00</td>
<td>Subject selected by Head of School</td>
</tr>
<tr>
<td>CSR Chemicals Ltd</td>
<td>200.00</td>
<td>Chemistry Honours</td>
</tr>
<tr>
<td>Inglis Hudson Bequest</td>
<td>15.00</td>
<td>2.002B Organic Chemistry I</td>
</tr>
<tr>
<td>Jeffery Bequest</td>
<td>100.00</td>
<td>2.043L Chemistry and Enzymology of Foods</td>
</tr>
<tr>
<td>Merck Sharp &amp; Dohme (Aust) Pty Ltd</td>
<td>52.50</td>
<td>Chemistry – Level II subjects in the Science and Mathematics Course</td>
</tr>
<tr>
<td></td>
<td>52.50</td>
<td>Chemistry – Level III subjects in the Science and Mathematics Course</td>
</tr>
<tr>
<td>RACI Analytical Chemistry Group</td>
<td>150.00</td>
<td>2.013D Advanced Analytical Chemistry</td>
</tr>
<tr>
<td>UNSW Chemical Society Parke-Pope</td>
<td>100.00</td>
<td>Subject selected by Head of School</td>
</tr>
<tr>
<td>UNSW Chemical Society George Wright</td>
<td>100.00</td>
<td>Best performance in 2.121 and 2.131 Year 1 Chemistry</td>
</tr>
<tr>
<td>June Griffith Memorial</td>
<td>60.00</td>
<td></td>
</tr>
<tr>
<td>Donor/Name of Prize</td>
<td>Value $</td>
<td>Awarded for</td>
</tr>
<tr>
<td>---------------------</td>
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<td>-------------</td>
</tr>
<tr>
<td><strong>School of Economics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Australian Finance Conference</td>
<td>75.00</td>
<td>15.083 Public Finance</td>
</tr>
<tr>
<td>Economic Society in Economics</td>
<td>100.00</td>
<td>Final year in Bachelor of Arts degree course with honours in Economics, Bachelor of Commerce degree course with honours in Economics or Bachelor of Commerce degree course with honours in Economics and Econometrics</td>
</tr>
<tr>
<td>and three years' membership of the Economic Society</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Statistical Society of Australia (New South Wales Branch)</td>
<td>70.00</td>
<td>General proficiency throughout the Bachelor of Commerce degree course in Econometrics</td>
</tr>
<tr>
<td><strong>Department of Industrial Relations</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industrial Relations Society of NSW</td>
<td>Books to the value of 100.00</td>
<td>Best performance in 15.511 Industrial Relations 1A in the Bachelor of Commerce or Bachelor of Arts degree course</td>
</tr>
<tr>
<td><strong>School of Electrical Engineering and Computer Science</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Austral Crane</td>
<td>37.50</td>
<td>Bachelor of Engineering degree course in Electrical Engineering, Year 3</td>
</tr>
<tr>
<td></td>
<td>37.50</td>
<td>Power or Control elective</td>
</tr>
<tr>
<td>Electricity Supply Engineers Association of New South Wales</td>
<td>100.00</td>
<td>Overall performance including proficiency in Electric Power Distribution in Year 3 full-time or equivalent part-time degree course</td>
</tr>
<tr>
<td>IBM</td>
<td>150.00</td>
<td>Best performance in 6.611 Computing 1</td>
</tr>
<tr>
<td>J. Douglas Maclurcan</td>
<td>50.00</td>
<td>Outstanding performance in the field of control systems</td>
</tr>
<tr>
<td>Book order</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>School of Geography</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jack Mabbutt Medal</td>
<td>Medal</td>
<td>Best performance in Fourth Year Project in Applied Geography by a student proceeding to Bachelor of Science</td>
</tr>
<tr>
<td>Jack Mabbutt Prize</td>
<td>150.00</td>
<td>Best performance by a third year student proceeding to Honours in Geography</td>
</tr>
<tr>
<td>Donor/Name of Prize</td>
<td>Value $</td>
<td>Awarded for</td>
</tr>
<tr>
<td>---------------------</td>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td><strong>School of Mathematics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Applied Mathematics</td>
<td>50.00</td>
<td>Excellence in Level III Applied Mathematics subjects</td>
</tr>
<tr>
<td>C. H. Peck</td>
<td>50.00</td>
<td>Best performance in Year 2 Mathematics proceeding to Year 3 in the School of Mathematics</td>
</tr>
<tr>
<td>Head of School's</td>
<td>50.00</td>
<td>Excellence in 4 or more Mathematics units in Year 2</td>
</tr>
<tr>
<td>IBM</td>
<td>150.00</td>
<td>Final year of an honours degree course</td>
</tr>
<tr>
<td>ICI Theory of Statistics IV</td>
<td>100.00</td>
<td>Best performance in 10.323 Theory of Statistics 4</td>
</tr>
<tr>
<td>I. P. Sharp Associates</td>
<td>75.00</td>
<td>Excellence in Higher Theory of Statistics 2</td>
</tr>
<tr>
<td>J. R. Holmes</td>
<td>50.00</td>
<td>Excellent performance in at least 4 pass-level (up to 1 pass-level unit may be replaced by a higher-level unit) Pure Mathematics Level III units taken over no more than two consecutive years</td>
</tr>
<tr>
<td>Michael Mihailavitch Enihman</td>
<td>750.00</td>
<td>Best performance by a student enrolled in a Mathematics Program, in examinations conducted by the School of Mathematics in any one year</td>
</tr>
<tr>
<td>Pure Mathematics</td>
<td>50.00</td>
<td>Best performance in Level III Pure Mathematics subjects</td>
</tr>
<tr>
<td>School of Mathematics</td>
<td>50.00</td>
<td>Best performance in 10.011 Higher Mathematics 1</td>
</tr>
<tr>
<td></td>
<td>50.00</td>
<td>Best performance in basic Year 2 Higher Mathematics units</td>
</tr>
<tr>
<td></td>
<td>50.00</td>
<td>Excellence in 4 or more Mathematics units in Year 2</td>
</tr>
<tr>
<td>Statistical Society of Australia (New South Wales Branch)</td>
<td>70.00</td>
<td>General proficiency – Theory of Statistics subjects</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>School of Mechanical and Industrial Engineering</strong></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ansett Airlines of Australia</td>
<td>200.00</td>
<td>Best overall performance in the Bachelor of Engineering degree course in Aeronautical Engineering</td>
</tr>
<tr>
<td></td>
<td></td>
<td>and bronze medal</td>
</tr>
<tr>
<td>Atlas Copco</td>
<td>125.00</td>
<td>General proficiency in Bachelor of Engineering degree course in Mechanical Engineering</td>
</tr>
<tr>
<td>Austral Crane</td>
<td>75.00</td>
<td>General proficiency in full-time Year 3 Mechanical Engineering</td>
</tr>
<tr>
<td>Australian Institute of Refrigeration, Air Conditioning and Heating</td>
<td>Student membership of the Institute for 1 year plus Design Aid and Data Book</td>
<td>Best performance in subject selected by Head of School in field of refrigeration and air conditioning</td>
</tr>
<tr>
<td>Babcock Aust Ltd</td>
<td>100.00</td>
<td>Subject selected by Head of School</td>
</tr>
</tbody>
</table>
Undergraduate University Prizes (continued)

<table>
<thead>
<tr>
<th>Donor/Name of Prize</th>
<th>Value $</th>
<th>Awarded for</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>School of Materials Science and Engineering</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alcan Australia Ltd</td>
<td>100.00</td>
<td></td>
</tr>
<tr>
<td>Austral Crane</td>
<td>150.00</td>
<td></td>
</tr>
<tr>
<td>Australian Institute of Metals</td>
<td>100.00</td>
<td>and one year’s membership of the Institute</td>
</tr>
<tr>
<td>Australian Welding Institute</td>
<td>30.00</td>
<td>Book order</td>
</tr>
<tr>
<td>The Broken Hill Proprietary Co Ltd</td>
<td>150.00</td>
<td></td>
</tr>
<tr>
<td>The Max Hatherly</td>
<td>275.00</td>
<td>Best performance in the final year practical examination or an outstanding effort in Metallography</td>
</tr>
<tr>
<td>The Hugh Muir</td>
<td>275.00</td>
<td>Best performance in the final year seminar class or, as judged by the Head of School, the contribution by a student most of all to the corporate life of the School of Materials Science and Engineering</td>
</tr>
<tr>
<td>Western Mining Corporation Ltd</td>
<td>150.00</td>
<td>Best overall performance in Year 3 full-time (or its equivalent part-time) in Bachelor of Engineering (or Bachelor of Science (Technology)) degree course</td>
</tr>
<tr>
<td></td>
<td>150.00</td>
<td>Best overall performance in Year 4 full-time (or its equivalent part-time) in the Bachelor of Engineering (or Bachelor of Science (Technology)) degree course</td>
</tr>
<tr>
<td>Zinc Corp Ltd</td>
<td>200.00</td>
<td>Subject selected by Head of School</td>
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</table>

**School of Optometry**

<table>
<thead>
<tr>
<th>Donor/Name of Prize</th>
<th>Value $</th>
<th>Awarded for</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australian Optometrical Association</td>
<td>200.00</td>
<td>Best performance in Year 3 of the Optometry degree course</td>
</tr>
<tr>
<td>Bausch &amp; Lomb Soflens</td>
<td></td>
<td>31.841 Clinical Optometry</td>
</tr>
<tr>
<td>Diagnostic set of contact lenses valued at 700.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bryan Powell</td>
<td>100.00</td>
<td>Colour vision section of 31.841 Clinical Optometry</td>
</tr>
<tr>
<td>Contavue</td>
<td></td>
<td>Best essay or project on contact lenses</td>
</tr>
<tr>
<td>G. Nissel &amp; Co Aust Pty Ltd</td>
<td></td>
<td>31.813 Optometry 3 and 31.841 Clinical Optometry — Contact Lenses sections</td>
</tr>
<tr>
<td>Trial fitting set of contact lenses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hoya Australia Pty Ltd</td>
<td>250.00</td>
<td>Highest academic record in the Optometry degree course</td>
</tr>
<tr>
<td>Donor/Name of Prize</td>
<td>Value $</td>
<td>Awarded for</td>
</tr>
<tr>
<td>---------------------</td>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td><strong>School of Optometry (continued)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydron (Australia) Pty Ltd</td>
<td>100.00</td>
<td>31.813 Optometry 3</td>
</tr>
<tr>
<td>The Keith Woodland Memorial</td>
<td>100.00</td>
<td>Optometry Year 4</td>
</tr>
<tr>
<td>Martin Wells Pty Ltd</td>
<td>200.00</td>
<td>Binocular vision component of 31.813 Optometry 3 and 31.841 Clinical Optometry</td>
</tr>
<tr>
<td>Optical Products Pty Ltd</td>
<td>100.00</td>
<td>31.821 Special Anatomy and Physiology</td>
</tr>
<tr>
<td>Optometric Vision Research Foundation</td>
<td>100.00</td>
<td>31.831 Diseases of the Eye</td>
</tr>
<tr>
<td>Optometrists’ Association of NSW</td>
<td>50.00</td>
<td>Final Year Essay</td>
</tr>
<tr>
<td>Optyl (Australia) Pty Ltd</td>
<td>100.00</td>
<td>Subject selected by Head of School</td>
</tr>
<tr>
<td>Safilo Australia</td>
<td>100.00</td>
<td>Subject selected by Head of School</td>
</tr>
<tr>
<td>Theo Kannis</td>
<td>250.00</td>
<td>31.841 Clinical Optometry</td>
</tr>
<tr>
<td><strong>School of Physics</strong></td>
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<td></td>
</tr>
<tr>
<td>Australian Institute of Physics</td>
<td>100.00</td>
<td>Highest aggregate in any 3 units chosen from 1.0133 Quantum Mechanics, 1.0143 Nuclear Physics, 1.023 Statistical Mechanics and Solid State Physics, 1.0333 Electromagnetism, 1.0343 Advanced Optics, and 1.043 Experimental Physics A in the Bachelor of Science</td>
</tr>
<tr>
<td>and one year’s membership of the Institute</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bodel in Microcomputers</td>
<td>100.00</td>
<td>Best performance in a competition based on the use of microcomputers in 1.061 Computer Applications in Experimental Science 1</td>
</tr>
<tr>
<td>ETP-Oxford</td>
<td>200.00</td>
<td>Most meritorious design study of an optical system in the subject 1.713 Advanced Laser and Optical Applications</td>
</tr>
<tr>
<td>Gordon and Mabel Godfrey in Theoretical Physics 3</td>
<td>100.00</td>
<td>Best performance in a selection of Year 3 Theoretical Physics subjects chosen from 1.5133, 1.5233, 1.5333, 1.5433 and 1.5533</td>
</tr>
<tr>
<td>Gordon and Mabel Godfrey in Theoretical Physics 4</td>
<td>100.00</td>
<td>Excellence in the subject 1.504 Theoretical Physics 4 in the Bachelor of Science degree course with Honours in Physics</td>
</tr>
<tr>
<td>Gordon and Mabel Godfrey</td>
<td>300.00</td>
<td>Best performance by a student who has completed third year and is entering the final year of the Honours Degree course in Theoretical Physics</td>
</tr>
</tbody>
</table>
### Undergraduate University Prizes (continued)

<table>
<thead>
<tr>
<th>Donor/Name of Prize</th>
<th>Value $</th>
<th>Awarded for</th>
</tr>
</thead>
<tbody>
<tr>
<td>School of Physics (continued)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Head of School's in Physics</td>
<td>50.00</td>
<td>Best Year 4 Honours Thesis in Physics in the Bachelor of Science degree course</td>
</tr>
<tr>
<td>Laser Electronics</td>
<td>200.00</td>
<td>Excellence in the laboratory work of 1.763 Laser and Optical Technology Laboratory 1</td>
</tr>
<tr>
<td>Monaro Research</td>
<td>200.00</td>
<td>Excellence in the subject 1.713 Advanced Laser and Optical Applications</td>
</tr>
<tr>
<td>Parameters in Electronics</td>
<td>200.00</td>
<td>Excellence in 1.133 Electronics, or, if no student of sufficient merit 1.043 Experimental Physics A and 1.763 Laser and Optical Technology Laboratory 1</td>
</tr>
<tr>
<td>Physics Staff for Physics 1</td>
<td>100.00</td>
<td>Best performance in 1.001 Physics 1</td>
</tr>
<tr>
<td>Physics Staff for Physics 2</td>
<td>100.00</td>
<td>Highest aggregate in 1.002 Mechanics, Waves and Optics, 1.012 Electromagnetism and Thermal Physics, 1.022 Physics and 1.032 Modern Laboratory in the Bachelor of Science degree course</td>
</tr>
<tr>
<td>Physics Staff for Physics Honours</td>
<td>100.00</td>
<td>Best performance in the Physics Honours Year of the Bachelor of Science degree course</td>
</tr>
<tr>
<td>Radiation Research</td>
<td>200.00</td>
<td>Excellence in the laboratory work in 1.773 Laser and Optical Technology Laboratory 2</td>
</tr>
<tr>
<td>School of Psychology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Australian Psychological Society</td>
<td>100.00</td>
<td>A Year 4 Psychology subject selected by Head of School</td>
</tr>
<tr>
<td>Milon Buneta</td>
<td>50.00</td>
<td>Best Psychology Year 2 performance by a student in the Bachelor of Science degree course in Psychology</td>
</tr>
<tr>
<td>Psychology Staff</td>
<td>80.00</td>
<td>Psychology Year 2</td>
</tr>
</tbody>
</table>

### Graduate University Prizes

The following table summarizes the graduate prizes awarded by the University.

<table>
<thead>
<tr>
<th>Donor/Name of Prize</th>
<th>Value $</th>
<th>Awarded for</th>
</tr>
</thead>
<tbody>
<tr>
<td>School of Biotechnology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mauri Foods</td>
<td>175.00</td>
<td>Best overall performance in the Master of Science (Biotechnology) degree course</td>
</tr>
<tr>
<td>School of Chemistry</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smith Kline and French</td>
<td>100.00</td>
<td>Best performance in the in Food and Drug Analysis graduate diploma course</td>
</tr>
<tr>
<td>Donor/Name of Prize</td>
<td>Value $</td>
<td>Awarded for</td>
</tr>
<tr>
<td>---------------------</td>
<td>---------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>Hydron Contact Lens</td>
<td></td>
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31.705G Advanced Contact Lens Theory and Practice
Faculty of Biological Sciences*

Staff

Comprises Schools of Chemistry, Mathematics, Optometry and Physics.

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Lecturer
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<table>
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</table>
The University of New South Wales Kensington Campus 1987

Theatres

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Rex Vowels Theatre F17
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Student Counseling and Research F15
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Student Records C22
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Surveying K17
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University Archives C22
University Press A28
University Union (Blockhouse) G6
Wool and Pastoral Sciences B8a
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For fuller details about the University — its organization, staff membership, description of disciplines, scholarships, prizes, and so on, you should consult the Calendar.

The Calendar and Handbooks also contain a summary list of higher degrees as well as the conditions for their award applicable to each volume.

For detailed information about courses, subjects and requirements of a particular faculty you should consult the relevant Faculty Handbook.

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The Calendar and Handbooks are available from the Cashier's Office.

The Calendar costs $6.00 (plus postage $1.40, interstate $1.80).

The Handbooks vary in cost: Applied Science, Architecture, Arts, Commerce, Engineering, Professional Studies, and Sciences are $4.00. Postage is $1.40 in each case ($1.80 interstate). Law, Medicine and AGSM are $3.00. Postage is $1.00 in each case ($1.10 interstate).

A set of books is $43.00. Postage is $3.00 ($7.00 interstate).

The General Studies Handbook is free. Postage is $1.00 ($1.10 interstate).